Carbon Mineralization by Aqueous Precipitation for Beneficial Use of CO_2 from Flue Gas

Phase I
Final Topical Report

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Principal Authors : Brent Constantz, Ph.D, Randy Seeker, Ph.D., and Martin Devenney, Ph.D.
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Submitted by:
Calera Corporation
14600 Winchester Blvd.
Los Gatos, CA 95032

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ABSTRACT

Calera's innovative Mineralization via Aqueous Precipitation (MAP) technology for the capture and conversion of CO_2 to useful materials for use in the built environment was further developed and proven in the Phase 1 Department of Energy Grant. The process was scaled to 300 gallon batch reactors and subsequently to Pilot Plant scale for the continuous production of product with the production of reactive calcium carbonate material that was evaluated as a supplementary cementitious material (SCM). The Calera SCM™ was evaluated as a 20% replacement for ordinary portland cement and demonstrated to meet the industry specification ASTM 1157 which is a standard performance specification for hydraulic cement. The performance of the 20% replacement material was comparable to the 100% ordinary portland cement control in terms of compressive strength and workability as measured by a variety of ASTM standard tests.

In addition to the performance metrics, detailed characterization of the Calera SCM was performed using advanced analytical techniques to better understand the material interaction with the phases of ordinary portland cement. X-ray synchrotron diffraction studies at the Advanced Photon Source in Argonne National Lab confirmed the presence of an amorphous phase(s) in addition to the crystalline calcium carbonate phases in the reactive carbonate material. The presence of carboaluminate phases as a result of the interaction of the reactive carbonate materials with ordinary portland cement was also confirmed.

A Life Cycle Assessment was completed for several cases based on different Calera process configurations and compared against the life cycle of ordinary portland cement.

In addition to the materials development efforts, the Calera technology for the production of product using an innovative building materials demonstration plant was developed beyond conceptual engineering to a detailed design with a construction schedule and cost estimate.

TABLE OF CONTENTS

0. EXECUTIVE SUMMARY

Calera Corporation has developed an innovative process that captures massive volumes of CO_2 and other emissions, such as SOx, acid gases, and mercury, and converts these emissions into sustainable building materials and water that meet or exceed industry performance standards.
This Calera process has many attributes which make it highly attractive to the power industry in particular where they see the value in capturing their CO_2 and criteria control pollutants. These attributes include lower capital expenditure and energy use than competitive CCS technologies, the potential ability to mitigate criteria pollutants, ability to utilize coal fly ash, bottom ash and boiler slag, and production of a material which will be sold and used in the construction industry instead of stored. During Phase I of the DOE Beneficial Use Grant, the production of Calera SCM™ (Supplementary Cementitious Material – a material utilized in the building material industry) was scaled from 100 gallon laboratory scale batch reactors to 300 gallon batch reactors in Calera's Moss Landing, CA Facility. The large batch-scale process produced approximately 18 lbs. of dried reactive carbonate material per run. Once the process was optimized, the reproducibility of the process was confirmed with three batch production runs producing similar material. Detailed analytical characterization was performed showing that the dry powder produced is reactive calcium carbonate composed mainly of polymorphs such as calcite (the main component of limestone), vaterite, and amorphous calcium carbonate. This product typically contains up to 40% CO_2 as determined by inorganic carbon coulometry. The origin of this CO_2 can be traced back to its source by following the carbon isotope fractionation between 12C ("light carbon") and 13C ("heavy carbon"). Coal and natural gas are composed of predominantly light carbon. Thus, power plant CO_2 emissions have relatively low δ13C values. This isotopically light carbon signature is transferred to the produced carbonate minerals thus confirming the origin of the fixed CO_2 to be from a fossil fuel source.

The performance of the Calera SCM™ was evaluated as a partial replacement of portland cement (OPC). In addition, the performance was compared to different Fly Ash SCMs and to ground calcium carbonate. The compressive strength performance of the Calera SCM™ when used as a 20% replacement is comparable to the 100% OPC reference material. Fly Ash, which is one of the most commonly used SCMs, is known to exhibit lower early strengths (one and seven days), this manifests as a longer hardening time for concrete using Fly Ash and has an economic penalty for large construction projects as the project moves slower. The Calera SCM™ does not show this decrease in early strength and is clearly an advantage over Fly Ash. A variety of other performance characteristics were also evaluated in mortar paste according to various ASTM methods and tests. Setting time measurements indicated the partial replacement of portland cement by Calera SCM™ had no impact on the start of setting. Flow measurements on the same materials indicated comparable rheological behavior as the reference portland cement mortars. Testing in Calera laboratories confirms that the Calera SCM™ as a 20% replacement in portland cement meets the standard performance specification for hydraulic cement as defined in ASTM C1157.

Work commenced in DOE Phase 1 with Professor Paulo Monteiro at UC Berkeley to more fully characterize the Calera SCM™ and better understand the nature of the interaction of the material with OPC. Prof. Monteiro is a world-leading expert on the microstructure of concrete.
The first generation reactive carbonate materials described above enables the replacement of 20% portland cement without sacrificing performance. Work will continue on the development of more reactive carbonate materials that will enable replacement levels of OPC beyond 20%. The reactive carbonate materials will also be the basis for an aggregate product. Concrete products contain up to 75

weight percent of coarse and fine aggregates which are produced today from open pit mining of limestone and other materials. Calera reactive carbonates are hydraulic cements in that in the presence of water under controlled conditions, the reactive material converts to a more stable material through a process that yields a hardened cemented network. Calera will exploit this self-cementing behavior to make a synthetic aggregate that contains 100% carbonate with properties comparable to traditional aggregates.

A Life Cycle Assessment was completed for several cases based on different Calera process configurations and compared against the life cycle of ordinary portland cement. The results showed a favorable position for the proposed demo plant.

1. INTRODUCTION

The objective is to demonstrate the innovative process to directly mineralize CO_2 in flue gas to carbonates and convert them to materials directly useable in the construction industry. The Calera process has several attributes which make it highly attractive to the power industry. These attributes include lower capital expenditure and parasitic load than competitive CCS technologies, potential ability to mitigate criteria pollutants, ability to utilize coal fly ash, bottom ash and boiler slag (both stored and as-generated by combustion), and production of a material which will be sold and used in the construction industry instead of stored.

This objective will be achieved by designing, constructing, and operating an innovative building materials demonstration plant at Calera's facility in Moss Landing, CA to produce commercially viable building material products. Calera has a 10 MWe CO_2 absorption facility operational at Moss Landing, CA, which captures and converts CO_2 to carbonate minerals. In Phase I of the Department of Energy grant the Calera technology was developed beyond conceptual engineering to a detailed design with a construction schedule and cost estimate. For Phase II, the Calera team will add a new building material production system that has been tested at smaller scales, to the existing 10MWe absorption facility. At this scale, Calera can evaluate and demonstrate the feasibility of the beneficial use operations at commercial-scale.

2. MATERIAL DEFINITION - SCM

During Phase I of the DOE Beneficial Use Grant, Materials Development focused on the optimization and scale-up of Calera's Mineralization by Aqueous Precipitation (MAP) process to produce a reactive carbonate material (RCM) composed of a mixture of calcium carbonate polymorphs containing captured CO_2 for evaluation as a supplementary cementitious material (SCM). SCM is often used as a partial replacement of ordinary portland cement (OPC) and is either blended with cement or added to the concrete mix as part of the total cementitious system. A SCM is defined as being hydraulic, which means it reacts to form a cementitious material in the presence of water, or pozzolanic, which means it reacts with the products of the cement hydration (i.e., calcium hydroxide). Many SCMs, such as Fly Ash, are the by-product of industrial processes and their use is desirable from an energy conservation perspective, in addition to the SCM often improving certain concrete properties. The manufacture of one ton of portland cement results in the release of approximately one ton of CO_2; therefore partial replacement of portland cement by materials with a carbon neutral footprint, such as a combustion of coal by-product, is desirable. Calera SCM^{TM} is a carbon negative material in that every ton of carbonate product produced using the MAP process sequesters approximately half a ton of CO_2. As a result, on a comparable replacement basis for portland cement, Calera SCM^{TM} reduces the carbon footprint of concrete by approximately an additional 50% compared to traditional SCM materials.

In Phase I, the MAP process for the production of Calera SCM^{TM} was scaled from 100 gallon laboratory scale batch reactors to 300 gallon batch reactors in Calera's Moss Landing Facility. Processes were developed to dewater and further wash the precipitated solids to remove chloride ions such that the final chloride level was below 0.1 wt%, and either dried using low-temperature ovens or spray dried to produce a 99.5% solids product. The large batch-scale process produced approximately 18 lbs. of dried RCM per run. Once the process was optimized, the reproducibility of the process was confirmed with three batch production runs producing similar material. Detailed analytical characterization was performed including X-ray Diffraction, FT-IR, and Raman to determine the structural characteristics of

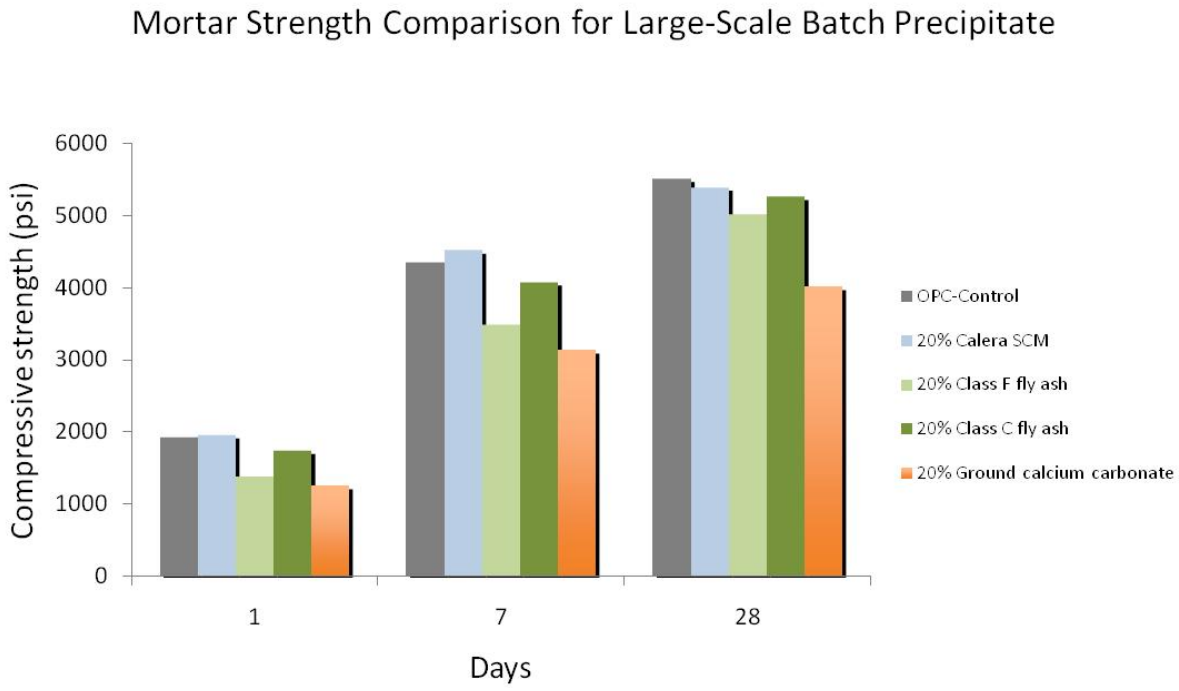
the reactive carbonate material and Scanning Electron Microscopy (SEM) to evaluate particle size and morphology.

The current generation Calera SCM™ produced using the Calera MAP process is a dry powder of reactive calcium carbonate composed mainly of polymorphs such as calcite (the main component of limestone), vaterite, and amorphous calcium carbonate. The product obtained from the MAP process typically contains up to 40% CO_2 as determined by inorganic carbon coulometry. The origin of this CO_2 can be traced back to its source by following the carbon isotope fractionation between 12C ("light carbon") and 13C ("heavy carbon"). Coal and natural gas are composed of predominantly light carbon. Thus, power plant CO_2 emissions have relatively low δ13C values. This isotopically light carbon signature is transferred to the produced carbonate minerals thus confirming the origin of the fixed CO_2 to be from a fossil fuel source.

3. MATERIAL PERFORMANCE

The performance of the Calera SCM™ was evaluated as a partial replacement of portland cement. Compressive strength was measured in mortar cubes for up to 20% replacement of portland cement and compared to reference 100% portland cement mortars. In addition, the performance was compared to different Fly Ash SCMs and to ground calcium carbonate which is known to act as an inert filler. Mortar samples were prepared following ASTM C305 mixing procedure and compressive strength measured according to ASTM C109 at 1 day, 7 days, and 28 days. Mortar samples are made from a mix of OPC, water, sand and SCM as a partial replacement of the OPC. The results are presented in Figure 1. The compressive strength performance of the Calera SCM™ when used as a 20% replacement is comparable to the 100% OPC reference material. Fly Ash, which is one of the most commonly used SCMs, is known to exhibit lower early strengths (one and seven days) which is clearly seen in Figure 1. This manifests as a longer hardening time for concrete using Fly Ash and has an economic penalty for large construction projects as the project moves slower. The Calera SCM™ does not show this decrease in early strength and is clearly an advantage over Fly Ash.

Figure 3.1 - Mortar strength for 2" mortar cubes with (i) reference sample OPC-Control (100% OPC), (ii) 80%OPC/20% Calera SCM™, (iii) 80% OPC, 20% Class F Fly Ash, (iv) 80%OPC/20% Class C Fly Ash and (v) 80% OPC/20% Ground calcium carbonate



A variety of other performance characteristics were also evaluated in mortar paste according to various ASTM methods and tests. Setting time measurements indicated the partial replacement of portland cement by Calera SCM™ had no impact on the start of setting. Flow measurements on the same materials indicated comparable rheological behavior as the reference portland cement mortars. Testing in Calera laboratories confirms that the Calera SCM™ as a 20% replacement in portland cement meets the standard performance specification for hydraulic cement as defined in ASTM C1157.

The MAP process for the production of Calera SCM™ was also transferred to Calera's Pilot Plant in an effort to demonstrate the continuous production of product. The Calera Pilot Plant is coupled with a coal-fired boiler simulator (CFBS), 0.3MW equivalent, which produces a CO_2-containing flue gas equivalent to that produced in a coal-fired power plant. The continuous production of reactive carbonate material was demonstrated through precipitation, dewatering and drying. Detailed characterization and material performance is currently in progress. The process will be subsequently scaled-up during Phase II to the Calera Demo Plant at Moss Landing which is a 10MW equivalent plant which captures CO_2 from a slip stream of the flue gas from the Dynegy natural gas-fired power plant located next to Calera's Moss Landing facility. Assuming 80% CO_2 capture, the Demo plant will be capable of producing approximately 100 tons of product per day.

Continuously produced Calera SCM™ will also be sent to a third party laboratory for external validation. This independent laboratory will confirm that a blended cement with 20% replacement of OPC with Calera SCM™ meets the standard performance specification for hydraulic cement according to industry standard ASTM C1157. Work commenced in DOE Phase 1 with Professor Paulo Monteiro at UC Berkeley to more fully characterize the Calera SCM™ and better understand the nature of the interaction of the material with OPC. Prof. Monteiro is a world-leading expert on the microstructure of concrete. Structural data has been collected from materials on the Advanced Light Source at Lawrence Berkeley

Laboratories and on the Advanced Photon Source at Argonne National Laboratory. Data analysis giving additional information on the nature of the reactivity of the Calera SCM™ as well as how it interacts with the various different phases of OPC is described in the subsequent sections below.

The first generation reactive carbonate materials described above enables the replacement of 20% portland cement without sacrificing performance. Work will continue on the development of more reactive carbonate materials that will enable replacement levels of OPC beyond 20%. The reactive carbonate materials will also be the basis for an aggregate product. Concrete products contain up to 75 weight percent of coarse and fine aggregates which are produced today from open pit mining of limestone and other materials. Calera reactive carbonates are hydraulic cements in that in the presence of water under controlled conditions, the reactive material converts to a more stable material through a process that yields a hardened cemented network. Calera will exploit this self-cementing behavior to make a synthetic aggregate that contains 100% carbonate with properties comparable to traditional aggregates.

4. MATERIAL ANALYSIS

Comprehensive analysis was done on two carbonate powders and two hydrated cements using three different methods. Microstructures and surface topography of each sample were first examined with a Scanning Electron Microscope (SEM). EDAX Energy-Dispersive Spectroscopy (EDS) capabilities of SEM were used to identify elemental composition and volume percentages. Two different x-ray diffraction techniques, conventional x-ray powder diffraction and x-ray synchrotron diffraction, were used to find crystal structure, crystallite size and relative phase abundance. Data obtained via x-ray diffraction is processed with Rietveld refinement (Rietveld 1969) as implemented in the software program MAUD (Material Analysis Using Diffraction) (Lutterotti et al. 1997). Rietveld refinement uses the least-squared method to minimize the difference between the experimental diffraction data and the calculated crystal structure model. The calculated model is determined by several parameters such as instrumental parameters, scattering background, crystal structure, microstructure, weight fraction of each phase and preferred orientation. This technique can successfully resolve overlapping peaks of multiphase samples. Combining SEM and x-ray diffraction methods provides thorough analysis of cement composition and microstructure, and is a crucial step to improving cement.

Four cement samples were analyzed. Two were fine-grained, white powders of carbonate materials (Sample ID: P01165-006 and MC048-09-006), and the other two were dry pieces of hydrated cement paste that had been cured for 7 days (Sample ID: SNG0035-010 and SNG0033-010). Different approaches were employed to identify phase composition and quantitatively analyze phase volume and crystallite size. By combining data obtained from the Scanning Electron Microscope (SEM) and x-ray diffraction techniques, accurate identification of phases was accomplished.

4.1 Method of Analysis

4.1.1 Scanning Electron Microscope (SEM)

A small amount of each sample was placed on carbon tape and examined with a Zeiss Evo MA10 low vacuum SEM equipped with an EDAX Energy-Dispersive Spectroscopy (EDS) system. The SEM was operated with an accelerating voltage of 25 kV, a probe current of 5 nA, and a variable pressure of 20 Pa to collect images. A backscattered (BE) SEM image shows different elemental

composition and microstructures of samples. The brightness variation of the BE image, ranging from low (black) to high (white) is due to the contrast in atomic number, with high atomic numbers showing as white. EDAX Genesis Imaging/Mapping software was used to collect compositional maps for Ca, Mg, C, O, Si, S and other elements, suggesting the abundance of calcite ($CaCO_3$), vaterite ($CaCO_3$), and portlandite ($Ca(OH)_2$) and some other Ca- and Mg-containing minerals. Phase abundance was quantitatively analyzed by selecting different spots on the sample (Tables 4.1-4.4).

4.1.2 X-ray Powder Diffraction (XRD)

X-ray powder diffraction was performed on samples P01165-006, SNG0035-010, and MC048-09-006 using a PANalytical X'Pert PRO Materials Research Diffractometer. X-ray powder diffraction (XRD) requires grinding a substantial amount of sample into a fine powder in order to get accurate data. Because of the limited amount of SNG0033-010 sample available, it was not possible to perform XRD on it.

The white powder samples P01165-006 and MC048-09-006 were placed on a thin slide made from a single crystal of quartz. Several chunks of SNG0035-010 were ground into a fine powder and placed on a similar slide. All three samples were loaded into the sample holder, then moved by a robotic arm into position between the x-ray gun and detector. Data was collected for each sample using an accelerating voltage of 40kV, a current of 10mA and a cobalt target which produces x-rays with wavelength λ=1.789 Å. Each sample was scanned continuously from 3° to 100° with a total scan time of approximately 56 minutes for each sample. The X'Celerator detector collects and translates diffracted x-ray intensities and angles into the software program X'pert Data Collector; data can be viewed in more detail in X'pert Data Viewer (Fig. 4.13). Information about diffraction angles (2θ) and intensities were analyzed using the Rietveld method as implemented in the program MAUD (Lutterotti et al. 1997).

4.1.3 X-ray Synchrotron Diffraction

The synchrotron diffraction measurements were done at beamline BESSRC 11-ID-C of the Advance Photon Source (APS) of Argonne National Laboratory. The samples were ground into a very fine-grained powder and stored inside a thin kapton tube approximately 1.5 mm in diameter. The x-ray beam with a wavelength of 0.1079 Å was used to collect data on a mar345 image plate detector (3450 x 3450 pixels) positioned about 2 meters from the sample. Each sample was exposed for 50 seconds, and images were taken for a 2θ range from 0-7.5° (Q range of 0 - 7.5° $\underline{\text{Å}^{-1}}$). The high x-ray energy provided high penetration with only minor absorption.

The sample-to-detector distance, image plate tilt angles, beam center, and Pseudo-Voigt instrumental functions were calibrated using a CeO_2 standard. The diffraction images were then integrated from 0° to 360° azimuth over 10° intervals to produce 36 spectra. Note that we express spectra as the function $Q=2\pi/d$ rather than d-spacing, where everything becomes compressed towards small spacings, or 2θ, which depends on wavelength. Using Q to express interplanar spacing allows the comparison of the spectra taken with XRD and synchrotron, which use different wavelengths. Both XRD and synchrotron diffraction spectra were processed with the Rietveld method as implemented in the software MAUD (Lutterotti et al. 1997). Crystallographic structures (CIF files) were required to obtain phase parameters such as cell

parameters and volume. Calcite* (Maslen et al 1993), vaterite* (Kamhi 1963), portlandite* (Nagai et al 2000), ettringite* (Moore and Taylor 1970), brownmillerite* (Bertaut et al 1959), monocarboaluminate* (Francois et al. 1998), C_2S* (Tsurumi et al. 1994), C_3S* (Bonaccorsi 2004) (*downloaded from the Crystallography Open Database (http://www.crystallography.net/search.html) were used. The peak shapes and widths are governed by microstructural parameters and thus were modeled by refining isotropic crystallite size and microstrain. In particular, the refinement of the atomic structure and nanostructure was performed on sample P01165-006 while quantitative analysis was performed on samples SNG0035-010, SNG0033-010, and MC048-09-006.

4.2 Results

In general, the identification of mineral phases in each sample is based on the elemental composition found with the SEM and the crystal structure found by Rietveld refinement of data collected via x-ray diffraction. The likeliness that the mineral is a component of cement was also taken into account.

4.2.1 Sample P01165-006

This sample is a fine-grained, white crystalline sample. Powder grains vary in size and elemental composition as observed from backscattering electron (BE) SEM images and EDS chemical maps (Fig. 4.1-4.2). The grain size varies greatly and ranges from roughly 50 to 100 µm. The majority of particles are irregularly shape. In quantitative phase analysis, at least six elements are identified within the sample (Fig. 4.2). The major elements are O (~44wt%), C (~22wt%), Ca (~17wt%) and Mg (~10wt%) with a trace amount of Al (~2wt%) and Na (~1wt%) (Table 4.1, Fig. 4.2).

Table 4.1: A summary of EDS spot analysis for phase abundances.

Element	Ca	C	O	Na	Mg	Al	Si	S	Cl	Total
Spot 1	25.41	17.19	43.65	1.42	7.20	3.36	0.11	0.61	1.05	100.00
Spot 2	6.82	14.04	54.66	1.10	20.63	1.51	0.53	0.37	0.34	100.00
Spot 3	11.35	31.45	43.60	2.00	7.05	3.51	0.63	0.10	0.30	99.99
Spot 4	24.02	23.26	38.86	0.37	10.18	2.85	0.18	0.14	0.14	100.00
Spot 5	17.62	25.28	41.94	1.26	9.07	3.21	0.24	0.43	0.93	99.98
Ave.	*17.04*	*22.24*	*44.54*	*1.23*	*10.83*	*2.89*	*0.34*	*0.33*	*0.55*	

Figure 4.1: A backscattered SEM image of P01165-006 showing microstructures.

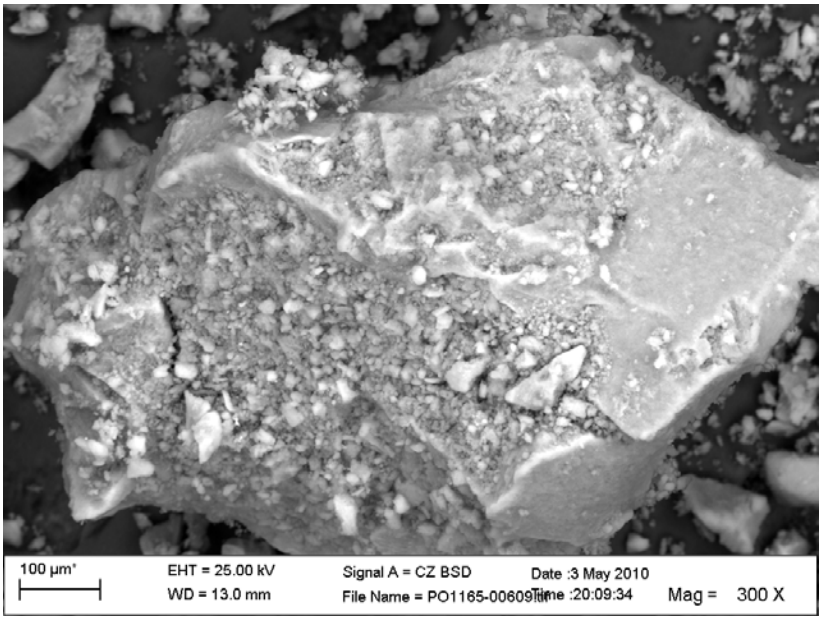
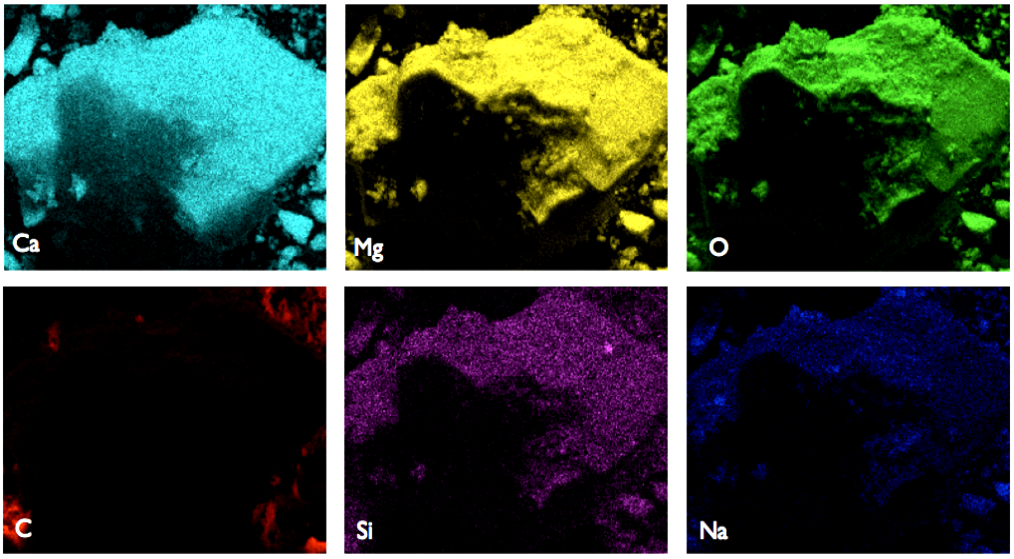


Figure 4.2: EDS chemical analysis of P01165-006 showing elemental distribution maps of Ca (aqua blue), Mg (yellow), O (green), C (red), Si (magenta), and Na (blue) (same area as in Fig.4.1).



The XRD spectrum shows a very broad peak at low 2θ angle indicating an amorphous phase. The synchrotron x-ray diffraction image shows diffuse intensity for the Debye rings which also indicates an amorphous structure (Fig. 4.3). Diffraction spectra for both XRD and synchrotron x-ray diffraction are illustrated with Q-space along the horizontal axis and intensity/count along the vertical axis (Fig. 4.4-4.5).

Figure 4.3: 2D diffraction image of P01165-006 as measured (left) and after subtraction of diffuse scattering from the polymeric sample holder (right).

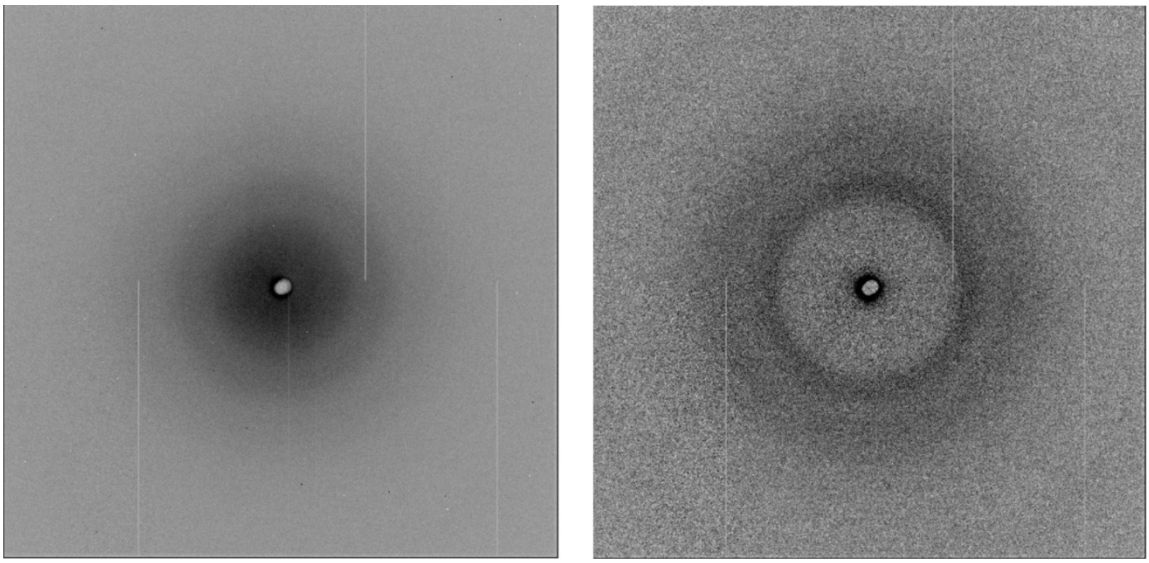


Figure 4.4: The calculated (solid line) peak profile compared to experimental data (dotted blue line) of sample P01165-066 taken with XRD.

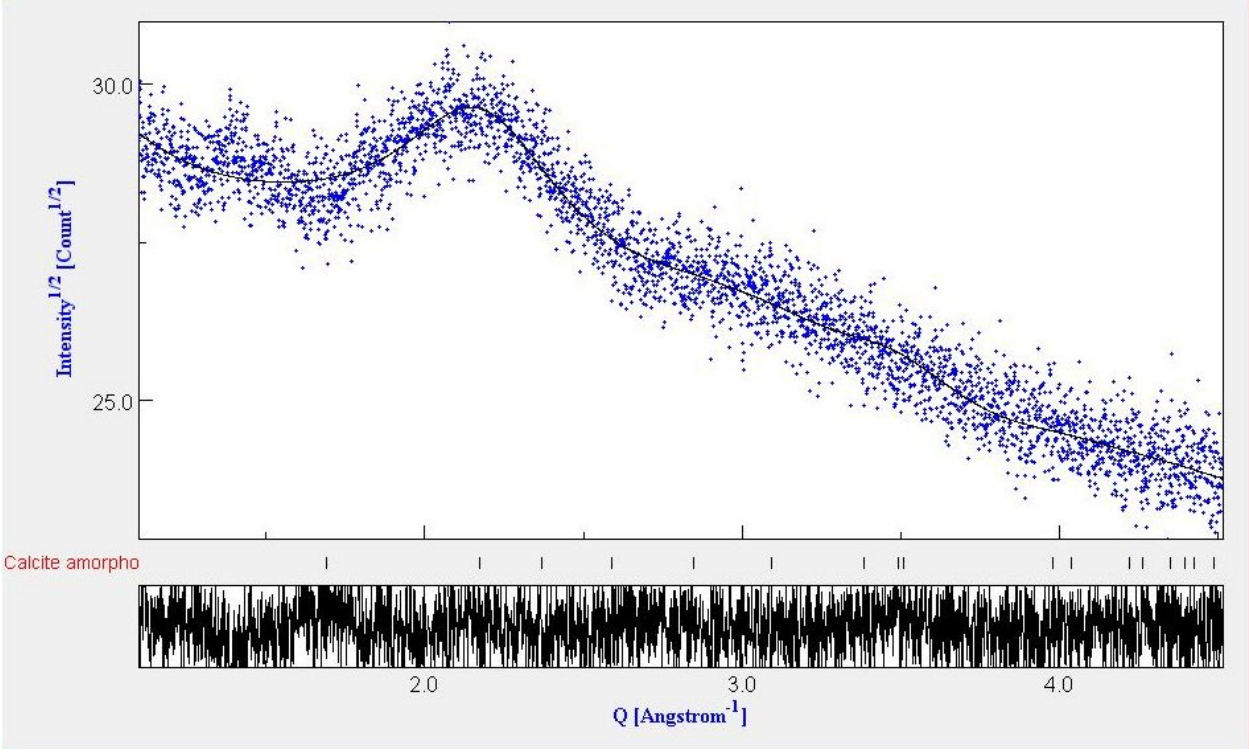
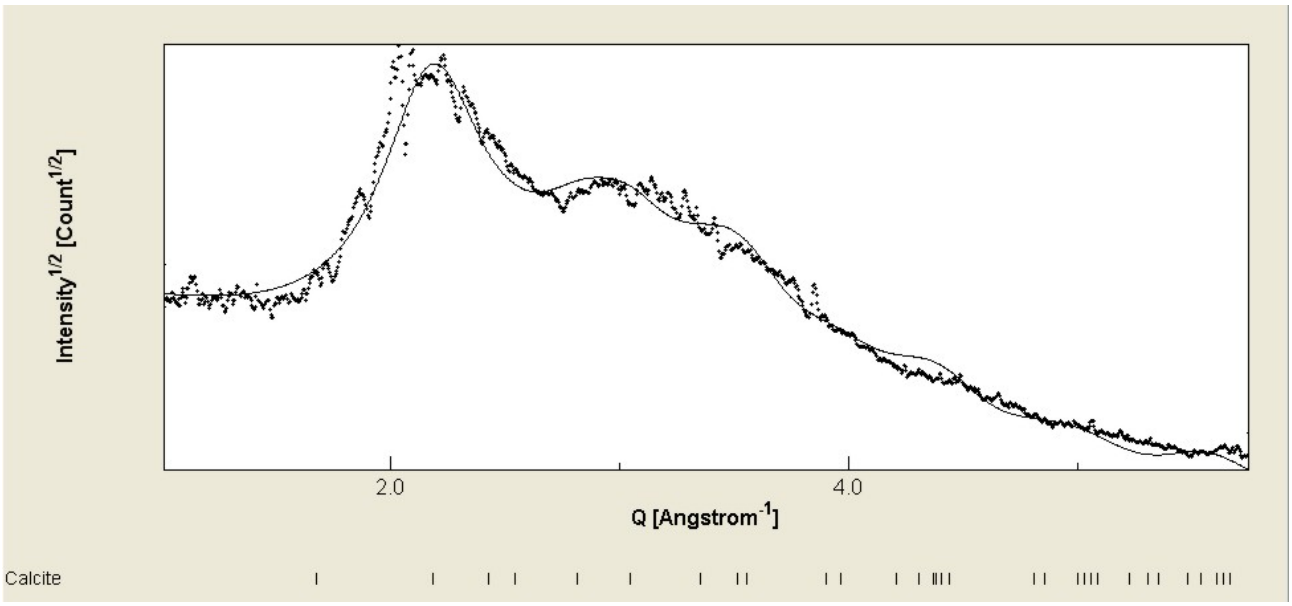


Figure 4.5: The calculated 2D peak profile (solid line) compared with experimental data (dotted blue line) for sample P01165-006 taken with synchrotron x-ray diffraction.



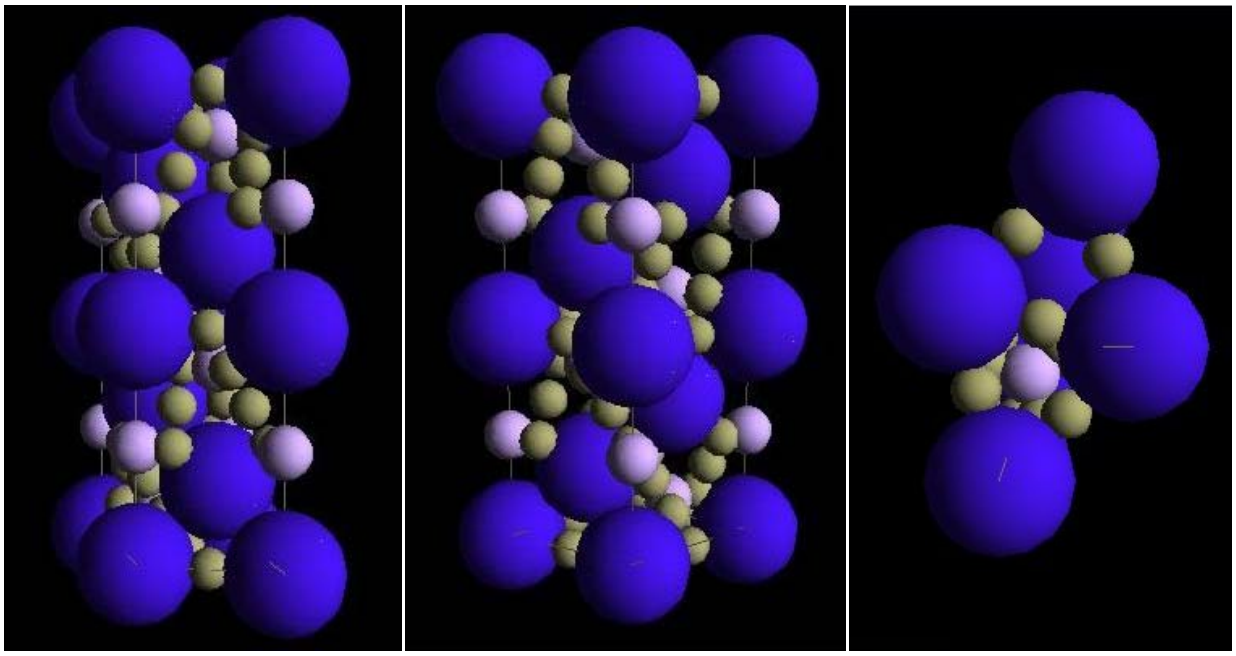
An arbitrary calcite amorphous phase was fit with Rietveld analysis for both x-ray spectra in order to find its approximate dimensions. The atomic structure of calcite was modified for a best fit by substituting magnesium atoms for calcium atoms and adding water molecules in interstitial positions (Fig. 4.5). In addition, the crystallite size and microstrain were refined in order to simulate the features of an amorphous structure. Cell parameters and crystallite size of the amorphous phase are shown below. The atomic structure is shown in Fig. 1.6.

	XRD	Synchrotron
Cell parameters	a = 4.89(3) Å	a = 4.940(3) Å
	c = 15.76(6) Å	c = 15.515(9) Å
Crystallite size	10(1) Å	12.45(2) Å

Dimensions are written to the last decimal point of accuracy, and numbers in parentheses give the uncertainty (for example, cell parameter *a* found from XRD data has length 4.89 Å with an error of 0.03 Å). Note that the dimension of the grain assuming an isotropic shape.

The table shows greater accuracy in synchrotron measurements than in XRD measurements due to the difference in wavelengths used in each experiment. Wavelengths are on the order of 1 to 2Å (1.79 Å for this experiment) for XRD and 0.1 to 0.5 (0.1079 Å for this experiment) for synchrotron x-ray diffraction. Shorter wavelengths translate to better counting statistics making synchrotron diffraction measurements more precise. Advantages of XRD and synchrotron x-ray diffraction are farther compared in the discussion section.

Figure 4.6: Two side views and a view down the c-axis (far right) of the calcite amorphous atomic structure. C atoms are shown as light purple spheres, Ca and Mg are the large royal blue spheres, and O is shown as smaller tan spheres.



Atom occupancy fractions and positions in space group R-3c:H which define the calcite amorphous phase are shown below.

Atom	Occupancy	x	y	z
Ca	0.51939636	0	0	0
C	0	0	0	0.24950005
O	0	0.25192013	0	0.25012937
Mg	0.48060364	0	0	0
Wat	0.3325632	0.5004601	.50046104	0

To obtain precise dimensions of a nanocrystalline or amorphous material, analysis using the pair distribution function (PDF), used to calculate the structure and bonding for a very short dimensional range, is necessary. PDF is a much larger undertaking, and out of scope for this project. However, it was indeterminable that an amorphous phase containing elements Ca, C, O, Mg, Na and Si (identified with SEM) was present. In addition, by refining a calcite amorphous phase to fit the P01165-006 spectra, a better structure was obtained to fit the amorphous phase in sample MC048-09-006 (see section 4.4).

4.2.2 Sample SNG0035-010

The sample is a solid gray piece of hydrated cement paste that is very fine-grained and homogenous (Fig.4.7). The surface is quite irregular and the grains are mostly less than 10 µm. Compositional maps indicate abundances of Ca (~39wt%), O (~37wt%), C (~11wt%), and Si (~8wt%) with a trace amount of Al and S (~1 wt%) (Table 4.2, Fig.4.8).

Table 4.2: A summary of EDS spot analysis for phase abundances.

Element	Ca	C	O	Na	Mg	Al	Si	S	Cl	Total

Spot 1	46.02	4.49	34.90	0.53	0.57	1.17	9.97	1.66	0.67	99.98
Spot 2	38.68	4.98	39.61	0.45	0.56	1.32	12.40	1.32	0.68	100.00
Spot 3	26.51	29.17	33.63	0.27	0.39	0.64	6.46	2.49	0.44	100.00
Spot 4	40.57	7.42	40.90	0.46	0.61	1.57	6.39	1.66	0.42	100.00
Spot 5	44.86	8.16	37.65	0.51	0.24	0.80	6.42	0.92	0.44	100.00
Ave.	*39.33*	*10.84*	*37.34*	*0.44*	*0.47*	*1.10*	*8.33*	*1.61*	*0.53*	

Figure 4.7: A backscattered SEM image of sample SNG0035-010 showing microstructures.

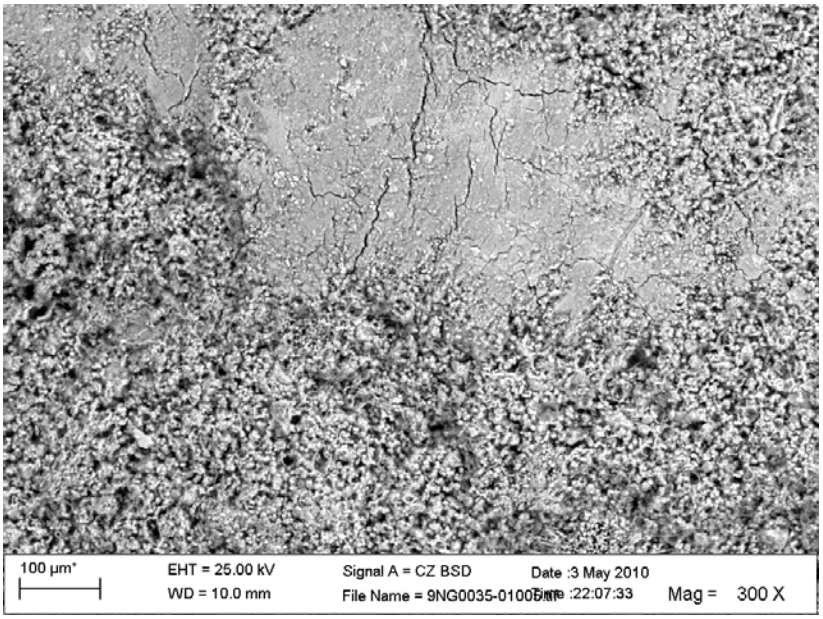
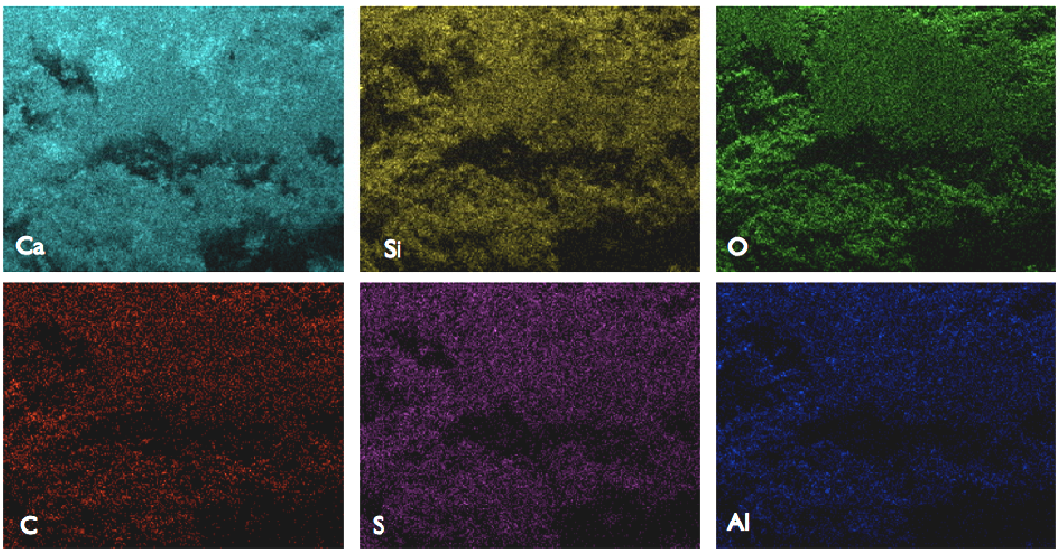


Figure 4.8: EDS chemical analysis of SNG0035-010 showing elemental distribution maps of Ca (aqua blue), Si (yellow), O (green), C (red), S (magenta), and Al (blue) (same area as in Fig.4.7).



Rietveld analysis of spectra obtained from both XRD and synchrotron methods indicate a composition of at least ten phases in the sample: portlandite, calcite, vaterite, ettringite, brownmillerite, monocarboaluminate, calcium silicate hydrate (CSH) I, CSH II, C_2S and C_3S. The Rietveld refinement fit is shown in Fig. 4.10 (XRD) and Fig. 4.11 (synchrotron). The calculated 2D peak profile (solid line) is compared with experimental data (dotted line), which indicates a close similarity indicative of an excellent fit, both in intensities as well as position of diffraction peaks. Note that many diffraction peaks contribute to these spectra representation.

Figure 4.9: Debye rings of SNG0035-010 taken with synchrotron x-ray diffraction.

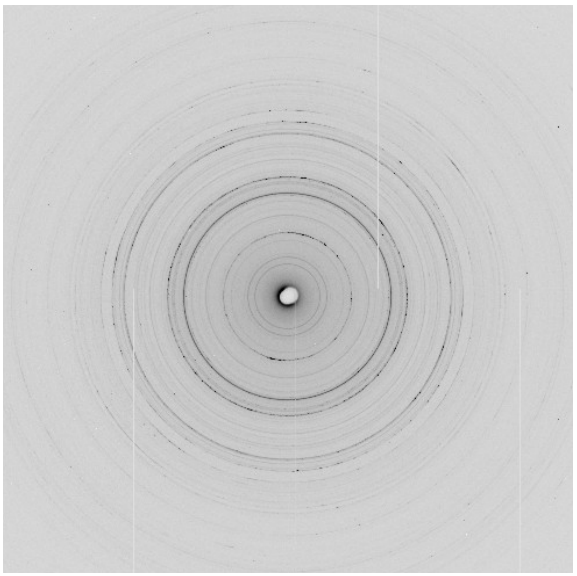


Figure 4.10: The calculated (solid line) peak profile compared with experimental data (dotted blue line) of sample SNG0035-010 taken with XRD.

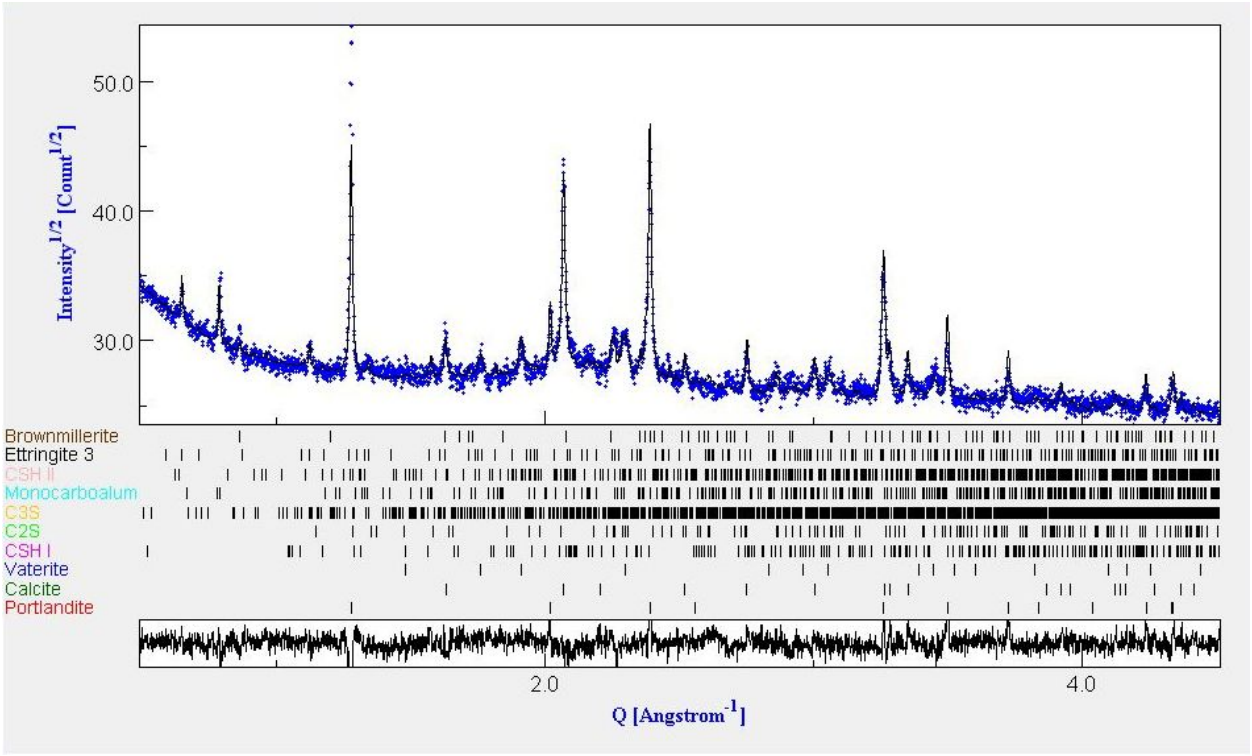
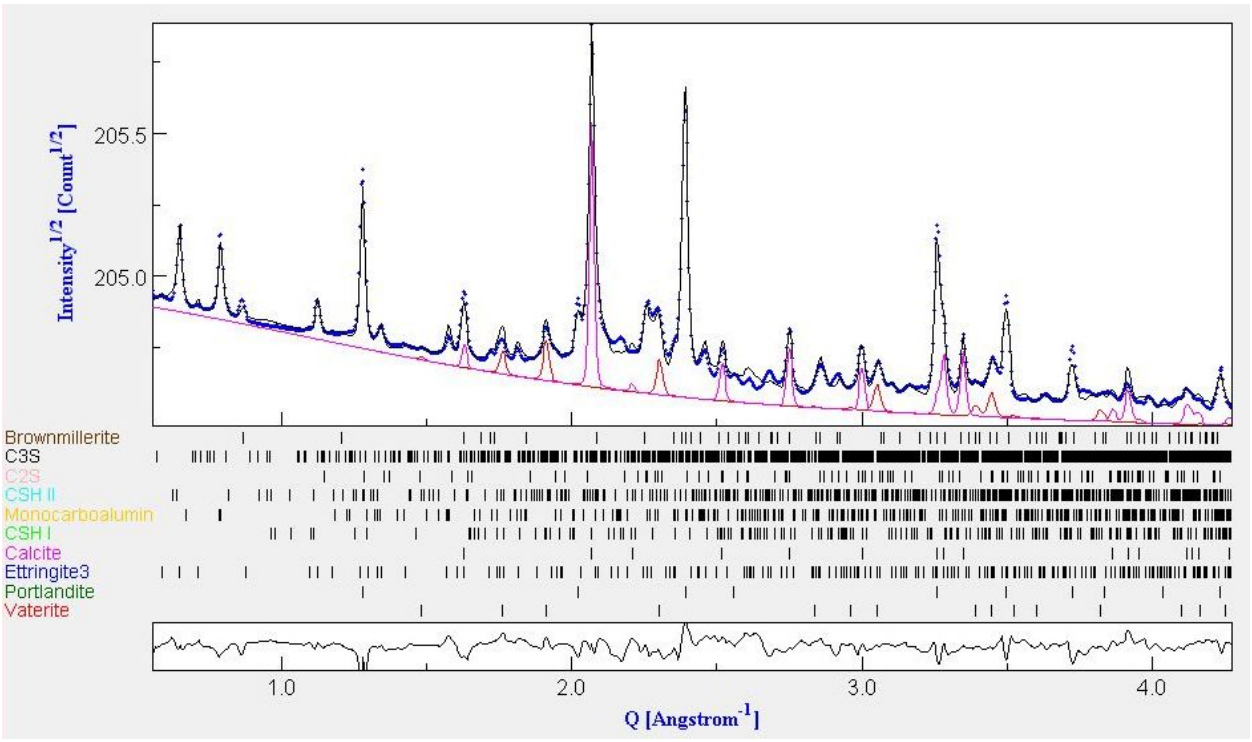


Figure 4.11: The calculated 2D peak profile (solid line) compared with experimental data (dotted blue line) of SNG0035-010 taken with synchrotron x-ray diffraction. Calcite peaks are shown in magenta, and vaterite peaks are shown in red.



Quantitative phase abundances and crystallite sizes are shown below.

Phase	XRD		Synchrotron	
	Volume fraction	Crystallite size (Å)	Volume fraction	Crystallite size (Å)
C_3S	0.013(5)	1011(630)	0.0170(5)	968(56)
C_2S	0.0454(4)	675(106)	0.0292(6)	962(40)
Portlandite	0.223(3)	746(15)	0.134(1)	3556(116)
CSH I	0.24(2)	47(4)	0.0303(4)	20.4(4)
CSH II	0.02(1)	727(473)	0.376(4)	162(2)
Calcite	0.167(4)	536(17)	0.136(1)	1827(47)
Vaterite	0.094(4)	323(8)	0.0538(9)	955(31)
Ettringite	0.107(9)	468(50)	0.112(1)	3542(155)
Monocarbolauminate	0.070(5)	530(56)	0.082(1)	1059(36)
Brownmillerite	0.037(3)	860(157)	0.0290(5)	984(34)

In order to refine the nanocrystalline CSH phase, two structures still at research level were used. The CSH I structure is an altered tobermorite 11 Å structure with average crystallite size 24 Å and Ca/Si = 0.75. The CSH II structure was refined from original jennite structure with average crystallite size 161 Å and Ca/Si = 1.7. Crystallite size was found assuming an isotropic shape.

4.2.3 Sample SNG0033-010

This is another dry, gray block of cement (Fig.4.12). The microstructure and surface topology are similar to that of SNG0035-010; however, the chemical composition is slightly different as Na and Cl are observed in addition (Fig.4.13). The major elements are Ca (~43wt%), O (~35wt%), Si (~9wt%), and C (~7wt%), with a trace amount of Al, S, Cl and Mg (~1 wt%) (Table 4.3, Fig. 4.13).

Table 4.3: A summary of EDS spot analysis for phase abundances.

Element	**Ca**	**C**	**O**	**Na**	**Mg**	**Al**	**Si**	**S**	**Cl**	**Total**
Spot 1	36.73	9.28	43.22	0.96	0.55	0.88	6.28	1.37	0.74	100.01
Spot 2	40.35	7.08	36.45	0.76	0.64	2.79	10.07	0.92	0.95	100.01
Spot 3	40.32	8.93	40.84	0.80	0.61	0.89	5.31	1.41	0.90	100.01
Spot 4	44.53	6.48	29.90	0.97	0.77	2.00	11.45	1.52	2.37	99.99
Spot 5	53.43	4.63	23.93	0.92	1.03	1.48	11.30	1.50	1.79	100.01
Ave.	*43.07*	*7.28*	*34.87*	*0.88*	*0.72*	*1.61*	*8.88*	*1.34*	*1.35*	

Figure 4.12: A backscattered SEM image of SNG0033-010 showing microstructures.

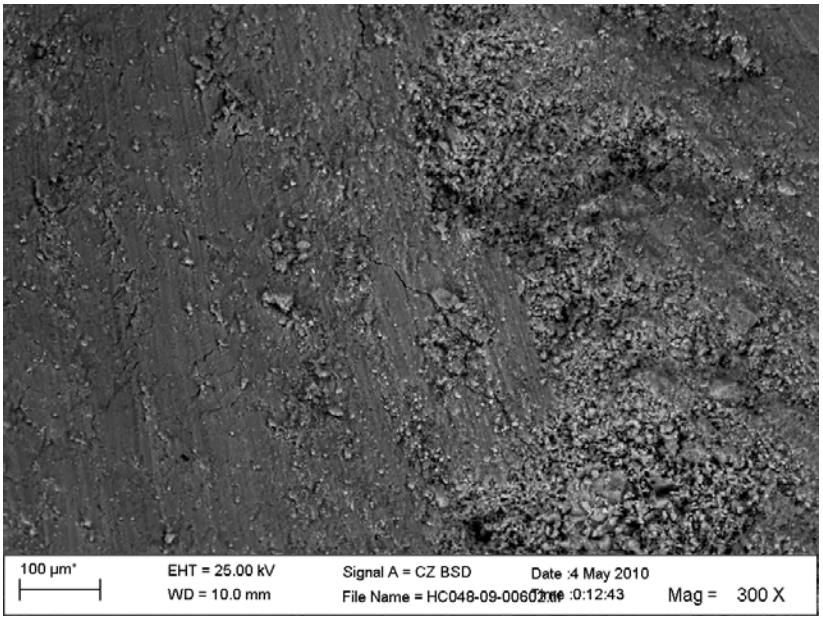
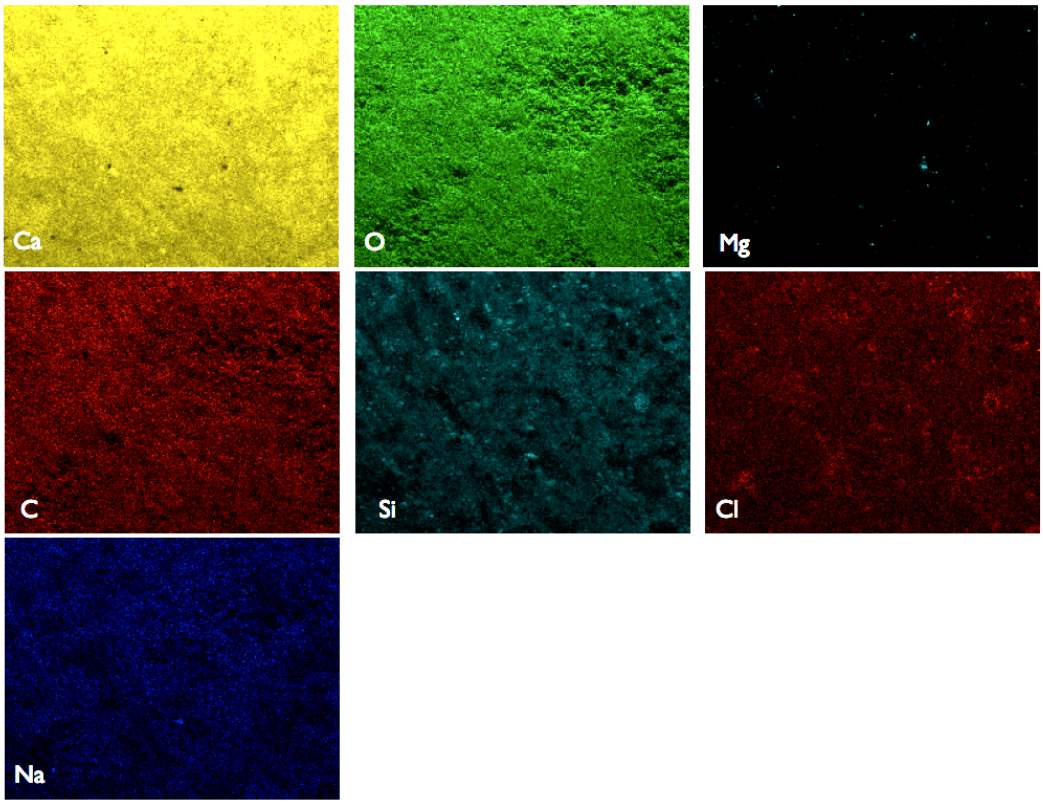


Figure 4.13: EDS chemical analysis of SNG0033-010 showing elemental distribution maps of Ca (yellow), O (green), Mg (aqua blue), C (red), Si (aqua blue), Cl (red) and Na (blue) (same area as in Fig.4.12).



Unfortunately, there was not enough sample to perform XRD. Only synchrotron x-ray diffraction was done on this sample and quantified for phase information such as volume

fractions and grain sizes (shown below). Sample SNG0033-010 contains the same ten phases found in sample SNG0035-010 but present in different proportions and having different crystallite sizes. Crystallite size was found assuming an isotropic shape.

Phase	Volume fraction	Crystallite size (Å)
C_3S	0.0170(4)	938(100)
C_2S	0.0292(6)	872(58)
Portlandite	0.134(1)	3502(318)
CSH I	0.0304(4)	20.4
CSH II	0.376(4)	68(2)
Calcite	0.136(1)	1850(162)
Vaterite	0.0538(9)	287(5)
Ettringite	0.112(1)	3530(530)
Monocarbolauminate	0.082(1)	961(71)
Brownmillerite	0.0290(5)	911(64)

The peak at Q = 2.3 $\underline{\text{Å}^{-1}}$ in both SNG0035-010 and SNG0033-010 diffraction patterns may be due to the CSH II phase. However, advanced modeling of CSH structure is needed in order to improve quantitative analysis on real concrete hydrated sample. A comparison between the modeled 2D peak profile (solid line) and the experimental data (dotted line) indicates an excellent fit, both in intensities as well as position of diffraction peaks (Fig. 4.15).

Figure 4.14: Debye rings of SNG0033-010 taken with synchrotron x-ray diffraction.

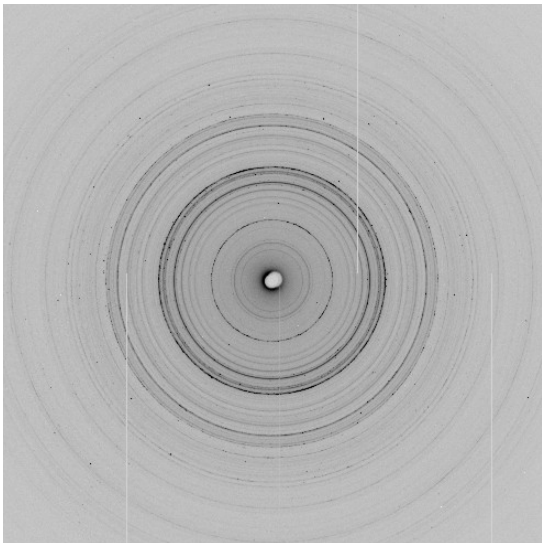
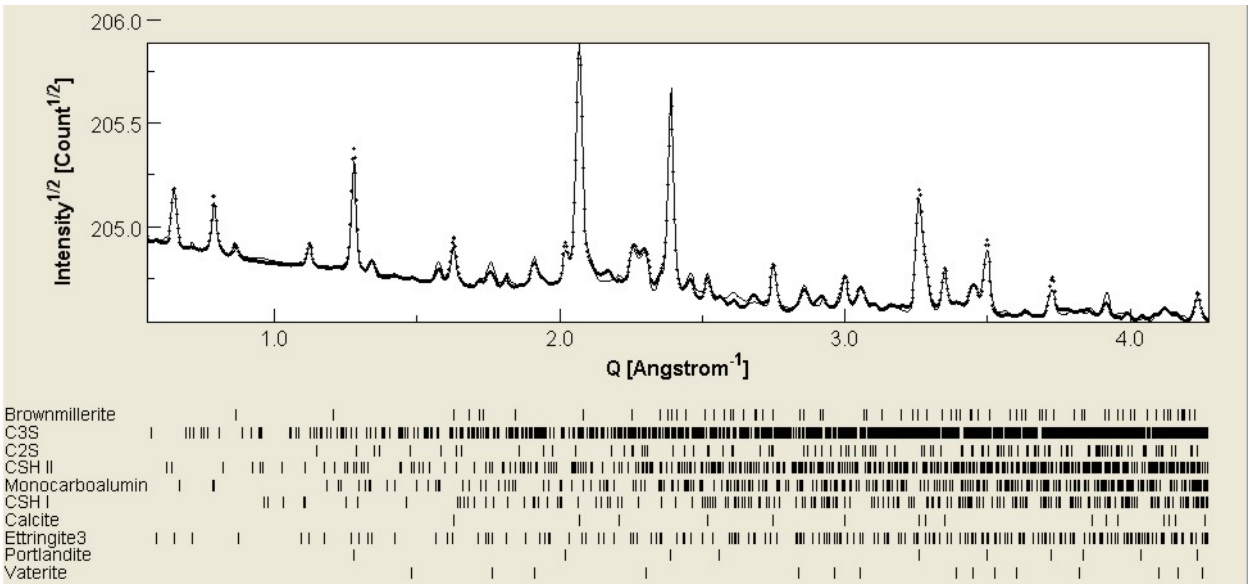


Figure 4.15: The calculated 2D peak profile (solid line) compared with experimental data (dotted blue line) of SNG0033-010 taken with synchrotron x-ray diffraction.



4.2.4 Sample MC048-09-006

The sample is a very fine powder of white spherical grains (Fig.4.16). The spheres are homogeneous, mostly less than 5 µm in size and clustered together. The main elements present are Ca (~54wt%), C (~17wt%), and O (~26wt%), with a trace amount of S (~1wt%) (Fig.4.17, Table 4.4).

Table 4.4: A summary of EDS spot analysis for phase abundances.

Element	Ca	C	O	Na	Mg	Al	Si	S	Cl	Total
Spot 1	60.29	12.81	25.65	0.00	0.00	0.00	0.00	0.69	0.56	100.00
Spot 2	34.33	24.07	36.69	0.93	0.82	0.46	0.92	1.14	0.64	100.00
Spot 3	49.41	21.93	27.66	0.00	0.00	0.39	0.00	0.61	0.00	100.00
Spot 4	61.37	15.29	21.78	0.00	0.00	0.00	0.00	0.73	0.82	99.99
Spot 5	64.34	12.62	20.14	0.00	0.00	0.13	0.43	1.41	0.93	100.00
Ave.	*53.95*	*17.34*	*26.38*	*0.19*	*0.16*	*0.20*	*0.27*	*0.92*	*0.59*	

Figure 4.16: A backscattered SEM image of MC048-09-006 showing microstructures.

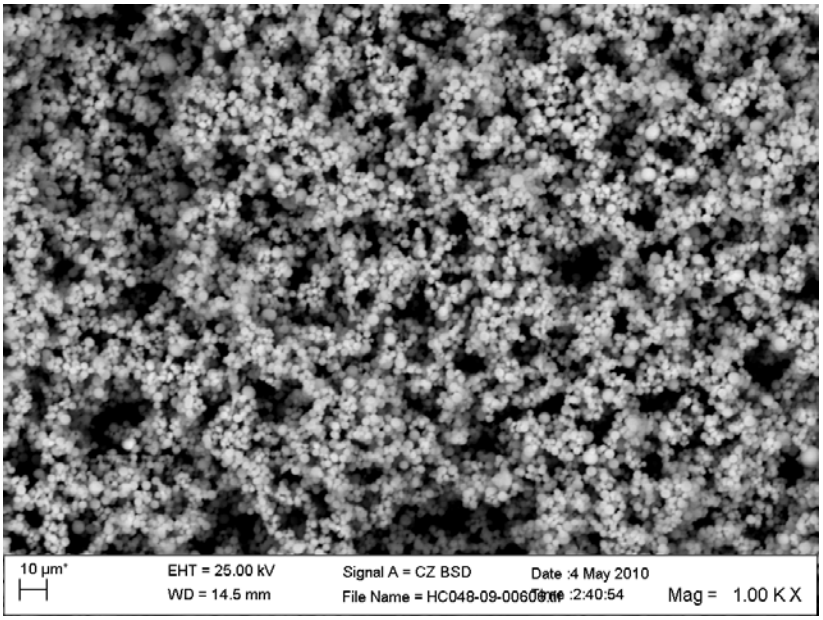
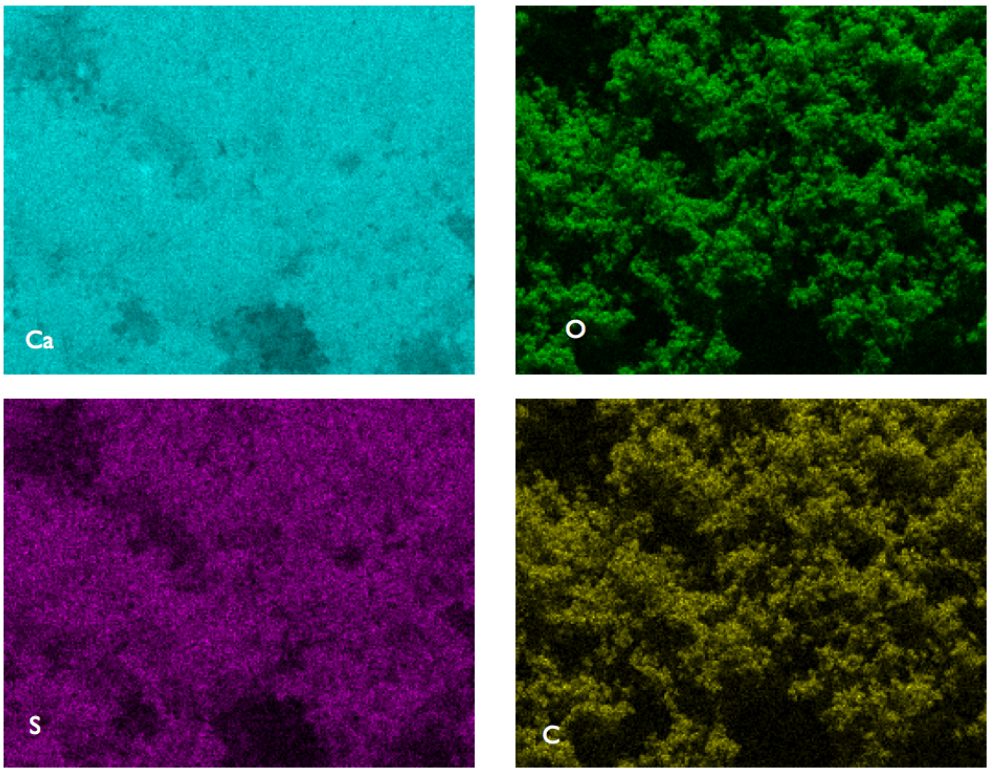


Figure 4.17: EDS chemical analysis of MC048-09-006 showing elemental distribution maps of Ca (aqua blue), O (green), S (magenta), and C (yellow) (same area as in Fig.4.16).



Rietveld refinement of both the XRD and synchrotron spectra identified three phases: vaterite, calcite and an amorphous phase. The amorphous phase used in analysis of sample P01165-006 was also used here to fit diffuse peaks observed at Q = 2.7 $\underline{Å^{-1}}$ and 4.1 $\underline{Å^{-1}}$. Note that, unlike sample P01165-006, the SEM data showed no Mg for this sample, and

substitution of Mg into Ca sites in the calcite amorphous phase is not relevant here. The addition of this phase improves quantitative analysis of the sample compared to the same analysis performed only with calcite and vaterite in crystalline form. Fig.4.19 and Fig. 4.20 display a calculated model plotted against experimental data.

Figure 4.18: Debye rings of MC048-09-006 taken with synchrotron x-ray diffraction.

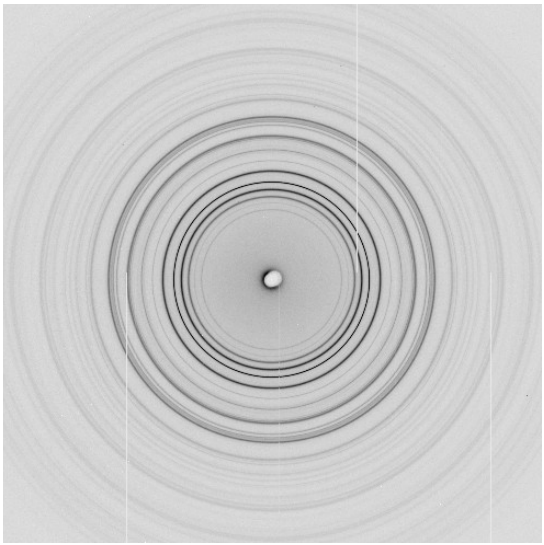


Figure 4.19: The calculated (solid line) peak profile compared with experimental data (dotted blue line) of MC048-09-006 taken with XRD.

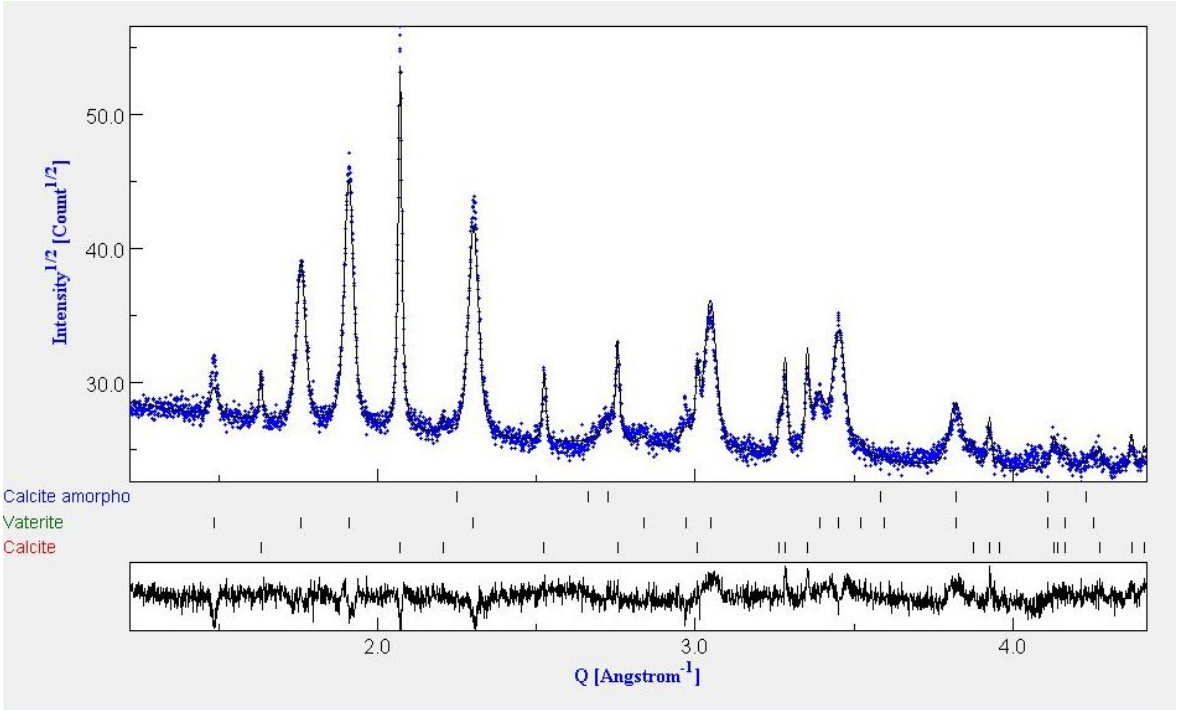
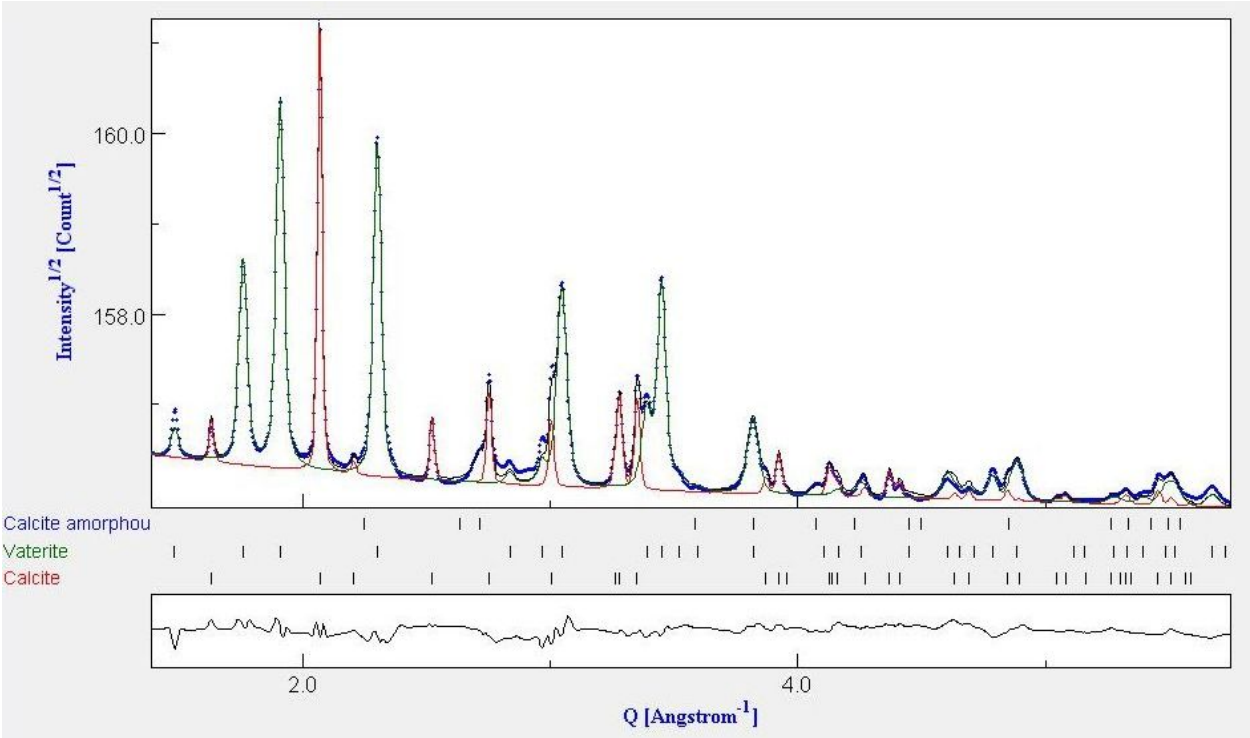


Figure 4.20: The calculated 2D peak profile (solid line) compared with experimental data (dotted blue line) of MC048-09-006 taken with synchrotron x-ray diffraction. Calcite peaks are shown in red, and vaterite peaks are shown in green.



The cell parameters, volume fractions and crystallite size for each phase are shown below. Note that the dimension of the grain assuming an isotropic shape, except for vaterite. R_0, R_1 and R_2 are the coefficients of the Popa model used to refine anisotropic grain shape.

	XRD			Synchrotron		
Phase	Volume fraction	Crystallite size (Å)	Cell parameter (Å)	Volume fraction	Crystallite size (Å)	Cell parameter (Å)
Calcite	0.232(2)	683(11)	a = 4.9779(2) c = 17.088(1)	0.237(2)	788(9)	a = 4.9806(1) c = 17.0942(4)
Vaterite	0.712(5)	353(5)	a = 4.1234(2) c = 8.464(1)	0.734(7)	R_0 = 315(1) R_1 = 10.2(5) R_2 = 88.8(2)	a = 4.12371(5) c = 8.4687(2)
Calcite amorphous	0.058(3)	102(3)	a = 3.428(9) c = 14.55(6)	0.0283(4)	292(6)	a = 3.5052(3) c = 14.4148(7)

4.3 Discussion

SEM produces high-quality images of sample surface that is essential for understating microstructural characteristics. It can also image large area and bulk volumes of sample. In addition the EDS system in an analytical SEM is used to find the distribution of different elements in a sample. These combined

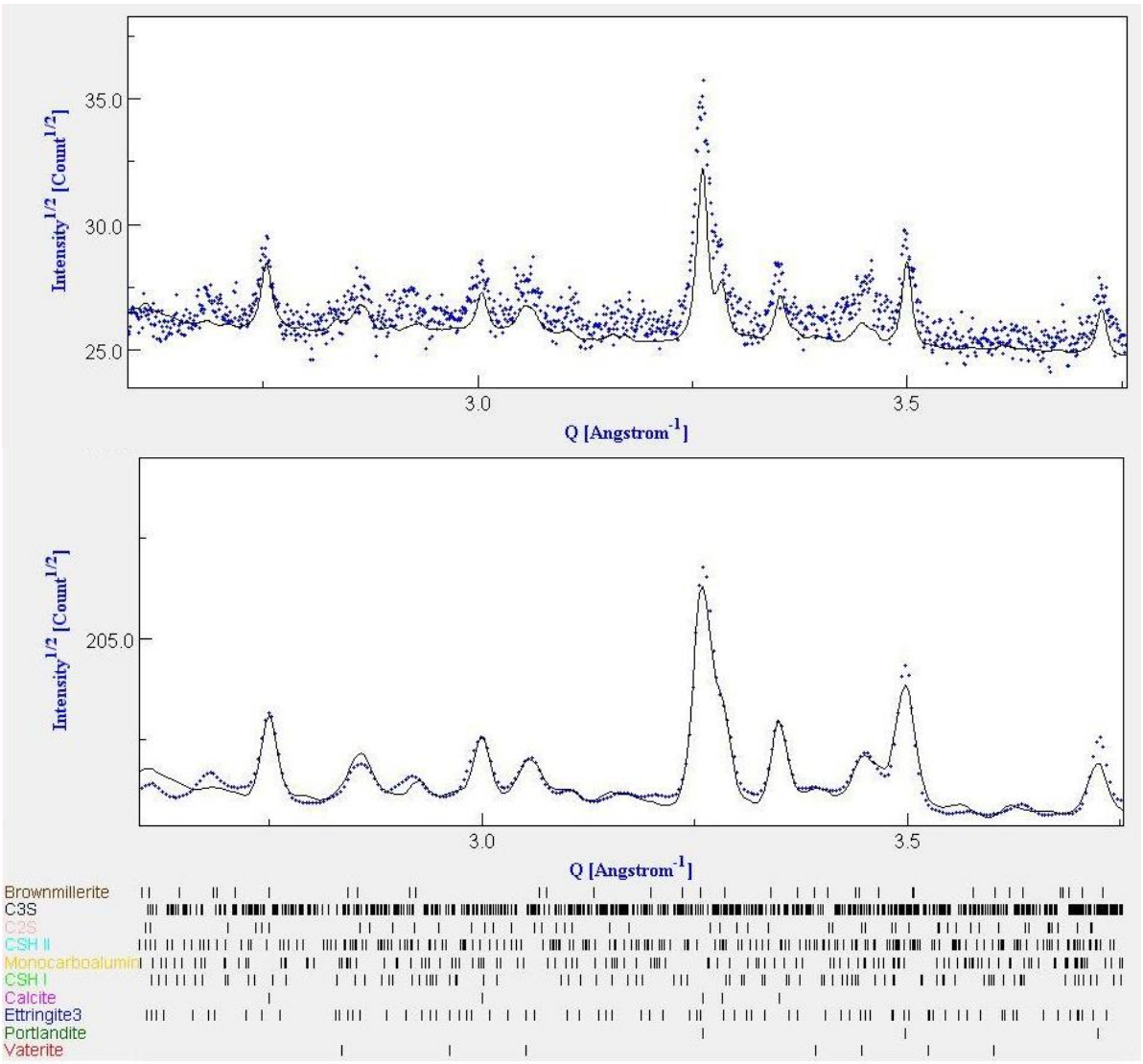
techniques successfully measure the elemental abundance and help determine preliminary composition. SEM and EDS analysis can be done fairly quickly. This is especially true of Zeiss Evo MA10 low vacuum SEM for which nonconductive specimens do not require coating with electrically-conducting material such as gold. In most cases we can obtain high-quality images just by placing samples on carbon tape that is electrically grounded to prevent or lessen the accumulation of static electric charge at the surface. However, nonconductive samples can sometimes charge and cause scanning faults and artifacts in images. Applying a very thin coat of conductive material prevents accumulation of static electric charge while increasing signal and surface resolution and produces improved images.

Besides the potential to charge, another disadvantage of SEM is its spatial resolution, which is limited by electron spot size and interaction volume. Because spot size and interaction volume are relatively large compared to atomic distances, the resolution of SEM is not high enough to image individual atoms. However, the resolution of SEM is good enough to observe surface topography and characterize elemental composition. Further aspects, such as crystallographic preferred orientation and grain boundary, can also be studied with electron backscattering diffraction (EBSD) using the SEM system.

The identification of mineral phases in each sample is based on the elemental composition found with the SEM and the crystal structure found by Rietveld refinement of data collected via x-ray diffraction. The likeliness that the mineral is a component of cement is also taken into account. There are both pros and cons for using XRD versus synchrotron x-ray diffraction. XRD machines are often readily available and are preferred for quick, preliminary analysis of sample composition and are reliable primarily for single-phase samples. However, spectrum images taken with XRD are not as defined as those taken with synchrotron and are not reliable for distinguishing peaks in multi-phase samples. To get more reliable results, a proposal must be submitted for time at a synchrotron beam line at a major facility such as the Advanced Photon Source at Argonne National Laboratory or the Advanced Light Source at Lawrence Berkeley National Lab. Training and often travel is required once beam time has been granted. Although synchrotron experiments require more expertise and time, they are necessary for accurate results.

While XRD and x-ray synchrotron diffraction results agree well for phase identification, there is some discrepancy in the phase proportion, particularly for phases CSH I (24% XRD and 3.04% synchrotron) and CSH II (0.2% XRD and 37.64% synchrotron) of sample SNG0035-010. This discrepancy is due to a difference in counting statistics between XRD and synchrotron detectors. In Figure 4.21, it is seen that the spectrum line in the synchrotron image is much finer and the peaks are much more well-defined. Peaks, likely from CSH II, are more evident in the synchrotron image and comprise a larger percent of the spectrum than they do in the XRD spectrum where the peaks are buried in the spectrum line. Because of its greater precision, results from the x-ray synchrotron analysis are considered to be more accurate.

Figure 4.21: A close-up comparison of sample SNG0035-010 showing resolution differences in XRD spectrum (top) and synchrotron x-ray diffraction spectrum (bottom).



4.4 Conclusion

The SEM imaging along with EDS chemical analysis provide useful information to understand surface topography, microstructures and preliminary elemental characterization and abundance for four cement samples. Conventional (XRD) and synchrotron x-ray diffraction techniques are employed to identify the mineral phases in each sample. The Rietveld refinement successfully quantifies phase parameters such as crystal structure, cell parameters, volume fraction and crystallite size. The results from both diffraction methods are consistent for phase identification but differ slightly in terms of phase proportions. This is due to differences in counting statistics between XRD and synchrotron detectors, which gives rise to different diffracting profile resolution.

5. PROCESS FLOW DIAGRAMS, MASS AND ENERGY BALANCES, AND LIFE CYCLE ANALYSIS

5.1 Demonstration Overview

Process flow sheets, energy balances, and mass balances, are included below for two Beneficial Use process configurations (Cement and Aggregate). The demonstration operations will focus on the first configuration with the production of cementitious material. The second configuration (aggregate production) is now out of the scope of the current demonstration project, although it could be added at a later time. As the scope of the grant focused on the production of building materials, the focus of these flow diagrams is on the product production section. Separate process flowsheets with materials flows are shown for the absorber island that will be feeding the product section.

As a general comment, note that certain mass and energy requirements are projected to differ at full scale; these differences are discussed in detail in the "Commercial Process" section. The mass and energy balances shown in this section reflect the proposed demonstration plant configurations. As with any demonstration project, simplifications are made to allow for demonstration of the key technology components at minimum cost.

One particular difference involves heat integration with the host plant. Heat integration is often neglected in pilot or demonstration facilities as it is a well-understood process with minimal scale-up risk. The present configuration does not demonstrate the use of waste heat in the flue gas because the demonstration site requires the piping of flue gas a substantial distance from the power plant prior to entering our facility. Thus, the heating requirement for solid product drying will be lower at full scale, with the heat required for drying expected to be provided by the low grade waste heat present in the flue gas exhaust leaving the power plant. Additionally, the attached balances show a conservative level of mechanical dewatering (to 60 wt% solids). Since the development of the enclosed material balances, we have demonstrated low-energy dewatering at our pilot plant to 80 wt% solids. If validated in the demonstration plant, as now expected, this increase in dewatering would represent a reduction in the water to solids ratio from 0.67 (40%/60%) to 0.25 (20%/80%), a reduction of over 60% in the drying requirement for SCM production.

Figure 5.1: Process Flow Diagram for Cement Demonstration Case

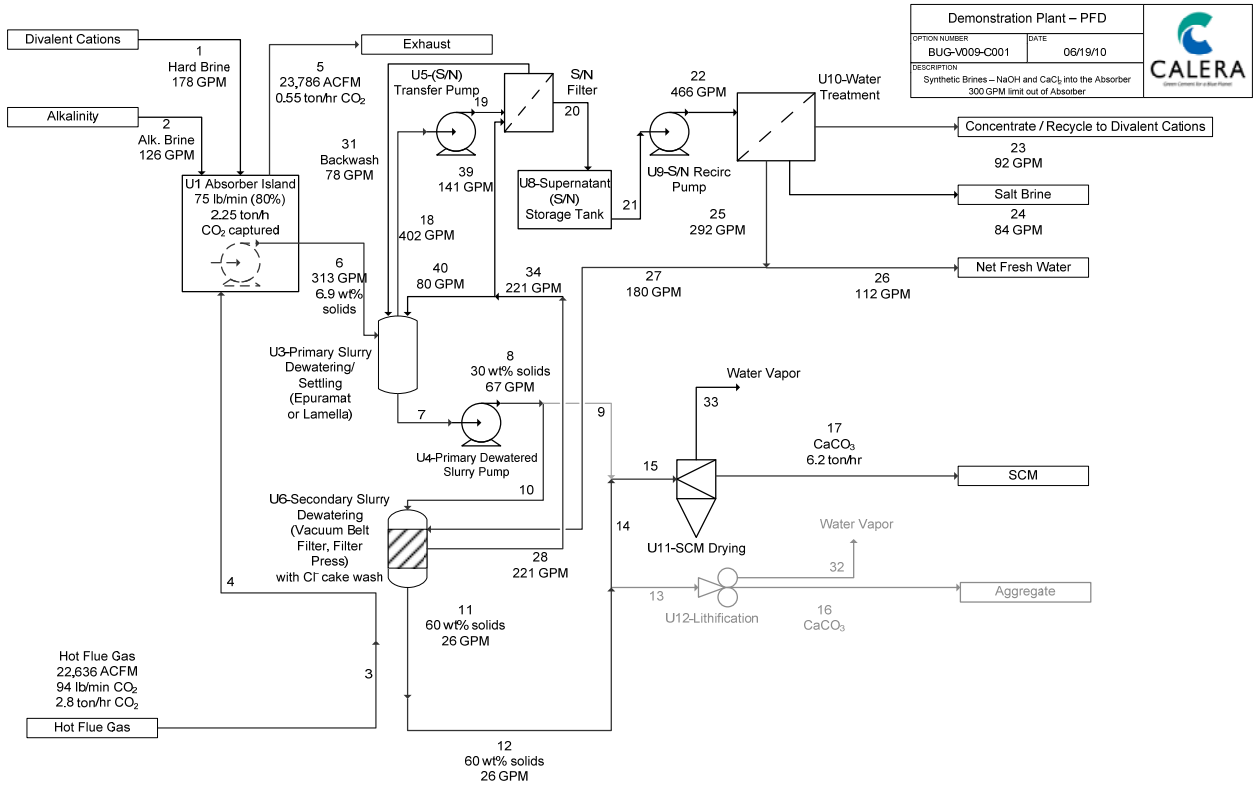


Table 5.1: Material Balance for Cement Demonstration Case

BUG300gpmR2									
		1	2	3	4	5	6	7	8
From		UF1-CAMX	UF2-NAMX		VALV002	U1B-AFLS	U1B-AFLS	U3E-SMIX	U4-PMP
To		U1-ABS	U1-ABS	VALV002	U1-ABS		U3A-DW1	U4-PMP	SPLT-001
Substream: ALL									
Mass Flow	LB/HR	100876.7	73257.04	93337.34	93337.34	90386.52	177084.6	42899.19	42899.19
Volume Flow_ACFM	ACFM	23.83	16.79	22635.63	22635.63	23786.41	41.8	8.93	8.93
Volume Flow_GAL/MIN	GAL/MIN	178.27	125.59	169326.3	169326.3	177934.7	312.67	66.84	66.83
Pressure_IN-WATER	IN-WATER	406.78	406.78	406.78	406.78	406.78	406.78	406.78	1606.78
Pressure_PSIG	PSIG	0	0	0	0	0	0	0	43.35
PH_pH		11.85	14.02	4.66	4.66		12.85	12.55	12.54
Average Molecular Weight		19.98	18.3	27.92	27.92	26.88	20.09	24.66	24.66
Mass Density_GM/ML	GM/ML	1.13	1.16	0	0	0	1.13	1.28	1.28
Mass Density_LB/CUFT	LB/CUFT	70.55	72.72	0.07	0.07	0.06	70.61	80.02	80.03
Mass Density_LB/GAL	LB/GAL	9.43	9.72	0.01	0.01	0.01	9.44	10.7	10.7
Vapor Fraction		0	0	1	1	1	0	0	0
Substream: MIXED									
Phase: All									
Temperature	F	99.78	115.28	100	100	122	122	122.56	122.76
Component Mass Fraction									
CACL2(S)		0	0	0	0	0	0	0	0
CACO3(S)		0.0492	0	0	0	0	0.0637	0.2654	0.2654
CAOH(S)		0	0	0	0	0	0	0	0
CO2		0	0	0.0602	0.0602	0	0	0	0
H2O		0.8325	0.8411	0.0452	0.0452	0.0762	0.818	0.6428	0.6428
HCL		0	0	0	0	0	0	0	0
MAGNE(S)		0	0	0	0	0	0	0	0
MGCL2(S)		0	0	0	0	0	0	0	0
MGCO3(S)		0	0	0	0	0	0	0	0
MGCO3X3W		0	0	0	0	0	0.0054	0.0307	0.0307
N2		0	0	0.8946	0.8946	0.9238	0	0	0
NACL(S)		0	0	0	0	0	0	0	0
NAOH(S)		0	0	0	0	0	0	0	0
NAOH:(S)		0	0	0	0	0	0	0	0
SODIU(S)		0	0	0	0	0	0	0	0
TRONA(S)		0	0	0	0	0	0	0	0
WEGSC(S)		0	0	0	0	0	0	0	0
CACL2(AQ)		0.0685425	0	0	0	0	0	0	0
CA(OH)2(AQ)		0.000649123	0	0	0	0	0	0	0
MGCL2(AQ)		0.008708333	0	0	0	0	0.001188	0.000792	0.000792
NAOH(AQ)		0.000119711	0.159059	0	0	0	0.008471	0.004706	0.004706
NACL(AQ)		0.019281087	0	0	0	0	0.011076	0.005991	0.005991
NA2CO3(AQ)		0	0	0	0	0	0.034627	0.018727	0.018727
NAHCO3(AQ)		0	0	0	0	0	0	0	0

BUG300gpmR2-5/6/2010									
		9	10	11	12	13	14	15	16
From		SPLT-001	SPLT-001	U6E-SMIX	VALV001	SPLT-002	SPLT-002	MIX-001	U12C-LIT
To		MIX-001	U6A-DW2	VALV001	SPLT-002	U12A-HT	MIX-001	U11-SDRY	
Substream: ALL									
Mass Flow	LB/HR		42899.19	20916.41	20916.41	20916.41			
Volume Flow_ACFM	ACFM		8.93	3.52	3.52	3.52			
Volume Flow_GAL/MIN	GAL/MIN		66.83	26.36	26.36	26.36			
Pressure_IN-WATER	IN-WATER		1606.78	406.78	406.78	406.78			
Pressure_PSIG	PSIG		43.35	0	0	0			
PH_pH			12.54	11.83	11.83	11.83			
Average Molecular Weight			24.66	35.83	35.83	35.83			
Mass Density_GM/ML	GM/ML		1.28	1.58	1.58	1.58			
Mass Density_LB/CUFT	LB/CUFT		80.03	98.91	98.91	98.91			
Mass Density_LB/GAL	LB/GAL		10.7	13.22	13.22	13.22			
Vapor Fraction			0	0	0	0			
Substream: MIXED									
Phase: All									
Temperature	F		122.76	122.82	122.81	122.81			
Component Mass Fraction									
CACL2(S)		0	0	0	0	0	0	0	0
CACO3(S)		0	0.2654	0.5389	0.5389	0.5389	0	0	0
CAOH(S)		0	0	0	0	0	0	0	0
CO2		0	0	0	0	0	0	0	0
H2O		0	0.6428	0.3919	0.3919	0.3919	0	0	0
HCL		0	0	0	0	0	0	0	0
MAGNE(S)		0	0	0	0	0	0	0	0
MGCL2(S)		0	0	0	0	0	0	0	0
MGCO3(S)		0	0	0	0	0	0	0	0
MGCO3X3W		0	0.0307	0.0587	0.0587	0.0587	0	0	0
N2		0	0	0	0	0	0	0	0
NACL(S)		0	0	0	0	0	0	0	0
NAOH(S)		0	0	0	0	0	0	0	0
NAOH:(S)		0	0	0	0	0	0	0	0
SODIU(S)		0	0	0	0	0	0	0	0
TRONA(S)		0	0	0	0	0	0	0	0
WEGSC(S)		0	0	0	0	0	0	0	0
CACL2(AQ)		0	0	0	0	0	0	0	0
CA(OH)2(AQ)		0	0	0	0	0	0	0	0
MGCL2(AQ)		0	0.000792	0.000396	0.000396	0.000396	0	0	0
NAOH(AQ)		0	0.004706	0.000706	0.000706	0.000706	0	0	0
NACL(AQ)		0	0.005991	0.000702	0.000702	0.000702	0	0	0
NA2CO3(AQ)		0	0.018727	0.003003	0.003003	0.003003	0	0	0
NAHCO3(AQ)		0	0	0	0	0	0	0	0

BUG300gpmR2									
		17	18	19	20	21	22	23	24
From		U11B-DR\	U3D-LMIX	U5-PMP	U7-FLT	U8-SSTG	U9-PMP	U10A-NF	U10B-RO
To			U5-PMP	U7-FLT	U8-SSTG	U9-PMP	U10A-NF	MIX002	
Substream: ALL									
Mass Flow	LB/HR		213143.4	213143.4	245573.6	245573.6	245573.6	48468.54	52027.39
Volume Flow_ACFM	ACFM		53.79	53.79	62.45	62.45	62.27	12.27	11.25
Volume Flow_GAL/MIN	GAL/MIN		402.4	402.37	467.13	467.13	465.84	91.78	84.14
Pressure_IN-WATER	IN-WATER		406.78	1606.78	406.78	406.78	1606.78	1606.78	1606.78
Pressure_PSIG	PSIG		0	43.35	0	0	43.35	43.35	43.35
PH_pH			12.55	12.54	12.52	12.52	12.51	12.29	14.16
Average Molecular Weight			18.69	18.69	18.64	18.64	18.64	18.85	20.54
Mass Density_GM/ML	GM/ML		1.06	1.06	1.05	1.05	1.05	1.05	1.23
Mass Density_LB/CUFT	LB/CUFT		66.04	66.04	65.54	65.54	65.72	65.84	77.09
Mass Density_LB/GAL	LB/GAL		8.83	8.83	8.76	8.76	8.79	8.8	10.31
Vapor Fraction			0	0	0	0	0	0	0
Substream: MIXED									
Phase: All									
Temperature	F		122.54	122.76	122.72	122.72	122.8	122.8	122.8
Component Mass Fraction									
CACL2(S)		0	0	0	0	0	0	0	0
CACO3(S)		0	0.0005	0.0005	0	0	0	0	0
CAOH(S)		0	0	0	0	0	0	0	0
CO2		0	0	0	0	0	0	0	0
H2O		0	0.9127	0.9127	0.9182	0.9182	0.9182	0.9304	0.6935
HCL		0	0	0	0	0	0	0	0
MAGNE(S)		0	0	0	0	0	0	0	0
MGCL2(S)		0	0	0	0	0	0	0	0
MGCO3(S)		0	0	0	0	0	0	0	0
MGCO3X3W		0	0.0001	0.0001	0	0	0	0	0
N2		0	0	0	0	0	0	0	0
NACL(S)		0	0	0	0	0	0	0	0.0389
NAOH(S)		0	0	0	0	0	0	0	0
NAOH:(S)		0	0	0	0	0	0	0	0
SODIU(S)		0	0	0	0	0	0	0	0
TRONA(S)		0	0	0	0	0	0	0	0
WEGSC(S)		0	0	0	0	0	0	0	0
CACL2(AQ)		0	0	0	0	0	0	0	0
CA(OH)2(AQ)		0	0	0	0	0	0	0	0
MGCL2(AQ)		0	0.001188	0.001188	0	0	0	0	0
NAOH(AQ)		0	0.006588	0.006588	0.006353	0.006353	0.006353	0.001647	0.026588
NACL(AQ)		0	0.008351	0.008351	0.007892	0.007892	0.007892	0	0
NA2CO3(AQ)		0	0.0265	0.0265	0.02385	0.02385	0.02385	0.10812	0.010777
NAHCO3(AQ)		0	0	0	0	0	0	0.000275	0

BUG300gpmR2								
		25	26	27	28	30	31	32
From		U10B-RO	SPLT-004	SPLT-004	U6D-LMIX	SPLT-003	U7-FLT	U12C-LIT
To		SPLT-004		U6A-DW2	SPLT-003		U3A-DW1	
Substream: ALL								
Mass Flow	LB/HR	145077.7	55653.28	89424.41	111411.2		38709.79	
Volume Flow_ACFM	ACFM	39.04	14.98	24.06	29.59		10.38	
Volume Flow_GAL/MIN	GAL/MIN	292.02	112.02	180	221.32		77.63	
Pressure_IN-WATER	IN-WATER	1606.78	1606.78	1606.78	406.78		406.78	
Pressure_PSIG	PSIG	43.35	43.35	43.35	0		0	
PH_pH		11.25	11.25	11.25	11.84		9.43	
Average Molecular Weight		18.05	18.05	18.05	18.23		18.19	
Mass Density_GM/ML	GM/ML	0.99	0.99	0.99	1.01		1	
Mass Density_LB/CUFT	LB/CUFT	61.94	61.94	61.94	62.76		62.17	
Mass Density_LB/GAL	LB/GAL	8.28	8.28	8.28	8.39		8.31	
Vapor Fraction		0	0	0	0		0	
Substream: MIXED								
Phase: All								
Temperature	F	122.8	122.8	122.8	122.86		122.72	
Component Mass Fraction								
CACL2(S)		0	0	0	0	0	0	0
CACO3(S)		0	0	0	0.001	0	0.0048	0
CAOH(S)		0	0	0	0	0	0	0
CO2		0	0	0	0	0	0	0
H2O		0.9947	0.9947	0.9947	0.9726	0	0.9879	0
HCL		0	0	0	0	0	0	0
MAGNE(S)		0	0	0	0	0	0	0
MGCL2(S)		0	0	0	0	0	0	0
MGCO3(S)		0	0	0	0	0	0.0073	0
MGCO3X3W		0	0	0	0.0001	0	0	0
N2		0	0	0	0	0	0	0
NACL(S)		0	0	0	0	0	0	0
NAOH(S)		0	0	0	0	0	0	0
NAOH:(S)		0	0	0	0	0	0	0
SODIU(S)		0	0	0	0	0	0	0
TRONA(S)		0	0	0	0	0	0	0
WEGSC(S)		0	0	0	0	0	0	0
CACL2(AQ)		0	0	0	0	0	0	0
CA(OH)2(AQ)		0	0	0	0	0	0	0
MGCL2(AQ)		0	0	0	0.000792	0	0	0
NAOH(AQ)		0.000471	0.000471	0.000471	0.002118	0	0	0
NACL(AQ)		0	0	0	0.002013	0	0	0
NA2CO3(AQ)		0.000177	0.000177	0.000177	0.00742	0	0	0
NAHCO3(AQ)		0	0	0	0	0	0	0

BUG300gpmR2									
		33	34	35	36	37	38	39	40
From		U11B-DRY	SPLT-003					SPLT101	SPLT101
To			SPLT101	MIX002	UF1-CAM	UF2-NAM	UF2-NAM	U7-FLT	U3A-DW1
Substream: ALL									
Mass Flow	LB/HR		111411.2	14008.18	38400	49977.04	23280	71139.99	40271.21
Volume Flow_ACFM	ACFM		29.59	3.75	7.38	13.37	4.12	18.89	10.69
Volume Flow_GAL/MIN	GAL/MIN		221.32	28.03	55.24	100	30.81	141.32	80
Pressure_IN-WATER	IN-WATER		406.78	406.78	406.78	406.78	406.78	406.78	406.78
Pressure_PSIG	PSIG		0	0	0	0	0	0	0
PH_pH			11.83	7.06	6.21	7.06	17	11.83	11.83
Average Molecular Weight			18.23	18.02	21.92	18.02	20.77	18.23	18.23
Mass Density_GM/ML	GM/ML		1.01	1	1.39	1	1.51	1.01	1.01
Mass Density_LB/CUFT	LB/CUFT		62.76	62.31	86.67	62.31	94.2	62.76	62.76
Mass Density_LB/GAL	LB/GAL		8.39	8.33	11.59	8.33	12.59	8.39	8.39
Vapor Fraction			0	0	0	0	0	0	0
Substream: MIXED									
Phase: All									
Temperature	F		122.92	70	70	70	70	122.92	122.92
Component Mass Fraction									
CACL2(S)		0	0	0	0	0	0	0	0
CACO3(S)		0	0.001	0	0	0	0	0.001	0.001
CAOH(S)		0	0	0	0	0	0	0	0
CO2		0	0	0	0	0	0	0	0
H2O		0	0.9726	1	0.6478	1	0.4999	0.9726	0.9726
HCL		0	0	0	0	0	0	0	0
MAGNE(S)		0	0	0	0	0	0	0	0
MGCL2(S)		0	0	0	0	0	0	0	0
MGCO3(S)		0	0	0	0	0	0	0	0
MGCO3X3W		0	0.0001	0	0	0	0	0.0001	0.0001
N2		0	0	0	0	0	0	0	0
NACL(S)		0	0	0	0	0	0	0	0
NAOH(S)		0	0	0	0	0	0.1847	0	0
NAOH:(S)		0	0	0	0	0	0	0	0
SODIU(S)		0	0	0	0	0	0	0	0
TRONA(S)		0	0	0	0	0	0	0	0
WEGSC(S)		0	0	0	0	0	0	0	0
CACL2(AQ)		0	0	0	0.326063	0	0	0	0
CA(OH)2(AQ)		0	0	0	0	0	0	0	0
MGCL2(AQ)		0	0.000792	0	0.022563	0	0	0.000792	0.000792
NAOH(AQ)		0	0.002118	0	0	0	0.315529	0.002118	0.002118
NACL(AQ)		0	0.002013	0	0	0	0	0.002013	0.002013
NA2CO3(AQ)		0	0.00742	0	0	0	0	0.00742	0.00742
NAHCO3(AQ)		0	0	0	0	0	0	0	0

Figure 5.2: Aggregate Production Case PFD

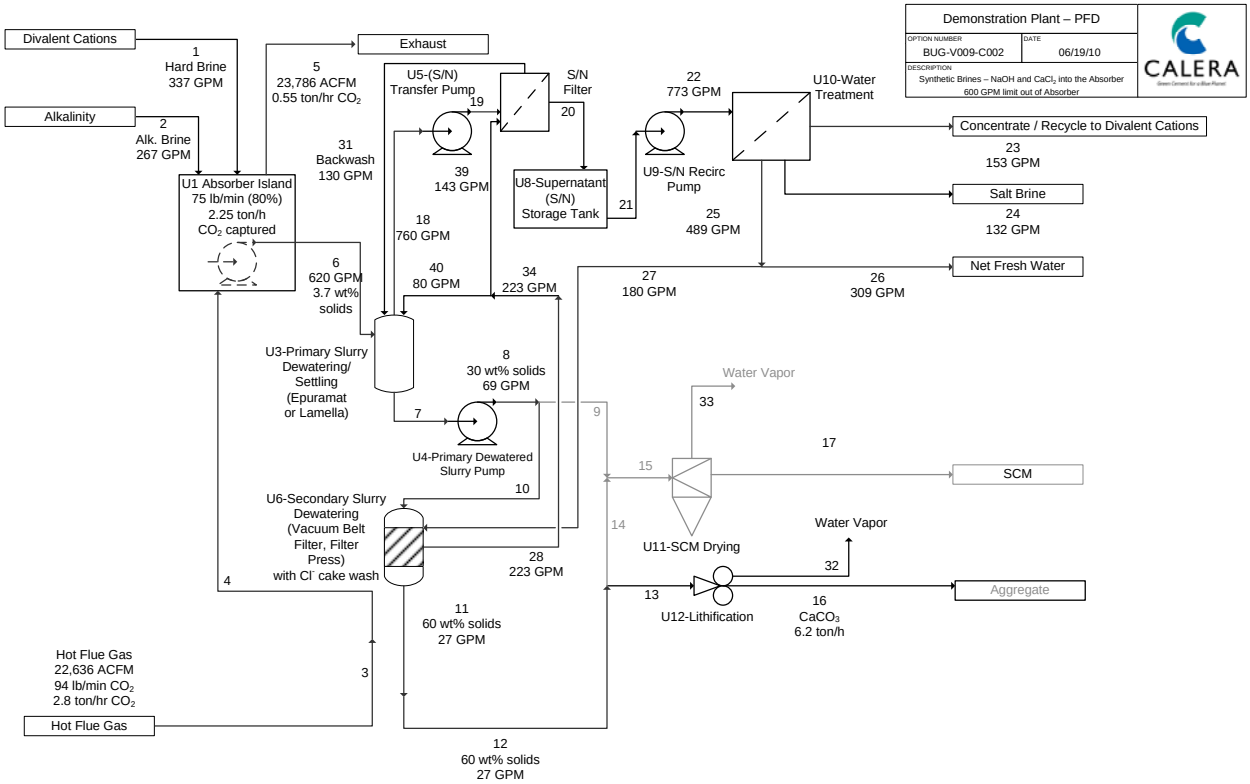


Table 5.2: Aggregate Production Case Mass Balance

BUG600gpmR2									
		1	2	3	4	5	6	7	8
From		UF1-CAM	UF2-NAMX		VALV002	U1B-AFLS	U1B-AFLS	U3E-SMIX	U4-PMP
To		U1-ABS	U1-ABS	VALV002	U1-ABS		U3A-DW1	U4-PMP	SPLT-001
Substream: ALL									
Mass Flow	LB/HR	180356.3	145224	93337.34	93337.34	87954.2	330963.4	43356.28	43356.28
Volume Flow_ACFM	ACFM	45.04	35.72	22635.63	22635.63	22228.13	82.84	9.25	9.25
Volume Flow_GAL/MIN	GAL/MIN	336.89	267.17	169326.3	169326.3	166278	619.71	69.19	69.18
Pressure_IN-WATER	IN-WATER	406.78	406.78	406.78	406.78	406.78	406.78	406.78	1606.78
Pressure_PSIG	PSIG	0	0	0	0	0	0	0	43.35
PH_pH		11.69	13.67	4.66	4.66		12.56	12.4	12.4
Average Molecular Weight		19.08	18.16	27.92	27.92	27.25	19.07	24.21	24.21
Mass Density_GM/ML	GM/ML	1.07	1.09	0	0	0	1.07	1.25	1.25
Mass Density_LB/CUFT	LB/CUFT	66.75	67.77	0.07	0.07	0.07	66.58	78.13	78.14
Mass Density_LB/GAL	LB/GAL	8.92	9.06	0.01	0.01	0.01	8.9	10.44	10.45
Vapor Fraction		0	0	1	1	1	0	0	0
Substream: MIXED									
Phase: All									
Temperature	F	87.75	93.85	100	100	106.54	106.54	106.67	106.71
Component Mass Fraction									
CACL2(S)		0	0	0	0	0	0	0	0
CACO3(S)		0.0293	0	0	0	0	0.0341	0.2626	0.2626
CAOH(S)		0	0	0	0	0	0	0	0
CO2		0	0	0.0602	0.0602	0	0	0	0
H2O		0.9052	0.9198	0.0452	0.0452	0.0506	0.9022	0.6727	0.6727
HCL		0	0	0	0	0	0	0	0
MAGNE(S)		0	0	0	0	0	0	0	0
MGCL2(S)		0	0	0	0	0	0	0	0
MGCO3(S)		0	0	0	0	0	0	0	0
MGCO3X3W		0	0	0	0	0	0.0024	0.0301	0.0301
N2		0	0	0.8946	0.8946	0.9494	0	0	0
NACL(S)		0	0	0	0	0	0	0	0
NAOH(S)		0	0	0	0	0	0	0	0
NAOH:(S)		0	0	0	0	0	0	0	0
SODIU(S)		0	0	0	0	0	0	0	0
TRONA(S)		0	0	0	0	0	0	0	0
WEGSC(S)		0	0	0	0	0	0	0	0
CACL2(AQ)		0.03663	0	0	0	0	0	0	0
CA(OH)2(AQ)		0.00026	0	0	0	0	0	0	0
MGCL2(AQ)		0.00475	0	0	0	0	0.000792	0.000792	0.000792
NAOH(AQ)		9.49E-05	0.080235	0	0	0	0.004471	0.002588	0.002588
NACL(AQ)		0.011582	0	0	0	0	0.006463	0.003132	0.003132
NA2CO3(AQ)		0	0	0	0	0	0.019963	0.0106	0.0106
NAHCO3(AQ)		0	0	0	0	0	0	0	0

BUG600gpmR2									
		9	10	11	12	13	14	15	16
From		SPLT-001	SPLT-001	U6E-SMIX	VALV001	SPLT-002	SPLT-002	MIX-001	U12C-LIT
To		MIX-001	U6A-DW2	VALV001	SPLT-002	U12A-HT	MIX-001	U11-SDRY	
Substream: ALL									
Mass Flow	LB/HR		43356.28	21118.1	21118.1	21118.1			
Volume Flow_ACFM	ACFM		9.25	3.59	3.59	3.59			
Volume Flow_GAL/MIN	GAL/MIN		69.18	26.84	26.84	26.84			
Pressure_IN-WATER	IN-WATER		1606.78	406.78	406.78	406.78			
Pressure_PSIG	PSIG		43.35	0	0	0			
PH_pH			12.4	11.83	11.83	11.83			
Average Molecular Weight			24.21	35.38	35.38	35.38			
Mass Density_GM/ML	GM/ML		1.25	1.57	1.57	1.57			
Mass Density_LB/CUFT	LB/CUFT		78.14	98.1	98.1	98.1			
Mass Density_LB/GAL	LB/GAL		10.45	13.11	13.11	13.11			
Vapor Fraction			0	0	0	0			
Substream: MIXED									
Phase: All									
Temperature	F		106.71	106.86	106.86	106.86			
Component Mass Fraction									
CACL2(S)		0	0	0	0	0	0	0	0
CACO3(S)		0	0.2626	0.5337	0.5337	0.5337	0	0	0
CAOH(S)		0	0	0	0	0	0	0	0
CO2		0	0	0	0	0	0	0	0
H2O		0	0.6727	0.4018	0.4018	0.4018	0	0	0
HCL		0	0	0	0	0	0	0	0
MAGNE(S)		0	0	0	0	0	0	0	0
MGCL2(S)		0	0	0	0	0	0	0	0
MGCO3(S)		0	0	0	0	0	0	0	0
MGCO3X3W		0	0.0301	0.0582	0.0582	0.0582	0	0	0
N2		0	0	0	0	0	0	0	0
NACL(S)		0	0	0	0	0	0	0	0
NAOH(S)		0	0	0	0	0	0	0	0
NAOH:(S)		0	0	0	0	0	0	0	0
SODIU(S)		0	0	0	0	0	0	0	0
TRONA(S)		0	0	0	0	0	0	0	0
WEGSC(S)		0	0	0	0	0	0	0	0
CACL2(AQ)		0	0	0	0	0	0	0	0
CA(OH)2(AQ)		0	0	0	0	0	0	0	0
MGCL2(AQ)		0	0.000792	0.000396	0.000396	0.000396	0	0	0
NAOH(AQ)		0	0.002588	0.000471	0.000471	0.000471	0	0	0
NACL(AQ)		0	0.003132	0.000399	0.000399	0.000399	0	0	0
NA2CO3(AQ)		0	0.0106	0.001767	0.001767	0.001767	0	0	0
NAHCO3(AQ)		0	0	0	0	0	0	0	0

BUG600gpmR2									
		17	18	19	20	21	22	23	24
From		U11B-DRY	U3D-LMIX	U5-PMP	U7-FLT	U8-SSTG	U9-PMP	U10A-NF	U10B-RO
To			U5-PMP	U7-FLT	U8-SSTG	U9-PMP	U10A-NF	MIX002	
Substream: ALL									
Mass Flow	LB/HR		392330.2	392330.2	399470.7	399470.7	399470.7	79419.78	76504.06
Volume Flow_ACFM	ACFM		101.55	101.53	103.47	103.47	103.32	20.47	17.69
Volume Flow_GAL/MIN	GAL/MIN		759.61	759.52	774.05	774.05	772.91	153.16	132.3
Pressure_IN-WATER	IN-WATER		406.78	1606.78	406.78	406.78	1606.78	1606.78	1606.78
Pressure_PSIG	PSIG		0	43.35	0	0	43.35	43.35	43.35
PH_pH			12.4	12.4	12.43	12.43	12.43	12.14	13.85
Average Molecular Weight			18.39	18.39	18.4	18.4	18.4	18.55	19.48
Mass Density_GM/ML	GM/ML		1.03	1.03	1.03	1.03	1.03	1.04	1.15
Mass Density_LB/CUFT	LB/CUFT		64.39	64.4	64.34	64.34	64.44	64.65	72.09
Mass Density_LB/GAL	LB/GAL		8.61	8.61	8.6	8.6	8.61	8.64	9.64
Vapor Fraction			0	0	0	0	0	0	0
Substream: MIXED									
Phase: All									
Temperature	F		106.66	106.68	106.83	106.83	106.85	106.85	106.85
Component Mass Fraction									
CACL2(S)		0	0	0	0	0	0	0	0
CACO3(S)		0	0.0003	0.0003	0	0	0	0	0
CAOH(S)		0	0	0	0	0	0	0	0
CO2		0	0	0	0	0	0	0	0
H2O		0	0.9507	0.9507	0.9494	0.9494	0.9494	0.9551	0.7932
HCL		0	0	0	0	0	0	0	0
MAGNE(S)		0	0	0	0	0	0	0	0
MGCL2(S)		0	0	0	0	0	0	0	0
MGCO3(S)		0	0	0	0	0	0	0	0
MGCO3X3W		0	0	0	0	0	0	0	0
N2		0	0	0	0	0	0	0	0
NACL(S)		0	0	0	0	0	0	0	0
NAOH(S)		0	0	0	0	0	0	0	0
NAOH:(S)		0	0	0	0	0	0	0	0
SODIU(S)		0	0	0	0	0	0	0	0
TRONA(S)		0	0	0	0	0	0	0	0
WEGSC(S)		0	0	0	0	0	0	0	0
CACL2(AQ)		0	0	0	0	0	0	0	0
CA(OH)2(AQ)		0	0	0	0	0	0	0	0
MGCL2(AQ)		0	0.000792	0.000792	0	0	0	0	0
NAOH(AQ)		0	0.003765	0.003765	0.003765	0.003765	0.003765	0.000941	0.017882
NACL(AQ)		0	0.004806	0.004806	0.00523	0.00523	0.00523	0	0
NA2CO3(AQ)		0	0.015017	0.015017	0.015547	0.015547	0.015547	0.070313	0.007773
NAHCO3(AQ)		0	0	0	0	0	0	0.000275	0

BUG600gpmR2								
		25	26	27	28	30	31	32
From		U10B-RO	SPLT-004	SPLT-004	U6D-LMIX	SPLT-003	U7-FLT	U12C-LIT
To		SPLT-004		U6A-DW2	SPLT-003		U3A-DW1	
Substream: ALL								
Mass Flow	LB/HR	243546.9	153921.6	89625.24	111863.5		64629.44	
Volume Flow_ACFM	ACFM	65.39	41.32	24.06	29.84		17.33	
Volume Flow_GAL/MIN	GAL/MIN	489.13	309.13	180	223.2		129.66	
Pressure_IN-WATER	IN-WATER	1606.78	1606.78	1606.78	406.78		406.78	
Pressure_PSIG	PSIG	43.35	43.35	43.35	0		0	
PH_pH		11.28	11.28	11.28	11.82		8.5	
Average Molecular Weight		18.04	18.04	18.04	18.14		18.07	
Mass Density_GM/ML	GM/ML	0.99	0.99	0.99	1		1	
Mass Density_LB/CUFT	LB/CUFT	62.08	62.08	62.08	62.48		62.14	
Mass Density_LB/GAL	LB/GAL	8.3	8.3	8.3	8.35		8.31	
Vapor Fraction		0	0	0	0		0	
Substream: MIXED								
Phase: All								
Temperature	F	106.85	106.85	106.85	107.09		106.83	
Component Mass Fraction								
CACL2(S)		0	0	0	0	0	0	0
CACO3(S)		0	0	0	0.001	0	0	0
CAOH(S)		0	0	0	0	0	0	0
CO2		0	0	0	0	0	0	0
H2O		0.9967	0.9967	0.9967	0.9836	0	0.9953	0
HCL		0	0	0	0	0	0	0
MAGNE(S)		0	0	0	0	0	0	0
MGCL2(S)		0	0	0	0	0	0	0
MGCO3(S)		0	0	0	0	0	0.0026	0
MGCO3X3W		0	0	0	0.0001	0	0	0
N2		0	0	0	0	0	0	0
NACL(S)		0	0	0	0	0	0	0
NAOH(S)		0	0	0	0	0	0	0
NAOH:(S)		0	0	0	0	0	0	0
SODIU(S)		0	0	0	0	0	0	0
TRONA(S)		0	0	0	0	0	0	0
WEGSC(S)		0	0	0	0	0	0	0
CACL2(AQ)		0	0	0	0	0	0	0
CA(OH)2(AQ)		0	0	0	0	0	0	0
MGCL2(AQ)		0	0	0	0.000396	0	0	0
NAOH(AQ)		0.000235	0.000235	0.000235	0.001176	0	0	0
NACL(AQ)		0	0	0	0.00117	0	0	0
NA2CO3(AQ)		0.000177	0.000177	0.000177	0.00424	0	0	0
NAHCO3(AQ)		0	0	0	0	0	0	0

BUG600gpmR2									
		33	34	35	36	37	38	39	40
From		U11B-DRY	SPLT-003					SPLT101	SPLT101
To			SPLT101	MIX002	UF1-CAM	UF2-NAM	UF2-NAM	U7-FLT	U3A-DW1
Substream: ALL									
Mass Flow	LB/HR		111863.5	62536.5	38400	121944	23280	71769.91	40093.57
Volume Flow_ACFM	ACFM		29.84	16.73	7.38	32.62	4.12	19.14	10.69
Volume Flow_GAL/MIN	GAL/MIN		223.2	125.13	55.24	244	30.81	143.2	80
Pressure_IN-WATER	IN-WATER		406.78	406.78	406.78	406.78	406.78	406.78	406.78
Pressure_PSIG	PSIG		0	0	0	0	0	0	0
PH_pH			11.82	7.06	6.21	7.06	17	11.82	11.82
Average Molecular Weight			18.14	18.02	21.92	18.02	20.77	18.14	18.14
Mass Density_GM/ML	GM/ML		1	1	1.39	1	1.51	1	1
Mass Density_LB/CUFT	LB/CUFT		62.48	62.31	86.67	62.31	94.2	62.48	62.48
Mass Density_LB/GAL	LB/GAL		8.35	8.33	11.59	8.33	12.59	8.35	8.35
Vapor Fraction			0	0	0	0	0	0	0
Substream: MIXED									
Phase: All									
Temperature	F		107.09	70	70	70	70	107.09	107.09
Component Mass Fraction									
CACL2(S)		0	0	0	0	0	0	0	0
CACO3(S)		0	0.001	0	0	0	0	0.001	0.001
CAOH(S)		0	0	0	0	0	0	0	0
CO2		0	0	0	0	0	0	0	0
H2O		0	0.9836	1	0.6478	1	0.4999	0.9836	0.9836
HCL		0	0	0	0	0	0	0	0
MAGNE(S)		0	0	0	0	0	0	0	0
MGCL2(S)		0	0	0	0	0	0	0	0
MGCO3(S)		0	0	0	0	0	0	0	0
MGCO3X3W		0	0.0001	0	0	0	0	0.0001	0.0001
N2		0	0	0	0	0	0	0	0
NACL(S)		0	0	0	0	0	0	0	0
NAOH(S)		0	0	0	0	0	0.1847	0	0
NAOH:(S)		0	0	0	0	0	0	0	0
SODIU(S)		0	0	0	0	0	0	0	0
TRONA(S)		0	0	0	0	0	0	0	0
WEGSC(S)		0	0	0	0	0	0	0	0
CACL2(AQ)		0	0	0	0.326063	0	0	0	0
CA(OH)2(AQ)		0	0	0	0	0	0	0	0
MGCL2(AQ)		0	0.000396	0	0.022563	0	0	0.000396	0.000396
NAOH(AQ)		0	0.001176	0	0	0	0.315529	0.001176	0.001176
NACL(AQ)		0	0.00117	0	0	0	0	0.00117	0.00117
NA2CO3(AQ)		0	0.00424	0	0	0	0	0.00424	0.00424
NAHCO3(AQ)		0	0	0	0	0	0	0	0

Table 5.3: Energy Balance for SCM (C001) and Aggregate (C002) production cases

Unit		BUG-V009-C001		BUG-V009-C002	
ID	Name	Electrical Power (kW)	Heat/Fuel (MMBTU/h)	Electrical Power (kW)	Heat/Fuel (MMBTU/h)
U01	Absorber Island	164.0	NA	203.6	NA
U03	Primary Slurry Dewatering	12.4	NA	24.5	NA
U04	Primary Dewatered Slurry Pump	6.0	NA	6.2	NA
U05	S/N Transfer Pump	15.9	NA	5.6	NA
U06	Secondary Slurry Dewatering	13.2	NA	44.0	NA
U08	S/N Storage Tank	0.0	NA	0.0	NA
U09	S/N Recirc Pump	19.2	NA	30.5	NA
U10	Water Treatment	17.5	NA	29.3	NA
U11	SCM Drying	2.1	10.27	NA	NA
U12	Lithification	0.0	NA	3.2	0.2
	Total	250.27	10.27	347.04	0.2

5.2 Process Flowsheets with Materials Flows for Absorber Island System (outside scope of current proposal)

Process flowsheets with materials flows for the absorber island system feeding the building materials demonstration are shown below. Note that 7.4 ton NaOH/h is used to simulate a combination of alkaline brine and NaOH produced through the Calera low energy electrochemical process. 9 ton $CaCl_2$/hr is used to simulate the calcium contained in subsurface hard waters.

Figure 5.3: Process Flowsheet for Absorber Island System 300 gpm

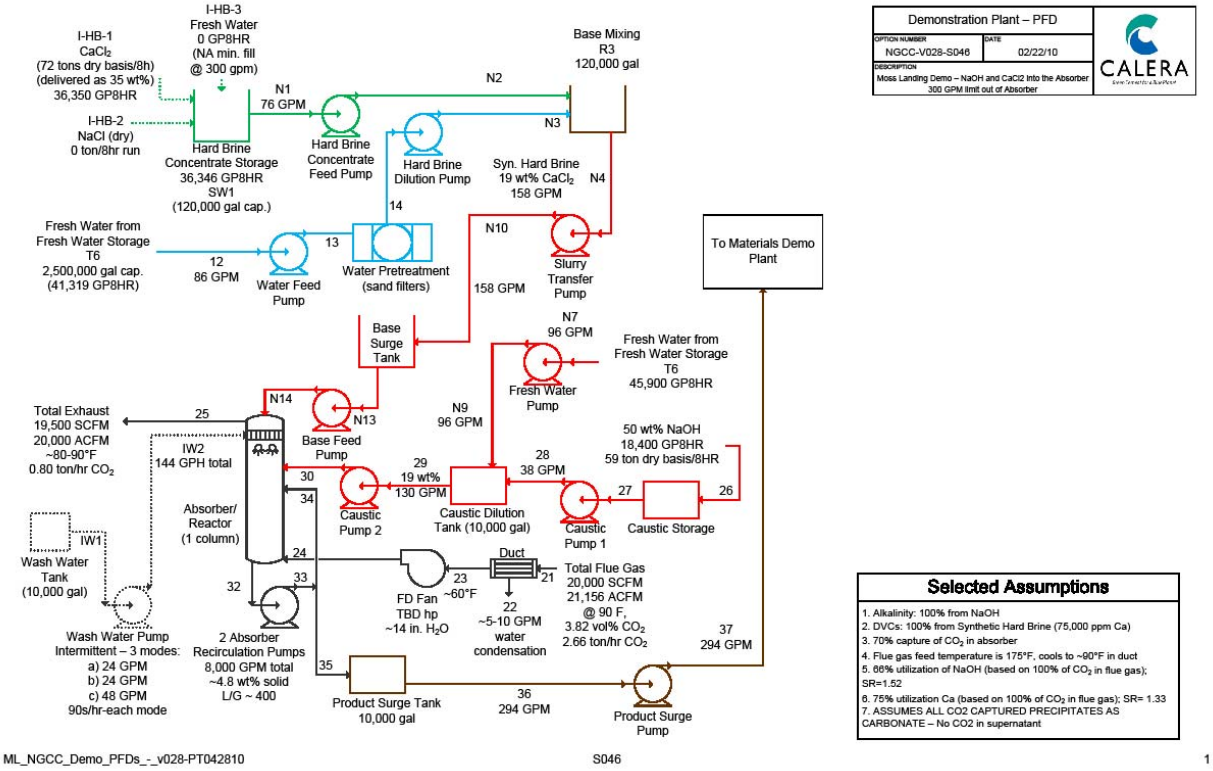
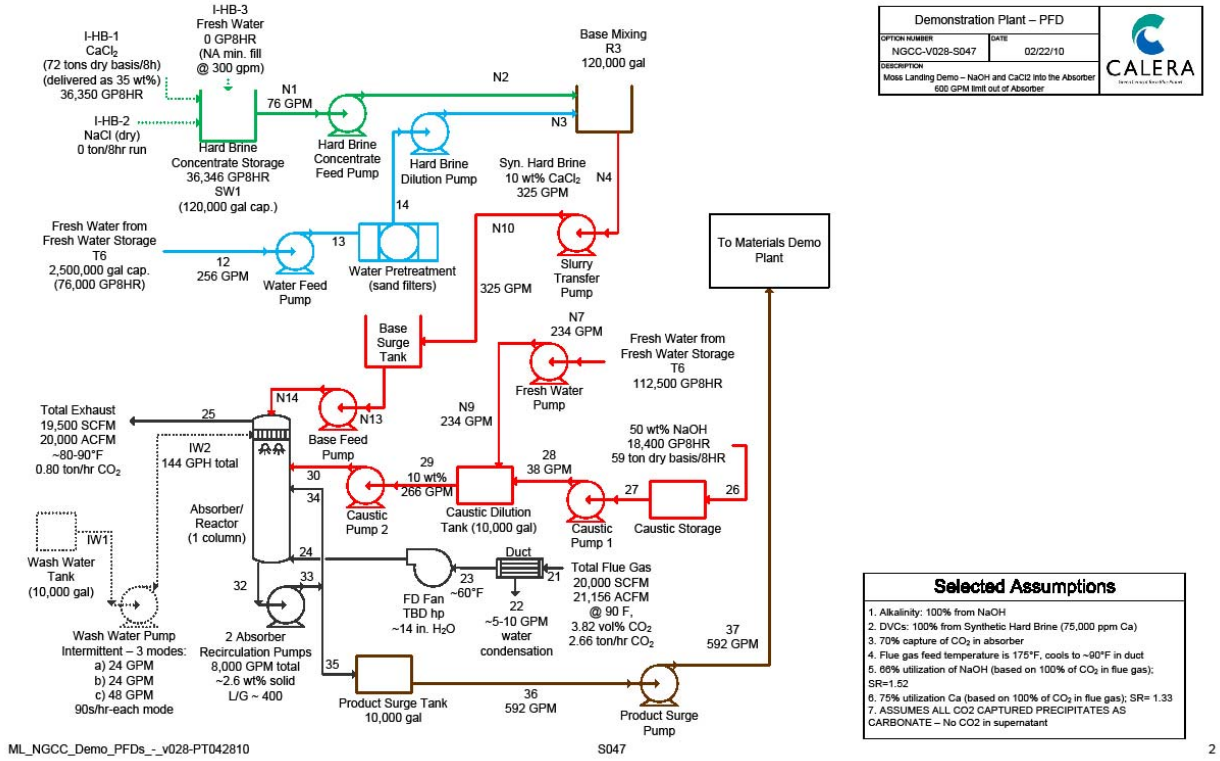


Figure 5.4: Process Flowsheet for Absorber Island System 600 gpm



5.3 Commercial Process Overview

The MAP process requires several inputs: 1) carbon dioxide, 2) alkalinity, 3) divalent cation, 4) non-potable water, and optionally 5) a source of sodium chloride for electrochemical production of sodium hydroxide.

Carbon dioxide will be captured from the flue gas of power plants, cement kilns, or other industrial processes. An emphasis will be placed on coal-fired power plants because of their carbon intensity and the ability of the MAP process to reduce other emissions including mercury and sulfur oxides. Calera has demonstrated capture of CO_2 from both a coal-fired boiler simulator and the natural gas fueled Moss Landing Power Plant (MLPP). The flue gas from the MLPP represented a particular challenge because of its low (less than 4 vol%) CO_2 content. Capture at coal plants (12-15 vol%) and cement plants (approximately 20-25 vol%) will be less capital and energy intensive because of the higher carbon dioxide concentrations in the flue gas.

Alkalinity will be provided from several sources primarily by alkaline-rich ground waters and manufactured sodium hydroxide. Alkaline-rich ground waters are expected to be found in many locations at acceptable depths and concentrations. In some locations, these alkaline brines will provide all of the alkalinity required for the MAP process. In locations where alkaline brines cannot be economically extracted or are of insufficient strength, alkalinity may be provided by sodium hydroxide manufactured using a new low-energy electrochemical process being developed by Calera outside of the

scope of this application. The proposed work uses purchased sodium hydroxide as a source of alkalinity; the caustic simulates the alkalinity provided by either alkaline brines or electrochemically produced sodium hydroxide.

In most locations, divalent cation will come from calcium-rich, saline groundwater. Calcium-rich brines can be found at acceptable depths and concentrations in most parts of the United States and worldwide. In addition to calcium, these brines also contain magnesium and other divalent cations that may be incorporated into the solid product, although most brines will be dominated by calcium owing to their contact with calcium-rich minerals. Given the predominance of calcium in these brines, purchased calcium chloride, containing small amounts of other divalent cations will be used in the proposed work as a brine simulant. In locations lacking access to calcium-rich waters, divalent cations may be extracted from calcium or magnesium-rich minerals using the hydrochloric acid byproduct of our electrochemical sodium hydroxide process. This extraction may occur after mining of minerals or through in-situ solution mining. In particular locations, calcium-rich waste materials such as fly ash or cement kiln dust may be used as a calcium source with the added benefit of waste mitigation. Waste mitigation may provided an added impetus for the construction of early MAP plants. The use of industrial wastes is, however, not a focus of the proposed work.

The non-potable water and sodium chloride (where needed) requirements will be provided in the calcium-rich and/or alkaline brines used in the process.

5.4 Commercial scale electrochemical alkalinity overview

The production of sodium hydroxide through traditional chlor-alkali technology is energy intensive and not suitable for the capture of CO_2 at scale. The chlor-alkali process chemistry (E-1) produces caustic, hydrogen, and chlorine at a cell voltage of 3.2 V and in capturing 70% of CO_2 emissions, would consume 245% of the output of a typical black coal plant (0.9 metric ton of CO2/MWh).

$NaCl + H_2O \rightarrow NaOH + ½\ H_2 + ½\ Cl_2$ (3.2V) (E-1)

Calera has developed various electrochemical alternatives for the production of alkalinity at substantially lower loads. In one configuration (E-2), caustic, and hydrochloric acid are produced at a cell voltage of 1.2 V. In capturing 70% of CO_2 emissions, such a process would consume 92% of the output of a typical black coal plant (0.9 metric ton of CO_2/MWh).

$NaCl + H_2O \rightarrow NaOH + HCl$ (1.2V) (E-2)

Other similar configurations can be employed such as that shown in (E-3) that reduces the load even more by combining several steps at a cell voltage of 0.9 V. The second configuration can capture 70% of CO_2 emissions of a typical black coal plant (0.9 metric ton of CO_2/MWh) while consuming 69% of the electrical output of the plant.

$NaCl + CO_2 + H_2O \rightarrow NaHCO_3 + HCl$ (0.9 V) (E-3)

5.5 Commercial scale brine overview

In many locations, subsurface waters are expected to provide the cations (Ca/Mg) and a portion of the alkalinity required by the process. Pumping power for brine extraction and reinjection is a function of depth and reservoir pressure, expressed in feet of dynamic head. Although wells will often be drilled to a depth in excess of the dynamic depth, the pumping power is reduced by the reservoir pressure, which in some locations is even sufficient to produce "artesian" conditions in which the brine will flow freely from the reservoir to the surface.

5.6 Commercial Scenarios

Several commercial scenarios are presented below with PFDs and mass and energy balances. These scenarios represent a subset of potential site-specific configurations which might be employed. As capture or mitigation requirements become clearer in the future, we will revise the case parameters accordingly. Case A represents a configuration capturing 70% of CO_2 using brines as feedstock. Case B represents a configuration capturing 70% of CO_2 using brines and electrochemically-produced alkalinity. Cases C and D represent reduced capture cases using only electrochemically-produced alkalinity in order to achieve 70% and 100% reduction in CO_2 on a lifecycle basis.

Table 5.4: Summary of Generic Assumptions

Plant Characteristics	Plant Size	200 MW
	Fuel	Subbituminous Coal
	Carbon Intensity	0.9 tonne CO_2/MWh
Alkaline Brine Characteristics	Alkalinity Concentration	500 mEq/liter
	Dynamic Depth	200 ft (66 m)
Hard (Calcium-rich) Brine Characteristics	Ca^{2+} Concentration	25,000 ppm (by mass)
	Dynamic Depth	200 ft (66 m)
Product Mix	Cement	100%
	Aggregate	0%

Table 5.5: Summary of case specific assumptions and energy requirements

	Case A	**Case B**	**Case C**	**Case D**
Short Description	Brine only	Brine + Echem	Echem only	Echem only
Plant Size, Fuel	200 MW; Subbituminous Coal			
Carbon Intensity	0.9 tonne/MWh			
CO_2 capture	70%		32.4%	45.3%
Alkalinity Sourcing	100% alkaline brine	80% alkaline brine 20% Electrochemistry	100% Electrochemistry	100% Electrochemistry
Ca, Mg Sourcing	100% Ca/Mg-rich brine			
Product composition	$CaCO_3$			

Annual CO_2 captured (@85% capacity)	938,200 metric tons per year		434,000 metric ton/yr	607,000 metric ton/yr
Energy Requirement	14.3 MW (7.1%)	43.2 MW (21.6%)	59.2 MW (29.6%)	79.0 MW (39.5%)

Figure 5.5: PFD for Case A – Brines Only

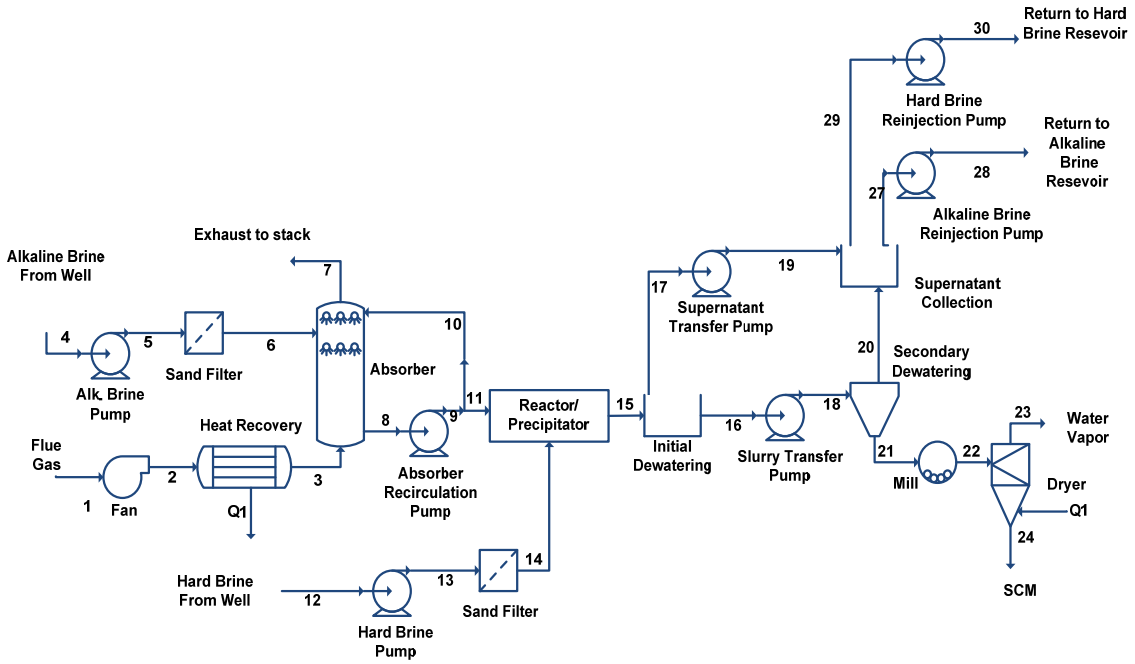


Figure 5.5: Overall Mass and Energy Balances for Case A – Brines Only

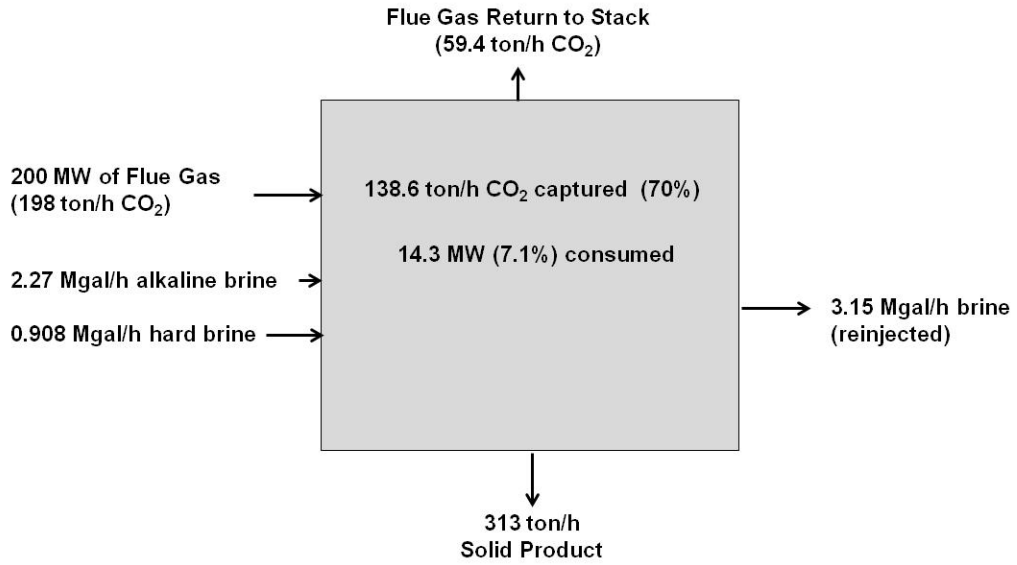


Table 5.6: Energy Balance Detail for Case A – Brines Only

	Electrical Power Demand	
Equipment List	(MWe)	(% of 200 MW)
Hard Brine Supply Pump	0.87	0.4%
Alkaline Brine Supply Pump	2.17	1.1%
Fan	2.20	1.1%
Absorber Recirculation Pump	3.70	1.9%
Initial Dewatering/Settling (includes associated pumps)	0.45	0.2%
Secondary Dewatering	2.40	1.2%
Supernatant Transfer Pump	0.42	0.2%
Slurry Transfer Pump	0.14	0.1%
Hard Brine Reinjection Pump	0.43	0.2%
Alkaline Brine Reinjection Pump	1.08	0.5%
Mill	0.15	0.1%
Dryer and Associated Equipment	0.26	0.1%
Total	14.27	7.1%

Figure 5.6: PFD for Case B – Brines plus Echem

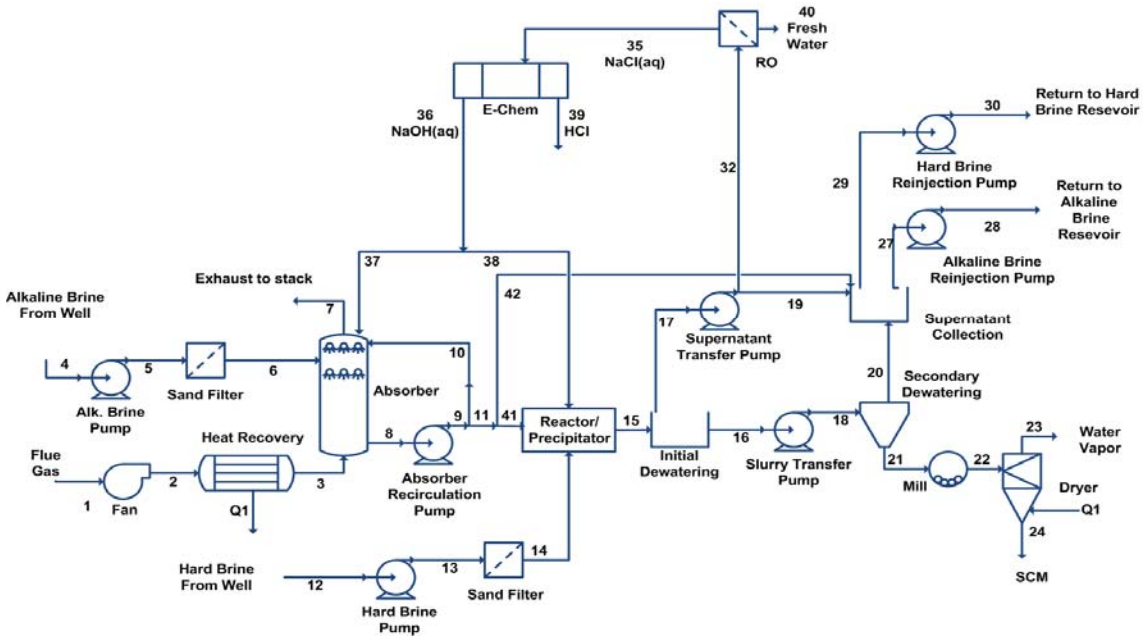


Figure 5.7: Overall Mass and Energy Balance for Case B – Brines plus Echem

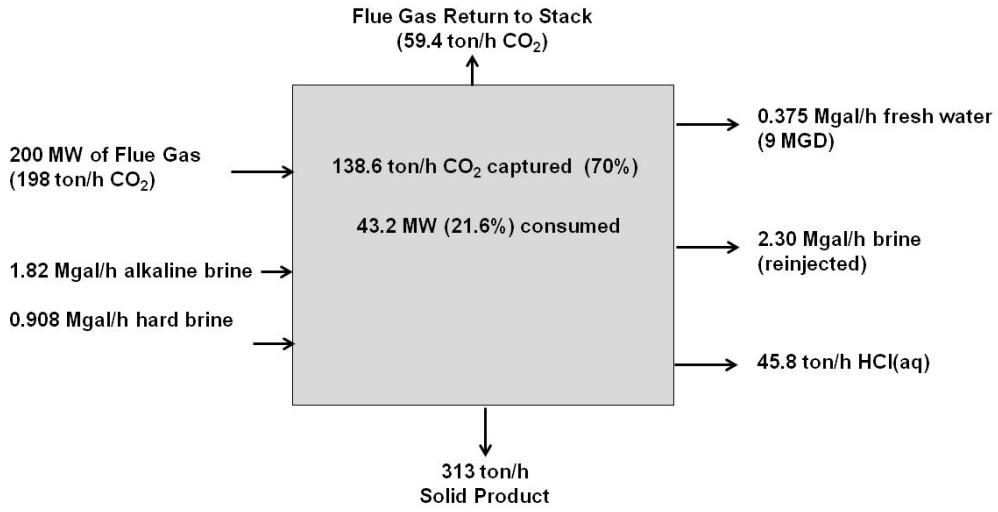


Table 5.7: Energy Balance Detail for Case B – Brines plus Echem

	Electrical Power Demand	
Equipment List	(MWe)	(% of 200 MW)
Hard Brine Supply Pump	0.87	0.4%
Alkaline Brine Supply Pump	1.74	0.9%
Fan	2.20	1.1%
Absorber Recirculation Pump	2.81	1.4%
Echem	30.5	15.3%
Initial Dewatering/Settling (includes associated pumps)	0.18	0.1%
Secondary Dewatering	1.14	0.6%
Supernatant Transfer Pump	0.20	0.1%
Slurry Transfer Pump	0.06	0.0%
Hard Brine Reinjection Pump	0.43	0.2%
Alkaline Brine Reinjection Pump	0.87	0.4%
Mill	0.15	0.1%
Dryer and Associated Equipment	0.26	0.1%
Total Ex. Fresh Water Production	41.41	20.7%
+ RO	1.76	0.9%
Total	43.17	21.6%

Figure 5.8: PFD for Case C – Echem – 70% Lifecycle Mitigation

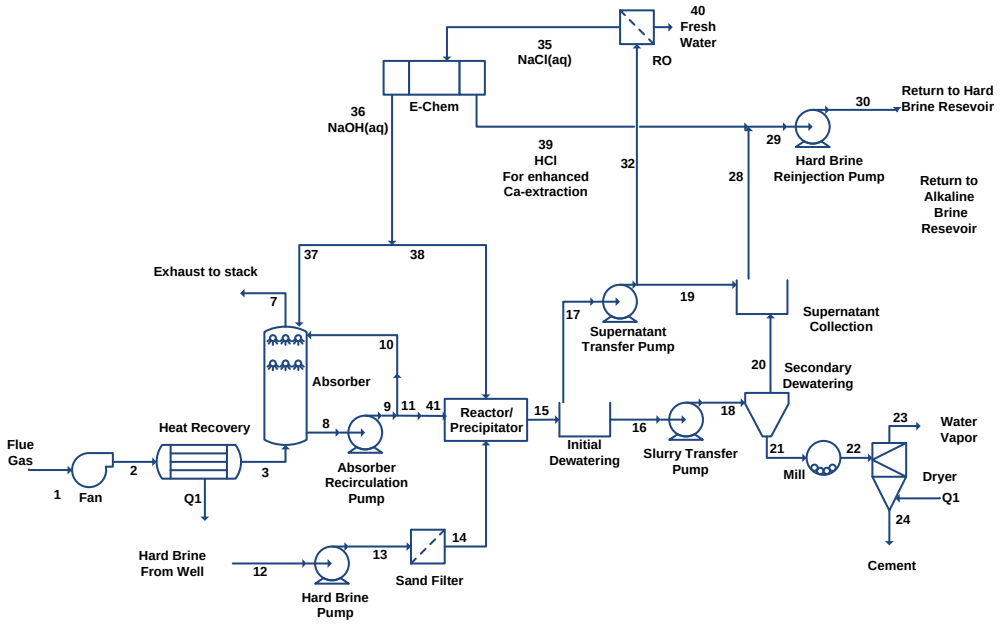


Figure 5.9: Overall Mass and Energy Balances for Case C – Echem – 70% Lifecycle Mitigation

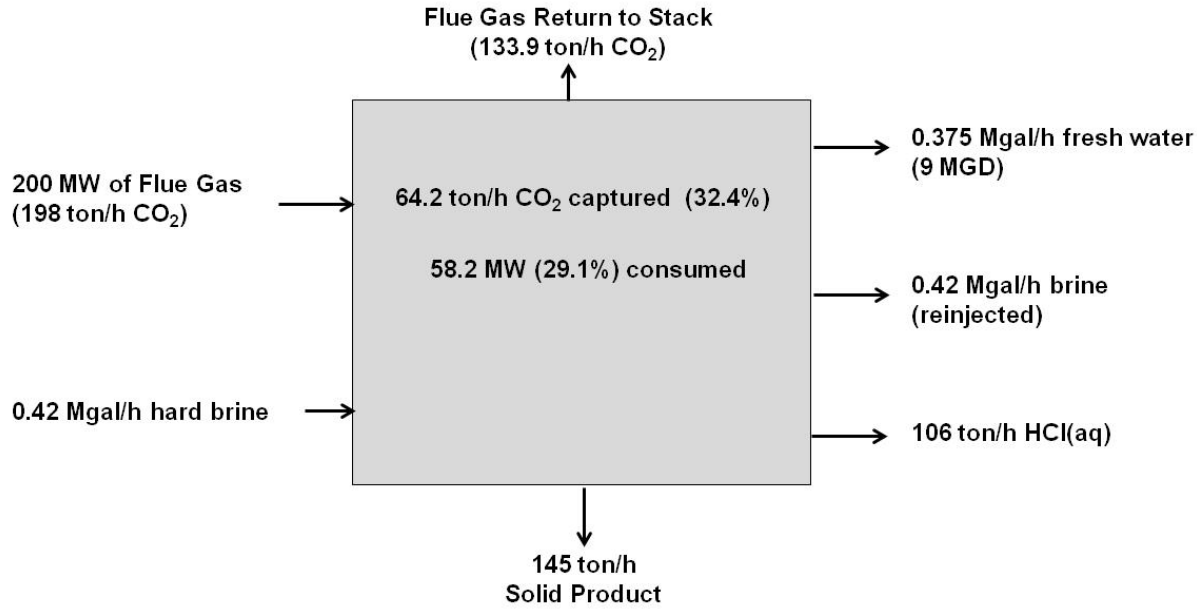


Table 5.8: Energy Balance Detail for Case C Echem – 70% Lifecycle Mitigation

	Electrical Power Demand	
Equipment List	(MWe)	(% of 200 MW)
Hard Brine Supply Pump	0.40	0.20%
Fan	2.20	1.10%

Absorber Recirculation Pump	2.63	1.32%
Echem	49.33	24.67%
Initial Dewatering/Settling (includes associated pumps)	0.21	0.10%
Secondary Dewatering	1.11	0.55%
Supernatant Transfer Pump	0.19	0.10%
Slurry Transfer Pump	0.06	0.03%
Hard Brine Reinjection Pump	0.20	0.10%
Mill	0.07	0.03%
Dryer and Associated Equipment	0.12	0.06%
Total Ex. Fresh Water Production	56.53	28.26%
+ RO	1.76	0.88%
Total	58.29	29.14%

Figure 5.10: PFD for Case D – Echem – 100% Lifecycle Mitigation

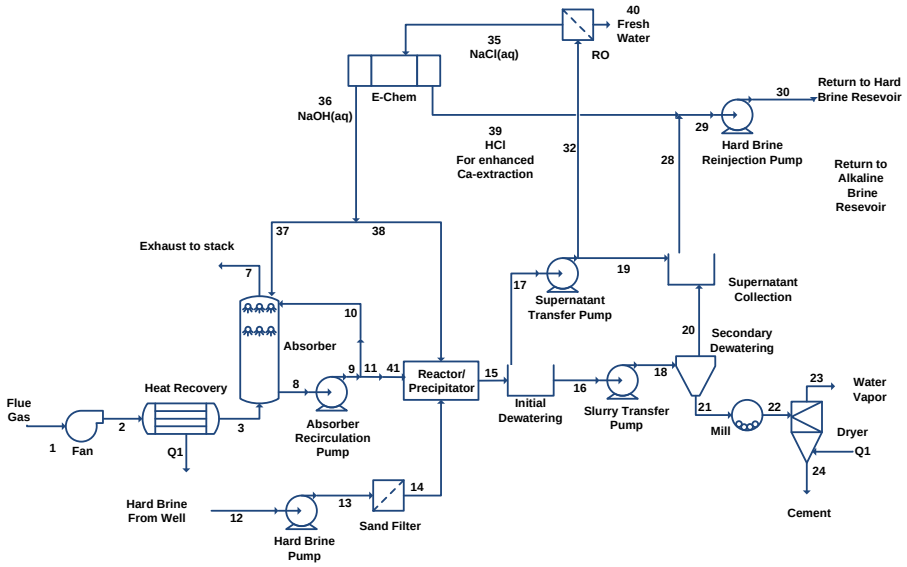


Figure 5.11: Overall Mass and Energy Balance for Case D – Echem – 100% Lifecycle Mitigation

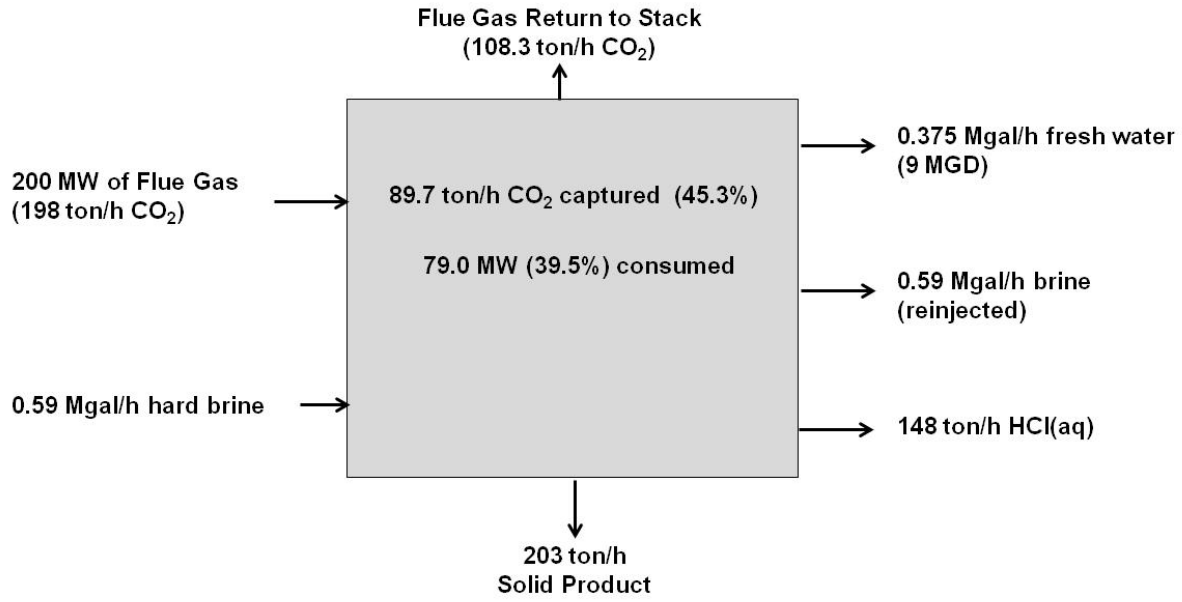


Table 5.9: Energy Balance Detail for Case D – Echem – 100% Lifecycle Mitigation

	Electrical Power Demand	
Equipment List	(MWe)	(% of 200 MW)
Hard Brine Supply Pump	0.56	0.28%
Fan	2.2	1.10%
Absorber Recirculation Pump	2.63	1.32%
Echem	69.1	34.54%
Initial Dewatering/Settling (includes associated pumps)	0.29	0.15%
Secondary Dewatering	1.55	0.78%
Supernatant Transfer Pump	0.27	0.14%
Slurry Transfer Pump	0.09	0.05%
Hard Brine Reinjection Pump	0.28	0.14%
Mill	0.10	0.05%
Dryer and Associated Equipment	0.17	0.08%
Total Ex. Fresh Water Production	77.23	38.6%

5.7 Lifecycle Analysis of Commercial Cases

A high level carbon lifecycle analysis has been performed on the selected commercial cases described in the mass and energy balance. The results and calculations are summarized in the table below. In brief, the analysis combines several contributions and relies on several assumptions:

1. The CO_2 directly captured from the plant (0.9 tonne/MWh) is one source of mitigated carbon.

2. Every tonne of Ordinary Portland Cement displaced represents 0.92 tonne of CO_2 avoided. Source: DOE NRTL database combining CO_2 liberated from limestone decomposition and CO_2 from fossil fuel burning for cement kiln

3. The electricity consumed in the capture and building materials production is assigned carbon emissions corresponding to the unscrubbed power plant (0.9 tonne/MWh). Note that this assumption is conservative relative to other analyses that assign a grid average carbon intensity (often about 0.6 tonne/MWh) to the power consumed.

4. The carbon avoided through direct capture and avoided cement less the emissions related to power consumption represent a good approximation of the overall carbon footprint of the process. In future analyses, other contributions to the carbon lifecycle will be considered, but are expected to be small. Examples of items to be examined further include the steel and cement required for building the plant. The tables below for OPC production taken from DOE NRTL are representative of the level of detail to be considered.

Table 5.10: Summary of Carbon Lifecycle Analysis for Selected Cases

	Case A - Natural Alkalinity	Case B - Natural Alkalinity + Echem	Case C - Echem 32.4% Capture	Case D - Echem 45.3% Capture
Product produced	2,118,725	2,118,725	979,457	1,371,118
x CO2 avoided/product product produced	0.92	0.92	0.92	0.92
CO2 avoided from Avoided Cement Production	1,949,227	1,949,227	901,100	1,261,429
+ CO2 captured	938,196	938,196	433,716	607,149
Gross CO2 mitigated	2,887,423	2,887,423	1,334,816	1,868,578
Power consumed by MAP Plant (%)	7.1%	21.6%	29.6%	39.5%
Power consumed by MAP Plant	106,478	321,667	434,146	588,129
x Carbon intensity of power	0.9	0.9	0.9	0.9
Carbon emitted by power consumed	95,830	289,500	390,731	529,316
Gross CO2 mitigated	2,887,423	2,887,423	1,334,816	1,868,578
- Carbon emitted by power consumed	95,830	289,500	390,731	529,316
Net CO2 mitigated	2,791,593	2,597,923	944,085	1,339,262
Net CO2 mitigated	2,791,593	2,597,923	944,085	1,339,262
Initial Power Plant CO2 emitted	1,340,280	1,340,280	1,340,280	1,340,280
Ratio CO2 mitigated:Initial Power Plant CO2	2.083	1.938	0.70	1.00

Table 5.11: Inputs from Technosphere Used in Production of Ordinary Portland Cement (OPC) – Source: DOE NRTL Database

		Quantity	
Inputs Required	Unit	For 1 kg OPC	For 2,120,000 tonne
Bituminous coal, combusted in industrial boiler	kg	1.075E-01	2.277E+05
Gasoline, combusted in equipment	L	1.330E-04	2.817E+02
Liquefied petroleum gas, combusted in industrial boiler	L	1.429E-05	3.028E+01

Dummy_Middle distillates, combusted in industrial boiler	m3	1.065E-06	2.257E+00
Natural gas, combusted in industrial boiler	m3	5.568E-03	1.180E+04
Dummy_Petroleum coke, combusted in industrial boiler	kg	2.234E-02	4.733E+04
Residual fuel oil, combusted in industrial boiler	L	4.418E-05	9.360E+01
Dummy_Waste, miscellaneous, combusted in industrial boiler	kg	1.483E-03	3.143E+03
Dummy_Waste, oil, combusted in industrial boiler	m3	4.872E-07	1.032E+00
Dummy_Waste, solvents, combusted in industrial boiler	kg	8.814E-03	1.867E+04
Dummy_Waste, tire derived, combusted in industrial boiler	kg	3.370E-03	7.140E+03
Dummy_Waste, other solid, combusted in industrial boiler	kg	9.339E-04	1.979E+03
Electricity, at grid, US	kWh	1.444E-01	3.059E+05
Dummy_Bottom ash, unspecified origin	kg	1.009E-02	2.138E+04
Dummy_Fly ash, unspecified origin	kg	1.346E-02	2.851E+04
Dummy_Foundry sand, at mine	kg	3.824E-03	8.102E+03
Dummy_Slag, at blast furnace	kg	1.980E-02	4.195E+04
Dummy_Explosives, at plant	kg	2.950E-04	6.250E+02
Dummy_Refractory material, unspecified, at plant	kg	6.475E-04	1.372E+03
Dummy_Grinding media, at plant	kg	1.400E-04	2.966E+02
Dummy_Grinding aids, at plant	kg	3.600E-04	7.627E+02
Dummy_Filter bags, at plant	kg	1.918E-05	4.063E+01
Dummy_Oil and grease, at plant	kg	1.300E-04	2.754E+02
Dummy_Cement bags, at plant	kg	6.800E-04	1.441E+03
Dummy_Chains, at plant	kg	2.007E-05	4.253E+01
Dummy_Disposal, cement kiln dust, in residual material landfill	kg	3.730E-02	7.903E+04
Dummy_Recycling, cement kiln dust	kg	9.650E-03	2.045E+04

Table 5.12: Inputs from Nature Used in Production of Ordinary Portland Cement (OPC) – Source: DOE NRTL Database

		Quantity	
Inputs Required	Unit	For 1 kg OPC	For 2,120,000 tonne
Limestone, in ground	kg	1.372E+00	2.907E+06
Shale, in ground	kg	5.223E-02	1.107E+05
Clay, unspecified, in ground	kg	5.969E-02	1.265E+05
Sand, unspecified, in ground	kg	4.050E-02	8.580E+04
Iron ore, in ground	kg	1.353E-02	2.866E+04
Slate, in ground	kg	1.134E-03	2.403E+03
Gypsum, in ground	kg	6.146E-02	1.302E+05
Raw material, unspecified	kg	2.642E-02	5.597E+04
Water, process, unspecified natural origin/kg	kg	8.829E-02	1.871E+05
Water, unspecified natural origin/kg	kg	7.523E-01	1.594E+06

Table 5.13: Outputs to Nature in Production of Ordinary Portland Cement (OPC) – Source: DOE NRTL Database

		Quantity	
Outputs	Unit	For 1 kg OPC	For 2,120,000 tonne
Particulates, unspecified	kg 2.	350E-03	4.980E+03
Particulates, > 2.5 um, and < 10um	kg 2.	963E-04	6.277E+02
Particulates, < 2.5 um	kg 9.	111E-08	1.930E-01
Carbon dioxide	kg 3.	736E-01	7.915E+05
Carbon dioxide, fossil	kg 5.	534E-01	1.173E+06
Sulfur dioxide	kg 1.	662E-03	3.522E+03
Nitrogen oxides	kg 2.	503E-03	5.304E+03
VOC, volatile organic compounds	kg 5.	015E-05	1.063E+02
Carbon monoxide	kg 1.	105E-03	2.340E+03
Methane	kg 3.	954E-05	8.378E+01
Ammonia	kg 4.	757E-06	1.008E+01
Hydrogen chloride	kg 6.	486E-05	1.374E+02
Mercury	kg 6.	236E-08	1.321E-01
Dioxins and furans, measured as 2,3,7,8-tetrachlorodibenzo-p-dioxin	kg 9.	975E-11	2.113E-04
Suspended solids, unspecified	kg 2.	344E-04	4.965E+02
Aluminum	kg 8.	598E-07	1.822E+00
Phenols, unspecified	kg 2.	205E-08	4.671E-02
Oils, unspecified	kg 7.	518E-06	1.593E+01
Nitrate compounds	kg 5.	897E-06	1.249E+01
DOC, Dissolved Organic Carbon	kg 1.	378E-05	2.919E+01
Chloride	kg 7.	275E-04	1.541E+03
Sulfate	kg 6.	156E-04	1.304E+03

6. PHASE I DELIVERABLES ACCOUNTING

In accordance with the Statement of Project Activities – DE-FOA-0000015, the following is an accounting of the completion of tasks as committed for Phase I.

- Task 1.1 Project Reports and Meeting
    - Subtask 1.1.1 Kick-Off Meeting
        - Deliverable – Kick-Off meeting agenda
        - Status – Complete. Lines of communication and procedures for implementing this project were established.
    - Subtask 1.1.2 Preliminary design, schedule and cost review meeting
        - Deliverable – Project review presentation
        - Status – Complete. A project status presentation based on the latest Process Design Basis (PDB) which included a preliminary schedule, preliminary cost estimate, and risk estimate was prepared.
    - Subtask 1.1.3 Final Meeting
        - Deliverable – Written documentation of meeting agreements and schedule for completing closeout activities.
        - Status – Scheduled.
    - Subtask 1.1.4 Progress Report
        - Deliverable – Quarterly Progress Reports and Special Status Reports
        - Status – First Quarterly Report Complete. Progress reports summarizing all project activities conducted by Calera for the reporting period, including an assessment of the ability to complete the project within the current budget and any anticipated cost overruns were prepared.
    - Subtask 1.1.5 Topical Report/Final Report for Phase I
        - Deliverable – Topical Report / Final Report Phase I
        - Status – Complete.
- Task 1.2 Renewal Application
    - Deliverable – Renewal Application
    - Status – Complete. Detailed scope of work, schedule, and cost estimates for Phase II developed. Renewal application for Phase II submitted.
- Task 1.3 Identify and Obtain Required Permits for Phase I
    - Deliverable –
        - Letter documenting the permits or stating that no permits are required
        - A copy of each approved permit (if applicable)
        - Updated list of permits as they change during the term of the Agreement (if applicable)
        - Updated schedule for acquiring permits as changes occur during the term of the Agreement (if applicable) – 1.3
    - Status – Complete. None required for Phase I.
- Task 1.4 Project Baseline and Technical Plan

    - Deliverable – Technical Plan and Process Design Basis (PDB)
    - Status – Complete. A PDB defining scope of work, methods, quality control practices, key technical elements such as feedstocks and product compositions, battery limit conditions, utility specifications, general arrangements, key financial elements such as budget and financial structures, and key managerial elements such as definition of the project team and organizational structure was completed and routed for internal review and approval.
- Task 1.5 Detailed Project Management Plan
    - Deliverable – Project Management Plan (PMP)
    - Status – Complete. A PMP that governs all project specific activities, manages change, and ensures compliance with all meeting and reporting requirements was written.
- Task 2 Research and Development
    - Deliverable – Not Applicable.
    - Status – All research activities performed in support of this project was funded by Calera Corporation.
- Task 3.1 Conceptual Design Block Flow Diagram and Conceptual Process Review
    - Deliverable – Block Flow Diagram (BFD)
    - Status – Complete. A BFD identifying main streams and unit operations along with defining interactions between unit operations was generated.
- Task 3.2 Preliminary Process Flow Diagram (PFD) and Heat and Material Balances
    - Deliverable – Preliminary heat and material balances. Preliminary process flow diagrams with stream tables.
    - Status – Complete. This PFD allowed a more detailed preliminary design to proceed. Addressed in this PFD were the following: definition of a preliminary equipment list, connectivity between major pieces of equipment, stream table, and material and heat balances.
- Task 4.1 Permitting Environmental Analysis
    - Deliverable – Environmental Analysis Report
    - Status – Complete. A complete list of required permits for construction and operation including relevant permitting agencies or individuals was developed. These permits included, but not limited to, NPDES discharge permit, NPDES storm water permit, air quality management permit and hazardous waste permit. A complete analysis of water sources, mineral compositions of process water, land constraints, transportation constraints, and flue gas characteristics was performed. Gaps between the above analysis and permit requirements were determined and a strategy to address them was established.
- Task 4.2 Site Specific NEPA Review
    - Deliverable – NEPA compliance report
    - Status – Complete. A compliance review with the Endangered Species Act and other NEPA specific requirements was conducted.
- Task 4.3 Environmental Management Plan

    - Deliverable – Environmental Management Plant
    - Status – Complete.
- Task 4.4 Risk Analysis
    - Deliverable – Risk Analysis Report
    - Status – Complete. A NEPA compliance report and Environmental Management Plan was compiled to do a risk analysis.
- Task 5.1 Preliminary Design Update Process Flow Diagram and Heat and Material Balance
    - Deliverable – Reviewed process flow diagrams with stream tables and heat and material balance. Plant simulation model in Aspen.
    - Status – Complete. Aspen model was developed. A review was conducted of the stream tables from Aspen and crosschecked with Process Flow Diagram.
- Task 5.2 Process Analysis
    - Deliverable – Analysis of opportunities for recycle, purge stream, and heat integration. Risk analysis and design review document.
    - Status – Complete. A risk analysis in the form of Failure Mode and Effects Analysis (FMEA) was completed with elements including recycle opportunities, purge streams, process performance, operability, and waste production.
- Task 5.3 First Process Design Review
    - Deliverable – Report detailing results of the first design review. Report detailing results of the second design review.
    - Status – First design review complete. First review checked key assumptions and calculations made in the development of the balances. A preliminary Hazard and Operability Analysis (HAZOP) using the preliminary process flow diagrams was performed. A review of outstanding environmental issues and check for basic operational concerns (start-up, maintenance, and shutdown) was done.
- Task 5.4 Project Schedule and Cost Estimate
    - Deliverable – Updated Process Design Basis. Preliminary Phase II project schedule.
    - Status – Complete. A project schedule with estimated costs was generated defining all administrative elements, all permitting activities, and all technical activities. A preliminary report on critical paths for project completion was written.
- Task 6.1 Detailed Design Select and Specify Major Equipment
    - Deliverable – Detailed specification sheets for all major pieces of equipment
    - Status – Complete. An equipment list with specification sheets was generated based on PFD and P&ID.
- Task 6.2 Integration of Demonstration Plants
    - Deliverable – Integration Plan
    - Status – Complete. All integration points between Absorption Demo Plant and Building Materials Demo Plant indentified along with strategies to address operational issues.
- Task 6.3 Utility, Infrastructure, and Controls
    - Deliverable – Utility analysis, infrastructure analysis, and control system package

    - Status – Complete. Electrical requirements have been defined in the form of a one-line diagram based on equipment completed. Control scheme and system package has been selected.
- Task 6.4 Piping and Instrumentation Diagrams
    - Deliverable – Piping and instrumentation diagrams for all major pieces of process and auxiliary equipment
    - Status – Complete. P&IDs showing major equipment, line sizes, valve locations, and connections were developed.
- Task 6.5 Process Design Specification
    - Deliverable – Process Design Specifications
    - Status – Complete.
- Task 6.6 Second Process Design Review
    - Deliverable – Report detailing the results of the first and second design reviews. Final Process Design Basis.
    - Status – Complete.
- Task 6.7 Final Project Schedule
    - Deliverable – Final Project Schedule
    - Status – Complete.
- Task 6.8 Final Cost Estimates and Analysis
    - Deliverable – Final Phase II Project Cost Estimate
    - Status – Complete.
- Task 6.9 Competitive Analysis and Production and Readiness Plan
    - Deliverable – Competitive Analysis and Production Readiness Plan
    - Status – Complete.
- Task 7 Construction
    - Deliverable – Not Applicable
    - Status – Not Started. All construction activities are part of Subphase IIB and preliminarily under Tasks 10, 11 and 12
- Task 8 Operations
    - Deliverable – Not Applicable
    - Status – Not Started. All operations activities are part of Subphase IIC and preliminarily under Tasks 13, 14, 15 and 16.

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LIST OF ACRONYMS AND ABBREVIATIONS

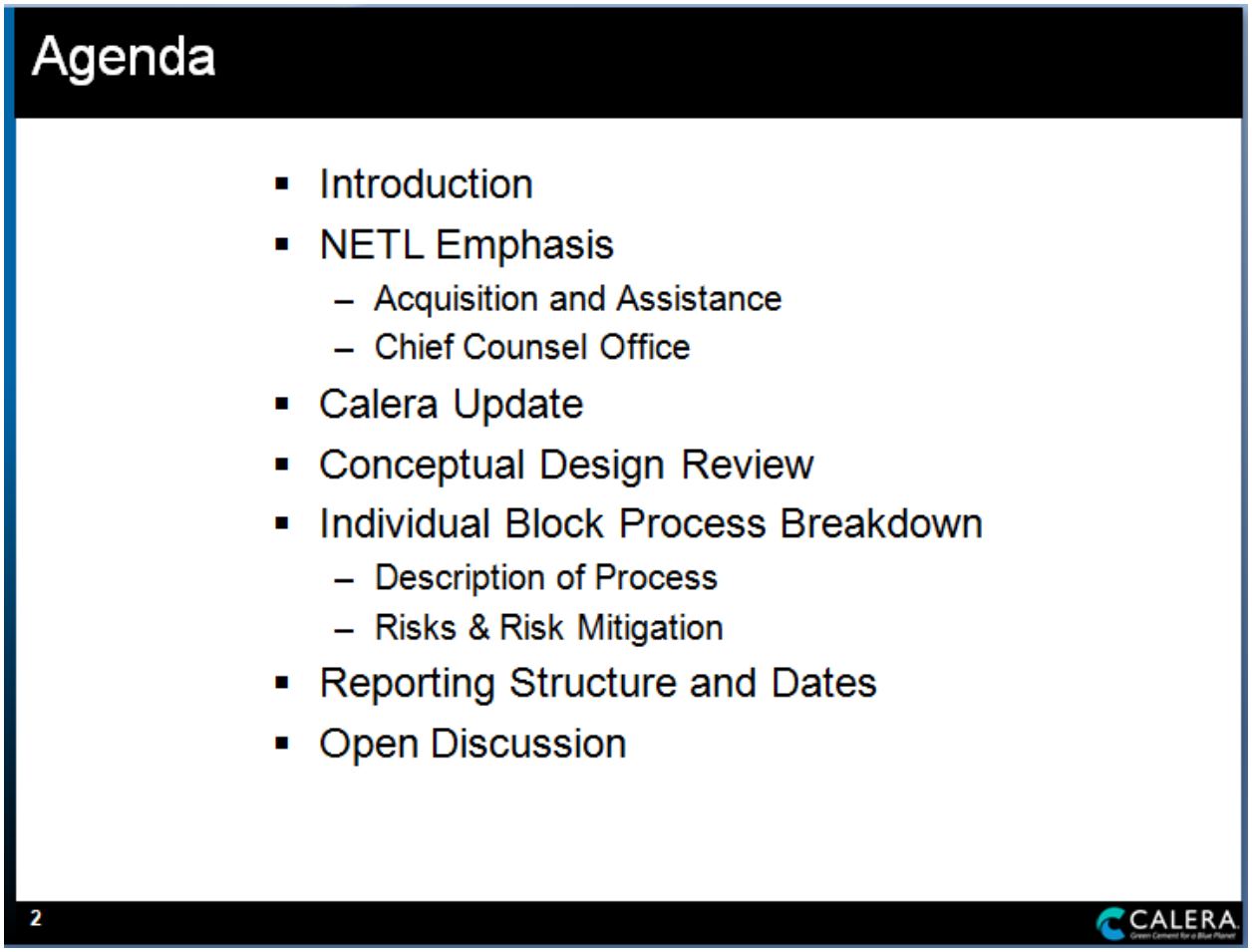
APS - Advance Photon Source
ASTM - American Society for Testing and Materials
ASTM C1157 - Standard Performance Specification for Hydraulic Cement
BFD – Block Flow Diagram
$CaCO_3$ - Calcium Carbonate
CCS - Carbon Capture Sequestration
CeO_2 – Cerium Oxide
CFBS - Coal Fired Boiler Simulator
CO_2 - Carbon Dioxide
EDAX/EDS – Energy-Dispersive Spectroscopy
FMEA – Failure Mode Effects Analysis
HAZOP - Hazard and Operability Analysis
MAP - Mineralization via Aqueous Precipitation
MAUD – Material Analysis Using Diffraction
NEPA - National Environmental Policy Act
NPDES - National Pollutant Discharge Elimination System
OPC - Ordinary Portland Cement
PDB – Process Design Basis
PFD – Process Flow Diagram
PMP – Project Management Plan
P&ID – Piping and Instrumentation Diagram
RCM – Reactive Carbonate Material
SCM - Supplementary Cementitious
SEM – Scanning Electron Microscope
SO_2 - Sulfur Dioxide
XRD – X-ray Powder Diffraction

Calcite - carbonate mineral and the most stable polymorph of calcium carbonate ($CaCO_3$).
Coulometry - analytical technique determine the amount of matter transformed during an electrolysis reaction by measuring the amount of electricity (in coulombs) consumed or produced. In Calera's case, carbon is the matter of interest.
Metastable - unstable and transient but relatively long-lived state of a chemical or physical system
Polymorph - a solid material existing in more than one form or crystal structure
Vaterite - a metastable polymorph of calcium carbonate mineral

APPENDICES

Appendix A – Task 1.1 Kick-Off Meeting Agenda
Appendix B – Task 4.3 Environmental Management Plan
Appendix C – Task 4.4 Risk Analysis Report
Appendix D – Task 5.4 Preliminary Phase II Project Schedule
Appendix E – Task 6.7 Final Project Schedule
Appendix F – Task 6.8 Final Phase II Project Cost Estimate
Appendix G – Task 6.9 Competitive Analysis and Production Readiness Plan

Appendix A – Task 1.1 Kick-Off Meeting Agenda



Appendix B – Task 4.3 Environmental Management Plan

Environmental Management Plan

Moss Landing Materials Demonstration Plant

CALERA

May 13, 2010

URS

Environmental Management Plan

Moss Landing Materials Demonstration Plant

May 13, 2010

Prepared by:

URS

TABLE OF CONTENTS

Page

LIST OF TABLES

LIST OF APPENDICES

LIST OF ACRONYMS AND ABBREVIATIONS

AAQS	ambient air quality standard
ATC Authorit	y To Construct
BAAQMD	Bay Area Air Quality Management District
BACT	Best Available Control Technology
bhp-hr/gal	brake horsepower hour per gallon
BMP	Best Management Practices
CA SHPO	California State Historic Preservation Office
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
Cal EPA	California Environmental Protection Agency
Cal/OSHA	California Occupational Safety and Health Administration
CARB	California Air Resources Board
CCR	California Code of Regulations
CCTA	Contra Costa Transportation Authority
CCRWQCB	Central Coast Regional Water Quality Control Board
CDFG	California Department of Fish and Game
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CMAP Carbonate	Mineralization by Aqueous Precipitation
CNEL	Community Noise Equivalent Level
CO carbon	monoxide
CO_2	carbon dioxide
CZ coastal	zone
db decibels	
dBA A-weighted	decibels
DDSD	Delta Diablo Sanitation District
DNL	Day-Night Average Sound Level
DOE	Department of Energy
DPM diesel	particulate matter
DTSC	Department of Toxic Substances Control
DWI	Detailed Work Instruction
ED electrodialy	sis
EIR	Environmental Impact Report
EMP	Environmental Management Plan
EMS	Environmental Management System
EO Executive	Order
FERC	Federal Energy Regulatory Commission
FWS	U.S. Fish and Wildlife Service
g/day	grams per day
g/hr	grams per hour
g/kW-hr	gallons per kilowatt hour
g/mi gram	s per minute
g/s	grams per second
g/year	grams per year
gpm gallon-per-m	inute
HC h	ydrocarbons
HRA	health risk assessment
HSP	health and safety plan
I&C	instrumentation and control

K Kelvin
kW kilowatts
L_{dn} Day-Night Average Sound Level
L_{eq} equivalent sound level
L_{90} sound level exceeded 90 percent of the time
LO/TO lockout/tag out
LOS level of service
m m eters
m/s meters per second
MBUAPCD Monterey Bay Unified Air Pollution Control District
mgd million gallons per day
MLCC Moss Landing Cement Company
MLCP Moss Landing Commercial Park
MLGS Marsh Landing Generating Station
MLMDP Moss Landing Materials Demonstration Plant
MW Megawatt
n/a not applicable
NAAQS National Ambient Air Quality Standards
NCLUP North County Land Use Plan
NCCAB North Central Coast Air Basin
NEPA National Environmental Policy Act
NO_X nitrogen oxides
NO_2 nitrogen dioxide
NPDES National Pollutant Discharge Elimination System
OSHA Occupational Safety and Health Administration
PM particulate matter
PM_{10} particulate matter of 10 microns or less
$PM_{2.5}$ particulate matter less than or equal to 2.5 microns in diameter
ppm parts per million
PTO Permit To Operate
RCRA Resource Conservation and Recovery Act
RO Reverse osmosis
SCM Supplem entary cementitious material
SILs Significant Impact Levels
SO_2 sulfur dioxide
SOP Standard Operating Procedure
SPL sound pressure level
SQG small quantity generator
SR State Route
SWPPP Stormwater Pollution Prevention Plan
TAC toxic air contaminant
TBD to be determined
USDOENNSA U.S. Department of Energy National Nuclear Security Commission
U.S. EPA U.S. Environmental Protection Agency
UTM Universal Transverse Mercator
VOC volatile organic compound
WPGS Willow Pass Generating Station
WTP Wastewater Treatment Plant

1.0 INTRODUCTION

The Calera Corporation's (Calera) currently proposed materials demonstration plant at the Moss Landing Cement Company (MLCC) site in Moss Landing, California, is Calera's signature project for demonstrating maximum carbon sequestration achieved through minimal energy consumption and minimal impact to the human and natural environments.

> ***Calera Corporation fully supports and approves this Environmental Management Plan (EMP). This includes a commitment to provide management assistance, manpower, training, equipment, and materials as necessary to implement the EMP and modify it as needed.***

Calera has developed this Environmental Management Plan (EMP) as a "management tool" for use by the Moss Landing Materials Demonstration Plant (MLMDP) management team, designers, constructors, and operators during project operation. The EMP presents Calera's organizational and management capabilities to successfully implement the project, achieve the project objectives, and oversee and minimize environmental concerns. This EMP presents Calera's capabilities and describes the process Calera will follow to maximize its environmental compliance and minimize impacts to the environment.

Specifically, the EMP:

- Discusses Calera's philosophy regarding environmental stewardship;
- Lists the Calera team members who oversee environmental and safety considerations at the MLMDP;
- Summarizes prior Calera team experience related to identification and minimization of potential environmental impacts, obtaining agency approval/permits, and meeting environmental regulatory requirements related to Calera operations;
- Describes/lists existing and proposed Environmental Policies, Procedures, and Plans;
- Discusses Calera's organizational and management capabilities for successfully implementing this EMP;
- Addresses environmental commitments relevant to construction and operation of the MLMDP; and
- Discusses how Calera will ensure compliance by its employees and subcontractors with all relevant project-related environmental requirements, best management practices designed for minimization of both regulated and unregulated pollutants, and mitigation measures; and Calera's approach regarding management and minimization of unexpected environmental consequences.

The EMP is a "living" document that will be revised and updated with additional information as applicable and appropriate. Calera will distribute the EMP to site personnel and notify them of substantive changes to the document or guidance, and provide appropriate training on EMP

implementation and environmental awareness. Implementation of the EMP will be promoted to ensure that the mitigation of adverse impacts and enhancement of beneficial impacts is carried out effectively during the project life cycle. Calera management will promote its use in the spirit of continual improvement, and to assist in achieving best practices in environmental management in an efficient and cost-effective manner.

In accordance with the principles of the EMP and Calera's philosophy regarding environmental stewardship, the EMP will be reviewed at regular intervals to assess the <u>overall</u> effectiveness of the management system and improvements relative to the environmental initiatives and to achieving the overall objectives of the project. Full implementation of, and continual improvements to, the EMP are key foci.

2.0 CALERA CORPORATION

2.1 ENVIRONMENTAL PHILOSOPHY

Green Cement for a Blue Planet - Calera seeks a new future that combines the world's most traded commodities (water, concrete, and electricity) into a synergistic infrastructure that converts man-made greenhouse gas emissions into sustainable products for use in the built environment.

Calera's Business System Plan is based on a "Do No Harm" philosophy. For Calera, the environment comes first in our operations. Calera has consistently demonstrated this commitment to the environment by recognizing that good environmental practices lead to good engineering and vice versa. Minimizing waste, recycling, and re-circulating byproducts is good business. Reducing the volume of raw materials put into our process and reusing byproducts saves money and is good environmental stewardship. Calera views this as a win-win. Calera aims for a zero discharge operation. Calera further strives to "do no harm" by constantly looking for opportunities to integrate our systems with other industries and by collaborating with these industries to reduce our impacts.

"ENVIRONMENT COMES FIRST / DO NO HARM"

Calera has the potential to significantly reduce the amount of carbon dioxide (CO_2) emissions from the emitter. Net emissions are calculated as the net capture of flue gas from the power plant (at least 70%), minus the emissions generated from the Calera process and the mining and transport of raw materials, plus the CO_2 avoided by the process:

1. Every ton of supplementary cementitious material (SCM) or cement replacement produced by Calera avoids the release of approximately a ton of CO_2 that would otherwise be emitted by the traditional manufacturing of Portland Cement (calcination).

2. The energy consumption needed to produce fresh water is reduced by the Calera process. By removing cations (calcium and magnesium), the energy use required for desalination is reduced by about 30%.

2.2 BACKGROUND

The primary objective of the MLMDP is to design, construct, and conduct Calera's innovative process for mineralization of CO_2 from flue gas directly to carbonates while maximizing the value and versatility of its beneficial use products. The MLMDP will be operated in conjunction with an existing 10 megawatt (MW) CO_2 Absorption Demonstration Plant. The beneficial use products will be tested and optimized to maximize their marketability and value. A second objective is to optimize the Carbonate Mineralization by Aqueous Precipitation (CMAP) process to achieve key metrics that will demonstrate the technology's commercial viability.

We anticipate that operating the MLMDP in conjunction with our Absorption Demonstration Plant will have a synergistic effect and increase the key performance metrics of the technology. The information

supplied by this study will be directly utilized for scale-up of the full carbonate mineralization technology to commercial scale in the future, presumably at other locations throughout the country.

The proposed MLMDP site is located adjacent to the Calera Absorption Demonstration Plant in Moss Landing, California. The Building Materials Demonstration Plant will receive product slurry produced in the CO_2 Absorption Demonstration Plant and convert it to aggregates and cementitious substitutes for use in the construction industry. In the Demonstration Plant, a variety of unit operations will be tested to find optimal combinations that maximize the value of carbonate mineralization beneficial use products. Producing marketable building materials from carbonate minerals by this technology can greatly reduce the net operating costs per amount of CO_2 sequestered.

2.3 PROJECT DESCRIPTION

The Proposed Action addressed in this EMP is the granting of Phase 2 federal financial assistance through the Department of Energy's (DOE's) Innovative Concepts for Beneficial Reuse of Carbon Dioxide program to Calera for the construction, operation, and maintenance of the MLMDP. The MLMDP would convert output from the Absorption Demonstration Plant into aggregates and cementitious products, which would be tested and optimized to maximize marketability and value. The Absorption Demonstration Plant and MLMDP are collectively referred to as the Moss Landing Demonstration Plant. An overview of the Proposed Action is provided below.

Calera is proposing a research-and-development facility for beneficial carbon dioxide use to be called the MLMDP. The facility will test and optimize aggregates and cementitious products that are created through an innovative process of mineralizing carbon dioxide from power plant flue gas. The MLMDP will be operated by the MLCC, which is a special-purpose entity company wholly owned by Calera. The project location is in Moss Landing in unincorporated Monterey County, California.

The MLCC currently operates a pilot plant at Moss Landing (the Pilot Plant) that encompasses the complete process of the absorption of carbon dioxide and the creation of aggregates and cementitious products. The Pilot Plant is 1:1,000 the scale of a commercial scale plant.

The MLCC also currently operates a demonstration plant at the site that is referred to as the Moss Landing Absorption Demonstration Plant (Absorption Demonstration Plant), which consists of the first (front-end) stage of Calera's process at 1:100 the scale of a commercial plant. The existing Absorption Demonstration Plant captures CO_2 from a slip stream of flue gas produced by the adjacent Dynegy Moss Landing natural gas–fired combined-cycle power plant (Dynegy Plant). The Absorption Demonstration Plant uses a source of base/high-alkalinity material plus calcium and/or other divalent cations to capture and convert the CO_2 into solid carbonates.

Project Construction

Calera will commence site mobilization subsequent to the receipt of all building, development, and environmental permits for the MLMDP. Site preparation work will include site grading and stormwater control. The project will continue to use several of the existing buildings and tanks currently used for the Absorption Demonstration Plant. No offsite linears will need to be constructed for implementation of the MLMDP. The following features will be constructed as part of the project:

- Three silos to store SCM
- An aggregate lay-down, drying, and harvesting area
- Three-sided uncovered bays for storage of aggregate and briquettes

Excavations will be needed for the installation of silos and within existing structures for installation of equipment. The depth of these excavations from existing foundations is expected to be approximately

3 feet. The total cut is not expected to exceed 90 cubic yards and cut material is expected to be placed around the existing facility to fill existing rough grades. No soils are expected to need to be imported to the site for construction of the project.

Portions of the site will be used for construction laydown, offices, and parking. Mobile trailers or similar suitable facilities (e.g., modular offices) will be used as construction offices for contractor and subcontractor personnel. Site access will be controlled for personnel and vehicles. The construction laydown and parking areas will be graded (as necessary) and surfaced with crushed rock—which will provide erosion protection. As necessary, temporary security fences will be installed for access control. A construction Storm water Pollution Prevention Plan (SWPPP) will be prepared and implemented if applicable. The plan will include best management practices (BMPs) to minimize erosion, such as use of strategically placed berms, swales, and culverts to redirect runoff toward storm water retention basins. After construction, disturbed areas will be cleaned up, but the crushed rock surfacing and fencing may remain in place.

A site-specific health and safety plan (HSP), incorporating information and procedures to be followed by onsite personnel for the completion of the work, will be developed and implemented. The HSP will outline requirements and provide guidance for control of construction safety hazards in compliance with safety standards and protection of public health.

Project Operations and Maintenance

MLMDP operations will primarily be consistent with operation of the Absorption Demonstration Plant, which is up to 24 hours each day. When the plant is not operating, personnel will be present as necessary for preparation of the plant for start-up, shutdown, and maintenance. Operation of the MLMDP will include continued testing and refinement of processes and monitoring of components and end products. Once operation provides sufficient data to allow for commercial scale up, the facility is expected to continue to operate as a research and development facility for Calera. Operation of process equipment is expected to require approximately 1 and 2 MW, which is anticipated to be provided by propane.

Liquid output streams are expected to be reused within the Moss Landing Demonstration Plant or in related processes at the MLCC site (including electrochemical production of sodium hydroxide, which is not part of this project). Specific liquid output streams include a calcium-rich water stream of about 130 gallongs per minute (gpm); sodium chloride-rich water stream of approximately 130 gpm; and a fresh water stream of about 300 gpm. The calcium-rich water stream will be recirculated to dilute or dissolve the incoming calcium chloride. The sodium chloride-rich stream is expected to be used in Calera's electrochemical process. Freshwater will either be sold or reused within the process for dilution of reagents.

Maintenance activities will be expected to be limited to equipment cleaning, testing, and maintenance as per product specifications within MLCC. Other facilities maintenance is the responsibility of the MLCP, as the owner of the site.

2.4 DEMONSTRATION OF CALERA ENVIRONMENTAL COMMITMENT

Calera's environmental commitment is best illustrated by our existing absorption demonstration plant (the "Absorption Demonstration Plant") in Moss Landing, California, which is being used to determine the commercial-scale processing and energy requirements to remove CO_2 from power plant flue gas. This Plant removes CO_2 from a slip stream of flue gas produced by the adjacent Dynegy Moss Landing natural gas-fired combined-cycle power plant (the "Dynegy Plant"). The Absorption Demonstration Plant instruments and controls allow Calera to obtain the data needed to quantify the amount of CO_2 removal obtained and internal power consumption required for the absorber configuration and operating condition being tested in pursuit of Calera's goals for CO_2 removal and power consumption.

During the Absorption Demonstration Plant planning and permitting process, Calera applied for and obtained an encroachment permit from the Monterey County Department of Public Works for extension of a flue gas conduit from the adjacent power plant to the Calera project site. The permit was required due to the need to trench across Dolan Road. Although not required to obtain the permit, Calera hired an independent consultant to perform a Biological Survey. Calera recognized the potentially sensitive nature of the proposed flue gas conduit's preferred path and sought independent assurance that sensitive habitat and species would not be directly or indirectly affected by the construction activities. Calera further demonstrated our proactive approach to good environmental stewardship by applying for and receiving air permits for individual pieces of equipment that would potentially, but not necessarily, be used by the absorption demonstration plant. Calera made an extensive effort during project planning and permitting to anticipate permit requirements and respond to those early and thoroughly. By permitting equipment that might be needed, Calera sought to ensure compliance with permitting requirements and demonstrate our desire to "do no harm".

Calera's commitment to "do no harm" cannot completely prevent the occasional instrument malfunction or unavoidable system breakdown. Calera has expressed our commitment, and demonstrated our ability, to respond to issues quickly and in compliance with incident reporting procedures. On January 7, 2010, due to a leak at a pipefitting, approximately 100 gallons of supernatant was released. The flow through the pipe was immediately discontinued. The spill was contained within an area that was approximately 150 feet long by 1 to 2 feet wide; 3 feet at the widest point on the side of the road (Highway 1). Procedures for clean up and incident reporting were immediately implemented. The spill was below reporting limits. However, courtesy calls were placed, as a precaution, to the appropriate parties including the California Highway Patrol, the Monterey County Health Department, and the North Monterey County Fire Department. The supernatant was absorbed and the remaining solid materials were properly disposed of onsite. Water used in the process and stored on site in T-tanks was released in a separate incident after instrument failure caused the tank to be overfilled. Calera was able to vacuum the water up and return it to the system. Calera's response to these minor incidents illustrates our commitment to the environment and our ability to respond to environmental issues that could arise.

Calera has developed guidelines to enhance the safety of staff, vendors, and visitors on our site. Anyone accessing the site is provided a safety briefing and written procedural guidelines to read and sign. The required form is included in Appendix B.

3.0 APPROACH FOR SUCCESSFULLY IMPLEMENTING THE ENVIRONMENTAL MANAGEMENT PLAN

Calera's Business System is a comprehensive set of procedures that are used to train employees on procedures relevant to their job responsibilities. The Calera Business System is a living plan that will grow with the company and be updated on an as-needed basis. We plan to amend the policy document for the Calera Business System to incorporate an environmental management systems (EMS) approach to environmental management, as well as incorporate this EMP. This formalized approach will demonstrate how we are fulfilling our obligations to the public, regulatory agencies, teaming partners, employees, and the environment.

The program elements of an effective EMS approach, and Calera's initial implementation of an EMS, include:

Establish Phase	Identify program goals and objectives to achieve maximum environmental compliance and minimal adverse environmental impacts; *this EMP was developed in support of the Establish Phase*
Deploy Phase	Deploy strategies; perform preliminary impact analysis and identify appropriate best management practices, mitigation, and permitting requirements – *Calera prepared an Environmental Information Volume for submittal to DOE, to assess impacts and identify our environmental commitments*
Implement Phase	Conduct field projects and implement strategies by using in-house resources and outside environmental specialists as needed – *Agency consultations and permitting discussions will be held, detailed resource studies will be performed (if required), permits will be obtained and conditions implemented, additional training will be developed/provided, and additional management plans will be developed and implemented as necessary*
Review	Evaluate the effectiveness of the EMP through audits and other evaluation factors; modify the program accordingly to further meet the objectives – *Calera will perform periodic audits; we will also modify the EMP as necessary based on DOE and other regulatory agency comments, and regulatory and permit requirements*

3.1 IMPLEMENTATION OF THE EMP

Implementation of the EMP will incorporate EMS components to achieve the project objectives while promoting continuous improvement. The eight primary components include:

Plans, Training, and Environmental Awareness. Based on Calera's philosophy of "Environment Comes First / Do No Harm," our approach is to first engineer to avoid adverse impacts to the environment, and second, control and minimize adverse impacts through administrative controls and procedures. For example, although Calera has a Resource Conservation and Recovery Act (RCRA,

hazardous waste) generator permit as a small-quantity generator, we have not required use of the permit based on our responsible use of hazardous products. Similarly, although the site has a National Pollutant Discharge Elimination System (NPDES) permit, we plan on reusing and recirculating excess waste water, with no discharge to surface waters, and, therefore, no (or limited) use of the NPDES permit. If any additional plans or actions are required or deemed necessary to protect the environment from Calera operations, Calera will prepare and implement the plans, and obtain agency approval as necessary.

Calera places utmost importance on proper training to facilitate awareness of environmental considerations and comply with environmental commitments.

Greater awareness of Calera's environmental policy, EMP, and related regulatory requirements supports the Calera philosophy identified in our Business System.

Calera is fully dedicated to maintaining a well-trained and well-prepared staff on the MLMDP site. To be effective, Calera's training program will include an induction and refresher training for staff and contractors as appropriate. It will cover general environmental issues and the purpose of environmental impact prevention goals, and provide details on specific controls relevant to individual job areas/responsibilities. An electronic training database has been implemented to maintain all training records for Calera staff.

Existing and proposed health and safety-related procedures and training courses that meet California Occupational Safety and Health Administration (Cal/OSHA) regulations, which take precedence over the federal OSHA regulations at this site, are listed in Table 3-1. This training is required for employees based on their project role and potential exposures to hazardous conditions. Calera will continue to update and determine site-specific health and safety-related procedures during project and site development.

Table 3-1
Safety Procedures and Training

Course Title	Category[1]	Document Number	Issue Date
Machine Shop Safety and Usage Guidelines	DWI	1230	Done
Asbestos Management	DWI	1178	Done
Injury and Illness Reporting	DWI	1174	05/31/10
Permit to Work Procedure	DWI	1058	05/31/10
Emergency Response and Evacuation	SOP.SS	1175	05/31/10
Lock Out Tag Out Procedure	DWI	1057	05/31/10
Job hazard Questionnaire	FRM	1173	05/31/10
Electrical Safety	DWI	1181	05/31/10
Industrial and Environmental Hygiene	SOP.SS	1144	05/31/10
Injury and Illness Prevention Plan	SOP.SS	1056	05/31/10

[1] DWI = Detailed work instructions, SOP = Standard Operating Procedures

Table 3-1
Safety Procedures and Training

Course Title	Category	Document Number	Issue Date
Confined Space Procedure	DWI	1063	05/31/10
Noise Hygiene Procedure	DWI	1180	05/31/10
Respiratory Program	DWI	1186	05/31/10
Personal Protective Equipment (PPE)	DWI	1187	05/31/10
First Aid, CPR, and AED	DWI	1188	05/31/10
Fire Prevention Plan	DWI	1176	06/30/10
Chemical Hygiene Plan	SOP.SS	1177	06/30/10
Ergonomics Procedure	DWI	1179	06/30/10
Elevated Work Procedure	DWI	1182	06/30/10
Construction Safety	SOP.SS	1183	06/30/10
Tool Safety	DWI	1184	06/30/10
Excavation Procedure	DWI	1185	06/30/10
Vehicle Safety	DWI	1189	06/30/10

Documentation and Recordkeeping. Good recordkeeping demonstrates that Calera is following the EMP and that it is working as intended. Appropriate records will be kept of inspections and audits, monitoring programs, training programs, incident forms and responses, internal and external communications regarding the EMP, and results of internal and external assessments and compliance visits. The type of records to be maintained will include completed forms, checklists and maintenance logs; memoranda documenting identified problems and corrective actions undertaken; and monitoring data/results. Records will include photographs of the site that are taken prior to, during and immediately after construction. The Manager of Environmental Services will be responsible for maintenance of these records consistent with Calera's document management and retention policies.

Reporting Procedures. The Manager of Environmental Services will establish specific reporting procedures associated with this EMP that are to be followed in response to agency/public inquiries, to meet permit requirements, and to inform Calera management of environmental accomplishments, improvements, and remedial actions. Incident reports and documentation of mitigation of adverse environmental impacts will be used to enhance and improve the program.

Progress Monitoring. Progress against Calera's project implementation schedule will be monitored and corrective actions identified as necessary. Of particular importance is progress made toward applying for and obtaining permits prior to required equipment installation and operation. Monitoring will be ongoing throughout the project life cycle to ensure that environmental impacts are within the predicted levels and that specified environmental performance targets are being achieved. For any sampling/monitoring undertaken, monitoring equipment will be accurately calibrated, quality controls implemented, accredited laboratories used, certified methods of testing employed and where specifications or guidance criteria exist for testing and sampling methods these are taken into account.

Auditing. Auditing of internal policies and procedures, and adherence to environmental and health and safety regulatory requirements will be performed on a 6-month basis. Action/corrective action plans will be developed and corrective actions undertaken and documented. Audits will ensure that the EMP is being appropriately updated and will confirm that identified corrective actions have been undertaken and will assess the effectiveness of such actions. The Manager of Environmental Services will be responsible

for scheduling and ensuring execution of the audit, as well as for the verification of the implementation of corrective action.

Flowdown of EMP Requirements to Calera Contractors, Subcontractors, and Other Parties. Environmental controls associated with the project that are directly relevant to a Contractor's or subcontractor's activities will be contained within environmental specifications or established within a set of management action method statements provided to or required from Contractors before performing any activity. These method statements, developed for managing impacts and achieving EMP objectives, will include management actions for pre-operations during construction, approval and permits; site clearing and landscaping; site management; water use management; soils management; materials handing/storage; fire control and emergency procedures; leaks and spill management; solid water; wastewater and stormwater management; and noise and dust control management.

Management Review and Revision of EMP. The Calera management team approves and fully supports implementation of this EMP. The EMP will be reviewed and updated regularly to ensure it reflects the current situation on the site. Updates will be made to document changes in staff roles and responsibilities, significant changes to the site's activities, facilities or pollution controls, key changes to the company, changes in industry best management practices, changes in legal requirements, and responses to inspection, incidents, and corrective actions. A document control system will be implemented to ensure that out-of-date versions of the latest EMP document are not used.

Life cycle of the project includes design, pre-construction planning and permitting, construction, commissioning, and operation. Implementation of this EMP will begin during the design stage and continue throughout the life of the project. Calera will consider revisions and additions to this EMP at each stage of the project as well as when auditing and any resulting action/corrective action plans should be documented. An EMP revision log will be maintained in Appendix D.

Financial Resources for Plan Implementation. All project activities will be reviewed to ensure that contractors have committed to meeting the environmental performance targets and have budgeted accordingly; and have retained sufficient flexibility to meet unforeseen but reasonable costs. Project budgets will be reviewed to ensure funds are available for the implementation of remedial actions when mitigation measures are not sufficiently effective or when unanticipated impacts occur. Costs for recurring expenses for implementing the EMP, including administrative, design and consultancy, operational and maintenance, training, monitoring, and auditing are included in the overall project costs.

4.0 ORGANIZATIONAL AND MANAGEMENT CAPABILITIES FOR SUCCESSFULLY IMPLEMENTING THE ENVIRONMENTAL MANAGEMENT PLAN

Calera is committed to hiring dedicated and experienced professionals for our team. The Calera Team is always growing, and is currently managed by Mr. Will Day, Ms. Nikki Blane, and Dr. Betty Pun for environmental management.

This Calera Management Team uses a proactive management approach to enhance overall environmental performance while simultaneously achieving the objectives of the MLMDP. The core team that has overall environmental management responsibility includes:

William Day, Vice President Development Engineer and Construction, has over 25 years of experience in construction oversight and management in the power industry prior to joining Calera. Mr. Day is responsible for the direction of all construction activities, ensuring all facilities are engineered to meet the specifications of Calera's designed process, and all equipment and material are procured and constructed within budget and schedule. As he did in numerous power plant projects, he has oversight responsibility on all regulatory compliance during construction and operation of Calera facilities.

Nikki Blane, Vice President of Operations, has over 20 years of experience in industrial operations in three continents, North America, South America, and Europe. As Vice President of Operations at CEMEX, she oversaw environmental operations at both the plant and corporate levels. Nikki's experience managing the environmental impacts of both construction and operation of major industrial facilities ensures strong environmental leadership for Calera's projects in the U.S. and around the world.

The **Manager of Environmental Services** is responsible for implementing environmental programs and plans to achieve Calera objectives, metrics, and timelines. The Manager ensures environmental policies and procedures are integrated with operations based on environmental risk factors, while measuring and evaluating environmental performance metrics. This Manager is responsible for reviewing environmental regulations and ensuring Calera is proactive in addressing issues that would have a negative impact on the company or the environment. The Manager of Environmental Services also develops processes to manage permitting requirements for locating projects. This Manager is also responsible for implementation and updating of this EMP. **Dr. Betty Pun** is currently serving in this role as the Manager of Environmental Services for the MLMDP, along with her role in operations.

Betty Pun, Ph.D., has over 10 years of related environmental experience. Dr. Pun is in charge of overall environmental strategy and regulatory compliance at the MLMDP site. Dr. Pun has performed computer modeling of criteria air pollutants, air toxics, and other environmental hazards at regional, urban, and local scales; performed statistical analysis to gain insights into underlying processes; reviewed environmental issues including human exposure and climate change; and recommended for measurement priorities in expensive field measurement campaigns. She has lead research teams to apply state-of-the-science air quality models to a variety of locations, including S.E. Tennessee, Big Bend National Park, and California Central Valley. She steered the research approach and was responsible for budget, delegation of tasks, schedule, and deliverables. She participated in multi-stakeholder studies involving industry, academic groups, and environmental groups to evaluate different modeling approaches and conduct multimedia modeling.

Michael Lach, General Manager at MLCC, has over 7 years of experience in industrial operations and construction. As a Regional Manager, Plant Manager, and Project Manager in construction and aggregate industries, he oversaw environmental and safety operations at the plant levels of employees numbering in

the hundreds. Michael's hands on development of programs and strategic implementation will help in creating a safe and environmentally friendly culture at the MLCC site.

Jeff Spear, EHS Manager at MLCC, has over 5 years of experience in environmentally and safety sensitive fields related to oil, gas, and aggregates. As an EHS manager with Columbia Inspections, he managed staff in document control, day-to-day operations and long term strategic planning. He is certified to teach multiple classes including OSHA inspections, respirator training, EAS, CPR, First Aid, HAZMAT, Material Management.

5.0 ENVIRONMENTAL COMMITMENTS

Calera has prepared an Environmental Information Volume (EIV) to preliminarily evaluate potential environmental impacts of the project, identify relevant regulatory agencies with whom we (or DOE) may need to consult, identify applicable federal, state, and local regulations that likely apply to this project, and identify and assess appropriate best management practices and mitigation measures necessary for minimizing adverse impacts to the human and natural environment. This EMP currently includes measures that are relevant to operation but also to detailed design and construction. Following completion of the design and construction phases the EMP will be amended to focus primarily on operation.

This section of the EMP is a reference for each Environmental Resource Topic, summarizing the applicable regulatory framework, relevant regulatory agencies, environmental permits, and environmental commitments. An important revision phase to this section will be tied to DOE's assessment and findings under the National Environmental Policy Act (NEPA). The Environmental Commitments section will also be updated as needed, including when new permits are obtained; and additional or revised environmental mitigation, monitoring or reporting are identified. Additional guidance material is provided in Appendix A.

5.1 ATMOSPHERIC CONDITIONS/AIR QUALITY

The federal Clean Air Act (CAA), California Clean Air Act, and other Acts govern air pollution and its control. Applicable regulatory agencies involved in air pollution regulation include:

U.S. EPA, Region 9 (Pacific Southwest)
75 Hawthorne Street
San Francisco, CA 94105
Regional Receptionist: (415) 947-8021
http://www.epa.gov/region9/

Monterey Bay Unified Air Pollution Control District (MBUAPCD)
24580 Silver Cloud Court
Monterey, CA 93940
Main Office: (831) 647-9411
http://www.mbuapcd.org/

California Air Resources Board (CARB)
1001 "I" Street
P.O. Box 2815
Sacramento, CA 95812
Public Information: (916) 322-2990
http://www.arb.ca.gov/homepage.htm

A summary of applicable air-related laws and regulations is presented in Table A-1 in Appendix A.

Commitments and Requirements

Potential air quality impacts associated with the MLMDP are related to emissions from both construction and operations, with the latter occurring primarily due to the facility's process equipment and other sources such as employee vehicles and aggregate laydown areas.

Calera will coordinate with MBUAPCD, the regional agency principally responsible for comprehensive air pollution control in the North Central Coast Air Basin (NCCAB), which includes the MLMDP site.

- In accordance with permit requirements, Calera will conduct or assist in public notice prior to issuance of the permits (if required), and conduct continuous monitoring during operations.

- Calera understands that any emissions during construction and operation that could cause a public nuisance, particulate matter emissions, sulfur compounds, and NOx from combustion equipment, and sulfur content of fuels must conform to permit requirements.

- During construction, dust-control measures such as watering all active grading areas and storage piles, cessation of grading in high winds, limiting vehicle speeds on unpaved roads to 15 mph, and preventing the track-out of dirt from unpaved areas to paved roadways will be implemented, if appropriate.

Table 5-1

Atmospheric Conditions/Air Quality Commitments and Requirements

Permit / Governing Body	Reason / Commitments	Comments
Existing		
(list any additional environmental permits applied for an/or obtained for equipment to be used for the project)		
Future		
Authority To Construct (ATC) MBUAPCD / Air Pollution Control Officer (APCO)	Required for each permit unit during construction. Commitments: TBD	Remains in effect until Permit to Operate is issued.
Permit To Operate (PTO)	Required for each air pollution-emitting equipment that will operate as part of the project. Commitments: Calera will conduct monitoring and reporting as required by the issued permit.	After project construction and upon completion of initial compliance testing, Calera understands that the MBUAPCD will grant or deny a PTO.

5.2 WATER RESOURCES

5.2.1 Water Quality/Quantity

The federal Clean Water Act, Rivers and Harbors Act, and the Porter-Cologne Water Quality Act are the primary laws governing surface water quality. The applicable regulatory agencies involved in water quality/quantity regulation are:

California State Water Resources Control Board
Physical Address
State Water Resources Control Board
1001 I Street
Sacramento, CA 95814

Mailing Address
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812
Tel: (916) 341-5272
Fax: (916) 341-5896
http://www.swrcb.ca.gov/

Central Coast Regional Water Quality Control Board (CCRWQCB)
895 Aerovista Place, Suite 101
San Luis Obispo, CA. 93401-7906
Tel: (805) 549-3147
Fax: (805) 543-0397
http://www.swrcb.ca.gov/centralcoast/

US Army Corps of Engineers
Los Angeles District
Physical Address
915 Wilshire Blvd., Suite 1101
Los Angeles, CA 90017

Mailing address
P.O. Box 532711
Los Angeles, CA 90053-2325
Tel: (213) 452-3333
Fax: (213) 452-4209
http://www.spl.usace.army.mil/cms/index.php?option=com_frontpage&Itemid=1

The regulations applicable to water quality/quantity are summarized in Table A-2 in Appendix A.

Commitments and Requirements

Calera currently complies with the NPDES General Industrial Permit and has prepared a SWPPP that describes the BMPs implemented at the site. To date, with the exception of the seven T-tanks, operations have been contained within existing buildings. The CCRWQCB issued Order No. R3-2009-0002, NPDES No. CA0007005, Waste Discharge Requirements for the Moss Landing Commercial Park and Moss Landing Cement Company, Moss Landing Cement Company Facility. This permit allows the facility to discharge calcium and magnesium depleted seawater to Monterey Bay by way of the existing discharge outfall structure at a maximum daily discharge rate of up to 60 million gallons per day (mgd). To date, however, the facility has contained the process effluent on site in the T-tanks instead of discharging to the bay.

The project will continue to comply with the General Industrial Storm water Permit by amending the current NOI filed for the Absorber Demonstration Plant and the associated SWPPP if the disturbance exceeds one acre. During operations, stormwater collected from the curbed laydown and storage area of the plant will be routed through a small settling basin. The water will be discharged with the process wastewater to one of the tanks. The remaining solids will either be reused or disposed of at an

appropriate facility. The proposed approach will be to evaluate and implement high-pressure seawater reverse osmosis (RO), high concentration electrodialysis (ED), and low energy enhanced evaporation methods to achieve zero liquid discharge conditions at the MLCP site.

Table 5-2

Water Resources Commitments and Requirements

Permit / Governing Body	Reason for Permit / Commitments	Comments
Current		
NPDES No. CA0007005, Waste Discharge Requirements for the Moss Landing Commercial Park and Moss Landing Cement Company, Moss Landing Cement Company Facility. The Central Coast RWQCB.	This permit allows the facility to discharge calcium and magnesium depleted seawater to Monterey Bay by way of the existing discharge outfall structure at a maximum daily discharge rate up to 60 million gallons per day (mgd). Commitments: Refer to permit in Appendix C for conditions and commitments.	To date, the facility has contained the process effluent on site in the T-tanks instead of discharging to the bay.
General Industrial Stormwater Permit NOI filed	SWPPP kept on site (SWPPP will be updated)	
Future		
General Industrial Stormwater Permit	Existing SWPPP to be revised. During operations, stormwater collected from the curbed laydown and storage area of the plant will be routed through a small settling basin. The water will be discharged with the process wastewater to one of the tanks. The remaining solids will either be reused or disposed of at an appropriate facility. Calera will conduct monitoring and reporting for requirements outlined in the permitting document.	
SWPPP The Central Coast RWQCB	The SWPPP describes BMPs to be used to minimize erosion and limit the rate and amount of stormwater runoff. Following each significant precipitation event, a site review of the effectiveness of the erosion control plan will take place. Commitment: TBD	
Construction Wastewater	Wastewater generated during construction will be disposed of in accordance with permit and regulatory requirements.	

5.2.2 Floodplains/Wetlands

Executive Order (EO) 11988—Floodplain Management, Flood Disaster Protection Act, Federal National Flood Insurance Program, Clean Water Act Section 404, EO 11990—Protection of Wetlands, and the Cobey-Alquist Flood Plain Management Act, California Department of Fish and Game (CDFG) Policies and Guidelines, Wetlands Resources Policy are the primary laws governing floodplains and wetlands. The applicable regulatory agencies involved in floodplain and wetland regulation are:

California State Water Resources Control Board
Physical Address
State Water Resources Control Board
1001 I Street
Sacramento, CA 95814

Mailing Address
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812

Compliance with environmental laws pertaining to water quality protection:
Tel: (916) 341-5272
Fax: (916) 341-5896
http://www.swrcb.ca.gov/

The regulations applicable to floodplains/wetlands are summarized in Table A-3 in Appendix A.

No floodplains or wetlands have been identified on the MLMDP site. At this time, no permits are required.

Commitments and Requirements

In accordance with the regulations contained in Title 10 Code of Federal Regulations (CFR) Part 1022, Compliance with Floodplain and Wetlands Environmental Review Requirements, the U.S. Department of Energy National Nuclear Security Administration (USDOENNSA) has established policy and procedures to consider impacts on floodplains and wetlands as part of its decision-making process. This policy was developed in response to EO 11990 Protection of Wetlands (May 24, 1977), and EO 11 988 Floodplain Management (May 24, 1977). These executive orders require federal agencies to evaluate and, to the extent possible, minimize the impacts of their projects on floodplains and wetlands. Under DOE policy, a floodplain and wetlands assessment is required for any activities involving floodplains or wetlands (10 CFR 1022).

The project area is within a 500-year flood plain according to the Federal Emergency Management Agency (FEMA) flood map for the project area (Panel 06053c0070g). The MLMDP is in a shaded area of the map labeled Zone X. FEMA defines that area as "Area of moderate flood hazard, usually the area between the limits of the 100-year and 500-year floods." Because no project activities would occur within the 100-year floodplain, there would be no impact to this resource.

Based on a field review of the project site and adjacent areas, likely wetland areas are present immediately east and south of the MLMDP associated with a coastal brackish marsh and the Mojo Oro Slough, respectively. However, these wetland areas are outside the MLMDP limits. No activities would occur within potential wetland areas; additionally all potential site runoff during construction and operation would be addressed through BMPs and permits. Therefore, there would be no direct or indirect impacts to wetlands.

Table 5-3
Floodplains / Wetlands Commitments and Requirements

Permit / Governing Body	Reason / Commitments	Comments
Current		
None required at this time. n/a		
Future		
Floodplain and Wetlands Assessment	DOE regulation 10 CFR Part 1022 requires a floodplain and wetlands assessment to be prepared.	

5.3 GEOLOGIC/SOIL CONDITIONS

The National Environmental Policy Act, Clean Water Act, Surface Mining and Reclamation Act, California Environmental Quality Act (CEQA), Alquist-Priolo Earthquake Fault Zoning Act, Seismic Hazards Mapping Act, California Building Standards Code, Porter-Cologne Water Quality Act are the primary laws governing geologic/soil conditions. The relevant regulatory agency will be dependent on specific soil conditions and issues to be addressed. For example, the applicable regulatory agency involved in seismic issues would be the County of Monterey Resource Management Agency to address Building Standard Codes. If contaminated soils are encountered or need to be addressed, and RCRA is the governing regulatory program, then Cal EPA DTSC would be the regulatory agency involved.

The regulations applicable to geologic/soil conditions are summarized in Table A-4 in Appendix A.

Commitments and Requirements

- No project-related features are anticipated to increase the hazard of erosion. Further, during construction, a construction SWPPP will be prepared and implemented.
- Following each significant precipitation event, a site review of the effectiveness of the erosion control plan will take place.
- Storm water will be retained on site for impoundment in storm water retention basins.
- Since no new paved areas are included in the Proposed Action, this alternative will have no adverse impact to the behavior of site conditions relative to soil permeability and filtration.
- No components of the Proposed Acton will alter groundwater resources, and therefore, there will be no impacts to land subsidence.
- Contaminated soils are not anticipated to be encountered during implementation of the Proposed Action. If contaminated soils are encountered, and in the event of leaks or spills occurring during construction, resulting contaminated soils will be addressed to mitigate impacts to surface and subsurface soils as addressed in Section 5.4.

Table 5-4 Geology and Soils Commitments and Requirements		
Action Required / Governing Body	**Reason / Commitments**	**Comments**
Current		
None required at this time. n/a		
Future		
SWPPP The Central Coast RWQCB	The SWPPP describes BMPs to be used to minimize erosion. Commitments: TBD	

5.4 SOLID AND HAZARDOUS WASTE

The Resource Conservation and Recovery Act (RCRA), 49 CFR Parts 172 and 173, and the California Hazardous Waste Control Law are the primary laws governing solid and hazardous waste. The applicable regulatory agency involved in solid waste regulation is:

The Monterey County Health Department, Environmental Health Division
1270 Natividad Road
Salinas, CA 93906
Phone: (831) 755-4505
Fax: (831) 755-4880

Monterey Branch Office
1200 Aguajito Road
Monterey, CA 93940
Phone: (831) 647-7654
Fax: (831) 647-7925

The applicable regulatory agency involved in hazardous waste regulation is:

California Environmental Protection Agency
Department of Toxic Substances Control (DTSC)
DTSC Headquarters (Joe Serna Jr. Cal/EPA Headquarters Building)
Physical Address
1001 I Street
Sacramento, CA 95814-2828

Mailing Address:
P.O. Box 806
Sacramento, CA 95812-0806
Tel: (800) 72TOXIC
http://www.dtsc.ca.gov/ContactDTSC/locations.cfm

A summary of applicable solid and hazardous waste related laws and regulations is presented in Table A-5 in Appendix A.

Commitments and Requirements

Calera will conduct baseline environmental sampling in areas where site operations would have the potential to affect subsurface conditions at the project site. Baseline sampling would include the collection and analysis of surface and near surface samples in order to establish conditions prior to project construction.

Table 5-5

Solid and Hazardous Waste Commitments and Requirements

Action Required / Governing Body	Reason / Commitments	Comments
Current		
RCRA Hazardous Waste Generator (Small Quantity Generator [SQG]) Cal EPA DTSC	This Generator status allows the facility to generate and manage small quantities of hazardous waste. Commitments: Generation of hazardous waste will be minimized to the extent possible.	Change in status from SQG is not anticipated.
Future		
Confirmation that Facility Remains an SQG (Maximum Quantities are not exceeded) Cal EPA	Commitments: Hazardous wastes will be segregated for compatibility and stored in designated accumulation areas with appropriate secondary containment; Additional hazardous wastes will be picked up for transport only by licensed hazardous waste haulers. All hazardous wastes will be properly manifested to a permitted disposal facility; Additional hazardous waste documentation, including the biennial hazardous waste generator reports that will be submitted to the DTSC, will be kept on site and accessible for inspection for a period of not less than 3 years; Employees training trained in hazardous waste management, spill prevention and response, and waste minimization will be updated; and Procedures will be developed to reduce the quantity of hazardous waste generated. Nonhazardous materials will be substituted for hazardous materials, and wastes will be recycled where possible. Additional commitments determined during permitting.	
Title 22 California Code of Regulations (CCR)	Commitments: Hazardous wastes will be stored on site for less than 90 days	

The construction contractor is considered the generator of hazardous waste associated with MLMDP construction activities and is responsible for proper handling of all hazardous wastes in accordance with all federal, state, and local regulations. This includes all licensing requirements, training of employees where required, accumulation limits and duration, and recordkeeping and reporting requirements. Wastes that are deemed hazardous are to be collected in hazardous waste accumulation containers placed near the area of generation. After the end of each workday, the accumulation containers will be moved to the contractor's licensed hazardous waste accumulation area where hazardous wastes can be stored up to 90 days after the date of generation. The construction contractor will manifest these wastes for disposal at a permitted Class I facility or recycling facility in accordance with all federal, state, and local regulations. All hazardous wastes will be removed from the site by a licensed hazardous waste management contractor.

During construction and operation of the proposed ML MDP, the pri mary waste generated will be solid nonhazardous wast e. It is anticipated that so me haza rdous solid waste(s) will also be generated during plant construction; however, the am ount that will be generated is anticipated to be small. Where practical, nonhazardous solid wastes will be recy cled. All remaining wastes will be r emoved by a licensed contractor and di sposed of properly . The types of waste(s), esti mated quantities, and the waste management methods are described below and summarized in Table 5-6.

Table 5-6
Summary of Anticipated Solid Waste Streams and Management Methods

Waste Stream	Waste Characteristics	Estimated Quantity	Estimated Frequency of Generation	Waste Management Method	
				On-site	Off-site Treatment
Construction Phase					
Scrap wood, steel, copper, aluminum, rags, abrasive materials, glass, plastic, paper, insulation, cardboard and corrugated packaging.	Nonhazardous solids	1 ton	Twice Weekly	Containerize, housekeeping	Recycle and/or Class III/II landfill disposal
Empty hazardous material containers	Hazardous solids	Less than 1 cubic yard	Monthly	Containerize and store for less than 90 days	Recycle and/or Class I/II landfill disposal
Spent welding materials	Hazardous solid	Less than 1 cubic yard	Monthly	Containerize and store for less than 90 days	Recycle and/or Class I landfill disposal
Concrete and soil	Nonhazardous	Up to 100 cubic yards	One time	Stockpile and cover	Reuse, recycle, or Disposal at a Class II/III landfill
Operation Phase					
Solids from slurry storage tank	Nonhazardous	Up to 1,000 tons	One time	Stored or containerized for potential reuse in site operations	N/A
Quality Control Laboratory waste; Paper, cardboard, plastic, glass	Nonhazardous 1	ton	Yearly	Containerize for recycling or disposal	Recycle or disposal at Class III landfill
Universal waste; fluorescent bulbs and ballasts	Hazardous solids	Up to 10 pounds	Yearly	Containerize for recycling or disposal	Disposal to a licensed Treatment, Storage, and Disposal Facility
Salts from zero liquid discharge crystallizer	Nonhazardous	Up to 240 tons	Weekly	Containerized for potential reuse in site operations	Disposal to a Class II/III landfill if not reused in site operations
Spent reverse osmosis membrane cartridges	Nonhazardous	1	Quarterly	Containerize for recycling or disposal	Reuse and disposal at a Class II/III landfill

5.5 LAND USE

The North County Land Use Plan (NCLUP) Local Coastal Program, the Monterey Bay Sanctuary Scenic Trail Master Plan, and the Moss Landing Community Plan are the primary laws governing land use. The applicable regulatory agencies involved in land use regulation are:

California Coastal Commission (CCC)
Central Coast District Office
725 Front Street, Suite 300
Santa Cruz, CA 95060-4508
(831) 427-4863
FAX (831) 427-4877
http://www.coastal.ca.gov/

County of Monterey
Resource Management Agency
Planning Department
Physical Address:
168 W. Alisal Street @ Capitol
2nd Floor
Salinas, CA 93901
Tel: (831) 755-5025
Fax: (831) 757-9516

Mailing Address:
168 W. Alisal Street,
2nd Floor
Salinas, CA 93901

Commitments and Requirements

The MLMDP is consistent with the Heavy Industrial (HI) CZ District. The MLMDP is similar to previous permitted industrial uses on-site, including the existing Absorption Demonstration Plant and Pilot Plant. In October 2009, Monterey County issued a Coastal Administrative Permit for Calera's existing operations.

The MLMDP is expected to require modification of Coastal Administrative Permit, a new Coastal Development Permit, or General Development Plan. The appropriate permit process would be determined in consultation with the Monterey County Planning Department. A component of these approvals would include a use permit for the height of proposed silos if the CZ District height limit of 35 feet is exceeded. However, these silos would be adjacent to existing buildings and would not exceed the height of the tallest of these buildings. Compliance with zoning requirements for landscaping, building site coverage, and parking for the overall MLCC would need to be maintained.

Table 5-7 Land Use Commitments and Requirements		
Permit / Governing Body	**Reason / Commitment**	**Comments**
Current		
(None currently applicable to the MLMDP)		
Future		
Coastal Administrative Permit Monterey County and CCC	The MLMDP is expected to require modification of the existing Coastal Administrative Permit, a new Coastal Development Permit, or General Development Plan.	

5.6 NOISE

The Noise Control Act of 1972; Federal Energy Regulatory Commission (FERC) Guidelines On Noise Emissions From Compressor Stations, Substations, And Transmission Lines; OSHA Occupational Noise Exposure; California Government Code Section 65302(f) and Section 46050.1 of the Health and Safety Code; Cal-OSHA; CEQA; and The Safety Element of the Monterey County General Plan are the primary laws governing noise. The applicable regulatory agency involved in noise regulation is:

Monterey County Health Department
Division of Environmental Health
Resource Protection Branch
1270 Natividad Road, Suite 109
Salinas, CA 93906-3198
Phone: (831) 755-4507
Fax: (831) 755-8929
http://www.co.monterey.ca.us/health/EnvironmentalHealth/

The regulations applicable to noise are summarized in Table A-6 in Appendix A.

Commitments and Requirements

Construction

Construction of SCM Silo and Aggregate Lay Down, Drying and Harvesting Area - It is very likely that pieces of equipment used during the construction of the SCM Silos and aggregate lay down, drying and harvesting area could be louder than 85 dBA at a distance of 50 feet. In order to meet the noise standards found in the Monterey County Noise Ordinance, mitigation will be implemented or a variance from the County of Monterey will be requested if this threshold is exceeded.

Operation

Table 5-8 summarizes noise impact criteria as it applies to the MLMDP Operations. Calera will consult with Monterey County Health Department regarding any noise levels above these limits.

Table 5-8
Noise Commitments and Requirements

Permit / Governing Body	Reason / Commitment	Comments
Current		
None required at this time. n/a		
Future		
Noise mitigation Monterey County Health Department Division of Environmental Health Resource Protection Branch	Noise generated at the MLCP site will be mitigated in order to meet Monterey County noise standards if the noise was from sources that are: (1) 85 dBA or above at a distance of 50 feet, and (2) within 2,500 feet of residences. Commitments: All construction and operational equipment will be fitted with applicable muffler technology to minimize noise levels	
Noise Variance Monterey County Health Department Division of Environmental Health Resource Protection Branch	In order to meet the noise standards found in the Monterey County Noise Ordinance, variance from the County of Monterey would be needed if noise thresholds are exceeded. Commitments: To be determined in consultation with Monterey County Health Department	

The significant noise impact criteria thresholds are listed in Table 5-9. The Day-Night Average Sound Level (L_{dn} or DNL) represents the average sound level for a 24-hour day and is calculated by adding a 10 dBA penalty to sound levels during the night period (10:00 p.m. to 7:00 a.m.). The L_{dn} is the descriptor of choice used by nearly all federal, state, and local agencies throughout the United States to define acceptable land use compatibility with respect to noise. Within the State of California, the Community Noise Equivalent Level (CNEL) is sometimes used. CNEL is very similar to L_{dn}, except that an additional 5 dB penalty is applied to the evening hours (7:00 p.m. to 10:00 p.m.).

Table 5-9
Significant Noise Impact Criteria-Project Operation

Jurisdiction	Criteria	Noise Metric	Noise Level	Notes
State of California	CEQA	CNEL	3 dBA increase in "normally unacceptable" or "clearly unacceptable" noise/land use compatibility categories	
State of California	CEQA	CNEL	5 dBA increase	
Monterey County	Noise Element	L_{dn}	60 dBA Exterior	Single-Family Residential

5.7 HISTORIC/CULTURAL RESOURCES

The regulations applicable to historic/cultural resources include numerous laws, regulations, and statutes on both the federal and State levels seek to protect and target the management of cultural resources.

These include the: Antiquities Act of 1906; Historic Sites Act of 1935; Reservoir Salvage Act of 1960; National Historic Preservation Act of 1966; National Environmental Policy Act of 1969; Executive Order 11593 (Projection and Enhancement of the Cultural Environment, 5/13/1971); 36 CFR 800 and CFR 60 (Advisory Council on Historic Preservation: Protection of Historic and Cultural Properties, Amendments to Existing Regulations, 1/30/1979, National Register of Historic Places, Nominations by States and Federal Agencies, Rules and Regulations, 1/9/1976); Revisions to 36 CFR 800 (Protection of Historic Properties, 1/10/1986); Archaeological and Historical Preservation Act of 1974; American Indian Religious Freedom Joint Resolution of 1978; Archaeological Resources Protection Act of 1979; Native American Graves Protection and Repatriation Act of 1990; and the California Environmental Quality Act. Collectively these regulations and guidelines establish a comprehensive program for the identification, evaluation, and treatment of cultural resources.

There are a number of federal, state, and local regulatory criteria regarding the documentation and treatment of cultural resources. Cultural resources are defined as buildings, sites, structures, or objects, each of which may have historical, architectural, archaeological, cultural, and/or scientific importance.

The applicable regulatory agencies involved in historic/cultural resource regulation are:

Office of Historic Preservation
California Department of Parks and Recreation
Physical address
1416 9th Street, Room 1442-7
Sacramento, CA 95814
Mailing address
P.O. Box 942896
Sacramento, CA 94296-0001
Tel: (916) 653-6624
Fax: (916) 653-9824
http://ohp.parks.ca.gov/

Office of the Sheriff, County of Monterey
Coroner Division
1414 Natividad Road
Salinas, California 93906
Tel: (831) 755-3792
http://www.co.monterey.ca.us/sheriff/links.htm

Commitments and Requirements

Based on the record search and archival document review, there is the potential for significant cultural resources within the MLMDP site.

Table 5-10
Historic/Cultural Resources Commitments and Requirements

Permit / Governing Body	Reason / Commitments	Comments
Current		
None required at this time.		
Future		
Phase I Cultural Resource Inventory (CRI) CA SHPO	A Phase I CRI will be required and will include the documentation of any potentially significant resources associated with the MLMDP and will provide appropriate mitigation measures and recommendations. If potentially significant resources are documented during the Phase I study, additional cultural resources study may be required such as Extended Phase I Survey, Phase II Testing, and Phase III Mitigation. Commitments: Survey will be conducted and SHPO concurrence received prior to ground disturbing activities,	
Coroner Notification Monterey County Coroner CA SHPO	Unanticipated discovery of human remains will require coroner notification. Commitments: In the event of the accidental discovery or recognition of any human remains in any location other than a dedicated cemetery during construction or operation of the MLMDP, there will be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains. The coroner of the County must be contacted to determine that no investigation of the cause of death is required.	

5.8 VISUAL RESOURCES

The National Environmental Policy Act (NEPA), Monterey County Coastal Implementation Plan, Parts 1 and 2, and The Scenic and Visual Qualities of the California Coastal Act are the primary laws governing visual resources. The applicable regulatory agencies involved in visual resource regulation are:

County of Monterey
Resource Management Agency
Planning Department
Physical Address:
168 W. Alisal Street at Capitol
2nd Floor
Salinas, CA 93901
Tel: (831) 755-5025
Fax: (831) 757-9516

Mailing Address:
168 W. Alisal Street,
2nd Floor
Salinas, CA 93901

The regulations applicable to visual resources are summarized in Table A-7 in Appendix A.

Commitments and Requirements

Compliance with Monterey County Coastal Implementation Plan, Parts 1 and 2 including standards for siting of structures, landscaping, and lighting, would limit potential visual impacts from the proposed project. The proposed project is consistent with the industrial character of the site and surrounding industrial uses and does not substantially degrade the visual character or quality of the area.

Section 30251 of the Scenic and Visual Qualities of the California Coastal Act (2009) states that scenic and visual qualities of coastal areas shall be considered and protected as a resource. The *North County Land Use Plan* Local Coastal Program serves as the guiding land use document for the coastal zone within unincorporated Monterey County. The project site is zoned Heavy Industrial Zoning District, (HI) Coastal Zone (CZ). The Monterey County Coastal Implementation Plan Part I, Title 20 Zoning Ordinance (Monterey County 2000) contains development standards that address the visual quality within the HI (CZ) Districts. The Monterey County Coastal Implementation Plan, Part 2 contains several development standards that apply to the project (Monterey County 1988). Section 20.144.030, Visual Resources Development Standards contains a requirement for onsite inspection by a planner for industrial uses, to determine conformance with policies of the land use and development standards of the Implementation Plan.

Table 5-11
Visual Resources Commitments and Requirements

Permit / Governing Body	Reason / Commitments	Comments
Current		
None required at this time		
Future		
Visual Mitigation n/a	Equipment and process design will incorporate visual mitigation measures where needed. Calera will manage dust through standard dust-control practices. All additional lighting, including during the construction period, will conform to any lighting plan required by the County.	
Onsite inspection Monterey County Planning Department	Compliance with Visual Resources Development Standards will be required. Commitments: An onsite inspection by a planner for industrial uses will be scheduled to determine conformance with policies of the land use and development standards of the Implementation Plan.	

5.9 ECOLOGY

The Endangered Species Act, Section 7 of Fish and Wildlife Coordinating Act, the Clean Water Act, Migratory Bird Treaty Act, California Endangered Species Act, Fish and Game Code, Native Plant Protection Act, CDFG Policies and Guidelines, Wetlands Resources Policy, Title 20 CCR §§1702 (q) and (v), Title 14 CCR Section 15000 et seq, and the Municipal Code, County of Monterey, California; Chapter 16.60 are the primary regulations governing ecological resources. The applicable regulatory agencies involved in ecology regulation are:

U.S. Fish and Wildlife Service
Sacramento Fish and Wildlife Office

2800 Cottage Way
Room W-2605
Sacramento, CA 95825
Tel: (916) 414-6600
http://www.fws.gov/sacramento/contact_us.htm

US Army Corps of Engineers
Los Angeles District
Physical Address
915 Wilshire Blvd., Suite 1101
Los Angeles, CA 90017

Mailing address
P.O. Box 532711
Los Angeles, CA 90053-2325
Tel: (213) 452-3333
Fax: (213) 452-4209
http://www.spl.usace.army.mil/cms/index.php?option=com_frontpage&Itemid=1
Central Coast Regional Water Quality Control Board (CCRWQCB)
895 Aerovista Place, Suite 101
San Luis Obispo, CA 93401-7906
Phone - 805 549 3147
Fax - 805 543 0397
http://www.swrcb.ca.gov/centralcoast/

California Department of Fish and Game (CDFG)
Headquarters
1416 9th Street
12th Floor
Sacramento, CA 95814
Tel: (916) 445-0411
http://www.dfg.ca.gov/

The regulations applicable to ecology are summarized in Table A-8 in Appendix A.

Commitments and Requirements

Due to the heavily developed and disturbed nature of the MLMDP, the need for ecological permitting and/or coordination is not anticipated.

Table 5-12
Ecological Resources Commitments and Requirements

Permit / Governing Body	Reason / Commitment	Comments
Current		
None required at this time. n/a		
Future		
None required at this time. n/a		

5.10 SOCIOECONOMIC CONDITIONS

The Uniform Relocation Assistance and Real Property Acquisition Act of 1970, Title VI of the Civil Rights Act of 1964, Executive Order 12898 Federal Actions to Address Environmental Justice in Minority and Low-Income Populations, and State Housing Element Law are the primary laws governing socioeconomic factors. The applicable regulatory agencies involved in socioeconomic regulation are:

The regulations applicable to socioeconomic conditions are summarized in Table A-9 in Appendix A.

Commitments and Requirements

Due to the developed nature of the area and the relatively small number of employees required, socioeconomic impacts and permitting are not anticipated. Should BMPs, mitigation, or other environmental permitting be required in the future, MLMDP will comply and update this section as necessary

Table 5-13

Socioeconomics Commitments and Requirements

Permit / Governing Body	Reason / Commitment	Comments
Current		
None required at this time. n/a		
Future		
None identified at this time.	As applicable, Spanish language materials and other accommodations (e.g., translators) will be considered for future public involvement efforts. The communication efforts will be recorded in the project files.	

5.11 HEALTH AND SAFETY FACTORS

California operates its own Occupational Safety and Health Administration (Cal/OSHA). As such, Cal/OSHA regulations will take precedence over the federal OSHA regulations at this site. The applicable regulatory agencies involved in socioeconomic regulation are:

Cal/OSHA

For issues involving federal agencies or private companies working for federal agencies, contact:

Region IX
90 7th Street, Suite 18100
San Francisco, California 94103
(415) 625-2547 (Main Public - 8:00 AM - 4:30 PM Pacific)
(800) 475-4019 (For Technical Assistance)
(800) 475-4020 (For Complaints - Accidents/Fatalities)
Note: The 800 number for Complaints - Accidents/Fatalities is Regional only.
(800) 475-4022 (For Publication Requests)
(415) 625-2534 FAX

http://www.osha.gov/oshdir/r09.html

For issues involving private or state government employers in California, contact:

California Department of Industrial Relations
455 Golden Gate Avenue, 10th Floor
San Francisco, California 94102
John Duncan, Director (415) 703-5050 Fax: (415) 703-5059
Len Welsh, Chief, Cal/OSHA (510) 286-7000 Fax: (510) 286-7037
Chris Lee, Deputy Chief, Cal/OSHA (510) 286-7000 Fax (510) 286-7037
http://www.osha.gov/dcsp/osp/stateprogs/california.html

Commitments and Requirements

Construction, operation, and maintenance activities associated with the MLMDP may expose workers to physical and chemical hazards. Potential worker hazards would be minimized through adherence to appropriate engineering design criteria and implementation of appropriate programs, plans, and procedures. Anticipated programs and program components are listed in Table 5-14. Additional detail regarding the individual program components can be found in Appendix E. The plans, as developed, will be compiled in the Safety Manual maintained onsite.

Table 5-14
Health and Safety Programs and Program Components

Program	Program Components
Construction Injury and Illness Prevention Programs	Construction Safety Program Construction Personal Protective Equipment Program Construction Exposure Monitoring Program Construction Emergency Plan Construction Written Safety Programs
Operations and Maintenance Injury and Illness Prevention Programs	Injury and Illness Prevention Plan Emergency Action Plan Hazardous Materials Management Program Personal Protective Equipment Program Operations and Maintenance Written Safety Program
Safety Training Programs	Construction Safety Training Program Operation and Maintenance Safety Training Programs
Fire Protection	Onsite and Offsite Construction Fire Suppression and Prevention Operations Fire Suppression and Prevention

The Potential hazards that workers may be exposed to while working on MLMDP are presented in Table 5-15. Potential worker exposure to hazards is minimized through adherence to appropriate engineering design criteria, implementation of appropriate administrative procedures, use of personal protective equipment, and compliance with applicable health and safety regulations. Formal health and safety procedures and programs will be established and implemented for construction and operations to control the various hazards and provide for a safe workplace. The regulations applicable to worker safety and health are summarized in Table A-10 in Appendix A.

Table 5-15

MLMDP Construction, Operation, and Maintenance Hazard Analysis

Activity	Exposure Potential	Potential Hazard	Control Strategies
Heavy Equipment Operation	C, O, M	Employee injury and property damage from collisions with workers and/or facility equipment.	Implement heavy equipment safety program, ensure that equipment is routinely inspected and operators are properly trained.
Trenching and Excavation	C, M	Employee injury and property damage from collapse of trenches and excavations or contact with underground utilities.	Trenching and excavation will be performed by subcontractor's using their own excavation and trenching safety program. All employees will receive training specific to excavation safety. Require digging permits prior to initiating excavation or trenching.
Vehicle Operation	C, O, M	Employee injury from vehicle accident or pedestrian/vehicle accident.	Incorporate vehicle safety information in general safety training.
Work at Elevation	C, O, M	Employee injury due to falls from the same level and elevated work areas.	Implement a fall protection program that requires fall protection systems whenever unprotected work is performed at greater than 6 feet.
General Project Work	C, O, M	Employee injury resulting from a slip, trip, or fall.	Maintain good housekeeping, adequate lighting, compliant stairways, and railings.
Crane and Derrick Operation	C, M	Employee injuries and property damage due to falling loads.	Implement hoisting and rigging safety program, inspect equipment routinely, and ensure that operators are properly trained.
Hot Work	C, O, M	Employee injuries and property damage due to fire or explosion.	Implement fire protection and prevention program, require Hot Work permits, ensure that welders, pipe fitters, etc., are properly trained.
Working with Combustible Liquids	C, O, M	Employee injuries and property damage due to fire or explosion.	Implement fire protection and prevention program that includes proper procedures for the proper storage and use of flammable or combustible liquids.
Electrical Work	C, O, M	Employee injuries due to contact with energized parts.	Implement energy control program, including LO/TO of energized sources.
Materials Handling	C, O, M	Employee injuries due to improper lifting.	Implement an ergonomics program, and train employees in proper lifting techniques.

Table 5-15 (cont.)
MLMDP Construction, Operation, and Maintenance Hazard Analysis

Activity	Exposure Potential	Potential Hazard	Control Strategies
Confined Space Entries	C, M	Employee injuries due to suffocation, exposure to toxic materials, engulfment, etc.	Implement a confined space program, including permit procedures and air monitoring requirements.
Compressed Gas Storage	C, O, M	Employee injuries and equipment damage due to explosive release of pressure.	Implement a compressed gas safety program, including procedures for proper use and storage.
Power Tool Use	C, O, M	Employee injuries due to improper use, or use of damaged power tools.	Implement procedures for inspecting power tools before operation and train employees on the proper use and care of power tools.
Working with or near hazardous or toxic materials	C, O, M	Employee injuries due to exposure to hazardous and/or toxic materials.	Implement hazard communication program and exposure control procedures including: engineering controls, administrative controls, and PPE for activities that may expose employees to hazardous/toxic materials.
Working with or near noisy equipment	C, O, M	Employee overexposure to noise.	Implement a hearing conservation program to include: identifying high noise activities and sources, sound level monitoring, and PPE.
Working with or near exposed machinery	C, O, M	Employee injuries from entanglement in rotating or moving equipment.	Develop and implement machine-guarding equipment LO/TO procedures.
Work outdoors	C, O, M	Employee injury or illness from biological hazards such as ticks, snakes, spiders, and wildlife.	Develop and implement procedures for outdoor work that warn employees of the potential for exposure and provide guidelines for avoidance of contact with biological hazards.
Work in weather extremes	C, O, M	Employee injury or illness due to heat or cold stress.	Develop and implement procedures for work in hot and cold environments that provide for employee monitoring, appropriate clothing and other guidance.

C = Construction Phase
O = Facility Operations
M = Facilities Maintenance
LO/TO = Lockout/tagout

Appendix A

Listing of Applicable Environmental Regulations and Acts

Table A-1 Air Related Laws and Regulations	
Law/Regulation	**Notes**
The federal Clean Air Act (CAA) of 1970, 42 United States Code 7401 *et seq*., as amended in 1977 and 1990	The basic federal statute governing air pollution and its control. The provisions of the CAA that are potentially relevant to the MLMDP include the National Ambient Air Quality Standards (NAAQS), Prevention of Significant Deterioration (PSD) Requirements, and General Conformity rule.
Proposed Endangerment and Cause or Contribute Findings for Green House Gases under the Clean Air Act	Signed on April 17, 2009, the final rule requires mandatory reporting of GHG emissions from large sources in the U.S.; however, Since CO_2 sequestration is at the heart of the MLBMDP, it is anticipated that its operational combustion CO_2 emissions will be low enough not to trigger this requirement.
California Clean Air Act (CCAA). The CCAA, as amended in 1992	Requires all air districts in the state to endeavor to achieve and maintain the California Ambient Air Quality Standards (CAAQS). The California Air Resources Board (CARB) administers the CCAA statewide.
California Global Warming Solutions Act of 2006	The CARB approved a regulation for the mandatory reporting and verifying of GHG emissions from major sources on December 6, 2007, pursuant to the California Global Warming Solutions Act of 2006. Since CO_2 sequestration is at the heart of this Project, it is anticipated that its operational combustion CO_2 emissions will be low enough not to trigger this requirement.

Table A-2 Water Quality/Quantity Related Laws and Regulations	
Law/Regulation	**Notes**
Clean Water Act Section 404 Permit for Fill Material in Waters and Wetlands	Section 404 of the act regulates the discharge of dredged or fill material into waters of the United States, including rivers, streams and wetlands.
Section 402 NPDES Program	Point source discharges to surface water are regulated by Section 402 of the CWA through requirements set forth in specific or general National Pollutant Discharge Elimination System (NPDES) permits. NPDES requirements apply to discharges of pollutants into navigable waters from a point source, discharges of dredged or fill material into navigable waters, and the disposal of sewage sludge that could result in pollutants entering navigable waters. Stormwater discharges during construction and operation of a facility and incidental non-stormwater discharges associated with construction also fall under this act and are addressed through a general NPDES permit. In California, requirements of the CWA regarding regulation of point source discharges and stormwater discharges are delegated to the SWRCB and administered by the nine RWQCBs. The Central Coast RWQCB implements the statewide policy in the study area. Under California's NPDES program, any waste discharger subject to the NPDES program must obtain an NPDES permit from the local RWQCB. The permits typically include criteria and water quality objectives and require periodic effluent sampling.
Section 401 Clean Water Quality Certification	Under Section 401 of the CWA, water quality certification is required from the state for any activity that requires a federal permit or license that may result in discharge into navigable waters. The certification must indicate that the activity will comply with the applicable state water quality standards. With respect to the project, the authority to grant water quality certification has been delegated to the SWRCB, and for the project study area, applications for certification under CWA Section 401 are processed by the Central Coast RWQCB. A Section 401 Certification would be necessary to obtain a Section 404 permit for discharge into waters subject to the Corps jurisdiction.
Section 303(d) Water Quality Impairments	Under Section 303(d) of the CWA, each state is required to develop effluent limitations for waters within its boundaries where water quality standards are not met. The state must establish priority rankings for these waters and develop Total Maximum Daily Loads (TMDLs) to improve water quality. In California, the SWRCB and RWQCBs prepare the Clean Water Act Section 303(d) List of Water Quality Limited Segments Requiring TMDLs. The United States Environmental Protection Agency (USEPA) approved California's 2006 303(d) List on June 28, 2007 (SWRCB, 2009).

Rivers and Harbors Act (33 USC 401 et seq.) Section 10	Section 10 of the Rivers and Harbors Act of 1899 requires approval from the Corps for the construction of any structure over or in navigable waters of the United States. The Corps also regulates the excavation, dredging or deposition of material in a navigable water and any obstruction or alteration in a navigable water. Work adjacent to navigable waters require permits under Section 10 of this act if structures or work alters the course, location, condition, or capacity of the water body.
Porter-Cologne Water Quality Act (Water Code § 13000 et seq.)	Established the SWRCB and nine RWQCBs as the primary state agencies with regulatory authority over water quality and surface water rights allocation. Requirements of the Porter-Cologne Act are implemented by the SWRCB at the state level and the RWQCBs at the regional level. The SWRCB, as authorized by the Porter-Cologne Act, promulgated regulations in the CCR Subchapter 15, Title 23 designed to protect water quality from the effects of waste discharges to land. Under Subchapter 15, wastes that cannot be discharged directly or indirectly to waters of the state (and therefore must be discharged to land for treatment, storage, or disposal) are classified to determine specifically where such wastes may be discharged. This classification requirement would apply to dredged material or fill that would be disposed in an upland environment.
State Water Resources Control Board	Applicable water quality protection regulations include SWRCB Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Water in California," which generally restricts dischargers from reducing the water quality of surface water and groundwater. SWRCB Resolution No. 88-63, "Sources of Drinking Water Policy," specifies that all groundwater occurrences in California are to be protected as existing or potential sources of municipal and domestic supply.
Regional Water Quality Control Boards	***Basin Plans and Water Quality Objectives*** Under the provisions of the Porter-Cologne Act and the CWA, the Central Coast RWQCB regulates water quality in the project area. The Water Quality Control Plan for the Central Coast Basin ("Basin Plan") (CCRWQCB, 1994) designates beneficial uses for specific surface water and groundwater resources, establishes water quality objectives to protect those uses, and sets forth policies to guide the implementation of programs to attain the objectives. Pursuant to the Porter-Cologne Act, the Central Coast RWQCB is authorized to issue individual permits to allow for discharge of specified quantities and qualities of waste to land or surface waters. The limitations placed on the discharge are designed to ensure compliance with water quality objectives in the Basin Plan. To obtain a permit, the discharger must submit a Report of Waste Discharge and the requirements of CEQA must be met. All dischargers must submit monitoring reports. The RWQCB can use this approach to regulate any discharge to surface waters. The discharger would be responsible for providing enough information regarding the chemicals and volumes to be discharged and receiving waters to allow preparation of a permit. The SWRCB also regulates activities that could result in adverse impacts to groundwater quality. Policies and regulations by the SWRCB, either under CWA authority or other state-derived authority, are implemented and enforced by the RWQCB. Groundwater-related activities governed by NPDES permits

	or waste discharge requirements issued by the RWQCB include aquifer re-injection, reclaimed water irrigation, and design of waste management facilities, including wastewater treatment plants. The RWQCB also oversees local implementation of underground storage tank management programs and other programs related to the prevention and control of groundwater impacts. In general, SWRCB policy prohibits degradation of groundwater quality, and in cases where impacts occur, the CCRWQCB typically requires restoration of impacted aquifers such that residual concentrations do not exceed the USEPA's Maximum Contaminant Levels (MCLs) for drinking water. In cases where the aquifer is hydraulically connected to a surface water body, water quality criteria for fresh water aquatic habitats may be imposed as standards for cleanup and restoration efforts.
	Construction Activities – NPDES General Construction Permit Surface water quality is regulated by the NPDES, developed by the U.S. EPA in accordance with Section 303 of the CWA. In California, the NPDES program is administered by the SWRCB, with implementation and enforcement by the RWQCBs. The NPDES program, designed to protect surface water quality, is applicable to all discharges to waters of the United States, including storm water discharges associated with municipal drainage systems, construction activities, industrial operations and point sources. In general, the NPDES permit program is designed to control, minimize or reduce surface water impacts. For any construction project that will result in the disturbance of one acre or more, a project must comply with the NPDES Construction Activities Storm Water General Permit (2009-0009-DWQ Permit). Construction activities subject to the permit include clearing, grubbing, grading, stockpiling, and excavation activities. The project applicant must submit must electronically submit Permit Registration Documents (PRDs) prior to commencement of construction activities in the Stormwater Multi- Application Report Tracking System (SMARTS). PRDs consist of the Notice of Intent, Risk Assessment, Post-Construction Calculations, a Site Map, a Stormwater Pollution Prevention Plan (SWPPP), a signed certification statement by the Licensed Responsible Person, and the first annual fee. The General Permit requires the preparation and implementation of a SWPPP for construction activities. The plan must describe best management practices to prevent erosion and stormwater pollution during construction activities. Best management practices include erosion controls, sediment controls, and other controls to prevent stormwater from contracting pollutants. The SWPPP must also include a stormwater monitoring program.

	Industrial Activities – NPDES General Industrial Permit SWRCB Order 97-03-DWQ, General Storm Water Permit for Industrial Activities, regulates industrial storm water discharges under the NPDES Program and in accordance with the CWA. The regulations require that storm water associated with industrial activity (stormwater) that discharges either directly to surface waters or indirectly through municipal separate storm sewers must be regulated by an NPDES permit. All permit holders are required to prepare a SWPPP that describes the BMPs to be implemented to prevent the discharge of polluted storm water off site. In addition, permit holders are required to sample and analyze their storm water runoff during a minimum of two storm events each rainy season. A no-exposure exemption can be authorized for those light industry facilities where all industrial activities are conducted inside buildings and where all materials stored and handled are not exposed to storm water.
Monterey Peninsula Water Management District	The Monterey Peninsula Water Management District (MPWMD) is responsible for the MPWMD law with the integrated management of groundwater and surface water resources in the Monterey Peninsula area (ESA, 2009). MPWMD is authorized to establish a written permit system for regulation of water distribution systems (ESA, 2009).
Monterey County Health Department	In order to protect groundwater quality, the well program is responsible for the permitting of the construction, destruction, and repairs/modification of a domestic, irrigation, agricultural, cathodic protection, observation, test, or monitoring well (ESA, 2009). The well program works closely with the cities and the MCWRA and MPWMD (Monterey County Health Department, 2008; from ESA, 2009).

Table A-3 Floodplains/Wetlands Related Laws and Regulations	
Law/Regulation	**Notes**
Executive Order (EO) 11988—Floodplain Management (U.S. DOT Order 5650.2; 23 CFR 650, Subpart A)	The U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) is delegated to map the designated floodplains along major streams and rivers and administer the National Flood Insurance Program (NFIP) for communities that have enacted local ordinances restricting development within the 100-year floodplain. Executive Order 11988 requires projects with federal funding or involvement to evaluate alternatives to floodplain encroachment and avoid adverse impacts to floodplain functions.
Flood Disaster Protection Act (42 USC 4001–4128; DOT Order 5650.2, 23 CFR 650 Subpart A; and 23 CFR 771)	The Flood Disaster Protection Act of 1973 establishes the National Flood Insurance Program to enable interested parties to purchase insurance against loss resulting from physical damage to or loss of real property or personal property as a result of flooding. This act substantially increases the coverage area authorized under the NFIP and provides for prompt identification and communication of information concerning flood-prone areas. Under this act, State or local communities are required to participate in the NFIP and establish flood ordinances that reduce or avoid flood losses, and property owners within special flood hazard areas are require to purchase flood insurance if they are being assisted by federally supported (funded, supervised, regulated, or insured) programs or agencies.
Department of Energy 10 CFR PART 1022—Compliance with Floodplain and Wetland Environmental Review Requirements	This part establishes policy and procedures for discharging the Department of Energy's (DOE's) responsibilities under EO 11988 and EO 11990, including: (1) DOE policy regarding the consideration of floodplain and wetland factors in DOE planning and decisionmaking; and (2) DOE procedures for identifying proposed actions located in a floodplain or wetland, providing opportunity for early public review of such proposed actions, preparing floodplain or wetland assessments, and issuing statements of findings for actions in a floodplain. To the extent possible, DOE shall accommodate the requirements of E.O 11988 and EO 11990 through applicable DOE NEPA procedures or, when appropriate, the environmental review process under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 U.S.C. 9601 et seq.).
Federal National Flood Insurance Program	FEMA is responsible for determining flood elevations and developing the Flood Insurance Rate Maps, which are used in the NFIP. Participation in the NFIP provides an opportunity for property owners in the community to purchase flood insurance, provided that the community complies with FEMA requirements for maintaining flood protection and managing development in the floodplain. Within designated floodplains, the community must not permit any development,

	new construction or encroachment, which would cause an increase in the 100-year (base) flood elevation. FEMA defines a significant increase to mean a maximum one-foot rise in the base flood elevation.
EO 11990, Protection of Wetlands,	Requires Federal agencies to take action to minimize the destruction or modification of wetlands by considering both direct and indirect impacts to wetlands. Furthermore, EO 11990 requires that Federal agencies proposing to fund a project that could adversely affect wetlands must consider alternatives to avoid such effects. Work involving wetlands is subject to Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the CWA
Cobey-Alquist Flood Plain Management Act (Water Code § 8400 et seq.)	Establishes mandatory floodplain management objectives, prohibiting inappropriate development that may endanger life or significantly restrict the carrying capacity of designated floodways. The Act states the primary responsibility for planning, adoption, and enforcement of land use regulations to accomplish floodplain management rests with local levels of government. It is the policy of the State to encourage government to accomplish and provide the State assistance and guidance for floodplain management.
CDFG Policies and Guidelines, Wetlands Resources Policy	Provides for the protection, preservation, restoration, enhancement, and expansion of wetland habitats in California, including vernal pools. The administering agencies for the above authority are the CDFG, California Environmental Protection Agency (Cal/EPA), and the Central Coast RWQCB.

Table A-4

Geologic/Soil Conditions Related Laws and Regulations

Law/Regulation	Notes
National Environmental Policy Act (NEPA) [42 U.S.C. Section 4321 et seq.]	Requires the consideration of potential environmental effects, including potential effects to geology, soils, and geologic resources, in the evaluation of any proposed Federal agency action. NEPA also obligates federal agencies to consider the environmental consequences and costs in their projects and programs as part of the planning process. General NEPA procedures are set forth in the Council on Environmental Quality (CEQ) regulations 23 CFR 771.
Clean Water Act Section 404 Permit for Fill Material in Waters and Wetlands	Section 404 of the act regulates the discharge of dredged or fill material into waters of the United States, including rivers, streams and wetlands.

Section 402 NPDES Program	Point source discharges to surface water are regulated by Section 402 of the CWA through requirements set forth in specific or general National Pollutant Discharge Elimination System (NPDES) permits. NPDES requirements apply to discharges of pollutants into navigable waters from a point source, discharges of dredged or fill material into navigable waters, and the disposal of sewage sludge that could result in pollutants entering navigable waters. Stormwater discharges during construction and operation of a facility and incidental non-stormwater discharges associated with construction also fall under this act and are addressed through a general NPDES permit. In California, requirements of the CWA regarding regulation of point source discharges and stormwater discharges are delegated to the SWRCB and administered by the nine RWQCBs. The Central Coast RWQCB implements the statewide policy in the study area. Under California's NPDES program, any waste discharger subject to the NPDES program must obtain an NPDES permit from the local RWQCB. The permits typically include criteria and water quality objectives and require periodic effluent sampling.
Section 401 Clean Water Quality Certification	Under Section 401 of the CWA, water quality certification is required from the state for any activity that requires a federal permit or license that may result in discharge into navigable waters. The certification must indicate that the activity will comply with the applicable state water quality standards. With respect to the project, the authority to grant water quality certification has been delegated to the SWRCB, and for the project study area, applications for certification under CWA Section 401 are processed by the Central Coast RWQCB. A Section 401 Certification would be necessary to obtain a Section 404 permit for discharge into waters subject to the Corps jurisdiction.
Section 303(d) Water Quality Impairments	Under Section 303(d) of the CWA, each state is required to develop effluent limitations for waters within its boundaries where water quality standards are not met. The state must establish priority rankings for these waters and develop Total Maximum Daily Loads (TMDLs) to improve water quality. In California, the SWRCB and RWQCBs prepare the Clean Water Act Section 303(d) List of Water Quality Limited Segments Requiring TMDLs. The United States Environmental Protection Agency (USEPA) approved California's 2006 303(d) List on June 28, 2007 (SWRCB, 2009).
Surface Mining and Reclamation Act [Public Resources Code, Division 2, Chapter 9, Section 2710 et seq.]	Enacted to address the need for a continuing supply of mineral resources, and to prevent or minimize the adverse impacts of surface mining to public health, property and the environment.
California Environmental Quality Act (CEQA) [Section 21000 et seq.] and CEQA Guidelines [Section 15000 et seq.]	Requires state and local agencies to identify the significant environmental impacts of their actions, including potential significant impacts to geology, soils, and geologic resources, and to avoid or mitigate those impacts, when feasible.

Alquist-Priolo Earthquake Fault Zoning Act [California Code of Regulations Section 2621 et seq.]	Provides policies and criteria to assist cities, counties, and state agencies in the exercise of their responsibility to prohibit the location of developments and structures for human occupancy across the trace of active faults.
Seismic Hazards Mapping Act [Public Resources Code Sections 2690 to 2699.6]	Requires that site-specific geotechnical investigations be performed prior to permitting development within the seismic hazard zones.
California Building Standards Code [California Code of Regulations Title 24]	Governs the design and construction of buildings, associated facilities and equipment and applies to buildings in California.
Porter-Cologne Water Quality Act [California Water Code Section 13000 et seq.]	Requires projects that are discharging or proposing to discharge wastes that could affect the quality of the state's water, to file a Report of Waste Discharge with the appropriate RWQCB.
California Government Code Section 65302(g)	Requires general plans to include a safety element for the protection of the community from any unreasonable risks associated with the effects of seismically induced surface rupture, ground shaking, ground failure, tsunami, seiche, and dam failure; slope instability leading to mudslides and landslides; subsidence and other geologic hazards known to the legislative body. Monterey County has a Health and Safety Element in its General Plan, and corresponding ordinances to enforce General Plan policies related to protection of public health and welfare from geologic hazards. In general, these policies and ordinances require soils engineering and geologic-seismic analysis of developments, including public infrastructure, in areas prone to geologic or seismic hazards, and enforce the California Building Standards Codes.
Surface Mining and Reclamation Act (SMARA) of 1975	Addresses the need for a continuing supply of mineral resources, and to prevent of minimize the negative effects of surface mining to public health, property, and the environment. The State has delegated the approval of reclamation plans to local agencies. The agency responsible for reclamation plans in the project study area is the Monterey County Resource Management Agency.

Table A-5 Solid and Hazardous Waste Related Laws and Regulations	
Law/Regulation	**Notes**
Resource Conservation and Recovery Act (RCRA), 42 United States Code (USC), § 6901 to § 6992k	Provides the basic framework for federal regulation of non-hazardous and hazardous waste. RCRA's Subtitle D establishes state responsibility for regulating non-hazardous wastes, while Subtitle C controls the generation, transfer, storage, and disposal of hazardous waste through a comprehensive "cradle to grave" system of hazardous waste management techniques and requirements. The U.S. Environmental Protection Agency (USEPA) is responsible for implementing the law, and the implementing regulations are set forth in 40 Code of Federal Regulations (CFR) 260 et seq. The law allows USEPA to delegate the administration of the RCRA programs to the various states provided that the state programs meet or are more stringent than the federal requirements. California's program was authorized by USEPA on August 1, 1992, and the California Environmental Protection Agency (Cal EPA) Department of Toxic Substances Control (DTSC) is responsible for administering the program.
49 CFR Parts 172 and 173	Provides for the controls for hazardous waste shipments that will be shipped offsite over the state highways and roads. Part 172 lists and classifies those materials that the Department of Transportation has designated as hazardous materials for purposes of transportation and prescribes the requirements for shipping papers, package marking, labeling, and transport vehicle placarding applicable to the shipment and transportation of those hazardous materials. Part 173 Includes definitions of hazardous materials for transportation purposes; requirements to be observed in preparing hazardous materials for shipment by air, highway, rail, or water, or any combination thereof; and inspection, testing, and retesting responsibilities for persons who retest, recondition, maintain, repair and rebuild containers used or intended for use in the transportation of hazardous materials. The US Department of Transportation and the California Highway Patrol are responsible for its administration and enforcement.
California Integrated Waste Management Act (CIWMA) of 1989 (PRC Sections 40000 et seq.).	Nonhazardous solid waste is regulated under the California Integrated Waste Management Act (CIWMA) of 1989 (PRC Sections 40000 et seq.). State and local efforts in source reduction, recycling, and land disposal safety are coordinated through CIWMA. CIWMA requires each county to submit an integrated waste management plan to the state. Monterey County, solid waste haulers, and disposal sites will all comply with CIWMA requirements. CIMWA affects facility operations to the extent that hazardous wastes are not to be disposed of with nonhazardous wastes. RCRA allows states to develop their own programs to regulate hazardous waste. California has developed its own program by passage of the California Hazardous Waste Control Law (HWCL), California

	Health and Safety Code, § 25100 et seq. It should be noted that California's HWCL includes non-RCRA (California) hazardous wastes. The law specifies two hazardous waste criteria (Soluble Threshold Limit Concentration and Total Threshold Limit Concentration) that are not required under RCRA but are used by California in the waste determination process to assess whether a waste is a California Hazardous Waste if RCRA does not apply. Primary authority for the statewide administration and enforcement of California's HWCL rests with the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC). However, local government often provides most regulatory functions covering those who generate hazardous waste.
The Monterey Count y Health Department, Environ mental Health Division	Designated by the California Integrated Waste Man agement Board, as the Local Enforcem ent Agency (LEA) . The LEA is responsible for administering and enforcing laws an d regulation s relating to the collection, handling , storage, and di sposal of solid waste materials in Monterey County.

Table A-6 Noise Related Laws and Regulations	
Law/Regulation	**Notes**
Noise Control Act of 1972 (42 U.S.C 4910)	This Act establishes a national policy to promote an environment for all Americans free from noise that jeopardizes their health and welfare. To accomplish this, the Act establishes a means for the coordination of Federal research and activities in noise control, authorizes the establishment of Federal noise emissions standards for products distributed in commerce, and provides information to the public respecting the noise emission and noise reduction characteristics of such products.
"Information on Levels of Environmental Noise Requisite to Protect Health and Welfare with an Adequate Margin of Safety", NTIS 550\9 -74-004, USEPA, Washington, D.C., March 1974.	In response to a federal mandate, the U.S. EPA provided guidance in this document, commonly referenced as the, "Levels Document," that establishes an L_{dn} of 55 dBA as the requisite level, with an adequate margin of safety, for areas of outdoor uses including residences and recreation areas. This document does not constitute U.S. EPA regulations or standards, but identifies safe levels of environmental noise exposure without consideration of costs for achieving these levels or other potentially relevant considerations. It is intended to "provide State and Local governments as well as the Federal Government and the private sector with an informational point of departure for the purpose of decision making." The agency is careful to stress that the recommendations contain a factor of safety and do not consider technical or economic feasibility issues, and therefore should not be construed as standards or regulations.
Federal Energy Regulatory Commission (FERC) Guidelines On Noise Emissions From Compressor Stations, Substations, And Transmission Lines (18 C.F.R 157.206(d)5)	These guidelines require that: "the noise attributable to any new compressor stations, compression added to an existing station, or any modification, upgrade or update of an existing station, must not exceed a day-night level (L_{dn}) of 55 dBA at any pre-existing noise sensitive area (such as schools, hospitals, or residences)." This policy was adopted based on the U.S. EPA-identified level of significance of 55 L_{dn} dBA.
Federal Highway Administration (FHWA) Noise Abatement Procedures (23 C.F.R. Part 772)	The purpose of 23 CFR Part 772 is to provide procedures for noise studies and noise abatement measures to help protect the public health and welfare, to supply noise abatement criteria, and to establish requirements for information to be given to local officials for use in the planning and design of highways. It establishes five categories of noise sensitive receptors and prescribes the use of the Hourly L_{eq} as the criterion metric for evaluating traffic noise impacts.
Department of Housing and Urban Development (HUD) Environmental Standards (24 C.F.R Part 51)	HUD Regulations set forth the following exterior noise standards for new home construction assisted or supported by the Department: 65 L_{dn} or less – Acceptable > 65 L_{dn} and < 75 L_{dn} – Normally unacceptable, appropriate sound attenuation measures must be provided > 75 L_{dn} – Unacceptable HUD's regulations do not contain standards for interior noise levels. Rather, a

	goal of 45 decibels is set forth and attenuation requirements are geared to achieve that goal.
Occupational Safety and Health Administration (OSHA) Occupational Noise Exposure; Hearing Conservation Amendment (FR 48 (46), 9738 – 9785 (1983).	The standard stipulates that protection against the effects of noise exposure shall be provided for employees when sound levels exceed 90 dBA over an 8-hour exposure period. Protection shall consist of feasible administrative or engineering controls. If such controls fail to reduce sound levels to within acceptable levels, personal protective equipment shall be provided and used to reduce exposure of the employee. Additionally, a Hearing Conservation Program must be instituted by the employers whenever employee noise exposure equals or exceeds the Action Level of an 8-hour time-weighted average (TWA) sound level of 85 dBA. The Hearing Conservation Program requirements consist of periodic area and personal noise monitoring, performance and evaluation of audiograms, provision of hearing protection, annual employee training, and record keeping.
California Government Code Section 65302(f) and Section 46050.1 of the Health and Safety Code	The State of California requires that all municipalities prepare and adopt a comprehensive long-range General Plan. General Plans must contain a Noise Element. The requirements for the Noise Element of the General Plan include describing the noise environment quantitatively using a cumulative noise metric such as CNEL or DNL, establishing noise/land use compatibility criteria, and establishing programs for achieving and/or maintaining land use compatibility.
Cal-OSHA in Title 8, Group 15, Article 105, Sections 5095-5100	Occupational exposure to noise is regulated by this standard. The standard stipulates that protection against the effects of noise exposure shall be provided when sound levels exceed 90 dBA over an 8-hour exposure period. Protection shall consist of feasible administrative or engineering controls. If such controls fail to reduce sound levels to within acceptable levels, personal protective equipment shall be provided and used to reduce exposure of the employee. Additionally, a Hearing Conservation Program must be instituted by the employers whenever employee noise exposure equals or exceeds the Action Level of an 8-hour time-weighted average (TWA) sound level of 85 dBA.
The California Environmental Quality Act (CEQA) (California Public Resources Code section 21000 et seq.). Section XI of Appendix G of CEQA Guidelines (Cal. Code Regs., Title 14, App. G).	Requires identification of "significant" environm ental im pacts an d their feasible mitigation. CEQA does not define a threshold of "significant increase" regarding noise exposure; however, based on human response and comm only applie d industry standard, the foll owing thresholds of signi ficance will be applied. A significant impact related to operational noise would result if: -The project causes the ambient noise level measured at the property line of affected uses to increase by 3 dBA in CNEL to or within the "normally unacceptable" or "clearly unacceptable" noise/land use compatibility category; or -The project causes any 5 dBA or greater noise increase.
The Safety Element of the Monterey County General Plan contains the Monterey County Noise Element	Designed to limit the exposure of the community to excessive noise levels by specifying noise guidelines at noise-sensitive receptors. No piece of machinery can be operated within 2,500 feet of a noise-sensitive receiver if the piece of the equipment has a sound level of 85 dBA at a reference distance of 50 feet.

Table A-7 Visual Resource Related Laws and Regulations	
Law/Regulation	**Notes**
The Scenic and Visual Qualities of the California Coastal Act (2009) Section 30251	States that scenic and visual qualities of coastal areas shall be considered and protected as a resource.
The Monterey County Coastal Implementation Plan Part I, Title 20 Zoning Ordinance (Monterey County 2000): 20.28.070 Site Development Standards and 20.28.080 Special Regulations.	Contains development standards that address the visual quality within the HI (CZ) Districts.
Monterey County Coastal Implementation Plan, Part 2 Development Standards: Section 20.144.030, Visual Resources Development Standards	Contains a requirement for onsite inspection by a planner for industrial uses, to determine conformance with policies of the land use and development standards of the Implementation Plan.

Table A-8 Ecology Related Laws and Regulations	
Law/Regulation	**Notes**
Endangered Species Act of 1973 and implementing regulations, Title 16 U.S. Code (USC) §1531 et seq. (16 USC 1531 et seq.), Title 50 Code of Federal Regulations (CFR) §17.1 et seq. (50 CFR 17.1 et seq.)	The Endangered Species Act (ESA) includes provisions for the protection and management of federally listed threatened or endangered plants and animals and their designated critical habitats. Section 10(1)(A) of the ESA requires a permit to take threatened or endangered species during lawful project activities. The administering agency for the above authority is the USFWS for terrestrial, avian, and most aquatic species, and the National Marine Fisheries Service (NMFS) for anadromous species.
Section 7 of Fish and Wildlife Coordinating Act, 16 USC 742 et seq., and Endangered Species Act, 16 USC 1531 et seq., and 50 CFR 17:	Section 7 requires consultation if any project facilities could jeopardize the continued existence of an endangered or threatened species, and issuance of a Biological Opinion that also authorizes incidental take of a threatened or endangered species. The applicability of this act depends on federal jurisdiction over some aspect of the project. The administering agencies for the above authority are the USFWS and the National Oceanic and Atmospheric Administration (NOAA).
Section 404 of the Clean Water Act of 1977 (33 USC 1251 et seq., 33 CFR §§320 and 323):	This section of the Clean Water Act gives the USACE authority to regulate discharges of dredge or fill material into waters of the United States, including wetlands. The administering agency for the above authority is the USACE.
Section 401 of the Clean Water Act of 1977:	Section 401 of the Clean Water Act requires the Applicant to conduct water quality impact analysis for the project when using Section 404 permits and for discharges to waterways.
Migratory Bird Treaty Act 16 USC §§703-711:	This Act includes provisions for protection of migratory birds, including the non-permitted take of migratory birds. The administering agencies for the above authority are the USFWS and CDFG.
California Endangered Species Act of 1984, Fish and Game Code, §2050 through §2098	The California Endangered Species Act (CESA) includes provisions for the protection and management of plant and animal species listed as endangered or threatened, or designated as candidates for such listing. CESA includes a consultation requirement "to ensure that any action authorized by a state lead agency is not likely to jeopardize the continued existences of any endangered or threatened species…or result in the destruction or adverse modification of habitat essential to the continued existence of the species" (§2090). Plants of California declared to be endangered, threatened, or rare are listed at 14 CCR §670.2. Animals of California declared to be endangered or threatened are listed at 14 CCR §670.5. 14 CCR §15000 et seq. describes the types and extent of information required to evaluate the effects of a proposed project on biological resources of a project site. Section 2081 also requires a permit to authorize incidental take of species listed as threatened or endangered. The

	administering agency for the above authority is CDFG.
Fish and Game Code, Fully Protected Species: §3511:	Fully Protected Birds; §4700: Fully Protected Mammals; §5050: Fully Protected Reptiles and Amphibians; §5515: Fully Protected Fishes. The Fish and Game Code prohibits the taking of listed plants and animals that are Fully Protected in California. The administering agency for the above authority is CDFG.
Fish and Game Code §1930, Significant Natural Areas:	Section 1930 of the Fish and Game Code designates certain areas such as refuges, natural sloughs, riparian areas, and vernal pools as significant wildlife habitats. These Significant Natural Areas are listed in the CNDDB. The administering agency for the above authority is CDFG.
Fish and Game Code §1580, Designated Ecological Reserves:	In Section 1580 of the Fish and Game Code, the CDFG Commission designates land and water areas as significant wildlife habitats to be preserved in natural condition for the general public to observe and study. The administering agency for the above authority is CDFG.
Fish and Game Code §1600, Streambed Alteration Agreement:	Section 1600 of the Fish and Game Code requires authorization for activities that impact waterways, including impacts to vegetation and wildlife from sediment, diversions, and other disturbances. The administering agency for the above authority is the CDFG.
Native Plant Protection Act of 1977, Fish and Game Code, §1900 et seq.:	The Native Plant Protection Act designates state rare and endangered plants and provides specific protection measures for identified populations. The administering agency for the above authority is the CDFG.
CDFG Policies and Guidelines, Wetlands Resources Policy	The Wetlands Resource policy provides for the protection, preservation, restoration, enhancement, and expansion of wetland habitats in California, including vernal pools. The administering agencies for the above authority are the CDFG, California Environmental Protection Agency (Cal/EPA), and the Regional Water Quality Control Board.
Public Resource Code §§25500 and 25527	Sections 25500 and 25527 of the Public Resource Code prohibits constructing facilities in certain areas of critical concern for biological resources, such as ecological preserves, wildlife refuges, estuaries, and unique or irreplaceable wildlife habitats of scientific or educational value. If there is no alternative, strict criteria are applied. The administering agencies for the above authority are the USFWS and CDFG.
Title 20 CCR §§1702 (q) and (v):	Title 20 CCR 1702 (q) and (v) protects "areas of critical concern" and "species of special concern" identified by local, state, or federal resource agencies within the project area, including the California Native Plant Society. The administering agencies for the above authority are the USFWS and CDFG.
Title 14 CCR Section 15000 et seq.:	The 14 CCR Section 15000 et seq. describe the types and extent of information required to evaluate the effects of a proposed project on biological resources of a project site. The administering agencies for the above authority are the USFWS and CDFG.
Municipal Code, County of	Chapter 16.60 describes the size and types of trees that are protected

Monterey, California; Chapter 16.60 - Preservation of Oak trees and other protected trees	from removal without a permit from the county of Monterey. The administering agencies for the above authority is Monterey County Planning and Building.

Table A-9 Socioeconomic Related Laws and Regulations	
Law/Regulation	**Notes**
The Uniform Relocation Assistance and Real Property Acquisition Act of 1970	The Uniform Relocation Assistance and Real Property Acquisition Act of 1970 **(**Uniform Act) addresses the need for consistent and equitable treatment of persons displaced from their homes, farms, or businesses by federally assisted programs. It specifies the due process to be followed in real property acquisitions and relocation of displaced individuals, families, businesses, farms, and nonprofit organizations. It provides for payment of moving expenses, housing rental or purchase supplements, down payment assistance, etc. The Uniform Act is in 49 Code of Federal Regulations Part 24.
Title VI of the Civil Rights Act of 1964	Title VI of the Civil Rights Act of 1964 directs federal agencies to ensure that no person is excluded from participation in, denied benefits of, or subject to discrimination under any program or activity receiving federal financial assistance on the basis of race, color, religion, national origin, sex, age, or handicap. Title VI is supplemented by EO 12898.
Executive Order 12898 Federal Actions to Address Environmental Justice in Minority and Low-Income Populations	EO 12898 was designed to supplement Title VI of the Civil Rights Act of 1964; this EO requires Federal agencies, such as the DOE, to consider EJ issues in their policies, activities, and procedures. The EO requires Federal agencies to identify and address as appropriate, as part of project planning and decision-making, the occurrence of disproportionately high and adverse effects on minority and low-income populations. A Presidential Memorandum accompanying EO 12898 directed to the heads of all departments and agencies states, "each Federal agency shall analyze the environmental effects, including human health, economic, and social effects, of Federal actions, including effects on minority communities and low-income communities, when such analysis is required by NEPA." The memorandum particularly emphasizes the importance of NEPA's public participation process, directing that "each Federal agency shall provide opportunities for community input in the NEPA process." Agencies are further directed to "identify potential effects and mitigation measures in consultation with affected communities, and improve the accessibility of meetings, crucial documents, and notices."
State Housing Element Law	There are no specific state guidelines that address population, socioeconomics, or EJ. However, state law recognizes the vital role local governments play in the supply and affordability of housing. Each county and city in California is required to adopt a comprehensive, long-term general plan to guide its physical development. The State Housing Element Law (Government Code Article 10.6, Sections 65580 through 65590), enacted in 1969, mandates that local governments adequately plan to meet the existing and projected housing needs of all economic segments of the community. The law acknowledges that, for the private market to adequately address housing needs and demand, local governments must adopt land use plans and regulatory systems that provide opportunities for, and do not unduly constrain, housing development. As a result, housing policy in the state rests largely upon the effective implementation of local general plans and, in particular, local housing elements.

Table A-10 Applicable Worker Safety and Health Laws, Ordinances, Regulations, and Standards		
Administering Agency	**Applicable LORS**	**Requirement/Compliance**
California Division of Occupational Safety and Health California Occupational Safety and Health Act 1973	Title 8, CCR	The Act establishes the Cal/OSHA and establishes minimum safety and health standards for work operations occurring in the state.
	8 CCR, Section 339	Requires listing of hazardous chemicals relating to the Hazardous Substance Information and Training Act.
	8 CCR, Section 450 et seq. – 560 et seq.	Establishes safety orders for pressurized vessels including: air tanks, anhydrous ammonia, and general safe work practices.
	8 CCR, Section 750 et seq.	Establishes safety orders of work with high-pressure steam.
	8 CCR, Construction Safety Orders (Sections 1500 et seq. – 1938 et seq.)	Establishes safety orders for construction work.
	8 CCR, Sections 1508 et. seq. – 1527 et seq.	Requirements for IIPP, PPE, and general site safety.
	8 CCR, Sections 1528 et seq. – 1537 et seq.	Requirements for controlling exposures to hazardous air contaminants.
	8 CCR, Sections 1539 et seq. – 1547 et seq.	Requirements for excavations and trenching.
	8 CCR, Sections 1590 et seq. – 1596 et seq.	Requirements for earth moving and haulage.
	8 CCR, Sections 1597 et seq. – 1599 et seq.	Requirements for vehicles, traffic control, flaggers, barricades, and warning signs.
	8 CCR, Sections 1604 et seq. – 1605 et seq.	Requirements for construction hoists.
	8 CCR, Sections 1620 et seq. – 1635 et seq.	Requirements for railings, ramps, stairs, access and egress, openings in floors, roofs and walls, and temporary floors.

Administering Agency	Applicable LORS	Requirement/Compliance
	8 CCR, Sections 1635 et seq. – 1667 et seq.	Requirements for scaffolding.
	8 CCR, Sections 1669 et seq. – 1678 et seq.	Requirements for safety belts, nets, and ladders.
	8 CCR, Sections 1680 et seq. – 1708 et seq.	Requirements for saws, powder-actuated tools, miscellaneous tools and equipment.
	8 CCR, Sections 1709 et seq. – 1722 et seq.	Requirements for steel reinforcing, concrete pouring, and structural steel erection operations.
	8 CCR, Sections 1760 et seq.	Electrical requirements for construction work.
	8 CCR, Sections 1920 et seq. – 1938 et seq.	Requirements for construction-related fire protection and prevention.
	8 CCR, Electrical Safety Orders (Sections 2299 et seq. – 2974 et seq.)	Establishes safety orders for installation of low and high voltage electrical systems.
	8 CCR, General Industry Safety Orders (Sections 3200 et seq. – 6184 et seq.)	Establishes safety orders for general industry work, including operations and maintenance.
	8 CCR, Sections 3200 et seq. – 3583 et seq.	Requirements for IIPP, PPE, and general site safety.
	8 CCR, Sections 3620 et seq. – 3920 et seq.	Requirements for mobile equipment operation.
	8 CCR, Sections 3940 et seq. – 4647 et seq.	Requirements for power transmission equipment, rotating equipment, moving parts points of operation, etc.
	8 CCR, Sections 4794 et seq. – 4884 et seq.	Requirements for compressed gases and gas systems for cutting and welding.

Administering Agency	Applicable LORS	Requirement/Compliance
	8 CCR, Sections 4850 et seq. – 4853 et seq.	Requirements for electric welding.
	8 CCR, Sections 4884 et seq. – 5049 et seq.	Requirements for cranes and other hoisting equipment.
	8 CCR, Sections 5094 et seq. – 5100 et seq.	Requirements for control of excessive noise exposure and ergonomic hazards.
	8 CCR, Sections 5139 et seq. – 5223 et seq.	Requirements for the control of hazardous substances, including Hazard Communication program requirements.
	8 CCR, Sections 5615 et seq. – 5629 et seq.	Requirements for the control of hazards from flammable liquids, gases, and vapors.
	8 CCR, Sections 6150 et seq. – 6184 et seq.	Requirements for fire protection and prevention.
	8 CCR, Part 6	Provides health and safety requirements for working with tanks and boilers.
	29 CFR 1926	Contains federal health and safety regulations pertaining to construction activities.
	29 CFR 1910	Contains federal health and safety regulations pertaining to general industry.
North County Fire Protection District	Section 25500 et seq. (LaFollette Bill)	Requires that every new or modified facility that handles, treats, stores, or disposes of more than the threshold quantity of any of the listed acutely hazardous materials prepare and maintain a Risk Management Plan.
North County Fire Protection District	Sections 25500 et seq. – 25541 et seq.	Requires the preparation of a Hazardous Material Business Plan that details emergency response plans for a hazardous materials emergency at the facility.
Administering Agency	**Applicable LORS**	**Requirement/Compliance**
North County Fire Protection District	California Fire Cod	Requires the prevention, control, and mitigation of dangerous conditions related to storage, dispensing, use, and handling of hazardous materials and information needed by emergency response personnel.
North County Fire Protection District	NFPA 10: Portable Fire Extinguishers	Requirements for the selection, placement, inspection, maintenance, and employee training for portable fire extinguishers.

	NFPA 12: Carbon Dioxide Fire Extinguishing Systems	Requirements for the installation and use of carbon dioxide extinguishing systems.
	NFPA 13 & 13A: Sprinkler Systems	Guidelines for selection, installation, maintenance, and testing of fire sprinkler systems.
	NFPA 14: Standpipe and Hose Systems	Guidelines for the selection and installation of standpipe and hose fire protection systems.
	NFPA 15: Water Spray Fixed Systems	Guidelines for selection and installation of fixed water spray systems.
	NFPA 22: Water Tanks and Private Fire Protection	Requirements for water tanks that are used for private fire protection.
	NFPA 24: Installation of Private Fire Service Mains and their Appurtenances	Requirements for installation of private fire service mains and appurtenances.
	NFPA 26: Supervision of Valves Controlling Water Supplies	Provides guidance for installation and supervision of valves used to control water supplies.
	NFPA 30: Flammable and Combustible Liquids	Requirements for storage, transfer, and use of flammable and combustible liquids.
Administering Agency	**Applicable LORS**	**Requirement/Compliance**
	NFPA 54: National Fuel Gas Code	Provides fire protection requirements for the use of fuel gas.
	NFPA 70, 70B & 70E: National Electric Code	Guidance on the safe selection and work practices associated with the design, installation, construction, and maintenance of electrical systems.
	NFPA 71: Installation, Maintenance and use of Central Station Signaling Systems	Provides requirements for the installation, maintenance, and use of central station signaling systems.

	NFPA 72A, 72E & 72F: Local Protective Signaling System, Automatic Fire Detection System, Emergency Voice/Alarm Communication System	Provides requirements for the design, installation, use and maintenance of local protective signaling systems, automatic fire detection systems and emergency communication systems.
	NFPA 78: Lightning Protection Code	Provides requirements for lightning protection.
	NFPA 80: Fire Doors and Windows	Provides requirements for fire doors and windows.
	NFPA 90A: Installation of Air Conditioning and Ventilation Systems	Provides guidance for the installation of air conditioning and ventilation systems.
	NFPA 101: Life Safety, Fire in Buildings and Structures	Requirements for the design and construction of means of egress from structures.
	NFPA 291: Fire Flow Testing and Marking of Hydrants	Requirements for flow testing and marking of fire hydrants.
	NFPA 1962: Care, Maintenance and Use of Fire Hoses	Requirements for the care, use and maintenance of fire hoses, connections, and nozzles.
Administering Agency	**Applicable LORS**	**Requirement/Compliance**
Cal/OSHA	ANSI/ASME Boiler and Pressure Vessel Code	Provides specifications and requirements for boilers and pressure vessels.

Appendix B

Forms

MOSS LANDING CEMENT COMPANY, LLC.

Contractors/Vendors/Visitors
Site Specific Hazard Training

The safety of contractors, visitors, and employees is paramount at this facility. The following guidelines were established to enhance your safety and provide you with procedural guidelines while at our facility. Should you have any questions regarding any of our policies, please see any member of management.

- Safety glasses, closed toed shoes, & hardhats are required at all areas. Hearing protection when posted is required and available. Safety glasses, goggles, shoes and hard hats are available at the reception area.
- Goggles are required in areas behind red lines.
- Please observe all posted speed limits, warning signs, & driving patterns.
- Equipment has right-of-way throughout the property.
- All contractors and persons not employed by **MLCC** are required to report to the reception area at the office to sign in prior to starting work for a briefing regarding their safety.
- Safety harness & tie-offs are required to be worn during any work from an elevated position.
- **MLCC, OSHA lockout-tagout policies** and **safety rules** must be followed prior to inspecting/repairing equipment or machinery.
- **DO NOT** under any circumstance, walk behind, drive behind, or park behind any other piece of mobile equipment.
- You are advised to report any unsafe conditions or unsafe acts that **YOU** observe to a member of management.
- Please do not leave designated work areas and travel within the property without a company escort.
- All contractor tools and equipment must meet or exceed OSHA Standards and are subject to inspection.
- Seat belts must be worn at all times when driving on **MLCC** property.
- The company reserves the right to conduct safety inspections, prohibit use of equipment, tools, or vehicles, which do not meet OSHA guidelines.
- We reserve the right to remove any contractor or visitor who does not adhere to our safety policies and practices.
- You may encounter various moving equipment, i.e. trucks, forklifts, etc. Be alert and stay clear of this equipment, making sure the operator knows you are in the vicinity.
- Stay clear of moving and idle machinery unless the controls are locked out by you personally, (conveyors, fans, drives, etc). Much of our equipment can be started from remote locations.
- Exercise caution when walking in work areas and stepping over and around obstacles. Fall protection is required when there is danger of falling.
- Avoid areas where welding or burning operations are conducted. **DO NOT** look at the flash.
- Observe No Smoking signs and areas. **DO NOT** smoke around flammable or explosive materials.
- Stay clear of all electrical transmissions, distribution and control equipment. Power circuits shall be de-energized before work is done on such circuits unless hot-wire tools are used.
- In the event of an emergency evacuation follow the instructions given by supervisors. (3 loud bursts from air horn. Meet by reception area until all clear is given by management,)
- Do not use cell-phones while walking in the plant, or driving in your vehicle.
- First aid kits are available in the main office, the shop and other designated areas.
- Fire extinguishers are located on all mobile equipment and in designated areas throughout the plant.
- No weapons or firearms are permitted on company property.
- Before working with or around any potentially hazardous materials (as defined by the **MLCC** Hazard Communication Program) site Material Safety Data Sheets (MSDS's) must be consulted.
- No hazardous materials are to be brought on-site unless accompanied by an MSDS, or an MSDS has been provided prior to the material being brought on-site.
- No **MLCC** equipment shall be used for contractor work without permission from the **MLCC** Supervisor in charge of said equipment. **MLCC** equipment shall be operated by **MLCC** personnel only, unless authorized by **MLCC** site management.
- All personnel entering Company property in a fuel or chemical delivery vehicle must stay inside the cab of the vehicle. If exiting the vehicle, proper PPE must be worn and instructions from **MLCC** site personnel must be followed.

Persons and equipment found in violations of these rules are subject to be removed from this operation, and are subject to possible OSHA citations.

I acknowledge the above safety guidelines and I understand them. I agree to abide by these practices during this visit and the subsequent visits. I have been provided with a copy of this training document.

Signed: _____ **Date: _____**

Printed: _____

Company Name: _____

Address: _____

Training Conducted by: _____

Form B-1 Facility Management Approval

This Environmental Management Plan (EMP) is fully supported and approved by the Calera Corporation. This includes a commitment to provide manpower, equipment, and materials as necessary to implement the EMP and modifying it as needed, due to expansions, modifications, and improvements to the Facility.

This EMP will be implemented as described herein.

William Day, Vice President	Date

Appendix C

Permits

MONTEREY BAY
Unified Air Pollution Control District
serving Monterey, San Benito, and Santa Cruz counties

INTERIM AIR POLLUTION CONTROL OFFICER
Ed Kendig

24580 Silver Cloud Court • Monterey, California 93940 • 831/647-9411 • FAX 831/647-8501

DEC 23 2008

Mr. Sam Bose
Director of Operations
Moss Landing Cement Company
P.O. Box 777
Moss Landing, CA 95039

SUBJECT: AUTHORITIES TO CONSTRUCT -
14006 - SPRAY DRYER WITH DEDICATED VENTILATION
14024 - R & D SCALE CEMENT PRODUCTION

Dear Mr. Bose:

The District has completed its evaluation of your applications for the following equipment:

- **New** Spray Dryer and Jet Mill With Dedicated Ventilation System
- **New** R& D Scale Cement Production Operation

Accordingly, I have enclosed Authorities to Construct (ATCs) 14006 and 14024 authorizing the installation and temporary operation of the subject equipment. **These Authorities to Construct must be posted or kept readily available at the operating premises.**

Please note the conditions which have been included on these Authorities to Construct. These conditions are necessary to insure that the equipment will operate in accordance with all applicable District Rules and Regulations. Particular attention should be paid to Condition 1 that requires the District to be notified at least 24 hours prior to the initial start-up of the equipment.

Lastly, these Permits cannot be considered permission to violate applicable laws, ordinances, regulations, or statutes of other governmental agencies.

If you should have any questions, please feel free to contact me at the District office.

Sincerely,

Mike Sewell
Air Quality Engineer

enclosure: Authorities to Construct 14006 & 14024

MONTEREY BAY UNIFIED AIR POLLUTION CONTROL DISTRICT

AUTHORITY TO CONSTRUCT

24580 SILVER CLOUD CT., MONTEREY, CA 93940
TELEPHONE (831) 647-9411 • FAX (831) 647-8501

APPLICATION NUMBER

14006

AN **AUTHORITY TO CONSTRUCT** IS GRANTED AS OF DEC 23 2008

LEGAL OWNER OR OPERATOR: MOSS LANDING CEMENT COMPANY

EQUIPMENT LOCATED AT: 7697 Highway One (Hwy One & Dolan Road)
Moss Landing, California

EQUIPMENT DESCRIPTION AND CONDITIONS: THIS AUTHORITY TO CONSTRUCT IS ISSUED AND IS VALID FOR THIS EQUIPMENT ONLY WHILE IT IS IN THE CONFIGURATION SET FORTH IN THE FOLLOWING DESCRIPTION:

SPRAY DRYER WITH DEDICATED VENTILLATION SYSTEM:

1) Installation Of Electrically Heated Spray Dryer With A Capacity Of 9 Kg Of Water Per Hour, With Dedicated Ventilation System.

2) Installation Of 12" Micron-Master Jet Mill, With Torit TD-162 Dust Collector.

THE EQUIPMENT FOR WHICH THIS AUTHORITY TO CONSTRUCT IS ISSUED MAY BE OPERATED ONLY WHEN IN COMPLIANCE WITH THE FOLLOWING CONDITIONS:

Conditions:

1. No later than twenty-four (24) hours prior to initial use of this equipment, Moss Landing Cement Company must notify the District and arrange for an inspection of the equipment during normal operations to verify compliance with District Rules and Regulations.

2. There shall be no visible emissions from the exhaust of the baghouse dust collectors.

THIS AUTHORITY TO CONSTRUCT IS NOT A PERMIT TO OPERATE!

APPROVAL OR DENIAL OF THE APPLICATION FOR PERMIT TO OPERATE THE ABOVE EQUIPMENT WILL BE MADE AFTER AN INSPECTION TO DETERMINE IF THE EQUIPMENT HAS BEEN CONSTRUCTED IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS, AND IF THE EQUIPMENT CAN BE OPERATED IN COMPLIANCE WITH ALL RULES AND REGULATIONS OF THE AIR POLLUTION CONTROL DISTRICT.

PLEASE NOTIFY Mike Sewell AT (831) 647-9411 WHEN CONSTRUCTION OF EQUIPMENT IS COMPLETED.

IT IS THE APPLICANT'S RESPONSIBILITY TO COMPLY WITH ALL LAWS, ORDINANCES, AND REGULATIONS OF OTHER GOVERNMENTAL AGENCIES WHICH ARE APPLICABLE TO THE EQUIPMENT CONSTRUCTED.

THIS AUTHORITY TO CONSTRUCT WILL EXPIRE TWO YEARS FROM DATE SHOWN, OR EARLIER, IF ANY CHANGE OF OWNERSHIP, LOCATION, OR MODIFICATION OCCURS.

AIR POLLUTION CONTROL OFFICER

BY

DATE DEC 23 2008

3. No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which exceeds the following limits:

   a) dark or darker than Ringelmann 1, or equivalent 20 percent opacity within the facility property boundary; and,

   b) dark or darker than Ringelmann ¼, or equivalent 5 percent opacity beyond the facility property boundary.

4. No emissions shall constitute a public nuisance.

NOTE: Upon completion of installation and demonstration of compliance with applicable District Rules and Regulations, Permit to Operate 14006 will be issued.

****

MONTEREY BAY UNIFIED AIR POLLUTION CONTROL DISTRICT

AUTHORITY TO CONSTRUCT

24580 SILVER CLOUD CT., MONTEREY, CA 93940
TELEPHONE (831) 647-9411 • FAX (831) 647-8501

APPLICATION NUMBER

14024

AN **AUTHORITY TO CONSTRUCT** IS GRANTED AS OF DEC 23 2008

LEGAL OWNER OR OPERATOR: MOSS LANDING CEMENT COMPANY

EQUIPMENT LOCATED AT: 7697 Highway One (Hwy One & Dolan Road)
Moss Landing, California

EQUIPMENT DESCRIPTION AND CONDITIONS: THIS AUTHORITY TO CONSTRUCT IS ISSUED AND IS VALID FOR THIS EQUIPMENT ONLY WHILE IT IS IN THE CONFIGURATION SET FORTH IN THE FOLLOWING DESCRIPTION:

R & D SCALE CEMENT PRODUCTION:

1) Installation Of Tanks, Valves, And Piping To Produce Green Cement By Sequestering CO_2 Along With The Minerals Contained In Seawater.

2) CO_2 Provided For The Process From Any One Or Combination Of The Following:

   a. CO_2 Cylinders,
   b. Permit Exempt Internal Combustion Engines Of Less Than 50 Bhp.
   c. Coal Burning Fireplace.

THE EQUIPMENT FOR WHICH THIS AUTHORITY TO CONSTRUCT IS ISSUED MAY BE OPERATED ONLY WHEN IN COMPLIANCE WITH THE FOLLOWING CONDITIONS:

Conditions:

1. No later than twenty-four (24) hours prior to initial use of this equipment, Moss Landing Cement Company must notify the District and arrange for an inspection of the equipment

THIS AUTHORITY TO CONSTRUCT IS NOT A PERMIT TO OPERATE!

APPROVAL OR DENIAL OF THE APPLICATION FOR PERMIT TO OPERATE THE ABOVE EQUIPMENT WILL BE MADE AFTER AN INSPECTION TO DETERMINE IF THE EQUIPMENT HAS BEEN CONSTRUCTED IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS, AND IF THE EQUIPMENT CAN BE OPERATED IN COMPLIANCE WITH ALL RULES AND REGULATIONS OF THE AIR POLLUTION CONTROL DISTRICT.

PLEASE NOTIFY Mike Sewell AT (831) 647-9411 WHEN CONSTRUCTION OF EQUIPMENT IS COMPLETED.

IT IS THE APPLICANT'S RESPONSIBILITY TO COMPLY WITH ALL LAWS, ORDINANCES, AND REGULATIONS OF OTHER GOVERNMENTAL AGENCIES WHICH ARE APPLICABLE TO THE EQUIPMENT CONSTRUCTED.

THIS AUTHORITY TO CONSTRUCT WILL EXPIRE TWO YEARS FROM DATE SHOWN, OR EARLIER, IF ANY CHANGE OF OWNERSHIP, LOCATION, OR MODIFICATION OCCURS.

AIR POLLUTION CONTROL OFFICER

BY

DATE DEC 23 2008

during normal operations to verify compliance with District Rules and Regulations.

2. This operation shall consume no more than 500 pounds of coal per day.

3. Any fuel consumed shall contain no more than 0.5% by weight sulfur.

4. No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which exceeds the following limits:

   a) dark or darker than Ringelmann 1, or equivalent 20 percent opacity within the facility property boundary; and,
   b) dark or darker than Ringelmann ¼, or equivalent 5 percent opacity beyond the facility property boundary.

5. No emissions shall constitute a public nuisance.

NOTE: Upon completion of installation and demonstration of compliance with applicable District Rules and Regulations, Permit to Operate 14024 will be issued.

****

MONTEREY BAY
Unified Air Pollution Control District
serving Monterey, San Benito, and Santa Cruz counties

INTERIM AIR POLLUTION CONTROL OFFICER
Ed Kendig

24580 Silver Cloud Court • Monterey, California 93940 • 831/647-9411 • FAX 831/647-8501

FEB - 9 2009

Mr. Sam Bose
Director of Operations
Moss Landing Cement Company
P.O. Box 777
Moss Landing, CA 95039

SUBJECT: AUTHORITIES TO CONSTRUCT -
14006A - SPRAY DRYERS WITH DEDICATED VENTILATION
14024A - R & D SCALE CEMENT PRODUCTION

Dear Mr. Bose:

The District has completed the Moss Landing Cement Companies' request to modify the subject Authorities to Construct to allow:

- **Installation** of a second Spray Dryer
- **Combustion** of higher sulfur content fuel

Accordingly, I have enclosed Authorities to Construct 14006A and 14024A authorizing the installation and temporary operation of the subject equipment. Authorities to Construct 14006A and 14024A replace Authorities to Construct 14006 and 14024 issued to the Moss Landing Cement Company on December 23, 2008. **These Authorities to Construct must be posted or kept readily available at the operating premises.**

Please note the conditions which have been included on these Authorities to Construct. These conditions are necessary to insure that the equipment will operate in accordance with all applicable District Rules and Regulations.

Lastly, these Permits cannot be considered permission to violate applicable laws, ordinances, regulations, or statutes of other governmental agencies.

If you should have any questions, please feel free to contact me at the District office.

Sincerely,

Mike Sewell
Air Quality Engineer

enclosure: Authorities to Construct 14006A & 14024A

MONTEREY BAY UNIFIED AIR POLLUTION CONTROL DISTRICT

AUTHORITY TO CONSTRUCT

24580 SILVER CLOUD CT., MONTEREY, CA 93940
TELEPHONE (831) 647-9411 • FAX (831) 647-8501

APPLICATION NUMBER

14006A

AN **AUTHORITY TO CONSTRUCT** IS GRANTED AS OF Dec 23, 2008
and amended on FEB - 9 2009

LEGAL OWNER OR OPERATOR: MOSS LANDING CEMENT COMPANY

EQUIPMENT LOCATED AT: 7697 Highway One (Hwy One & Dolan Road)
Moss Landing, California

EQUIPMENT DESCRIPTION AND CONDITIONS: THIS AUTHORITY TO CONSTRUCT IS ISSUED AND IS VALID FOR THIS EQUIPMENT ONLY WHILE IT IS IN THE CONFIGURATION SET FORTH IN THE FOLLOWING DESCRIPTION:

SPRAY DRYERS WITH DEDICATED VENTILLATION SYSTEMS:

1) Installation Of Electrically Heated Spray Dryer With A Capacity Of 9 Kg Of Water Per Hour, With Dedicated Ventilation System.

2) Installation Of A NIRO 12.5N Spray Dryer With A Capacity Of 140 Kg Of Water Per Hour, LPG Fired With A Maximum Heat Input Of 750,000 BTU/Hr, With Fischer-Closteram SB-40-503-8 Dust Collector.

3) Installation Of 12" Micron-Master Jet Mill, With Torit TD-162 Dust Collector.

THE EQUIPMENT FOR WHICH THIS AUTHORITY TO CONSTRUCT IS ISSUED MAY BE OPERATED ONLY WHEN IN COMPLIANCE WITH THE FOLLOWING CONDITIONS:

Conditions:

1. No later than twenty-four (24) hours prior to initial use of this equipment, Moss Landing Cement Company must notify the

THIS AUTHORITY TO CONSTRUCT IS NOT A PERMIT TO OPERATE!

APPROVAL OR DENIAL OF THE APPLICATION FOR PERMIT TO OPERATE THE ABOVE EQUIPMENT WILL BE MADE AFTER AN INSPECTION TO DETERMINE IF THE EQUIPMENT HAS BEEN CONSTRUCTED IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS, AND IF THE EQUIPMENT CAN BE OPERATED IN COMPLIANCE WITH ALL RULES AND REGULATIONS OF THE AIR POLLUTION CONTROL DISTRICT.

PLEASE NOTIFY Mike Sewell AT (831) 647-9411 WHEN CONSTRUCTION OF EQUIPMENT IS COMPLETED.

IT IS THE APPLICANT'S RESPONSIBILITY TO COMPLY WITH ALL LAWS, ORDINANCES, AND REGULATIONS OF OTHER GOVERNMENTAL AGENCIES WHICH ARE APPLICABLE TO THE EQUIPMENT CONSTRUCTED.

THIS AUTHORITY TO CONSTRUCT WILL EXPIRE TWO YEARS FROM DATE SHOWN, OR EARLIER, IF ANY CHANGE OF OWNERSHIP, LOCATION, OR MODIFICATION OCCURS.

AIR POLLUTION CONTROL OFFICER

BY

DATE FEB - 9 2009

APCD 2 (REV. 8/07)

District and arrange for an inspection of the equipment during normal operations to verify compliance with District Rules and Regulations.

2. There shall be no visible emissions from the exhaust of the baghouse dust collectors.

3. No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which exceeds the following limits:

   a) dark or darker than Ringelmann 1, or equivalent 20 percent opacity within the facility property boundary; and,

   b) dark or darker than Ringelmann ¼, or equivalent 5 percent opacity beyond the facility property boundary.

4. No emissions shall constitute a public nuisance.

NOTE: Upon completion of installation and demonstration of compliance with applicable District Rules and Regulations, Permit to Operate 14006 will be issued.

****

MONTEREY BAY UNIFIED AIR POLLUTION CONTROL DISTRICT

AUTHORITY TO CONSTRUCT

24580 SILVER CLOUD CT., MONTEREY, CA 93940
TELEPHONE (831) 647-9411 • FAX (831) 647-8501

APPLICATION NUMBER

14024A

AN **AUTHORITY TO CONSTRUCT** IS GRANTED AS OF Dec 23, 2008
and amended on FEB - 9 2009

LEGAL OWNER OR OPERATOR: MOSS LANDING CEMENT COMPANY

EQUIPMENT LOCATED AT: 7697 Highway One (Hwy One & Dolan Road)
Moss Landing, California

EQUIPMENT DESCRIPTION AND CONDITIONS: THIS AUTHORITY TO CONSTRUCT IS ISSUED AND IS VALID FOR THIS EQUIPMENT ONLY WHILE IT IS IN THE CONFIGURATION SET FORTH IN THE FOLLOWING DESCRIPTION:

R & D SCALE CEMENT PRODUCTION:

1) Installation Of Tanks, Valves, And Piping To Produce Green Cement By Sequestering CO_2 Along With The Minerals Contained In Seawater.

2) CO_2 Provided For The Process From Any One Or Combination Of The Following:

   a. CO_2 Cylinders,
   b. Permit Exempt Internal Combustion Engines Of Less Than 50 Bhp.
   c. Coal Burning Fireplace.

THE EQUIPMENT FOR WHICH THIS AUTHORITY TO CONSTRUCT IS ISSUED MAY BE OPERATED ONLY WHEN IN COMPLIANCE WITH THE FOLLOWING CONDITIONS:

Conditions:

1. No later than twenty-four (24) hours prior to initial use of this equipment, Moss Landing Cement Company must notify the District and arrange for an inspection of the equipment

THIS AUTHORITY TO CONSTRUCT IS NOT A PERMIT TO OPERATE!

APPROVAL OR DENIAL OF THE APPLICATION FOR PERMIT TO OPERATE THE ABOVE EQUIPMENT WILL BE MADE AFTER AN INSPECTION TO DETERMINE IF THE EQUIPMENT HAS BEEN CONSTRUCTED IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS, AND IF THE EQUIPMENT CAN BE OPERATED IN COMPLIANCE WITH ALL RULES AND REGULATIONS OF THE AIR POLLUTION CONTROL DISTRICT.

PLEASE NOTIFY Mike Sewell AT (831) 647-9411 WHEN CONSTRUCTION OF EQUIPMENT IS COMPLETED.

IT IS THE APPLICANT'S RESPONSIBILITY TO COMPLY WITH ALL LAWS, ORDINANCES, AND REGULATIONS OF OTHER GOVERNMENTAL AGENCIES WHICH ARE APPLICABLE TO THE EQUIPMENT CONSTRUCTED.

THIS AUTHORITY TO CONSTRUCT WILL EXPIRE TWO YEARS FROM DATE SHOWN, OR EARLIER, IF ANY CHANGE OF OWNERSHIP, LOCATION, OR MODIFICATION OCCURS.

AIR POLLUTION CONTROL OFFICER

BY James E. Lee for

DATE FEB - 9 2009

during normal operations to verify compliance with District Rules and Regulations.

2. This operation shall consume no more than 500 pounds of coal per day.

3. Sulfur Dioxide emissions shall not exceed 0.526 lbs/10^6 Btu heat input.

4. No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which exceeds the following limits:

   a) dark or darker than Ringelmann 1, or equivalent 20 percent opacity within the facility property boundary; and,
   b) dark or darker than Ringelmann ¼, or equivalent 5 percent opacity beyond the facility property boundary.

5. No emissions shall constitute a public nuisance.

NOTE: Upon completion of installation and demonstration of compliance with applicable District Rules and Regulations, Permit to Operate 14024 will be issued.

****

MONTEREY BAY
Unified Air Pollution Control District
serving Monterey, San Benito, and Santa Cruz counties

Air Pollution Control Officer
Richard A. Stedman

24580 Silver Cloud Court • Monterey, California 93940 • 831/647-9411 • FAX 831/647-8501

SEP 22 2009

Ms. Betty Pun
Environmental Manager
Moss Landing Cement Company
14600 Winchester Blvd.
Los Gatos, CA 95032

SUBJECT: AUTHORITY TO CONSTRUCT -
14417 - INSTALLATION OF CUSTOM CO_2 ABSORBER

Dear Ms. Pun:

The District has completed its evaluation of your application for the following equipment:

- **New** Custom CO_2 Absorber

Accordingly, I have enclosed Authority to Construct (ATC) 14417 authorizing the installation and temporary operation of the subject equipment. **This Authority to Construct must be posted or kept readily available at the operating premises.**

Please note the conditions which have been included on this Authority to Construct. These conditions are necessary to insure that the equipment will operate in accordance with all applicable District Rules and Regulations. Particular attention should be paid to Condition 1 that requires the District to be notified at least 24 hours prior to the initial start-up of the equipment.

Lastly, this Permit cannot be considered permission to violate applicable laws, ordinances, regulations, or statutes of other governmental agencies.

If you should have any questions, please feel free to contact me at the District office.

Sincerely,

Mike Sewell
Air Quality Engineer

enclosure: Authority to Construct 14417

MONTEREY BAY UNIFIED AIR POLLUTION CONTROL DISTRICT

AUTHORITY TO CONSTRUCT

24580 SILVER CLOUD CT., MONTEREY, CA 93940
TELEPHONE (831) 647-9411 • FAX (831) 647-8501

APPLICATION NUMBER

14417

AN **AUTHORITY TO CONSTRUCT** IS GRANTED AS OF SEP 22 2009

LEGAL OWNER OR OPERATOR: MOSS LANDING CEMENT COMPANY

EQUIPMENT LOCATED AT: Moss Landing Cement Company Or Moss Landing Power Plant
Hwy One & Dolan Road
Moss Landing, California

EQUIPMENT DESCRIPTION AND CONDITIONS: THIS AUTHORITY TO CONSTRUCT IS ISSUED AND IS VALID FOR THIS EQUIPMENT ONLY WHILE IT IS IN THE CONFIGURATION SET FORTH IN THE FOLLOWING DESCRIPTION:

CUSTOM CO2 ABSORBER:

Installation Of Custom CO2 Absorber, Designed For A Nominal Flue Gas Flow Rate Of 100,000 SCFM.

THE EQUIPMENT FOR WHICH THIS AUTHORITY TO CONSTRUCT IS ISSUED MAY BE OPERATED ONLY WHEN IN COMPLIANCE WITH THE FOLLOWING CONDITIONS:

Conditions:

1. No later than twenty-four (24) hours prior to initial use of this equipment, Moss Landing Cement Company must notify the District and arrange for an inspection of the equipment during normal operations to verify compliance with District Rules and Regulations.

2. No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which exceeds the following limits:

THIS AUTHORITY TO CONSTRUCT IS NOT A PERMIT TO OPERATE!

APPROVAL OR DENIAL OF THE APPLICATION FOR PERMIT TO OPERATE THE ABOVE EQUIPMENT WILL BE MADE AFTER AN INSPECTION TO DETERMINE IF THE EQUIPMENT HAS BEEN CONSTRUCTED IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS, AND IF THE EQUIPMENT CAN BE OPERATED IN COMPLIANCE WITH ALL RULES AND REGULATIONS OF THE AIR POLLUTION CONTROL DISTRICT.

PLEASE NOTIFY Mike Sewell AT (831) 647-9411 WHEN CONSTRUCTION OF EQUIPMENT IS COMPLETED.

IT IS THE APPLICANT'S RESPONSIBILITY TO COMPLY WITH ALL LAWS, ORDINANCES, AND REGULATIONS OF OTHER GOVERNMENTAL AGENCIES WHICH ARE APPLICABLE TO THE EQUIPMENT CONSTRUCTED.

THIS AUTHORITY TO CONSTRUCT WILL EXPIRE TWO YEARS FROM DATE SHOWN, OR EARLIER, IF ANY CHANGE OF OWNERSHIP, LOCATION, OR MODIFICATION OCCURS.

AIR POLLUTION CONTROL OFFICER

BY

DATE SEP 22 2009

a) dark or darker than Ringelmann 1, or equivalent 20 percent opacity within the facility property boundary; and,

b) dark or darker than Ringelmann ¼, or equivalent 5 percent opacity beyond the facility property boundary.

3. No emissions shall constitute a public nuisance.

NOTE: Upon completion of installation and demonstration of compliance with applicable District Rules and Regulations, Permit to Operate 14417 will be issued.

****

California Regional Water Quality Control Board
Central Coast Region

Linda Adams
Secretary for Environmental Protection

895 Aerovista Place, Suite 101, San Luis Obispo, California 93401-7906
Phone (805) 549-3147 • FAX (805) 543-0397
http://www.waterboards.ca.gov/centralcoast

Arnold Schwarzenegger
Governor

March 27, 2009

Sam Bose
Moss Landing Cement Company, LLC
P.O. Box 777
Moss Landing, CA 95039

Dear Mr. Bose:

ADOPTED WASTE DISCHARGE REQUIREMENTS ORDER NO. R3-2009-0002, NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT NO. CA0007005 – MOSS LANDING COMMERCIAL PARK AND MOSS LANDING CEMENT COMPANY, MOSS LANDING CEMENT COMPANY FACILITY, MONTEREY COUNTY

Enclosed is Waste Discharge Requirements Order No. R3-2009-0002 (National Pollutant Discharge Elimination System Permit No. CA0007005) for the Moss Landing Cement Company Facility. Order No. R3-2009-0002 was adopted by the Regional Water Quality Control Board at its March 19, 2009 meeting, and is effective May 9, 2009. Please note, as discussed during the Water Board meeting, the Monitoring and Reporting Program has been revised from the original draft permit and requires that you also submit data and reports to the California Coastal Commission.

If you have questions, please contact **Peter von Langen at (805) 549-3688** or Burton Chadwick at (805) 542-4786.

Sincerely,

Susan H McCann

for Roger W. Briggs
Executive Officer

Enclosure: 1. Waste Discharge Requirements Order No. R3-2009-0002

cc: via email

Jae Kim, Tetra Tech (jae.kim@tetratech-ffx.com)

Douglas E. Eberhardt, EPA Region 9 (eberhardt.doug@epa.gov)

Phil S. Isorena, SWRCB – NPDES Unit (pisorena@waterboards.ca.gov)

Dierdre Hall, MBNMS (deirdre.hall@noaa.gov)

Tom Luster, California Coastal Commission (tluster@coastal.ca.gov)

Filename and Path: S:\NPDES\NPDES Facilities\Monterey Co\National Refractory, Moss Landing\Order No. 09-0002\Adopted order\Adopted order transmittal-Moss Landing Cement Plant.doc

California Regional Water Quality Control Board

Central Coast Region

895 Aerovista Place, Suite 101, San Luis Obispo, California 93401
Phone (805) 549-3147 • Fax (805) 543-0397
http://www.waterboards.ca.gov/centralcoast/

Linda S. Adams
Agency Secretary

Arnold Schwarzenegger
Governor

ORDER NO. R3-2009-0002
NPDES NO. CA0007005

WASTE DISCHARGE REQUIREMENTS FOR THE MOSS LANDING COMMERCIAL PARK AND MOSS LANDING CEMENT COMPANY MOSS LANDING CEMENT COMPANY FACILITY

Table 1. Discharger Information

Discharger	Moss Landing Commercial Park, LLC and Moss Landing Cement Company, LLC
Name of Facility	Moss Landing Cement Plant
Facility Address	7697 Highway 1
	Moss Landing, CA 95039
	Monterey County
The U.S. Environmental Protection Agency (USEPA) and the Regional Water Quality Control Board have classified this discharge as a major discharge.	

Discharges by the Moss Landing Cement Plant from the discharge point identified below are subject to waste discharge requirements as set forth in this Order.

Table 2. Discharge Location

Discharge Point	Effluent Description	Discharge Point Latitude	Discharge Point Longitude	Receiving Water
001	Calcium and Magnesium Depleted Seawater	36°, 48' 08" N	121°, 47' 29" W	Monterey Bay

Table 3. Administrative Information

This Order was adopted by the Regional Water Quality Control Board on:	**March 19, 2009**
This Order shall become effective on:	**May 9, 2009**
This Order shall expire on:	**May 9, 2014**
The Discharger shall file a Report of Waste Discharge in accordance with title 23, California Code of Regulations, as application for issuance of waste discharge requirements no later than:	**November 10, 2013**

IT IS HEREBY ORDERED, that in order to meet the provisions contained in division 7 of the California Water Code (commencing with section 13000) and regulations adopted thereunder, and the provisions of the federal Clean Water Act (CWA) and regulations and guidelines adopted thereunder, the Discharger shall comply with the requirements in this Order.

I, Roger W. Briggs Executive Officer, do hereby certify that this Order, with all attachments, is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Coastal Region, on **March 19, 2009**.

for Lisa A McCann
Roger W. Briggs, Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
REGION 3, CENTRAL COAST REGION

TABLE OF CONTENTS

LIST OF TABLES

I. FACILITY INFORMATION

The following Discharger is authorized to discharge in accordance with the conditions set forth in this Order.

Table 4. Facility Information

Discharger	Moss Landing Commercial Park, LLC (7695 Hwy 1, Moss Landing, CA 95039) and Moss Landing Cement Company, LLC (7697 Hwy 1, Moss Landing, CA 95039)
Name of Facility	Moss Landing Cement Plant
Facility Address	7697 Highway 1
	Moss Landing, CA 95039
	Monterey County
Facility Contact, Title, and Phone	Sam Bose, Director of Operations (408) 340-4600
Mailing Address	PO Box 777 Moss Landing, CA 95039
Type of Facility	Industrial
Facility Design Flow	Phase 1 = 0.04 million gallons per day (mgd)(daily average), 0.05 mgd (daily maximum) Phase 2 = 24 mgd (daily average), 25 mgd (daily maximum) Phase 3 = 56 mgd (daily average), 60 mgd (daily maximum)

II. FINDINGS

The California Regional Water Quality Control Board, Central Coast Region (hereinafter the Regional Water Board), finds:

A. Background. The Moss Landing Cement Company, LLC is the operator of the Moss Landing Cement Plant, which is located at 7697 Highway 1, Moss Landing on land owned by the Moss Landing Commercial Park, LLC. Together, the Moss Landing Commercial Park, LLC and the Moss Landing Cement Company, LLC are hereinafter referred to as the Discharger. The Discharger is currently authorized to discharge pursuant to Order No. R3-2001-030 and National Pollutant Discharge Elimination System (NPDES) Permit No. CA-0007005. The Discharger submitted a Report of Waste Discharge, dated May 9, 2008, and applied to renew its NPDES permit to discharge up to 60 mgd, in three phases of development, of calcium and magnesium depleted seawater from the former National Refractories and Minerals Corporation Seawater Magnesia Plant.

For the purposes of this Order, references to the "discharger" or "permittee" in applicable federal and State laws, regulations, plans, or policy are held to be equivalent to references to the Discharger herein.

B. Facility Description. Seawater is pumped from Moss Landing Harbor by up to nine 100 horsepower pumps through two intake lines to the facility. Seawater, which contains calcium and magnesium chloride ($CaCl_2$ and $MgCl_2$), is combined with dolime, lime, brucite (magnesium hydroxide tailings from historical operations of the National Refractories and Minerals Corporation), sodium hydroxide, sodium carbonate, fly ash, and/or calcium and magnesium bearing silicate materials such as olivine and serpentine. The Discharger's precipitation process also utilizes carbon dioxide (CO_2), sparged from flue gases of the neighboring Moss Landing Power Plant. Following precipitating reactions, the seawater mixture will be directed to as many as seven 3-million gallon (capacity) tanks where settling of precipitated solids will occur. Settled material is then dried to be sold to the construction industry as green cement or as a cement supplement. Calcium and magnesium depleted seawater, decanted from the thickening tanks, will be discharged back to Monterey Bay, within the Monterey Bay National Marine Sanctuary, through Discharge Point 001. See section II. A of the Fact Sheet (Attachment F) for a more complete description of this facility.

C. Legal Authorities. This Order is issued pursuant to CWA section 402 and implementing regulations adopted by the USEPA, and Chapter 5.5, Division 7 of the California Water Code (the Water Code). It shall serve as an NPDES permit for point source discharges from this facility to surface waters; and it shall serve as Waste Discharge Requirements (WDRs) pursuant to Article 4, Chapter 4, Division 7 of the Water Code (commencing with section 13260).

D. Background and Rationale for Requirements. The Regional Water Board developed the requirements in this Order based on information submitted as part of the application, through monitoring and reporting programs, and through special studies. Attachments A through F, which contain background information and rationale for the requirements of the

Order, are hereby incorporated into this Order and therefore constitute part of the Findings for this Order.

E. California Environmental Quality Act (CEQA). Pursuant to California Water Code section 13389, this action to adopt an NPDES permit is exempt from the provisions of CEQA, Public Resources Code sections 21100-21177.

F. Technology-Based Effluent Limitations. CWA section 301 (b) and USEPA implementing regulations at 40 CFR 122.44 require that permits include conditions meeting applicable technology-based requirements at a minimum, and any more stringent effluent limitations necessary to meet minimum water quality standards. The discharge authorized by this Order must meet applicable federal technology-based requirements based on Effluent Limitations Guidelines (ELGs) and Standards for industrial categories listed in 40 CFR Parts 402 through 699, and based on best professional judgment (BPJ) in accordance with 40 CFR 125.3. A detailed discussion of development of technology-based effluent limitations is included in the Fact Sheet (Attachment F).

G. Water Quality-Based Effluent Limitations. CWA 301 (b) and NPDES regulations at 40 CFR 122.44 (d) require that permits include limitations more stringent than applicable federal technology-based requirements where necessary to achieve applicable water quality standards.

NPDES regulations at 40 CFR Section 122.44 (d) (1) (i) mandate that permits include effluent limitations for all pollutants that are or may be discharged at levels that have the reasonable potential to cause or contribute to an exceedance of a water quality standard, including numeric and narrative objectives within a standard. Where reasonable potential has been established for a pollutant, but there is no numeric criterion or objective for the pollutant, water quality-based effluent limitations (WQBELs) must be established using: (1) USEPA criteria guidance under CWA section 304 (a), supplemented where necessary by other relevant information; (2) an indicator parameter for the pollutant of concern; or (3) a calculated numeric water quality criterion, such as a proposed State criterion or policy interpreting the State's narrative criterion, supplemented with other relevant information, pursuant to NPDES regulations at 40 CFR 122.44 (d) (1) (vi).

H. Water Quality Control Plans. The Regional Water Board has adopted a Water Quality Control Plan for the Central Coast Region (the Basin Plan) that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for the Pacific Ocean. In addition, the Basin Plan implements State Water Board Resolution No. 88-63, which establishes State policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply (MUN). Because of very high levels of total dissolved solids (TDS) in marine waters, the receiving water for this discharge meets an exception to Resolution No. 88-63, which precludes waters with TDS levels greater than 3,000 mg/L from the MUN designation.

Table 5 presents the beneficial uses established by the Basin Plan for the coastal waters between Soquel Point and the Salinas River.

Table 5. Receiving Water Beneficial Uses Established by the Basin Plan

Discharge Point	Receiving Water	Beneficial Uses
001	Pacific Ocean between Soquel Point and the Salinas River	• Water Contact (REC-1) and Non-Contact Recreation (REC-2) • Industrial Service Supply (IND) • Navigation (NAV) • Shellfish Harvesting (SHELL) • Commercial and Sport Fishing (COMM) • Marine Habitat (MAR) • Rare, Threatened, or Endangered Species (RARE) • Wildlife Habitat (WILD)

I. California Ocean Plan. The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005, and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the Pacific Ocean. The Ocean Plan identifies the following beneficial uses of ocean waters of the State.

Table 6. Receiving Water Beneficial Uses Established by the Ocean Plan

Discharge Point	Receiving Water	Beneficial Uses
001	Pacific Ocean	• Industrial Water Supply • Water Contact and Non-Contact Recreation, including Aesthetic Enjoyment • Navigation • Commercial and Sport Fishing • Rare and Endangered Species • Marine Habitat • Mariculture • Fish Migration • Fish Spawning and Shellfish Harvesting • Preservation of Designated Areas of Special Biological Significance

In order to protect the beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Requirements of this Order implement the Ocean Plan.

J. Alaska Rule. On March 30, 2000, USEPA revised its regulation that specifies when new and revised state and tribal water quality standards (WQS) become effective for CWA purposes. [65 Fed. Reg. 24641 (April 27, 2000), codified at 40 CFR 131.21] Under the revised regulation (also known as the Alaska Rule), new and revised standards submitted to USEPA after May 30, 2000 must be approved by USEPA before being used for CWA purposes. The final rule also provides that standards already in effect and submitted to USEPA by May 30, 2000, may be used for CWA purposes, whether or not approved by USEPA.

K. Stringency of Requirements for Individual Pollutants. This Order contains both technology-based and water quality-based effluent limitations (WQBELs) for individual pollutants. As discussed in section IV.B. of the Fact Sheet, the Order establishes

technology-based effluent limitations for total suspended solids (TSS), settleable solids, oil and grease, turbidity, and pH for Discharge Point 001. These technology-based limitations implement the minimum, applicable federal technology-based requirements. The Order also contains effluent limitations in addition to the minimum federal technology-based requirements, necessary to meet applicable water quality standards. These limitations are not more stringent than required by the CWA.

WQBELs have been scientifically derived to implement water quality objectives that protect beneficial uses. Both the beneficial uses and the water quality objectives have been approved pursuant to federal law and are the applicable federal water quality standards. For Discharge Point 001, procedures for calculating individual WQBELs are based on the Ocean Plan, which was approved by USEPA on February 14, 2006. All beneficial uses and water quality objectives contained in the Ocean Plan were approved under state law and submitted to and approved by USEPA prior to May 30, 2000. Any water quality objectives and beneficial uses submitted to USEPA prior to May 30, 2000, but not approved by USEPA before that date, are nonetheless "applicable water quality standards for purposes of the CWA" pursuant to NPDES regulations at 40 CFR 131.21 (c) (1).

Collectively, this Order's restrictions on individual pollutants are no more stringent than required to implement the requirements of the CWA.

L. Antidegradation Policy. NPDES regulations at 40 CFR 131.12 require that State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16, which incorporates the requirements of the federal antidegradation policy. Resolution No. 68-16 requires that existing water quality be maintained unless degradation is justified based on specific findings. As discussed in detail in the Fact Sheet, the permitted discharge is consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16.

M. Anti-Backsliding Requirements. CWA sections 402 (o) (2) and 303 (d) (4) and NPDES regulations at 40 CFR 122.44 (l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require that effluent limitations in a reissued permit be as stringent as those in the previous permit, with some exceptions in which limitations may be relaxed. The requirements of this Order are consistent with the anti-backsliding provisions of the Clean Water Act and with applicable NPDES regulations that pertain to backsliding.

N. Endangered Species Act. This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 - 2097) or the federal Endangered Species Act (16 U.S.C.A. sections 1531 - 1544). This Order requires compliance with effluent limits, receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Discharger is responsible for meeting all requirements of the State and federal acts pertaining to endangered species.

O. Monitoring and Reporting. NPDES regulations at 40 CFR 122.48 require that all NPDES permits specify requirements for recording and reporting of monitoring results. California Water Code sections 13267 and 13383 authorize the Regional Water Boards to require technical and monitoring reports. The Monitoring and Reporting Plan (MRP), which is provided as Attachment E of this Order, establishes monitoring and reporting requirements to implement federal and State requirements.

P. Standard and Special Provisions. Standard Provisions, which apply to all NPDES discharges pursuant to NPDES regulations at 40 CFR 122.41 - 122.42, and which must be included in every NPDES permit, are provided in Attachment D. The Regional Water Board has also included in this Order special provisions applicable to the Discharger. A rationale for the special provisions contained in this Order is provided in the attached Fact Sheet (Attachment F).

Q. Provisions and Requirements Implementing State Law. The provisions and requirements in subsections IV. B, IV. C, and V. B of this Order are included to implement State law only. These provisions and requirements are not required or authorized under the federal CWA; consequently, violations of these provisions and requirements are not subject to the enforcement remedies that are available for NPDES violations.

R. Consideration of Public Comment. The Regional Water Board, in a public meeting, heard and considered all comments pertaining to the discharge. Details of the public hearing are provided in the Fact Sheet of this Order.

III. DISCHARGE PROHIBITIONS

A. Discharge of wastewater to the Pacific Ocean (Monterey Bay) at a location other than as described by this Order at 36º, 48', 08" N. Latitude, 121º, 47', 29" W. Longitude is prohibited.

B. Discharge of any waste or discharges in any manner other than as described by this Order is prohibited.

C. Discharges to Monterey Bay and within the Monterey Bay National Marine Sanctuary, which are authorized by this Order, shall not exceed the following daily discharge rates during each operational phase, as those operational phases are described by this Order.

Operational Phase	Daily Average Discharge (mgd)	Maximum Daily Discharge (mgd)
1	0.04	0.05
2	24	25
3	56	60

D. The discharge of any radiological, chemical, or biological warfare agent or high level radioactive waste to the Pacific Ocean and within the Monterey Bay National Marine Sanctuary is prohibited.

E. Federal law prohibits the discharge of sludge by pipeline to the Pacific Ocean and within the Monterey Bay National Marine Sanctuary. The discharge of municipal or industrial

waste sludge or other material with high solids content directly to the Ocean or into a waste stream that discharges to the Ocean is prohibited.

F. "Overflow" or "Bypass" of any wastewater other than spent ocean water is prohibited.

G. The discharge of domestic wastewater at Discharge Point 001 is prohibited.

H. The discharge of storm water at Discharge Point 001, pursuant to the limitations and conditions of this Order, is prohibited.

I. The discharge of chemical additives not described herein, including, but not limited to, scale inhibitors, chelants, cleaning compounds, and any organic chemicals (except carbon dioxide and carbonate ion) is prohibited.

J. The discharge of wastewater containing added coloration is prohibited.

K. Wastewater discharged pursuant to this Order shall not be discharged to receiving water at a temperature that adversely affects beneficial uses.

IV. EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

A. Effluent Limitations – Discharge Point No. 001

1. Final Effluent Limitations – Discharge Point No. 001

a. The Discharger shall maintain compliance with the following effluent limitations at Discharge Point 001 at all times, with compliance measured at Monitoring Location EFF-001 as described in the attached MRP (Attachment E).

Table 7. Effluent Limitations for Conventional Pollutants

Parameter	Units	Monthly 30-Day Average	Weekly 7-Day Average	Instantaneous Maximum
Oil and Grease	mg/L	25	40	75
Settleable Solids	mL/L	1.0	1.5	3.0
TSS	mg/L	60 [1]	---	---
Turbidity	NTU	75	100	225
pH	s.u.	Within 6.0 to 9.0 at all times		

[1] Discharger shall, as a 30-day average, remove 75% of suspended solids from the influent stream before discharging wastewaters to the ocean, except that the effluent limitation to be met shall not be lower then 60 mg/L.

b. The Discharger shall maintain compliance with the following effluent limitations for toxic pollutants at Discharge Point 001, with compliance measured at Monitoring Location EFF-001 as described in the attached MRP (Attachment E).

Table 8. Protection of Marine Aquatic Life

Parameter	Units	6-Month Median [5]	Daily Maximum [6]	Instantaneous Maximum [7]
Arsenic	µg/L	173	989	2621

Phase 1	lb/day	0.072	0.41	1.1
Phase 2	lb/day	36	206	546
Phase 3	lb/day	87	495	1312
Cadmium	µg/L	34	136	340
Phase 1	lb/day	0.014	0.057	0.14
Phase 2	lb/day	7.1	28	71
Phase 3	lb/day	17	68	170
Chromium(Hex) [1]	µg/L	68	272	680
Phase 1	lb/day	0.028	0.11	0.28
Phase 2	lb/day	14	57	142
Phase 3	lb/day	34	136	340
Copper	µg/L	36	342	954
Phase 1	lb/day	0.015	0.14	0.4
Phase 2	lb/day	7.5	71	199
Phase 3	lb/day	18	171	477
Lead	µg/L	68	272	680
Phase 1	lb/day	0.028	0.11	0.28
Phase 2	lb/day	14	57	142
Phase 3	lb/day	34	136	340
Mercury	µg/L	1.3	5.4	14
Phase 1	lb/day	0.00056	0.0023	0.0057
Phase 2	lb/day	0.28	1.1	2.8
Phase 3	lb/day	0.67	2.7	6.8
Nickel	µg/L	170	680	1700
Phase 1	lb/day	0.071	0.28	0.71
Phase 2	lb/day	35	142	354
Phase 3	lb/day	85	340	851
Selenium	µg/L	510	2040	5100
Phase 1	lb/day	0.21	0.85	2.1
Phase 2	lb/day	106	425	1063
Phase 3	lb/day	255	1021	2552
Silver	µg/L	19	90	233
Phase 1	lb/day	0.0077	0.037	0.1
Phase 2	lb/day	3.9	19	49
Phase 3	lb/day	9.3	45	116
Zinc	µg/L	416	2456	6536
Phase 1	lb/day	0.17	1.0	2.7
Phase 2	lb/day	87	512	1363
Phase 3	lb/day	208	1229	3271
Cyanide [2]	µg/L	34	136	340
Phase 1	lb/day	0.014	0.057	0.14
Phase 2	lb/day	7.1	28	71
Phase 3	lb/day	17	68	170
Total Chlorine Residual [3]	µg/L	68	272	2040
Phase 1	lb/day	0.028	0.11	0.85
Phase 2	lb/day	14	57	425
Phase 3	lb/day	34	136	1021

Ammonia(as N)	µg/L	20400	81600	204000
Phase 1	lb/day	8.5	34	85
Phase 2	lb/day	4253	17014	42534
Phase 3	lb/day	10208	40833	102082
Chronic Toxicity [4], [8]	TUc	-------	34	-------
Phenolic Compounds (non-chlorinated)	µg/L	1020	4080	10200
Phase 1	lb/day	0.43	1.7	4.3
Phase 2	lb/day	213	851	2127
Phase 3	lb/day	510	2042	5104
Chlorinated Phenolics	µg/L	34	136	340
Phase 1	lb/day	0.014	0.057	0.14
Phase 2	lb/day	7.1	28	71
Phase 3	lb/day	17	68	170
Endosulfan	µg/L	0.31	0.61	0.92
Phase 1	lb/day	0.00013	0.00026	0.00038
Phase 2	lb/day	0.064	0.13	0.19
Phase 3	lb/day	0.15	0.31	0.46
Endrin	µg/L	0.068	0.14	0.2
Phase 1	lb/day	0.000028	0.000057	0.000085
Phase 2	lb/day	0.014	0.028	0.043
Phase 3	lb/day	0.034	0.068	0.1
HCH [9]	µg/L	0.14	0.27	0.41
Phase 1	lb/day	0.000057	0.00011	0.00017
Phase 2	lb/day	0.028	0.057	0.085
Phase 3	lb/day	0.068	0.14	0.2
Radioactivity	Not to exceed limits specified in Title 17, Division 5, Chapter 4, Group 3, Article 3, Section 32069 of the California Code of Regulations.			

[1] Discharger may, at its option, meet this limitation as a total chromium limitation.

[2] If the Discharger can demonstrate to the satisfaction of the Regional Water Board (subject to USEPA approval) that an analytical method is available to reliably distinguish between strongly and weakly complexed cyanide, effluent limitations for cyanide may be met by the combined measurement of free cyanide, simple alkali metal cyanides, and weakly complexed organometallic cyanide complexes. In order for the analytical method to be acceptable, the recovery of free cyanide from metal complexes must be comparable to that achieved by the approved method in 40 CFR PART 136, as revised May 14, 1999.

[3] Water quality objectives for total chlorine residual applying to intermittent discharges not exceeding two hours shall be determined using the following equation:

logy=-0.43(logx)+1.8 where: y = the water quality objective (in µg/L) to apply when chlorine is being discharged; and

x = the duration of uninterrupted chlorine discharge in minutes.

The applicable effluent limitation must then be determined using Equation No. 1 from the Ocean Plan.

[4] The Discharger shall conduct chronic toxicity testing if the minimum initial dilution of the effluent falls below 100:1 at the edge of the mixing zone. As the minimum initial dilution for the Moss Landing Cement Company Ocean Outfall is currently calculated as 33:1, chronic toxicity testing is required at this time.

[5] The six-month median shall apply as a moving median of daily values for any 180-day period in which daily values represent flow weighted average concentrations within a 24-hour period. For intermittent discharges, the daily value shall be considered to equal zero for days on which no discharge occurred. The six-month median limit on daily mass emissions shall be determined using the six-month median effluent concentration

as Ce and the observed flow rate Q in millions of gallons per day (each variable referring to Equation 3 of the Ocean Plan).

[6] The daily maximum shall apply to flow weighted 24-hour composite samples. The daily maximum mass emission shall be determined using the daily maximum effluent concentration limit as Ce and the observed flow rate Q in millions of gallons per day (each variable referring to Equation 3 of the Ocean Plan).

[7] The instantaneous maximum shall apply to grab sample determinations.

[8] This parameter shall be used to measure the acceptability of waters for supporting a healthy marine biota until improved methods are developed to evaluate biological response.

Chronic Toxicity - Expressed as Toxic Units Chronic (TUc)

$$TUc = \frac{100}{NOEL}$$

No Observed Effect Level (NOEL) - The NOEL is expressed as the maximum percent effluent or receiving water that causes no observable effect on a test organism, as determined by the result of a critical life stage toxicity test listed in Appendix II.

[9] See Definitions (Attachment A)

Table 9. Protection of Human Health - Non-Carcinogens

Parameter	Units	30-Day Average
Acrolein	µg/L	7480
Phase 1	lb/day	3.1
Phase 2	lb/day	1560
Phase 3	lb/day	3743
Antimony	µg/L	40800
Phase 1	lb/day	17
Phase 2	lb/day	8507
Phase 3	lb/day	20416
Bis(2-Chloroethoxy)Methane	µg/L	150
Phase 1	lb/day	0.062
Phase 2	lb/day	31
Phase 3	lb/day	75
Bis(2-Chloroisopropyl)Ether	µg/L	40800
Phase 1	lb/day	17
Phase 2	lb/day	8507
Phase 3	lb/day	20416
Chlorobenzene	µg/L	19380
Phase 1	lb/day	8.1
Phase 2	lb/day	4041
Phase 3	lb/day	9698
Chromium (III)	µg/L	6460000
Phase 1	lb/day	2694
Phase 2	lb/day	1346910
Phase 3	lb/day	3232584
Di-n-Butyl Phthalate	µg/L	119000
Phase 1	lb/day	50
Phase 2	lb/day	24812
Phase 3	lb/day	59548
Dichlorobenzenes [1]	µg/L	173400
Phase 1	lb/day	72
Phase 2	lb/day	36154

Phase 3	lb/day	86769
Diethyl Phthalate	µg/L	1122000
Phase 1	lb/day	468
Phase 2	lb/day	233937
Phase 3	lb/day	561449
Dimethyl Phthalate	µg/L	27880000
Phase 1	lb/day	11626
Phase 2	lb/day	5812980
Phase 3	lb/day	13951152
2-Methyl-4,6-Dinitrophenol	µg/L	7480
Phase 1	lb/day	3.1
Phase 2	lb/day	1560
Phase 3	lb/day	3743
2,4-Dinitrophenol	µg/L	136
Phase 1	lb/day	0.057
Phase 2	lb/day	28
Phase 3	lb/day	68
Ethylbenzene	µg/L	139400
Phase 1	lb/day	58
Phase 2	lb/day	29065
Phase 3	lb/day	69756
Fluoranthene	µg/L	510
Phase 1	lb/day	0.21
Phase 2	lb/day	106
Phase 3	lb/day	255
Hexachlorocyclopentadiene	µg/L	1972
Phase 1	lb/day	0.82
Phase 2	lb/day	411
Phase 3	lb/day	987
Nitrobenzene	µg/L	167
Phase 1	lb/day	0.069
Phase 2	lb/day	35
Phase 3	lb/day	83
Thallium	µg/L	68
Phase 1	lb/day	0.028
Phase 2	lb/day	14
Phase 3	lb/day	34
Toluene	µg/L	2890000
Phase 1	lb/day	1205
Phase 2	lb/day	602565
Phase 3	lb/day	1446156
Tributyltin	µg/L	0.048
Phase 1	lb/day	0.00002
Phase 2	lb/day	0.0099
Phase 3	lb/day	0.024
1,1,1-Trichloroethane	µg/L	18360000
Phase 1	lb/day	7656
Phase 2	lb/day	3828060

Phase 3	lb/day	9187344

Table 10. Protection of Human Health – Carcinogens

Parameter	Units	30-Day Average
Acrylonitrile	µg/L	3.4
Phase 1	lb/day	0.0014
Phase 2	lb/day	0.71
Phase 3	lb/day	1.7
Aldrin	µg/L	0.00075
Phase 1	lb/day	0.00000031
Phase 2	lb/day	0.00016
Phase 3	lb/day	0.00037
Benzene	µg/L	201
Phase 1	lb/day	0.084
Phase 2	lb/day	42
Phase 3	lb/day	100
Benzidine	µg/L	0.0023
Phase 1	lb/day	0.00000098
Phase 2	lb/day	0.00049
Phase 3	lb/day	0.0012
Beryllium	µg/L	1.1
Phase 1	lb/day	0.00047
Phase 2	lb/day	0.23
Phase 3	lb/day	0.56
Bis(2-Chloroethyl)Ether	µg/L	1.5
Phase 1	lb/day	0.00064
Phase 2	lb/day	0.32
Phase 3	lb/day	0.77
Bis(2-Ethylhexyl)Phthalate	µg/L	119
Phase 1	lb/day	0.05
Phase 2	lb/day	25
Phase 3	lb/day	60
Carbon Tetrachloride	µg/L	31
Phase 1	lb/day	0.013
Phase 2	lb/day	6.4
Phase 3	lb/day	15
Chlordane [1]	µg/L	0.00078
Phase 1	lb/day	0.00000033
Phase 2	lb/day	0.00016
Phase 3	lb/day	0.00039
Chlorodibromomethane	µg/L	292
Phase 1	lb/day	0.12
Phase 2	lb/day	61
Phase 3	lb/day	146
Chloroform	µg/L	4420
Phase 1	lb/day	1.8

Phase 2	lb/day	922
Phase 3	lb/day	2212
DDT (total) [1]	µg/L	0.0058
Phase 1	lb/day	0.0000024
Phase 2	lb/day	0.0012
Phase 3	lb/day	0.003
1,4 Dichlorobenzene	µg/L	612
Phase 1	lb/day	0.26
Phase 2	lb/day	128
Phase 3	lb/day	306
3,3'-Dichlorobenzidine	µg/L	0.28
Phase 1	lb/day	0.00011
Phase 2	lb/day	0.057
Phase 3	lb/day	0.14
1,2-Dichloroethane	µg/L	952
Phase 1	lb/day	0.4
Phase 2	lb/day	198
Phase 3	lb/day	476
1,1-Dichloroethylene	µg/L	31
Phase 1	lb/day	0.013
Phase 2	lb/day	6.4
Phase 3	lb/day	15
Dichlorobromomethane	µg/L	211
Phase 1	lb/day	0.088
Phase 2	lb/day	44
Phase 3	lb/day	105
Methylene Chloride	µg/L	15300
Phase 1	lb/day	6.4
Phase 2	lb/day	3190
Phase 3	lb/day	7656
1,3-Dichloropropylene	µg/L	303
Phase 1	lb/day	0.13
Phase 2	lb/day	63
Phase 3	lb/day	151
Dieldrin	µg/L	0.0014
Phase 1	lb/day	0.00000057
Phase 2	lb/day	0.00028
Phase 3	lb/day	0.00068
2,4-Dinitrotoluene	µg/L	88
Phase 1	lb/day	0.037
Phase 2	lb/day	18
Phase 3	lb/day	44
1,2-Diphenylhydrazine	µg/L	5.4
Phase 1	lb/day	0.0023
Phase 2	lb/day	1.1
Phase 3	lb/day	2.7
Halomethanes [1]	µg/L	4420

Phase 1	lb/day	1.84
Phase 2	lb/day	922
Phase 3	lb/day	2212
Heptachlor	µg/L	0.0017
Phase 1	lb/day	0.00000071
Phase 2	lb/day	0.00035
Phase 3	lb/day	0.00085
Heptachlor Epoxide	µg/L	0.00068
Phase 1	lb/day	0.00000028
Phase 2	lb/day	0.00014
Phase 3	lb/day	0.00034
Hexachlorobenzene	µg/L	0.0071
Phase 1	lb/day	0.000003
Phase 2	lb/day	0.0015
Phase 3	lb/day	0.0036
Hexachlorobutadiene	µg/L	476
Phase 1	lb/day	0.2
Phase 2	lb/day	99
Phase 3	lb/day	238
Hexachloroethane	µg/L	85
Phase 1	lb/day	0.035
Phase 2	lb/day	18
Phase 3	lb/day	43
Isophorone	µg/L	24820
Phase 1	lb/day	10
Phase 2	lb/day	5175
Phase 3	lb/day	12420
N-Nitrosodimethylamine	µg/L	248
Phase 1	lb/day	0.1
Phase 2	lb/day	52
Phase 3	lb/day	124
N-Nitrosodi-n-Propylamine	µg/L	13
Phase 1	lb/day	0.0054
Phase 2	lb/day	2.7
Phase 3	lb/day	6.5
N-Nitrosodiphenylamine	µg/L	85
Phase 1	lb/day	0.035
Phase 2	lb/day	18
Phase 3	lb/day	43
PAHs (total) [1]	µg/L	0.3
Phase 1	lb/day	0.00012
Phase 2	lb/day	0.062
Phase 3	lb/day	0.15
PCBs [1]	µg/L	0.00065
Phase 1	lb/day	0.00000027
Phase 2	lb/day	0.00013
Phase 3	lb/day	0.00032

TCDD Equivalents [1]	µg/L	0.00000013
Phase 1	lb/day	0.000000000055
Phase 2	lb/day	0.000000028
Phase 3	lb/day	0.000000066
1,1,2,2-Tetrachloroethane	µg/L	78
Phase 1	lb/day	0.033
Phase 2	lb/day	16
Phase 3	lb/day	39
Tetrachloroethylene	µg/L	68
Phase 1	lb/day	0.028
Phase 2	lb/day	14
Phase 3	lb/day	34
Toxaphene	µg/L	0.0071
Phase 1	lb/day	0.000003
Phase 2	lb/day	0.0015
Phase 3	lb/day	0.0036
Trichloroethylene	µg/L	918
Phase 1	lb/day	0.38
Phase 2	lb/day	191
Phase 3	lb/day	459
1,1,2-Trichloroethane	µg/L	320
Phase 1	lb/day	0.13
Phase 2	lb/day	67
Phase 3	lb/day	160
2,4,6-Trichlorophenol	µg/L	9.9
Phase 1	lb/day	0.0041
Phase 2	lb/day	2.1
Phase 3	lb/day	4.9
Vinyl Chloride	µg/L	1224
Phase 1	lb/day	0.51
Phase 2	lb/day	255
Phase 3	lb/day	612

[1] See definitions (Attachment A)

c. Initial Dilution: The minimum initial dilution at the point of discharge to Monterey Bay and within the Monterey Bay National Marine Sanctuary shall not be less than 33 to 1 (seawater to effluent) at any time.

2. Interim Effluent Limitations

This section of the standardized permit template is not applicable to this facility.

B. Land Discharge Specifications

This section of the standardized permit template is not applicable to this facility.

C. Reclamation Specifications

This section of the standardized permit template is not applicable to this facility.

V. RECEIVING WATER LIMITATIONS

A. Surface Water Limitations

The following receiving water limitations are based on water quality objectives contained in the Ocean Plan and are a required part of this Order. Compliance shall be determined from samples collected at stations representative of the area within the waste field where initial dilution is completed.

1. Within a zone bounded by the shoreline and a distance of 1,000 feet from the shoreline or the 30-foot depth contour, whichever is further from the shoreline, and in areas outside this zone used for water contact sports, as determined by the Regional Water Board, but including all kelp beds, the following bacteriological objectives shall be maintained throughout the water column.

   30-Day Geometric Mean – The following standards are based on the geometric mean of the five most recent samples from each receiving water monitoring location.

   a. Total coliform density shall not exceed 1,000 per 100 mL, and

   b. Fecal coliform density shall not exceed 200 per 100 mL, and

   c. Enterococcus density shall not exceed 35 per 100 mL.

   Single Sample maximum;

   a. Total coliform density shall not exceed 10,000 per 100 ml, and

   b. Fecal coliform density shall not exceed 400 per 100 mL, and

   c. Enterococcus density shall not exceed 104 per 100 mL, and

   d. Total coliform density shall not exceed 1,000 per 100 mL when the fecal coliform to total coliform ratio exceeds 0.1.

2. At all areas where shellfish may be harvested for human consumption, as determined by the Regional Water Board, the following bacteriological objectives shall be maintained throughout the water column:

   a. The median total coliform density shall not exceed 70 organisms per 100 mLs, and in not more than 10 percent of samples shall coliform density exceed 230 organisms per 100 mLs.

3. Floating particulates and grease and oil shall not be visible.

4. The discharge of waste shall not cause aesthetically undesirable discoloration of the ocean surface.

5. Natural light shall not be significantly reduced at any point outside the initial dilution zone as the result of the discharge of waste.

6. The rate of deposition of inert solids and the characteristics of inert solids in ocean sediments shall not be changed such that benthic communities are degraded.

7. The dissolved oxygen concentration shall not at any time be depressed more than 10 percent from that which occurs naturally, as a result of the discharge of oxygen demanding waste material.

8. The pH shall not be changed at any time more than 0.2 units from that which occurs naturally.

9. The dissolved sulfide concentration of waters in and near sediments shall not be significantly increased above that present under natural conditions.

10. The concentration of substances set forth in Chapter IV, Table B of the Ocean Plan in marine sediments shall not be increased to levels that would degrade indigenous biota.

11. The concentration of organic materials in marine sediments shall not be increased to levels that would degrade marine life.

12. Nutrient levels shall not cause objectionable aquatic growths or degrade indigenous biota.

13. Discharges shall not cause exceedances of water quality objectives for ocean waters of the State established in Table B of the Ocean Plan.

14. Marine communities, including vertebrate, invertebrate and plant species, shall not be degraded.

15. The natural taste, odor, and color of fish, shellfish, or other marine resources used for human consumption shall not be altered.

16. The concentration of organic materials in fish, shellfish, or other marine resources used for human consumption shall not bioaccumulate to levels that are harmful to human health.

17. Discharge of radioactive waste shall not degrade marine life.

B. Groundwater Limitations

Activities at the facility shall not cause exceedance or deviation from the following water quality objectives for groundwater established by the Basin Plan.

1. Groundwater shall not contain taste or odor producing substances in concentrations that adversely affect beneficial uses.

2. Radionuclides shall not be present in concentrations that are deleterious to human, plant, animal, or aquatic life; or result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life.

VI. PROVISIONS

A. Standard Provisions

1. The Discharger shall comply with all Standard Provisions included in Attachment D of this Order.

2. The Discharger shall comply with the following provision:

a. Prior to making any change in the point of discharge, place of use, or purpose of use of treated wastewater that results in a decrease in flow in any portion of an inland watercourse, the Discharger must file a petition with the State Water Board, Division of Water Rights, and receive approval for such a change. (Wat. Code § 1211.)

B. Monitoring and Reporting Program Requirements

The Discharger shall comply with the Monitoring and Reporting Program (MRP), and future revisions thereto, in Attachment E of this Order. All monitoring shall be conducted according to 40 CFR Part 136, *Guidelines Establishing Test Procedures for Analysis of Pollutants.*

C. Special Provisions

1. Reopener Provisions

a. This permit may be reopened and modified in accordance with NPDES regulations at 40 CFR 122 and 124, as necessary, to include additional conditions or limitations based on newly available information or to implement any U.S. EPA approved, new, State water quality objective.

2. Special Studies, Technical Reports and Additional Monitoring Requirements

a. Toxicity Reduction Requirements

If the discharge consistently exceeds an effluent limitation for toxicity specified by Section IV of this Order, the Discharger shall conduct a Toxicity Reduction Evaluation (TRE) in accordance with the Discharger's TRE Workplan.

A TRE is a study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the

reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE. A TIE is a set of procedures to identify the specific chemical(s) responsible for toxicity. These procedures are performed in three phases – characterization, identification, and confirmation using aquatic organism toxicity tests. The TRE shall include all reasonable steps to identify the source of toxicity. The Discharger shall take all reasonable steps to reduce toxicity to the required level once the source of toxicity is identified.

The Discharger shall maintain a TRE Workplan which describes steps that the Discharger intends to follow in the event that a toxicity effluent limitation established by this Order is exceeded in the discharge. The Workplan shall be prepared in accordance with current technical guidance and reference material, including EPA/600/2-88-070 (for industrial discharges) or EPA/600/2-88/062 (for municipal discharges), and shall include, at a minimum:

- Actions that will be taken to investigate/identify the causes/sources of toxicity,
- Actions that will be evaluated to mitigate the impact of the discharge, to correct the non-compliance, and/or to prevent the recurrence of acute or chronic toxicity (this list of action steps may be expanded, if a TRE is undertaken), and
- A schedule under which these actions will be implemented.

When monitoring measures toxicity in the effluent above a limitation established by this Order, the Discharger shall resample immediately, if the discharge is continuing, and retest for whole effluent toxicity. Results of an initial failed test and results of subsequent monitoring shall be reported to the Executive Officer (EO) as soon as possible following receipt of monitoring results. The EO will determine whether to initiate enforcement action, whether to require the Discharger to implement a TRE, or to implement other measures. The Discharger shall conduct a TRE giving due consideration to guidance provided by the USEPA's Toxicity Reduction Procedures, Phases 1, 2, and 3 (EPA document nos. EPA 600/3-88/034, 600/3-88/035, and 600/3-88/036, respectively). A TRE, if necessary, shall be conducted in accordance with the following schedule:

Table 11. Toxicity Reduction Evaluation Schedule

Action Step	When Required
Take all reasonable measures necessary to immediately reduce toxicity, where the source is known.	Within 24 hours of identification of noncompliance.
Initiate TRE in accordance with Workplan.	Within 7 days of notification by EO.
Conduct the TRE following the procedures in the	Within the period specified in the Workplan

Workplan.	(not to exceed one year, without an approved Workplan).
Submit the results of the TRE, including summary of findings, required corrective action, and all results and data.	Within 60 days of completion of the TRE.
Implement corrective actions to meet Permit limits and conditions.	To be determined by the EO.

3. Best Management Practices and Pollution Prevention

a. Pollutant Minimization Goal

The goal of the Pollutant Minimization Program is to reduce potential sources of Ocean Plan Table B toxic pollutants through pollutant minimization (control) strategies, including pollution prevention measures, to maintain effluent concentrations at or below the effluent limitation.

b. Determining the Need for a Pollutant Minimization Program

(1) The Discharger shall develop and implement a Pollutant Minimization Program if:

(a) A calculated effluent limitation is less than the reported Minimum Level,

(b) The concentration of the pollutant is reported as DNQ, and

(c) There is evidence showing that the pollutant is present in the effluent above the calculated effluent limitation. Such evidence may include: health advisories for fish consumption; presence of whole effluent toxicity; results of benthic or aquatic organism tissue sampling; sample results from analytical methods more sensitive than methods included in the permit; and the concentration of the pollutant is reported as DNQ and the effluent limitation is less than the MDL.

(2) Alternatively, the Discharger shall develop and implement a Pollutant Minimization Program if:

(a) A calculated effluent limitation is less than the Method Detection Limit (MDL),

(b) The concentration of the pollutant is reported as ND, and

(c) There is evidence showing that the pollutant is present in the effluent above the calculated effluent limitation. Such evidence may include: health advisories for fish consumption; presence of whole effluent toxicity; results of benthic or aquatic organism tissue sampling; sample results from analytical methods more sensitive than methods included in the permit; and the concentration of the pollutant is reported as DNQ and the effluent limitation is less than the MDL.

c. Elements of a Pollutant Minimization Program

A Pollutant Minimization Program shall include actions and submittals acceptable to the Regional Water Board including, but not limited to, the following.

(1) An annual review and semiannual monitoring of potential sources of the reportable pollutant, which may include fish tissue monitoring and other bio-uptake sampling;

(2) Quarterly monitoring for the reportable pollutant in influent to the wastewater treatment system;

(3) Submittal of a control strategy designed to proceed toward the goal of maintaining concentrations of the reportable priority pollutant in the effluent at or below the calculated effluent limitation;

(4) Implementation of appropriate cost-effective control measures for the pollutant, consistent with the control strategy;

(5) An annual status report that shall be sent to the Executive Officer that includes:

(i) All Pollutant Minimization Program monitoring results for the previous year;

(ii) A list of potential sources of the reportable pollutant;

(iii) A summary of all actions taken in accordance with the control strategy; and

(iv) A description of actions to be taken in the following year.

4. Construction, Operation and Maintenance Specification

This section of the standardized permit template is not applicable to the Facility.

5. Special Provisions for Municipal Facilities (POTWs Only)

This section of the standardized permit template is not applicable to the Facility.

6. Other Special Provisions

a. **Discharges of Storm Water.** For the control of storm water discharged from the site, the Discharger shall seek authorization to discharge under and meet the requirements of the State Water Resources Control Board's Water Quality Order 97-03-DWQ, NPDES General Permit No. CAS000001, *Waste Discharge Requirements for Discharges of Storm Water Associated with Industrial Activities Excluding Construction Activities.*

b. **Phase 1 Discharge Characterization Study.** In addition to monitoring required by section IV. A of the Monitoring and Reporting Plan (Attachment E), in order to more fully characterize the discharge, the Discharger shall perform the following monitoring of influent and effluent at Discharge Point 001 during Phase 1 of operations. Monitoring results for the entire Phase 1 period of operations shall be summarized and submitted to the Regional Water Board within 30 days of completion of Phase 1 operations. The Discharger shall not initiate discharges under Phase 2 until the Regional Water Board Executive Officer has reviewed results of this Phase 1 Discharge Characterization Study and has confirmed in writing that the character of the discharge is as contemplated by this Order and is therefore properly regulated by this Order. If monitoring requirements established for this Phase 1 Discharge Characterization Study are duplicated in section IV. A of the Monitoring and Reporting Plan, monitoring performed for this Phase 1 Discharge Characterization Study shall satisfy the requirements of the Monitoring and Reporting Plan.

Table 12. Phase 1 Discharge Characterization Monitoring Requirements

Parameter	Units	Sample Type	Sample Location	Minimum Sampling Frequency
Flow	mgd	Metered	Eff-001	Daily
Specific Conductivity	µmhos/cm	Grab	Inf-001 Eff-001	Daily
Total Dissolved Solids (TDS)	mg/L	Grab	Inf-001 Eff-001	Weekly
Settleable Solids	ml/L	Grab	Inf-001 Eff-001	Weekly
Total Suspended Solids (TSS)	mg/L	Grab	Inf-001 Eff-001	Weekly
Turbidity	NTU	Grab	Inf-001 Eff-001	Daily
pH	Units	Grab	Inf-001 Eff-001	Daily
Chronic Toxicity [1]	TUc	Grab	Inf-001 Eff-001	Monthly
Ocean Plan Table B Metals [2],[4]	µg/L	24-hr composite	Inf-001 Eff-001	Monthly
Ocean Plan Table B Pollutants [3], [4]	µg/L	24-hr composite	Inf-001 Eff-001	Monthly
1,3-Butadiene [5]	µg/L	24-hr composite	Inf-001 Eff-001	Monthly
Acetaldehyde [5]	µg/L	24-hr composite	Inf-001 Eff-001	Monthly
Formaldehyde [5]	µg/L	24-hr composite	Inf-001 Eff-001	Monthly
Naphthalene [5]	µg/L	24-hr composite	Inf-001 Eff-001	Monthly
Propylene Oxide [5]	µg/L	24-hr composite	Inf-001 Eff-001	Monthly

Parameter	Units	Sample Type	Sample Location	Minimum Sampling Frequency
Xylenes [5]	µg/L	24-hr composite	Inf-001 Eff-001	Monthly
Total Organic Carbon (TOC) [5]	µg/L	24-hr composite	Inf-001 Eff-001	Monthly

[1] Whole effluent chronic toxicity monitoring shall be conducted according to the requirements established in section V. of this Monitoring and Reporting Plan; however, tests shall be performed with a vertebrate, an invertebrate, and an aquatic plant during each monitoring event performed for the Phase 1 Discharge Characterization Study.

[2] The metals with applicable water quality objectives established by Table B of the Ocean Plan (2005) – As, Cd, Cr^{+6}, Cu, Pb, Hg, Ni, Se, Ag, Zn.

[3] The pollutants, excluding radioactivity and acute toxicity, with applicable water quality objectives established by Table B of the Ocean Plan (2005). Monitoring for the Table B metals, which occurs quarterly, shall satisfy that portion (for the Table B metals) of this monitoring requirement.

[4] Analyses, compliance determination, and reporting for these pollutants shall adhere to applicable provisions of the Ocean Plan, including the Standard Monitoring Procedures presented in Appendix III of the Ocean Plan. The Discharger shall instruct its analytical laboratory to establish calibration standards so that the Minimum Levels (MLs) presented in Appendix II of the Ocean Plan are the lowest calibration standards. The Discharger and its analytical laboratory shall select MLs, which are below applicable water quality criteria of Table B; and when applicable water quality criteria are below all MLs, the Discharger and its analytical laboratory shall select the lowest ML.

[5] The analytical method selected for a parameter shall be the one that can measure the lowest detected limit for that parameter.

7. Compliance Schedules

This section of the standardized permit template is not applicable to the Facility.

VII. COMPLIANCE DETERMINATION

Compliance with the effluent limitations contained in Section IV of this Order will be determined as specified below:

A. General.

Compliance with effluent limitations for reportable pollutants shall be determined using sample reporting protocols defined in the MRP and Attachment A of this Order. For purposes of reporting and administrative enforcement by the Regional and State Water Boards, the Discharger shall be deemed out of compliance with effluent limitations if the concentration of the reportable pollutant in the monitoring sample is greater than the effluent limitation and greater than or equal to the reported Minimum Level (ML).

B. Multiple Sample Data.

When determining compliance with a measure of central tendency (arithmetic mean, geometric mean, median, etc.) of multiple sample analyses and the data set contains one or more reported determinations of “Detected, but Not Quantified” (DNQ) or “Not Detected” (ND), the Discharger shall compute the median in place of the arithmetic mean in accordance with the following procedure:

1. The data set shall be ranked from low to high, ranking the reported ND determinations lowest, DNQ determinations next, followed by quantified values (if any). The order of the individual ND or DNQ determinations is unimportant.

2. The median value of the data set shall be determined. If the data set has an odd number of data points, then the median is the middle value. If the data set has an even number of data points, then the median is the average of the two values around the middle unless one or both of the points are ND or DNQ, in which case the median value shall be the lower of the two data points where DNQ is lower than a value and ND is lower than DNQ.

ATTACHMENT A – DEFINITIONS, ACRONYMS, AND ABBREVIATIONS

Acute Toxicity:

a. Acute Toxicity (TUa)

Expressed in Toxic Units Acute (TUa)

$$TUa = \frac{100}{\text{96-hr LC}_{50\%}}$$

b. Lethal Concentration 50% (LC 50)

LC 50 (percent waste giving 50% survival of test organisms) shall be determined by static or continuous flow bioassay techniques using standard marine test species as specified in Ocean Plan Appendix III. If specific identifiable substances in wastewater can be demonstrated by the discharger as being rapidly rendered harmless upon discharge to the marine environment, but not as a result of dilution, the LC 50 may be determined after the test samples are adjusted to remove the influence of those substances.

When it is not possible to measure the 96-hour LC 50 due to greater than 50 percent survival of the test species in 100 percent waste, the toxicity concentration shall be calculated by the expression:

$$TUa = \frac{\log (100 - S)}{1.7}$$

where:

S = percentage survival in 100% waste. If S > 99, TUa shall be reported as zero.

Areas of Special Biological Significance (ASBS) are those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All Areas of Special Biological Significance are also classified as a subset of STATE WATER QUALITY PROTECTION AREAS.

Average Monthly Effluent Limitation (AMEL): The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.

Average Weekly Effluent Limitation (AWEL): The highest allowable average of daily discharges over a calendar week (Sunday through Saturday), calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week.

Chlordane shall mean the sum of chlordane-alpha, chlordane-gamma, chlordene-alpha, chlordene-gamma, nonachlor-alpha, nonachlor-gamma, and oxychlordane.

Chronic Toxicity: This parameter shall be used to measure the acceptability of waters for supporting a healthy marine biota until improved methods are developed to evaluate biological response.

a. Chronic Toxicity (TUc)

Expressed as Toxic Units Chronic (TUc)

$$TUc = \frac{100}{NOEL}$$

b. No Observed Effect Level (NOEL)

The NOEL is expressed as the maximum percent effluent or receiving water that causes no observable effect on a test organism, as determined by the result of a critical life stage toxicity test listed in Ocean Plan Appendix II.

Daily Discharge: Daily Discharge is defined as either: (1) the total mass of the constituent discharged over the calendar day (12:00 am through 11:59 pm) or any 24-hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g., concentration).

The daily discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day or other 24-hour period defined as a day) or by the arithmetic mean of analytical results from one or more grab samples taken over the course of the day.

For composite sampling, if 1 day is defined as a 24-hour period other than a calendar day, the analytical result for the 24-hour period will be considered as the result for the calendar day in which the 24-hour period ends.

DDT shall mean the sum of 4,4'DDT, 2,4'DDT, 4,4'DDE, 2,4'DDE, 4,4'DDD, and 2,4'DDD.

Degrade: Degradation shall be determined by comparison of the waste field and reference site(s) for characteristic species diversity, population density, contamination, growth anomalies, debility, or supplanting of normal species by undesirable plant and animal species. Degradation occurs if there are significant differences in any of three major biotic groups, namely, demersal fish, benthic invertebrates, or attached algae. Other groups may be evaluated where benthic species are not affected, or are not the only ones affected.

Detected, but Not Quantified (DNQ) are those sample results less than the reported Minimum Level, but greater than or equal to the laboratory's MDL.

Dichlorobenzenes shall mean the sum of 1,2- and 1,3-dichlorobenzene.

Downstream Ocean Waters shall mean waters downstream with respect to ocean currents.

Dredged Material: Any material excavated or dredged from the navigable waters of the United States, including material otherwise referred to as "spoil".

Enclosed Bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between headlands or outermost harbor works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. This definition includes but is not limited to: Humboldt Bay, Bodega Harbor, Tomales Bay, Drakes Estero, San Francisco Bay, Morro Bay, Los Angeles Harbor, Upper and Lower Newport Bay, Mission Bay, and San Diego Bay.

Endosulfan shall mean the sum of endosulfan-alpha and -beta and endosulfan sulfate.

Estuaries and Coastal Lagoons are waters at the mouths of streams that serve as mixing zones for fresh and ocean waters during a major portion of the year. Mouths of streams that are temporarily separated from the ocean by sandbars shall be considered as estuaries. Estuarine waters will generally be considered to extend from a bay or the open ocean to the upstream limit of tidal action but may be considered to extend seaward if significant mixing of fresh and salt water occurs in the open coastal waters. The waters described by this definition include but are not limited to the Sacramento-San Joaquin Delta as defined by Section 12220 of the California Water Code, Suisun Bay, Carquinez Strait downstream to Carquinez Bridge, and appropriate areas of the Smith, Klamath, Mad, Eel, Noyo, and Russian Rivers.

Halomethanes shall mean the sum of bromoform, bromomethane (methyl bromide) and chloromethane (methyl chloride).

HCH shall mean the sum of the alpha, beta, gamma (lindane) and delta isomers of hexachlorocyclohexane.

Initial Dilution is the process that results in the rapid and irreversible turbulent mixing of wastewater with ocean water around the point of discharge.

For a submerged buoyant discharge, characteristic of most municipal and industrial wastes that are released from the submarine outfalls, the momentum of the discharge and its initial buoyancy act together to produce turbulent mixing. Initial dilution in this case is completed when the diluting wastewater ceases to rise in the water column and first begins to spread horizontally.

For shallow water submerged discharges, surface discharges, and non-buoyant discharges, characteristic of cooling water wastes and some individual discharges, turbulent mixing results primarily from the momentum of discharge. Initial dilution, in these cases, is considered to be completed when the momentum induced velocity of the discharge ceases to produce significant mixing of the waste, or the diluting plume reaches a fixed distance from the discharge to be specified by the Regional Water Board, whichever results in the lower estimate for initial dilution.

Instantaneous Maximum Effluent Limitation: the highest allowable value for any single grab sample or aliquot (i.e., each grab sample or aliquot is independently compared to the instantaneous maximum limitation).

Instantaneous Minimum Effluent Limitation: the lowest allowable value for any single grab sample or aliquot (i.e., each grab sample or aliquot is independently compared to the instantaneous minimum limitation).

Kelp Beds, for purposes of the bacteriological standards of the Ocean Plan, are significant aggregations of marine algae of the genera Macrocystis and Nereocystis. Kelp beds include the total foliage canopy of Macrocystis and Nereocystis plants throughout the water column.

Mariculture is the culture of plants and animals in marine waters independent of any pollution source.

Material: (a) In common usage: (1) the substance or substances of which a thing is made or composed (2) substantial; (b) For purposes of the Ocean Plan relating to waste disposal, dredging and the disposal of dredged material and fill, MATERIAL means matter of any kind or description which is subject to regulation as waste, or any material dredged from the navigable waters of the United States. See also, DREDGED MATERIAL.

Maximum Daily Effluent Limitation (MDEL): the highest allowable daily discharge of a pollutant.

MDL (Method Detection Limit) is the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero, as defined in title 40 of the Code of Federal Regulations, PART 136, Appendix B.

Minimum Level (ML) is the concentrations at which the entire analytical system must give a recognizable signal and acceptable calibration point. The ML is the concentration in a sample that is equivalent to the concentration of the lowest calibration standard analyzed by a specific analytical procedure, assuming that all the method-specified sample weights, volumes and processing steps have been followed.

Natural Light: Reduction of natural light may be determined by the Regional Water Board by measurement of light transmissivity or total irradiance, or both, according to the monitoring needs of the Regional Water Board.

Not Detected (ND) are those sample results less than the laboratory's MDL.

Ocean Waters are the territorial marine waters of the state as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. If a discharge outside the territorial waters of the state could affect the quality of the waters of the state, the discharge may be regulated to assure no violation of the Ocean Plan will occur in ocean waters.

PAHs (polynuclear aromatic hydrocarbons) shall mean the sum of acenaphthylene, anthracene, 1,2-benzanthracene, 3,4-benzofluoranthene, benzo[k]fluoranthene, 1,12-benzoperylene, benzo[a]pyrene, chrysene, dibenzo[ah]anthracene, fluorene, indeno[1,2,3-cd]pyrene, phenanthrene and pyrene.

PCBs (polychlorinated biphenyls) shall mean the sum of chlorinated biphenyls whose analytical characteristics resemble those of Aroclor-1016, Aroclor-1221, Aroclor-1232, Aroclor-1242, Aroclor-1248, Aroclor-1254 and Aroclor-1260.

Pollutant Minimization Program (PMP) means waste minimization and pollution prevention actions that include, but are not limited to, product substitution, waste stream recycling, alternative waste management methods, and education of the public and businesses. The goal of the PMP shall be to reduce all potential sources of Ocean Plan Table B pollutants through pollutant minimization (control) strategies, including pollution prevention measures as appropriate, to maintain the effluent concentration at or below the water quality-based effluent limitation. Pollution prevention measures may be particularly appropriate for persistent bioaccumulative priority pollutants where there is evidence that beneficial uses are being impacted. The Regional Water Board may consider cost effectiveness when establishing the requirements of a PMP. The completion and implementation of a Pollution Prevention Plan, if required pursuant to Water Code section 13263.3(d), shall be considered to fulfill the PMP requirements.

Reported Minimum Level is the ML (and its associated analytical method) chosen by the Discharger for reporting and compliance determination from the MLs included in this Order. The MLs included in this Order correspond to approved analytical methods for reporting a sample result that are selected by the Regional Water Board either from Appendix II of the Ocean Plan in accordance with section III.C.5.a. of the Ocean Plan or established in accordance with section III.C.5.b. of the Ocean Plan. The ML is based on the proper application of method-based analytical procedures for sample preparation and the absence of any matrix interferences. Other factors may be applied to the ML depending on the specific sample preparation steps employed. For example, the treatment typically applied in cases where there are matrix-effects is to dilute the sample or sample aliquot by a factor of ten. In such cases, this additional factor must be applied to the ML in the computation of the reported ML.

Satellite Collection System is the portion, if any, of a sanitary sewer system owned or operated by a different public agency than the agency that owns and operates the wastewater treatment facility that a sanitary sewer system is tributary to.

Shellfish are organisms identified by the California Department of Health Services as shellfish for public health purposes (i.e., mussels, clams and oysters).

Significant Difference is defined as a statistically significant difference in the means of two distributions of sampling results at the 95 percent confidence level.

Six-month Median Effluent Limitation: the highest allowable moving median of all daily discharges for any 180-day period.

State Water Quality Protection Areas (SWQPAs) are non-terrestrial marine or estuarine areas designated to protect marine species or biological communities from an undesirable alteration in natural water quality. All AREAS OF SPECIAL BIOLOGICAL SIGNIFICANCE (ASBS) that were previously designated by the State Water Board in Resolution No.s 74-28,

74-32, and 75-61 are now also classified as a subset of State Water Quality Protection Areas and require special protections afforded by the Ocean Plan.

TCDD Equivalents shall mean the sum of the concentrations of chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans (2,3,7,8-CDFs) multiplied by their respective toxicity factors, as shown in the table below.

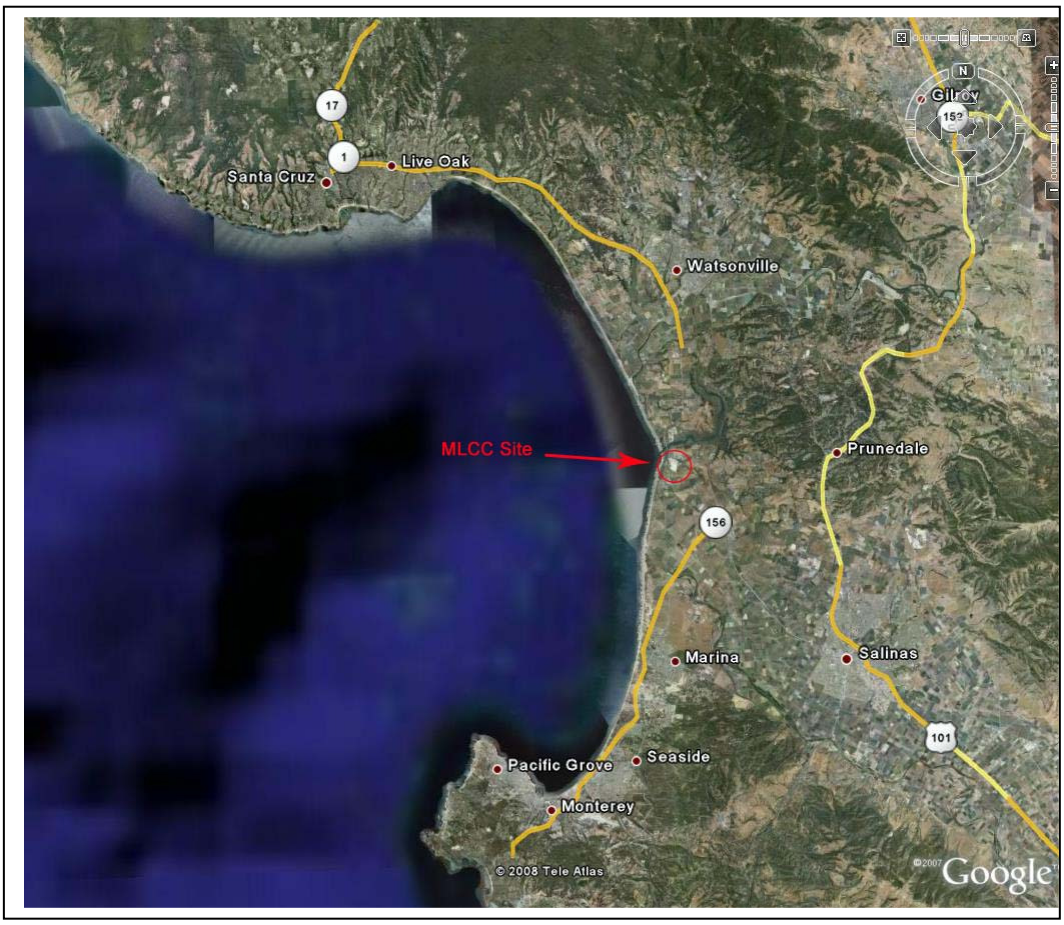
Isomer Group	Toxicity Equivalence Factor
2,3,7,8-tetra CDD	1.0
2,3,7,8-penta CDD	0.5
2,3,7,8-hexa CDDs	0.1
2,3,7,8-hepta CDD	0.01
octa CDD	0.001
2,3,7,8 tetra CDF	0.1
1,2,3,7,8 penta CDF	0.05
2,3,4,7,8 penta CDF	0.5
2,3,7,8 hexa CDFs	0.1
2,3,7,8 hepta CDFs	0.01
octa CDF	0.001

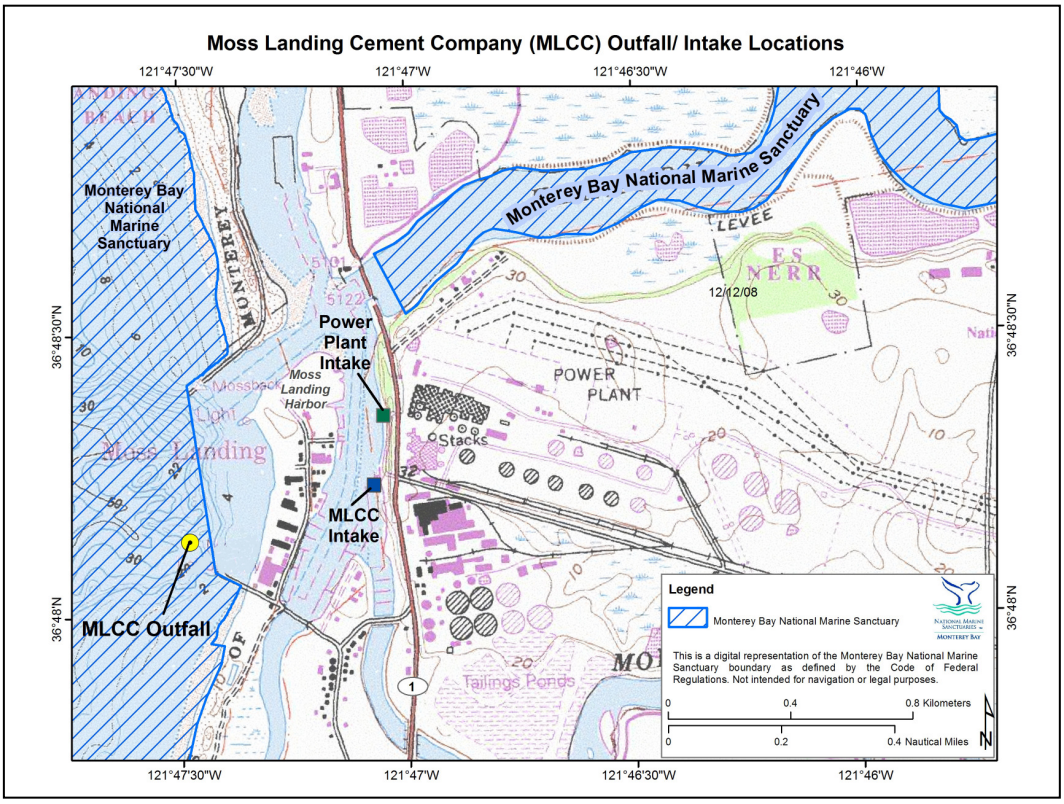
Toxicity Reduction Evaluation (TRE) is a study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A TOXICITY IDENTIFICATION EVALUATION (TIE) may be required as part of the TRE, if appropriate. (A TIE is a set of procedures to identify the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.)

Waste: As used in the Ocean Plan, waste includes a Discharger's total discharge, of whatever origin, i.e., gross, not net, discharge.

Water Reclamation: The treatment of wastewater to render it suitable for reuse, the transportation of treated wastewater to the place of use, and the actual use of treated wastewater for a direct beneficial use or controlled use that would not otherwise occur.

ATTACHMENT B – LOCATION MAPS

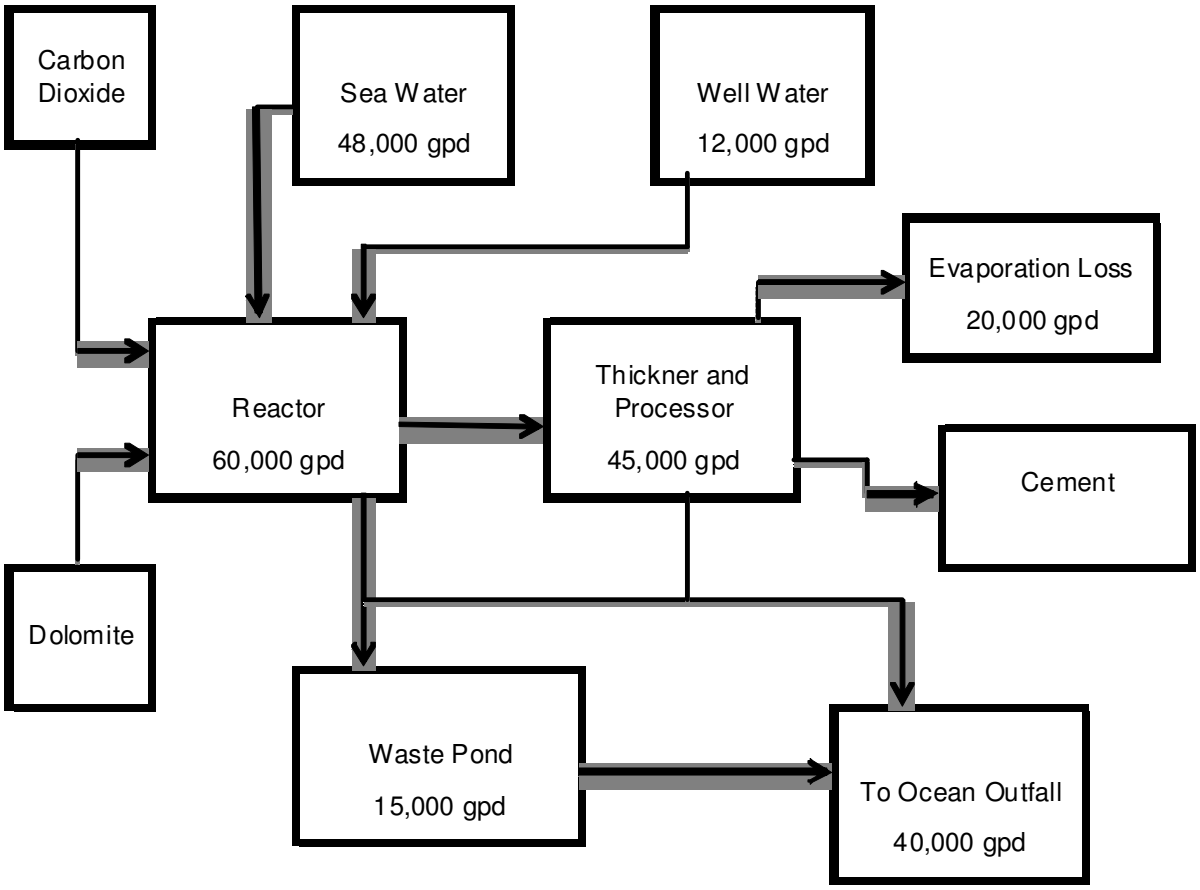




ATTACHMENT C – FLOW SCHEMATIC

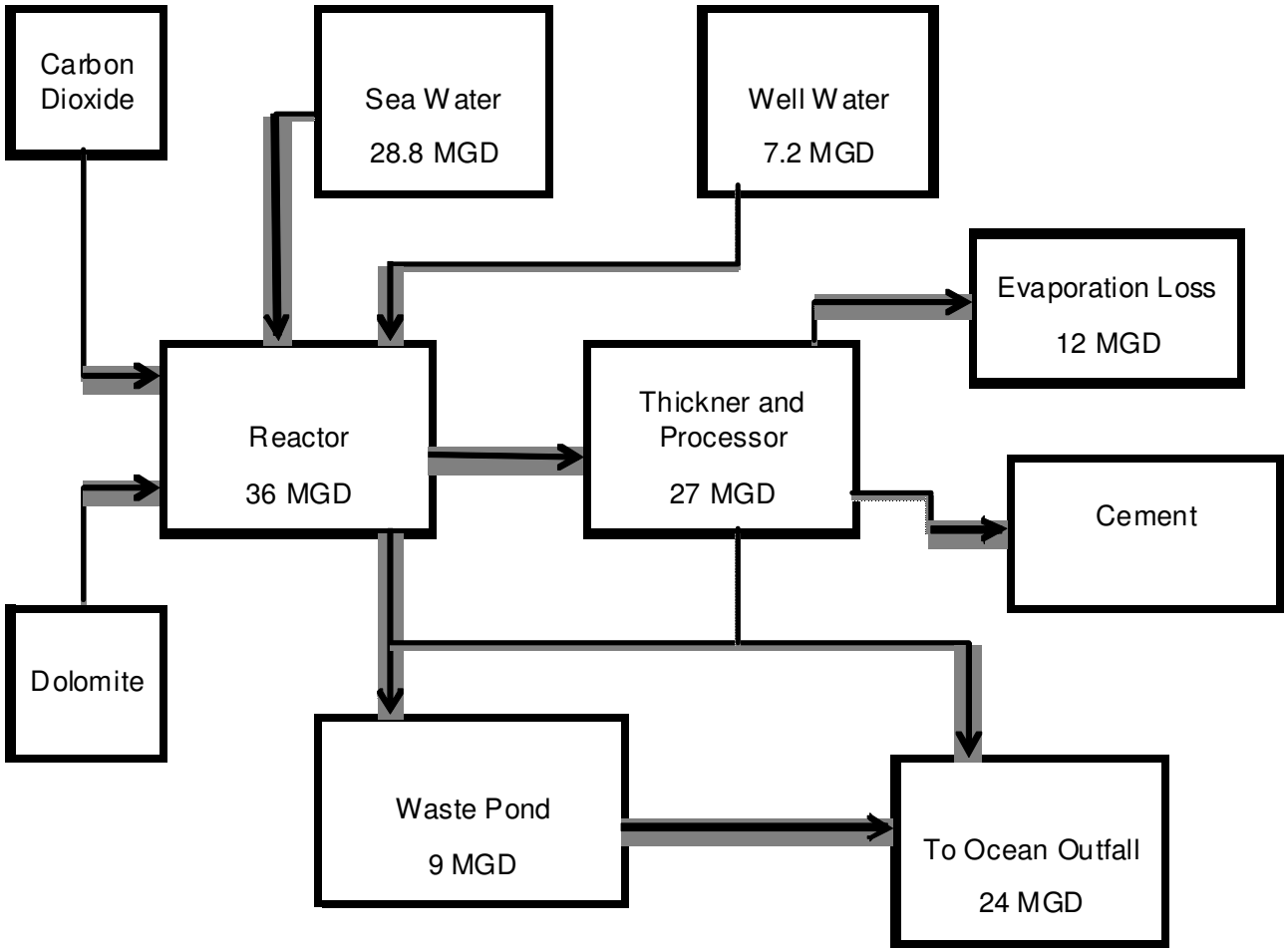
SCHEMATIC DRAWING OF WATER FLOW

Phase I Pilot Process



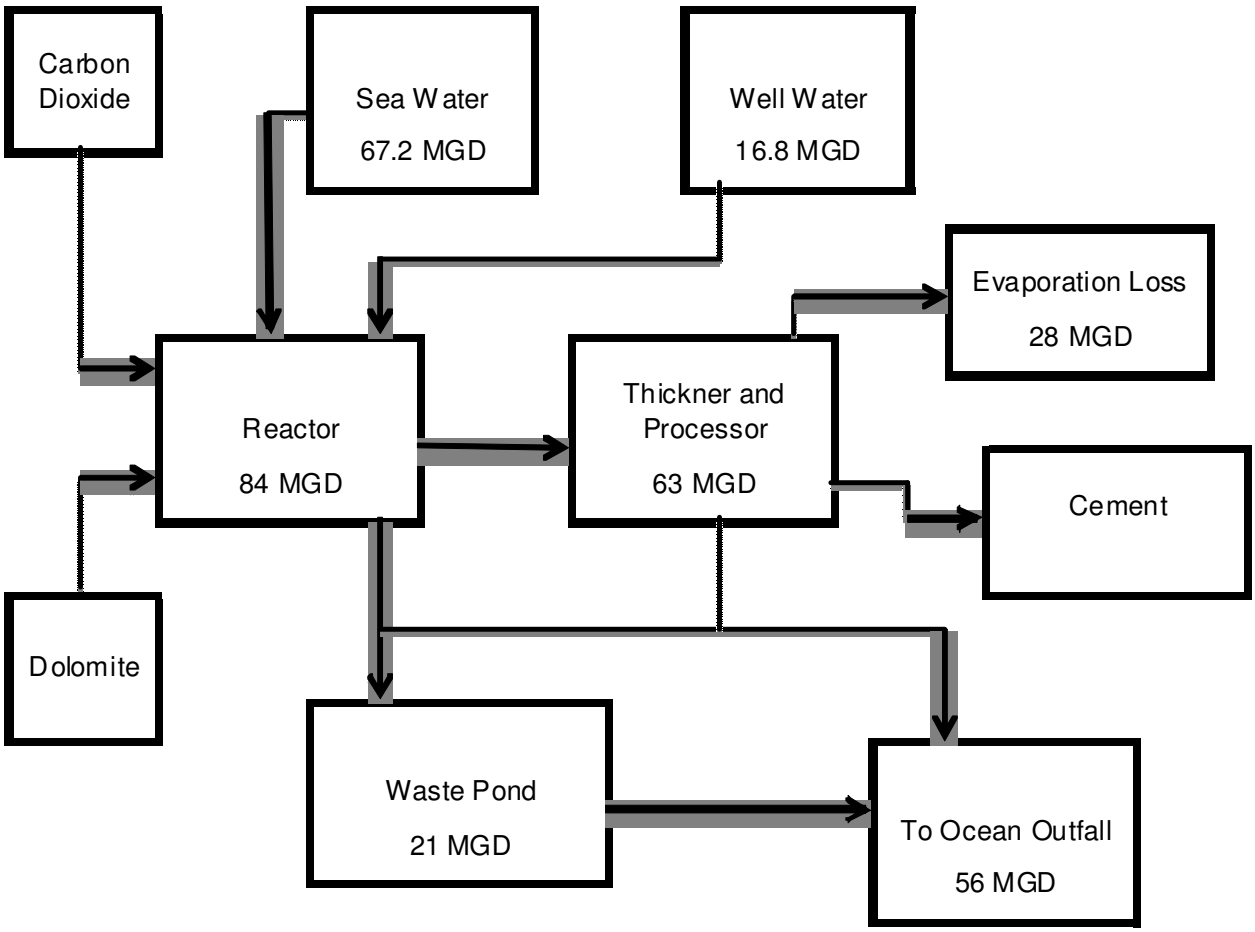
SCHEMATIC DRAWING OF WATER FLOW

Phase II Prototype Process



SCHEMATIC DRAWING OF WATER FLOW

Phase III Full-Scale Process



ATTACHMENT D – FEDERAL STANDARD PROVISIONS

I. STANDARD PROVISIONS – PERMIT COMPLIANCE

A. Duty to Comply

1. The Discharger must comply with all of the conditions of this Order. Any noncompliance constitutes a violation of the CWA and the CWC and is grounds for enforcement action, for permit termination, revocation and reissuance, or denial of a permit renewal application [*40 CFR §122.41(a)*].

2. The Discharger shall comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions, even if this Order has not been modified to incorporate the requirement [*40 CFR §122.41(a)(1)*].

B. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a Discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Order [*40 CFR §122.41(c)*].

C. Duty to Mitigate

The Discharger shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this Order that has a reasonable likelihood of adversely affecting human health or the environment [*40 CFR §122.41(d)*].

D. Proper Operation and Maintenance

The Discharger shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Discharger to achieve compliance with the conditions of this Order. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems that are installed by a Discharger only when necessary to achieve compliance with the conditions of this Order [*40 CFR §122.41(e)*].

E. Property Rights

1. This Order does not convey any property rights of any sort or any exclusive privileges [*40 CFR §122.41(g)*].

2. The issuance of this Order does not authorize any injury to persons or property or invasion of other private rights, or any infringement of State or local law or regulations [*40 CFR §122.5(c)*].

F. Inspection and Entry

The Discharger shall allow the Regional Water Quality Control Board (Regional Water Board), State Water Resources Control Board (State Water Board), United States Environmental Protection Agency (USEPA), and/or their authorized representatives (including an authorized contractor acting as their representative), upon the presentation of credentials and other documents, as may be required by law, to [*40 CFR §122.41(i)*] [*CWC 13383(c)*]:

1. Enter upon the Discharger's premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this Order [*40 CFR §122.41(i)(1)*];

2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Order [*40 CFR §122.41(i)(2)*];

3. Inspect and photograph, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order [*40 CFR §122.41(i)(3)*];

4. Sample or monitor, at reasonable times, for the purposes of assuring Order compliance or as otherwise authorized by the CWA or the CWC, any substances or parameters at any location [*40 CFR §122.41(i)(4)*].

G. Bypass

1. Definitions

   a. “Bypass” means the intentional diversion of waste streams from any portion of a treatment facility [*40 CFR §122.41(m)(1)(i)*].

   b. “Severe property damage” means substantial physical damage to property, damage to the treatment facilities, which causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production [*40 CFR §122.41(m)(1)(ii)*].

2. Bypass not exceeding limitations – The Discharger may allow any bypass to occur which does not cause exceedances of effluent limitations, but only if it is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions listed in Standard Provisions – Permit Compliance I.G.3 and I.G.5 below [*40 CFR §122.41(m)(2)*].

3. Prohibition of bypass – Bypass is prohibited, and the Regional Water Board may take enforcement action against a Discharger for bypass, unless [*40 CFR §122.41(m)(4)(i)*]:

a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage [*40 CFR §122.41(m)(4)(A)*];

b. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass that occurred during normal periods of equipment downtime or preventive maintenance [*40 CFR §122.41(m)(4)(B)*]; and

c. The Discharger submitted notice to the Regional Water Board as required under Standard Provision – Permit Compliance I.G.5 below [*40 CFR §122.41(m)(4)(C)*].

4. The Regional Water Board may approve an anticipated bypass, after considering its adverse effects, if the Regional Water Board determines that it will meet the three conditions listed in Standard Provisions – Permit Compliance I.G.3 above [*40 CFR §122.41(m)(4)(ii)*].

5. Notice

a. Anticipated bypass. If the Discharger knows in advance of the need for a bypass, it shall submit a notice, if possible at least 10 days before the date of the bypass [*40 CFR §122.41(m)(3)(i)*].

b. Unanticipated bypass. The Discharger shall submit notice of an unanticipated bypass as required in Standard Provisions - Reporting V.E below [*40 CFR §122.41(m)(3)(ii)*].

H. Upset

Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation [*40 CFR §122.41(n)(1)*].

1. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of paragraph H.2 of this section are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review [*40 CFR §122.41(n)(2)*].

2. Conditions necessary for a demonstration of upset. A Discharger who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs or other relevant evidence that [*40 CFR §122.41(n)(3)*]:

a. An upset occurred and that the Discharger can identify the cause(s) of the upset [*40 CFR §122.41(n)(3)(i)*];

b. The permitted facility was, at the time, being properly operated [*40 CFR §122.41(n)(3)(i)*];

c. The Discharger submitted notice of the upset as required in Standard Provisions – Reporting V.E.2.b [*40 CFR §122.41(n)(3)(iii)*]; and

d. The Discharger complied with any remedial measures required under Standard Provisions – Permit Compliance I.C above [*40 CFR §122.41(n)(3)(iv)*].

3. Burden of proof. In any enforcement proceeding, the Discharger seeking to establish the occurrence of an upset has the burden of proof [*40 CFR §122.41(n)(4)*].

II. STANDARD PROVISIONS – PERMIT ACTION

A. General

This Order may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Discharger for modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any Order condition [*40 CFR §122.41(f)*].

B. Duty to Reapply

If the Discharger wishes to continue an activity regulated by this Order after the expiration date of this Order, the Discharger must apply for and obtain a new permit [*40 CFR §122.41(b)*].

C. Transfers

This Order is not transferable to any person except after notice to the Regional Water Board. The Regional Water Board may require modification or revocation and reissuance of the Order to change the name of the Discharger and incorporate such other requirements as may be necessary under the CWA and the CWC [*40 CFR §122.41(l)(3)*] [*40 CFR §122.61*].

III. STANDARD PROVISIONS – MONITORING

A. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity [*40 CFR §122.41(j)(1)*].

B. Monitoring results must be conducted according to test procedures under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503 unless other test procedures have been specified in this Order [*40 CFR §122.41(j)(4)*] [*40 CFR §122.44(i)(1)(iv)*].

IV. STANDARD PROVISIONS – RECORDS

A. Except for records of monitoring information required by this Order related to the Discharger's sewage sludge use and disposal activities, which shall be retained for a period of at least five years (or longer as required by 40 CFR Part 503), the Discharger shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the Regional Water Board Executive Officer at any time [*40 CFR §122.41(j)(2)*].

B. Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements [*40 CFR §122.41(j)(3)(i)*];
2. The individual(s) who performed the sampling or measurements [*40 CFR §122.41(j)(3)(ii)*];
3. The date(s) analyses were performed [*40 CFR §122.41(j)(3)(iii)*];
4. The individual(s) who performed the analyses [*40 CFR §122.41(j)(3)(iv)*];
5. The analytical techniques or methods used [*40 CFR §122.41(j)(3)(v)*]; and
6. The results of such analyses [*40 CFR §122.41(j)(3)(vi)*].

C. Claims of confidentiality for the following information will be denied [*40 CFR §122.7(b)*]:

1. The name and address of any permit applicant or Discharger [*40 CFR §122.7(b)(1)*]; and
2. Permit applications and attachments, permits and effluent data [*40 CFR §122.7(b)(2)*].

V. STANDARD PROVISIONS – REPORTING

A. Duty to Provide Information

The Discharger shall furnish to the Regional Water Board, State Water Board, or USEPA within a reasonable time, any information which the Regional Water Board, State Water Board, or USEPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Order or to determine compliance with this Order. Upon request, the Discharger shall also furnish to the Regional Water Board, State Water Board, or USEPA copies of records required to be kept by this Order [*40 CFR §122.41(h)*] [*CWC 13267*].

B. Signatory and Certification Requirements

1. All applications, reports, or information submitted to the Regional Water Board, State Water Board, and/or USEPA shall be signed and certified in accordance with paragraph (2.) and (3.) of this provision [*40 CFR §122.41(k)*].

2. All permit applications shall be signed as follows:

   a. For a municipality, State, federal, or other public agency: by either a principal executive officer or ranking elected official. For purposes of this provision, a principal executive officer of a federal agency includes: (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of USEPA) [*40 CFR §122.22(a)(3)*].

3. All reports required by this Order and other information requested by the Regional Water Board, State Water Board, or USEPA shall be signed by a person described in paragraph V.B.2 above, or by a duly authorized representative of that person. A person is a duly authorized representative only if:

   a. The authorization is made in writing by a person described in paragraph (2.) of this provision [*40 CFR §122.22(b)(1)*];

   b. The authorization specified either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company (a duly authorized representative may thus be either a named individual or any individual occupying a named position) [*40 CFR §122.22(b)(2)*]; and

   c. The written authorization is submitted to the Regional Water Board, State Water Board, or USEPA [*40 CFR §122.22(b)(3)*].

4. If an authorization under Standard Provisions – Reporting V.B.3. above is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (3.) of this provision must be submitted to the Regional Water Board, State Water Board or USEPA prior to or together with any reports, information, or applications, to be signed by an authorized representative [40 CFR §122.22(c)].

5. Any person signing a document under Standard Provisions – Reporting V.B.2 or V.B.3 above shall make the following certification:

   "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted

is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations" [*40 CFR §122.22(d)*].

C. Monitoring Reports

1. Monitoring results shall be reported at the intervals specified in the MRP in this Order [*40 CFR §122.41(l)(4)*].

2. Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the Regional Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices [*40 CFR §122.41(l)(4)(i)*].

3. If the Discharger monitors any pollutant more frequently than required by this Order using test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, or as specified in this Order, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Regional Water Board [*40 CFR §122.41(l)(4)(ii)*].

4. Calculations for all limitations, which require averaging of measurements, shall utilize an arithmetic mean unless otherwise specified in this Order [*40 CFR §122.41(l)(4)(iii)*].

D. Compliance Schedules

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this Order, shall be submitted no later than 14 days following each schedule date [*40 CFR §122.41(l)(5)*].

E. Twenty-Four Hour Reporting

1. The Discharger shall report any noncompliance that may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the Discharger becomes aware of the circumstances. A written submission shall also be provided within five (5) days of the time the Discharger becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance [*40 CFR §122.41(l)(6)(i)*].

2. The following shall be included as information that must be reported within 24 hours under this paragraph [*40 CFR §122.41(l)(6)(ii)*]:

   a. Any unanticipated bypass that exceeds any effluent limitation in this Order [*40 CFR §122.41(l)(6)(ii)(A)*].

b. Any upset that exceeds any effluent limitation in this Order [*40 CFR §122.41(l)(6)(ii)(B)*].

c. Violation of a maximum daily discharge limitation for any of the pollutants listed in this Order to be reported within 24 hours [*40 CFR §122.41(l)(6)(ii)(C)*].

3. The Regional Water Board may waive the above-required written report under this provision on a case-by-case basis if an oral report has been received within 24 hours [*40 CFR §122.41(l)(6)(iii)*].

F. Planned Changes

The Discharger shall give notice to the Regional Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required under this provision only when [*40 CFR §122.41(l)(1)*]:

1. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR §122.29(b) [*40 CFR §122.41(l)(1)(i)*]; or

2. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants that are not subject to effluent limitations in this Order. (40 C.F.R. § 122.41(l)(1)(ii).)

3. The alteration or addition results in a significant change in the Discharger's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan [*40 CFR §122.41(l)(1)(iii)*].

G. Anticipated Noncompliance

The Discharger shall give advance notice to the Regional Water Board or State Water Board of any planned changes in the permitted facility or activity that may result in noncompliance with General Order requirements [*40 CFR §122.41(l)(2)].*

H. Other Noncompliance

The Discharger shall report all instances of noncompliance not reported under Standard Provisions – Reporting E.3, E.4, and E.5 at the time monitoring reports are submitted. The reports shall contain the information listed in Standard Provision – Reporting V.E [*40 CFR §122.41(l)(7)*].

I. Other Information

When the Discharger becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the

Regional Water Board, State Water Board, or USEPA, the Discharger shall promptly submit such facts or information [*40 CFR §122.41(l)(8)*].

VI. STANDARD PROVISIONS – ENFORCEMENT

A. The Regional Water Board is authorized to enforce the terms of this permit under several provisions of the Water Code, including, but not limited to, sections 13385, 13386, and 13387.

VII. ADDITIONAL PROVISIONS – NOTIFICATION LEVELS

A. Non-Municipal Facilities

Existing manufacturing, commercial, mining, and silvicultural Dischargers shall notify the Regional Water Board as soon as they know or have reason to believe (40 C.F.R. § 122.42(a)):

1. That any activity has occurred or will occur that would result in the discharge, on a routine or frequent basis, of any toxic pollutant that is not limited in this Order, if that discharge will exceed the highest of the following "notification levels" (40 C.F.R. § 122.42(a)(1)):

   a. 100 micrograms per liter (µg/L) (40 C.F.R. § 122.42(a)(1)(i));

   b. 200 µg/L for acrolein and acrylonitrile; 500 µg/L for 2,4 dinitrophenol and 2 methyl 4,6 dinitrophenol; and 1 milligram per liter (mg/L) for antimony (40 C.F.R. § 122.42(a)(1)(ii));

   c. Five (5) times the maximum concentration value reported for that pollutant in the Report of Waste Discharge (40 C.F.R. § 122.42(a)(1)(iii)); or

   d. The level established by the Regional Water Board in accordance with section 122.44(f). (40 C.F.R. § 122.42(a)(1)(iv).)

2. That any activity has occurred or will occur that would result in the discharge, on a non-routine or infrequent basis, of any toxic pollutant that is not limited in this Order, if that discharge will exceed the highest of the following “notification levels" (40 C.F.R. § 122.42(a)(2)):

   a. 500 micrograms per liter (µg/L) (40 C.F.R. § 122.42(a)(2)(i));

   b. 1 milligram per liter (mg/L) for antimony (40 C.F.R. § 122.42(a)(2)(ii));

   c. Ten (10) times the maximum concentration value reported for that pollutant in the Report of Waste Discharge (40 C.F.R. § 122.42(a)(2)(iii)); or

   d. The level established by the Regional Water Board in accordance with section 122.44(f). (40 C.F.R. § 122.42(a)(2)(iv).)

ATTACHMENT D-1 - CENTRAL COAST WATER BOARD STANDARD PROVISIONS (JANUARY 1985)

I. Central Coast General Permit Conditions

A. Central Coast Standard Provisions – Prohibitions

1. Introduction of "incompatible wastes" to the treatment system is prohibited.

2. Discharge of high-level radiological waste and of radiological, chemical, and biological warfare agents is prohibited.

3. Discharge of "toxic pollutants" in violation of effluent standards and prohibitions established under Section 307(a) of the Clean Water Act is prohibited.

4. Discharge of sludge, sludge digester or thickener supernatant, and sludge drying bed leachate to drainageways, surface waters, or the ocean is prohibited.

5. Introduction of pollutants into the collection, treatment, or disposal system by an "indirect discharger" that:

   a. Inhibit or disrupt the treatment process, system operation, or the eventual use or disposal of sludge; or,

   b. Flow through the system to the receiving water untreated; and,

   c. Cause or "significantly contribute" to a violation of any requirement of this Order, is prohibited.

6. Introduction of "pollutant free" wastewater to the collection, treatment, and disposal system in amounts that threaten compliance with this order is prohibited.

B. Central Coast Standard Provisions – Provisions

1. Collection, treatment, and discharge of waste shall not create a nuisance or pollution, as defined by Section 13050 of the California Water Code.

2. All facilities used for transport or treatment of wastes shall be adequately protected from inundation and washout as the result of a 100-year frequency flood.

3. Operation of collection, treatment, and disposal systems shall be in a manner that precludes public contact with wastewater.

4. Collected screenings, sludges, and other solids removed from liquid wastes shall be disposed in a manner approved by the Executive Officer.

5. Publicly owned wastewater treatment plants shall be supervised and operated by persons possessing certificates of appropriate grade pursuant to Title 23 of the California Administrative Code.

6. After notice and opportunity for a hearing, this order may be terminated for cause, including, but not limited to:

   a. violation of any term or condition contained in this order;

   b. obtaining this order by misrepresentation, or by failure to disclose fully all relevant facts;

   c. a change in any condition or endangerment to human health or environment that requires a temporary or permanent reduction or elimination of the authorized discharge; and,

   d. a substantial change in character, location, or volume of the discharge.

7. Provisions of this permit are severable. If any provision of the permit is found invalid, the remainder of the permit shall not be affected.

8. After notice and opportunity for hearing, this order may be modified or revoked and reissued for cause, including:

   a. Promulgation of a new or revised effluent standard or limitation;

   b. A material change in character, location, or volume of the discharge;

   c. Access to new information that affects the terms of the permit, including applicable schedules;

   d. Correction of technical mistakes or mistaken interpretations of law; and,

   e. Other causes set forth under Sub-part D of 40 CFR Part 122.

9. Safeguards shall be provided to assure maximal compliance with all terms and conditions of this permit. Safeguards shall include preventative and contingency plans and may also include alternative power sources, stand-by generators, retention capacity, operating procedures, or other precautions. Preventative and contingency plans for controlling and minimizing the affect of accidental discharges shall:

   a. identify possible situations that could cause "upset", "overflow" or "bypass", or other noncompliance. (Loading and storage areas, power outage, waste treatment unit outage, and failure of process equipment, tanks and pipes should be considered.)

   b. evaluate the effectiveness of present facilities and procedures and describe procedures and steps to minimize or correct any adverse environmental impact resulting from noncompliance with the permit.

10. Physical Facilities shall be designed and constructed according to accepted engineering practice and shall be capable of full compliance with this order when

properly operated and maintained. Proper operation and maintenance shall be described in an Operation and Maintenance Manual. Facilities shall be accessible during the wet-weather season.

11. Production and use of reclaimed water is subject to the approval of the Regional Water Board. Production and use of reclaimed water shall be in conformance with reclamation criteria established in Chapter 3, Title 22, of the California Administrative Code and Chapter 7, Division 7, of the California Water Code. An engineering report pursuant to section 60323, Title 22, of the California Administrative Code is required and a waiver or water reclamation requirements from the Regional Water Board is required before reclaimed water is supplied for any use, or to any user, not specifically identified and approved either in this Order or another order issued by this Board.

C. Central Coast Standard Provisions – General Monitoring Requirements

1. If results of monitoring a pollutant appear to violate effluent limitations based on a weekly, monthly, 30-day, or six-month period, but compliance or non-compliance cannot be validated because sampling is too infrequent, the frequency of sampling shall be increased to validate the test within the next monitoring period. The increased frequency shall be maintained until the Executive Officer agrees the original monitoring frequency may be resumed.

   For example, if copper is monitored annually and results exceed the six-month median numerical effluent limitation in the permit, monitoring of copper must be increased to a frequency of at least once every two months (Central Coast Standard Provisions – Definitions I.G.13.). If suspended solids are monitored weekly and results exceed the weekly average numerical limit in the permit, monitoring of suspended solids must be increased to at least four (4) samples every week (Central Coast Standard Provisions – Definitions I.G.14.).

2. Water quality analyses performed in order to monitor compliance with this permit shall be by a laboratory certified by the State Department of Health Services for the constituent(s) being analyzed. Bioassay(s) performed in order to monitor compliance with this permit shall be in accord with guidelines approved by the State Water Resources Control Board and the State Department of Fish and Game. If the laboratory used or proposed for use by the discharger is not certified by the California Department of Health Services or, where appropriate, the Department of Fish and Game due to restrictions in the State's laboratory certification program, the discharger shall be considered in compliance with this provision provided:

   a. Data results remain consistent with results of samples analyzed by the Central Coast Water Board;

   b. A quality assurance program is used at the laboratory, including a manual containing steps followed in this program that is available for inspections by the staff of the Central Coast Water Board; and,

c. Certification is pursued in good faith and obtained as soon as possible after the program is reinstated.

3. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. Samples shall be taken during periods of peak loading conditions. Influent samples shall be samples collected from the combined flows of all incoming wastes, excluding recycled wastes. Effluent samples shall be samples collected downstream of the last treatment unit and tributary flow and upstream of any mixing with receiving waters.

4. All monitoring instruments and devices used by the discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary to ensure their continued accuracy.

D. Central Coast Standard Provisions – General Reporting Requirements

1. Reports of marine monitoring surveys conducted to meet receiving water monitoring requirements of the Monitoring and Reporting Program shall include at least the following information:

   a. A description of climatic and receiving water characteristics at the time of sampling (weather observations, floating debris, discoloration, wind speed and direction, swell or wave action, time of sampling, tide height, etc.).

   b. A description of sampling stations, including differences unique to each station (e.g., station location, grain size, rocks, shell litter, calcareous worm tubes, evident life, etc.).

   c. A description of the sampling procedures and preservation sequence used in the survey.

   d. A description of the exact method used for laboratory analysis. In general, analysis shall be conducted according to Central Coast Standard Provisions – C.1 above, and Federal Standard Provision – Monitoring III.B. However, variations in procedure are acceptable to accommodate the special requirements of sediment analysis. All such variations must be reported with the test results.

   e. A brief discussion of the results of the survey. The discussion shall compare data from the control station with data from the outfall stations. All tabulations and computations shall be explained.

2. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule shall be submitted within 14 days following each scheduled date unless otherwise specified within the permit. If reporting noncompliance, the report shall include a description of the reason, a description and schedule of tasks necessary to achieve compliance, and an estimated date for achieving full compliance. A second report shall be submitted within 14 days of full compliance.

3. The “Discharger” shall file a report of waste discharge or secure a waiver from the Executive Officer at least 180 days before making any material change or proposed change in the character, location, or plume of the discharge.

4. Within 120 days after the discharger discovers, or is notified by the Central Coast Water Board, that monthly average daily flow will or may reach design capacity of waste treatment and/or disposal facilities within four (4) years, the discharger shall file a written report with the Central Coast Water Board. The report shall include:

   a. the best estimate of when the monthly average daily dry weather flow rate will equal or exceed design capacity; and,

   b. a schedule for studies, design, and other steps needed to provide additional capacity for waste treatment and/or disposal facilities before the waste flow rate equals the capacity of present units.

   In addition to complying with Federal Standard Provision – Reporting V.B., the required technical report shall be prepared with public participation and reviewed, approved and jointly submitted by all planning and building departments having jurisdiction in the area served by the waste collection, treatment, or disposal facilities.

5. All “Dischargers” shall submit reports to the:

   California Regional Water Quality Control Board
   Central Coast Region
   895 Aerovista Place, Suite 101
   San Luis Obispo, CA 93401-7906

   In addition, "Dischargers" with designated major discharges shall submit a copy of each document to:

   Regional Administrator
   US Environmental Protection Agency, Region 9
   Attention: CWA Standards and Permits Office (WTR-5)
   75 Hawthorne Street
   San Francisco, California 94105

6. Transfer of control or ownership of a waste discharge facility must be preceded by a notice to the Central Coast Water Board at least 30 days in advance of the proposed transfer date. The notice must include a written agreement between the existing “Discharger” and proposed “Discharger” containing specific date for transfer of responsibility, coverage, and liability between them. Whether a permit may be transferred without modification or revocation and reissuance is at the discretion of the Board. If permit modification or revocation and reissuance is necessary, transfer may be delayed 180 days after the Central Coast Water Board's receipt of a complete permit application. Please also see Federal Standard Provision – Permit Action II.C.

7. Except for data determined to be confidential under Section 308 of the Clean Water Act (excludes effluent data and permit applications), all reports prepared in accordance with this permit shall be available for public inspection at the office of the Central Coast Water Board or Regional Administrator of EPA. Please also see Federal Standard Provision – Records IV.C.

8. By January 30th of each year, the discharger shall submit an annual report to the Central Coast Water Board. The report shall contain both tabular and graphical summaries of the monitoring data obtained during the previous year. The discharger shall discuss the compliance record and corrective actions taken, or which may be needed, to bring the discharge into full compliance. The report shall address operator certification and provide a list of current operating personnel and their grade of certification. The report shall inform the Board of the date of the Facility's Operation and Maintenance Manual (including contingency plans as described Central Coast Standard Provision – Provision B.9., above), of the date the manual was last reviewed, and whether the manual is complete and valid for the current facility. The report shall restate, for the record, the laboratories used by the discharger to monitor compliance with effluent limits and provide a summary of performance relative to Section C above, General Monitoring Requirements.

   If the facility treats industrial or domestic wastewater and there is no provision for periodic sludge monitoring in the Monitoring and Reporting Program, the report shall include a summary of sludge quantities, analyses of its chemical and moisture content, and its ultimate destination.

   If applicable, the report shall also evaluate the effectiveness of the local source control or pretreatment program using the State Water Resources Control Board's "Guidelines for Determining the Effectiveness of Local Pretreatment Programs."

E. Central Coast Standard Provisions – General Pretreatment Provisions

1. Discharge of pollutants by "indirect dischargers" in specific industrial sub-categories (appendix C, 40 CFR Part 403), where categorical pretreatment standards have been established, or are to be established, (according to 40 CFR Chapter 1, Subchapter N), shall comply with the appropriate pretreatment standards:

   a. By the date specified therein;

   b. Within three (3) years of the effective date specified therein, but in no case later than July 1, 1984; or,

   c. If a new indirect discharger, upon commencement of discharge.

F. Central Coast Standard Provisions – Enforcement

1. Any person failing to file a report of waste discharge or other report as required by this permit shall be subject to a civil penalty not to exceed $5,000 per day.

2. Upon reduction, loss, or failure of the treatment facility, the "Discharger" shall, to the extent necessary to maintain compliance with this permit, control production or all discharges, or both, until the facility is restored or an alternative method of treatment is provided.

G. Central Coast Standard Provisions – Definitions

(Not otherwise included in Attachment A to this Order)

1. A “composite sample" is a combination of no fewer than eight (8) individual samples obtained at equal time intervals (usually hourly) over the specified sampling (composite) period. The volume of each individual sample is proportional to the flow rate at the time of sampling. The period shall be specified in the Monitoring and Reporting Program ordered by the Executive Officer.

2. “Daily Maximum” limit means the maximum acceptable concentration or mass emission rate of a pollutant measured during a calendar day or during any 24-hour period reasonably representative of the calendar day for purposes of sampling. It is normally compared with results based on "composite samples” except for ammonia, total chlorine, phenolic compounds, and toxicity concentration. For all exceptions, comparisons will be made with results from a “grab sample”.

3. “Discharger", as used herein, means, as appropriate: (1) the Discharger, (2) the local sewering entity (when the collection system is not owned and operated by the Discharger), or (3) "indirect discharger" (where "Discharger" appears in the same paragraph as "indirect discharger”, it refers to the discharger.)

4. “Duly Authorized Representative" is one where:

   a. the authorization is made in writing by a person described in the signatory paragraph of Federal Standard Provision V.B.;

   b. the authorization specifies either an individual or the occupant of a position having either responsibility for the overall operation of the regulated facility, such as the plant manager, or overall responsibility for environmental matters of the company; and,

   c. the written authorization was submitted to the Central Coast Water Board.

5. A "grab sample" is defined as any individual sample collected in less than 15 minutes. "Grab samples” shall be collected during peak loading conditions, which may or may not be during hydraulic peaks. It is used primarily in determining compliance with the daily maximum limits identified in Central Coast Standard Provision – Provision G.2. and instantaneous maximum limits.

6. "Hazardous substance” means any substance designated under 40 CFR Part 116 pursuant to Section 311 of the Clean Water Act.

7. "Incompatible wastes” are:

a. Wastes which create a fire or explosion hazard in the treatment works;

b. Wastes which will cause corrosive structural damage to treatment works, but in no case wastes with a pH lower than 5.0 unless the works is specifically designed to accommodate such wastes;

c. Solid or viscous wastes in amounts which cause obstruction to flow in sewers, or which cause other interference with proper operation of treatment works;

d. Any waste, including oxygen demanding pollutants (BOD, etc), released in such volume or strength as to cause inhibition or disruption in the treatment works and subsequent treatment process upset and loss of treatment efficiency; and,

e. Heat in amounts that inhibit or disrupt biological activity in the treatment works or that raise influent temperatures above 40°C (104°F) unless the treatment works is designed to accommodate such heat.

8. "Indirect Discharger" means a non-domestic discharger introducing pollutants into a publicly owned treatment and disposal system.

9. "Log Mean" is the geometric mean. Used for determining compliance of fecal or total coliform populations, it is calculated with the following equation:

$$\text{Log Mean} = (C1 \times C2 \times ... \times Cn)1/n,$$

in which "n" is the number of days samples were analyzed during the period and any "C" is the concentration of bacteria (MPN/100 ml) found on each day of sampling. "n" should be five or more.

10. "Mass emission rate" is a daily rate defined by the following equations:

$$\text{mass emission rate (lbs/day)} = 8.34 \times Q \times C; \text{ and,}$$

$$\text{mass emission rate (kg/day)} = 3.79 \times Q \times C,$$

where "C" (in mg/L) is the measured daily constituent concentration or the average of measured daily constituent concentrations and "Q" (in mgd) is the measured daily flow rate or the average of measured daily flow rates over the period of interest.

11. The "Maximum Allowable Mass Emission Rate," whether for a month, week, day, or six-month period, is a daily rate determined with the formulas in paragraph G.10, above, using the effluent concentration limit specified in the permit for the period and the average of measured daily flows (up to the allowable flow) over the period.

12. "Maximum Allowable Six-Month Median Mass Emission Rate" is a daily rate determined with the formulas in Central Coast Standard Provision – Provision G.10, above, using the "six-month Median" effluent limit specified in the permit, and the average of measured daily flows (up to the allowable flow) over a 180-day period.

13. "Median" is the value below which half the samples (ranked progressively by increasing value) fall. It may be considered the middle value, or the average of two middle values.

14. "Monthly Average" (or "Weekly Average", as the case may be) is the arithmetic mean of daily concentrations or of daily mass emission rates over the specified 30-day (or 7-day) period.

$$\text{Average} = (X1 + X2 + ... + Xn) / n$$

in which "n" is the number of days samples were analyzed during the period and "X" is either the constituent concentration (mg/L) or mass emission rate (kg/day or lbs/day) for each sampled day. "n" should be four or greater.

15. "Municipality" means a city, town, borough, county, district, association, or other public body created by or under state law and having jurisdiction over disposal of sewage, industrial waste, or other waste.

16. "Overflow" means the intentional or unintentional diversion of flow from the collection and transport systems, including pumping facilities.

17. "Pollutant-free wastewater" means inflow and infiltration, storm waters, and cooling waters and condensates which are essentially free of pollutants.

18. "Primary Industry Category" means any industry category listed in 40 CFR Part 122, Appendix A.

19. "Removal Efficiency" is the ratio of pollutants removed by the treatment unit to pollutants entering the treatment unit. Removal efficiencies of a treatment plant shall be determined using "Monthly averages" of pollutant concentrations (C, in mg/L) of influent and effluent samples collected about the same time and the following equation (or its equivalent):

$$C_{Effluent} \text{ Removal Efficiency } (\%) = 100 \times (1 - C_{effluent} / C_{influent})$$

20. "Severe property damage" means substantial physical damage to property, damage to treatment facilities which causes them to become inoperable, or substantial and permanent loss to natural resources which can reasonably be expected to occur in the absence of a "bypass". It does not mean economic loss caused by delays in production.

21. "Sludge" means the solids, residues, and precipitates separated from, or created in, wastewater by the unit processes of a treatment system.

22. To "significantly contribute" to a permit violation means an "indirect discharger" must:

    a. Discharge a daily pollutant loading in excess of that allowed by contract with the "Discharger" or by Federal, State, or Local law;

b. Discharge wastewater which substantially differs in nature or constituents from its average discharge;

c. Discharge pollutants, either alone or in conjunction with discharges from other sources, which results in a permit violation or prevents sewage sludge use or disposal; or

d. Discharge pollutants, either alone or in conjunction with pollutants from other sources that increase the magnitude or duration of permit violations.

23. "Toxic Pollutant" means any pollutant listed as toxic under Section 307 (a) (1) of the Clean Water Act or under 40 CFR Part 122, Appendix D. Violation of maximum daily discharge limitations are subject to 24-hour reporting (Federal Standard Provisions V.E.).

24. “Zone of Initial Dilution" means the region surrounding or adjacent to the end of an outfall pipe or diffuser ports whose boundaries are defined through calculation of a plume model verified by the State Water Resources Control Board.

Attachment E – Monitoring and Reporting Program – Table of Contents

LIST OF TABLES

ATTACHMENT E – MONITORING AND REPORTING PROGRAM (MRP)

NPDES regulations at 40 CFR 122.48 require that all NPDES permits specify monitoring and reporting requirements. Water Code sections 13267 and 13383 also authorize the Regional Water Board to require technical and monitoring reports. This MRP establishes monitoring and reporting requirements, which implement the federal and California regulations.

I. GENERAL MONITORING PROVISIONS

A. Laboratories analyzing monitoring samples shall be certified by the Department of Health Services, in accordance with Water Code section 13176, and must include quality assurance/quality control data with their reports.

B. Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge. All samples shall be taken at the monitoring locations specified below and, unless otherwise specified, before the monitored flow joins or is diluted by any other waste stream, body of water, or substance. Monitoring locations shall not be changed without notification to and approval of the Regional Water Board.

C. Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated, and maintained to ensure that the accuracy of the measurements is consistent with the accepted capability of that type of device. Devices selected shall be capable of measuring flows with a maximum deviation of less than ±10 percent from true discharge rates throughout the range of expected discharge volumes. Guidance in selection, installation, calibration, and operation of acceptable flow measurement devices can be obtained from the following references:

1. A Guide to Methods and Standards for the Measurement of Water Flow, U.S. Department of Commerce, National Bureau of Standards, NBS Special Publication 421, May 1975, 96 pp. (Available from the U.S. Government Printing Office, Washington, D.C. 20402. Order by SD Catalog No. C13.10:421)

2. Water Measurement Manual, U.S. Department of Interior, Bureau of Reclamation, Second Edition, Revised Reprint, 1974, 327 pp. (Available from the U.S. Government Printing Office, Washington D.C. 20402. Order by Catalog No. 172.19/2:W29/2, Stock No. S/N 24003-0027).

3. Flow Measurement in Open Channels and Closed Conduits, U.S. Department of Commerce, National Bureau of Standards, NBS Special Publication 484, October 1977, 982 pp. (Available in paper copy or microfiche from National Technical Information Services (NTIS) Springfield, VA 22151. Order by NTIS No. PB-273 535/5ST.)

4. NPDES Compliance Sampling Manual, U.S. Environmental Protection Agency, Office of Water Enforcement, Publication MCD-51, 1977, 140 pp (Available from the

General Services Administration (8FFS), Centralized Mailing Lists Services, Building 41, Denver Federal Center, CO 80225.)

D. All monitoring instruments and devices used by the Discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary to ensure their continued accuracy. All flow measurement devices shall be calibrated at least once per year to ensure continued accuracy of the devices.

E. Monitoring results, including noncompliance, shall be reported at intervals and in a manner specified in this MRP.

F. Unless otherwise specified by this MRP, all monitoring shall be conducted according to test procedures established at 40 CFR 135, *Guidelines Establishing Test Procedures for Analysis of Pollutants*. All analyses shall be conducted using the lowest practical quantification limit achievable using the specified methodology. Where effluent limitations are set below the lowest achievable quantitation limits, pollutants not detected at the lowest practical quantitation limits will be considered in compliance with effluent limitations. Analysis for toxics listed by the California Toxics Rule shall also adhere to guidance and requirements contained in the Policy for *Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (2005). Analyses for toxics listed in Table B of the California Ocean Plan (2005) shall adhere to guidance and requirements contained in that document.

II. MONITORING LOCATIONS

The Discharger shall establish the following monitoring locations to demonstrate compliance with the effluent limitations, discharge specifications, and other requirements in this Order:

Table E-1. Monitoring Locations

Discharge Point Name	Monitoring Location Name	Monitoring Location Description
---	INF-001	At a location where a representative sample of intake seawater can be obtained prior to its contact with any operations, chemical application, other water or waste streams, and/or treatment.
001	EFF-001	At a point where an effluent sample can be collected that is representative of discharges to the Pacific Ocean, but before dilution occurs with ocean water and other waste streams not authorized by this Order (e.g., Moss Landing Marine Laboratories and Monterey Bay Aquarium Research Institute).

III. INFLUENT MONITORING REQUIREMENTS

A. Monitoring Location INF-001

The Discharger shall monitor influent seawater at Monitoring Location INF-001, during all phases of operation, in accordance with the following schedule.

Table E-2. Influent Seawater Monitoring Requirements

Parameter	Units	Sample Type	Minimum Sampling Frequency
pH	Units	Grab	Daily
Temperature	° F	Grab	Weekly
Turbidity	NTU	Grab	Weekly
Specific Conductivity	µmhos/cm	Grab	Weekly
Settleable Solids	mL/L/hr	Grab	Weekly
TDS	mg/L	Grab	Monthly
Ocean Plan Table B Metals [1]	µg/L	Grab	Annually [2]

[1] The metals with applicable water quality objectives established by Table B of the Ocean Plan (2005) – As, Cd, Cr+6, Cu, Pb, Hg, Ni, Se, Ag, Zn. Analyses, compliance determination, and reporting for these pollutants shall adhere to applicable provisions of the Ocean Plan, including the Standard Monitoring Procedures presented in Appendix III of the Ocean Plan. The Discharger shall instruct its analytical laboratory to establish calibration standards so that the Minimum Levels (MLs) presented in Appendix II of the Ocean Plan are the lowest calibration standards. The Discharger and its analytical laboratory shall select MLs, which are below applicable water quality criteria of Table B; and when applicable water quality criteria are below all MLs, the Discharger and its analytical laboratory shall select the lowest ML.

[2] Monitoring for the Ocean Plan Table B metals shall be performed during the first year following the effective date of this Order and every year thereafter.

IV. EFFLUENT MONITORING REQUIREMENTS

A. Monitoring Location EFF-001

The Discharger shall monitor its discharge to Monterey Bay at Monitoring Location EFF-001, during all phases of operation, in accordance with the following schedule.

Table E-3. Effluent Monitoring Requirements

Parameter	Units	Sample Type	Minimum Sampling Frequency
Flow	mgd	Metered	Daily
pH	Units	Grab	Daily
Temperature	℃	Grab	Weekly
Specific Conductivity	µmhos/cm	Grab	Weekly
TDS	mg/L	Grab	Weekly
Settleable Solids	ml/L	Grab	Weekly
TSS	mg/L	Grab	Monthly
Turbidity	NTU	Grab	Monthly
Oil and Grease	mg/L	Grab	Annually
Chronic Toxicity [1]	TUc	Grab	Quarterly
Ocean Plan Table B Pollutants [2], [3]	µg/L	Grab	Annually
1,3-Butadiene [4]	µg/L	Grab	Annually
Acetaldehyde [4]	µg/L	Grab	Annually
Formaldehyde [4]	µg/L	Grab	Annually
Naphthalene [4]	µg/L	Grab	Annually
Propylene Oxide [4]	µg/L	Grab	Annually
Xylenes [4]	µg/L	Grab	Annually

Parameter	Units	Sample Type	Minimum Sampling Frequency
Total Organic Carbon (TOC) [4]	µg/L	24-hr composite	Annually

[1] Whole effluent chronic toxicity monitoring shall be conducted according to the requirements established in section V. of this Monitoring and Reporting Plan.

[2] The pollutants, excluding radioactivity and acute toxicity, with applicable water quality objectives established by Table B of the Ocean Plan (2005).

[3] Analyses, compliance determination, and reporting for these pollutants shall adhere to applicable provisions of the Ocean Plan, including the Standard Monitoring Procedures presented in Appendix III of the Ocean Plan. The Discharger shall instruct its analytical laboratory to establish calibration standards so that the Minimum Levels (MLs) presented in Appendix II of the Ocean Plan are the lowest calibration standards. The Discharger and its analytical laboratory shall select MLs, which are below applicable water quality criteria of Table B; and when applicable water quality criteria are below all MLs, the Discharger and its analytical laboratory shall select the lowest ML.

[4] The analytical method selected for a parameter shall be the one that can measure the lowest detected limit for that parameter.

V. WHOLE EFFLUENT TOXICITY TESTING REQUIREMENTS

A. Chronic Toxicity

The presence of chronic toxicity shall be estimated as specified in *Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms*, EPA-821/600/R-95/136; *Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms*, EPA-600-4-91-003; *Procedures Manual for Conducting Toxicity Tests developed by the Marine Bioassay Project, SWRCB 1996, 96-1WQ; and/or Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms*, EPA/600/4-87-028 or subsequent editions.

Chronic toxicity measures a sub lethal effect (e.g., reduced growth or reproduction) to experimental test organisms exposed to an effluent compared to that of the control organisms. The no observed effect concentration (NOEC) is the maximum tested concentration in a medium which does not cause known adverse effects upon chronic exposure in the species in question (i.e. the highest effluent concentration to which organisms are exposed in a chronic test that causes no observable adverse effects on the test organisms; (e.g., the highest concentration of a toxicant to which the values for the observed responses are not statistically significantly different from the controls). Examples of chronic toxicity include but are not limited to measurements of toxicant effects on reproduction, growth, and sublethal effects that can include behavioral, physiological, and biochemical effects. Test results shall be reported in chronic toxicity units (TUc), where TUc = 100/NOEC. For this discharge, the presence of chronic toxicity at more than 34 TUc shall trigger the TRE requirements of the Order.

If the effluent to be discharged to a marine or estuarine system (e.g., salinity values in excess of 1,000 mg/L) originates from a freshwater supply, salinity of the effluent must be increased with dry ocean salts (e.g., FORTY FATHOMS®) to match salinity of the receiving water. This modified effluent shall then be tested using marine species.

Test species shall include a vertebrate, an invertebrate, and an aquatic plant. After a screening period, monitoring may be reduced to the most sensitive species. Screening phase chronic toxicity monitoring shall be conducted with approved test protocols and species shown in Table E-4 below.

Table E-4. Approved Tests – Chronic Toxicity

Species	Test	Tier [1]	Reference [2]
Giant Kelp, *Macrocystis pyrifera*	percent germination; germ tube length	1	a, c
Red abalone, *Haliotis rufescens*	abnormal shell development	1	a, c
Oyster, *Crassostrea gigas*; mussels, *Mytilus spp.*	abnormal sell development; percent survival	1	a, c
Urchin, *Strongylocentrotus purpuratus;* sand dollar, *Dendraster excentricus*	percent normal development; percent fertilization	1	a, c
Shrimp, *Homesimysis costata*	percent survival; growth	1	a, c
Shrimp*, Menidia beryllina*	percent survival; fecundity	2	b, d
Topsmelt, *Atherinops affinis*	larval growth rate; percent survival	1	a, c
Silverside, *Menidia beryllina*	larval growth rate; percent survival	2	b, d

[1] First tier methods are preferred for compliance monitoring. If first tier organisms are not available, the Discharger can use a second tier test method following approval by the Regional Water Board

[2] Protocol References:

a. Chapman, G.A., D.L. Denton, and J.M. Lazorchak. 1995. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms. U.S. EPA Report No. EPA/600/R-95/136

b. Klemm, D.J., G.E. Morrison, T.J. Norberg-King, W.J. Peltier, and M.A. Heber. 1994. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Marine and Estuarine Organisms. U.S. EPA Report No. EPA-600-4-91-003.

c. SWRCB 1996. Procedures Manual for Conducting Toxicity Tests Developed by the Marine Bioassay Project. 96-1WQ.

d. Webber, C.I., W.B. Horning II, D.J. Klemm, T.W. Nieheisel, P.A. Lewis, E.L. Robinson, J. Menkedick and F. Kessler (eds). 1998. Short-term methods for estimating the chronic toxicity of effluents and receiving waters to marine and estuarine organisms. EPA/600/4-87/028.

Authorized dischargers shall conduct toxicity tests using effluent dilutions of 100%, 85%, 70%, 50%, and 25%. Dilution and control waters shall be obtained from an area of the receiving waters, typically upstream, which is unaffected by the discharge. Standard dilution water can be used, if the receiving water itself exhibits toxicity or if approved by the Regional Water Board. If the dilution water used in testing is different from the water in which the test organisms were cultured, a second control sample using culture water shall be tested.

The sensitivity of test organisms to a reference toxicant shall be determined concurrently with each bioassay and reported with the test results.

B. Toxicity Reporting

1. The Discharger shall include a full report of toxicity test results with the regular monthly monitoring report and include the following information.

a. toxicity test results,

b. dates of sample collection and initiation of each toxicity test, and

c. and/or chronic toxicity discharge limitations (or value).

2. Toxicity test results shall be reported according to the appropriate guidance - *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, Fifth Edition, U.S. EPA Office of Water, EPA-821-R-02-012 (2002) or the latest edition, or, EPA-821-R-02-012 (2002) or subsequent editions.

3. If the initial investigation TRE workplan is used to determine that additional (accelerated) toxicity testing is unnecessary, these results shall be submitted with the monitoring report for the month in which investigations conducted under the TRE workplan occurred.

4. Within 14 days of receipt of test results exceeding the chronic toxicity discharge limitation, the Discharger shall provide written notification to the Executive Officer of:

   a. Findings of the TRE or other investigation to identify the cause(s) of toxicity,

   b. Actions the Discharger has taken/will take, to mitigate the impact of the discharge and to prevent the recurrence of toxicity. When corrective actions, including TRE, have not been completed, a schedule under which corrective actions will be implemented, or the reason for not taking corrective action, if no action has been taken.

VI. LAND DISCHARGE MONITORING REQUIREMENTS

This section of the standardized permit form is not applicable.

VIII. RECEIVING WATER MONITORING REQUIREMENTS – SURFACE WATER AND GROUNDWATER

This section of the standardized permit form is not applicable.

IX. OTHER MONITORING REQUIREMENTS

A. Video Tape Survey of Diffuser and Diffuser Area

A video tape reconnaissance survey of the diffuser and diffuser area shall be conducted annually. Surveys shall occur during periods of safe diving conditions and water clarity conducive to good video taping. The surveys shall include the diffuser and bottom area within at least 20 feet on each side of the diffuser. The videotape shall be submitted to the Regional Water Board and shall be accompanied by a diver narrative describing bottom conditions, any fish or macroinvertebrates, and any apparent effects of the diffuser and outfall system.

X. REPORTING REQUIREMENTS

A. General Monitoring and Reporting Requirements

1. The Discharger shall comply with all Standard Provisions (Attachment D) related to monitoring, reporting, and recordkeeping.

2. If there is no discharge during any reporting period, the report shall so state.

3. Each monitoring report shall contain a separate section titled "Summary of Non-Compliance" which discusses the compliance record and corrective actions taken or planned that may be needed to bring the discharge into full compliance with waste discharge requirements. This section shall clearly list all non-compliance with waste discharge requirements, as well as all excursions of effluent limitations.

4. The Discharger shall inform the Regional Water Board well in advance of any proposed construction activity that could potentially affect compliance with applicable requirements

5. The Discharger shall report the results of chronic toxicity testing, TRE and TIE as required in the Attachment E, Monitoring and Reporting, Section V.G.

B. Self Monitoring Reports (SMRs)

1. At any time during the term of this permit, the State or Regional Water Board may notify the Discharger to electronically submit SMRs using the State Water Board's California Integrated Water Quality System (CIWQS) Program Web site (http://www.waterboards.ca.gov/ciwqs/index.html). Until such notification is given, the Discharger shall submit hard copy SMRs. The CIWQS Website will provide additional directions for SMR submittal in the event there will be service interruption for electronic submittal.

2. The Discharger shall report in the SMR the results for all monitoring specified in this MRP under sections III through IX. The Discharger shall submit monthly SMRs including the results of all required monitoring using USEPA-approved test methods or other test methods specified in this Order. If the Discharger monitors any pollutants more frequently than required by this Order, the results of this monitoring shall be included in the calculations and reporting of the data submitted in the SMR.

3. Monitoring periods and reporting for all required monitoring shall be completed according to the following schedule:

Table E-5. Monitoring Periods and Reporting Schedule

Sampling Frequency	Monitoring Period Begins On…	Monitoring Period	SMR Due Date
Continuous	**May 9, 2009**	All	Submit with monthly SMR

Daily	**May 9, 2009**	(Midnight through 11:59 PM) or any 24-hour period that reasonably represents a calendar day for purposes of sampling.	Submit with monthly SMR
Monthly	First day of calendar month following permit effective date or on permit effective date if that date is first day of the month	1st day of calendar month through last day of calendar month	Submit with monthly SMR
Quarterly	Closest of January 1, April 1, July 1, or October 1 following (or on) permit effective date	January 1 through March 31 April 1 through June 30 July 1 through September 30 October 1 through December 31	Submit with next monthly SMR
Semiannually	Closest of January 1 or July 1 following (or on) permit effective date	January 1 through June 30 July 1 through December 31	Submit with monthly SMR
Annually	January 1 following (or on) permit effective date	January 1 through December 31	Submit with Annual Report

4. The Discharger shall report with each sample result the applicable Minimum Level (ML) and the current Method Detection Limit (MDL), as determined by the procedure in 40 CFR Part 136.

   a. Sample results greater than or equal to the reported ML shall be reported as measured by the laboratory (i.e., the measured chemical concentration in the sample).

   b. Sample results less than the reported ML, but greater than or equal to the laboratory's MDL, shall be reported as "Detected, but Not Qualified," or DNQ. The estimated chemical concentration of the sample shall also be reported.

      For the purposes of data collection, the laboratory shall write the estimated chemical concentration next to the DNQ as well as the words "Estimated Concentration" (may be shortened to "Est. Conc."). The laboratory may, if such information is available, include numerical estimates of the data quality for the reported result. Numerical estimates of data quality may be percent accuracy (± a percentage of the reported value), numerical ranges (low to high), or any other means considered appropriate by the laboratory.

   c. Sample results less than the laboratory's MDL shall be reported as "Not Detected", or ND.

   d. Dischargers are to instruct laboratories to establish calibration standards so that the ML value (or its equivalent if there is a differential treatment of samples relative to calibration standards) is the lowest calibration standard. At no time is the Discharger to use analytical data derived from *extrapolation* beyond the lowest point of the calibration curve.

5. The Discharger shall submit SMRs in accordance with the following requirements:

a. The Discharger shall arrange all reported data in a tabular format. The data shall be summarized to clearly illustrate whether the facility is operating in compliance with interim and/or final effluent limitations. The Discharger is not required to duplicate the submittal of data that is entered in a tabular format within CIWQS. When electronic submittal of data is required and CIWQS does not provide for entry into a tabular format within the system, the Discharger shall electronically submit the data in a tabular format as an attachment.

b. The Discharger shall attach a cover letter to the SMR. The information contained in the cover letter shall clearly identify violations of the WDRs; discuss corrective actions taken or planned; and the proposed time schedule for corrective actions. Identified violations must include a description of the requirement that was violated and a description of the violation.

c. SMRs must be submitted to the Regional Water Board, signed and certified as required by the Standard Provisions (Attachment D), to the address listed below:

Central Coast Regional Water Quality Control Board
895 Aerovista Place, Suite 101
San Luis Obispo, California 93401

6. An Annual Self Monitoring Report shall be due on February 1 following each calendar year and shall include:

a, All data required by this MRP for the corresponding monitoring period, including appropriate calculations to verify compliance with effluent limitations.

b. A discussion of any incident of non-compliance and corrective actions taken.

C. Discharge Monitoring Reports (DMRs)

1. As described in Section X.B.1 above, at any time during the term of this permit, the State or Regional Water Board may notify the Discharger to electronically submit SMRs that will satisfy federal requirements for submittal of Discharge Monitoring Reports (DMRs). Until such notification is given, the Discharger shall submit DMRs in accordance with the requirements described below.

2. DMRs must be signed and certified as required by the standard provisions (Attachment D). The Discharger shall submit the original DMR and one copy of the DMR to the address listed below.

Standard Mail
State Water Resources Control Board
Division of Water Quality
c/o DMR Processing Center
PO Box 100
Sacramento, CA 95812-1000

Fed Ex / UPS / Other Private Carrier
State Water Resources Control Board
Division of Water Quality
c/o DMR Processing Center
1001 I Street, 15th Floor
Sacramento, CA 95814

3. All discharge monitoring results must be reported on the official USEPA pre-printed DMR forms (EPA Form 3320-1). Forms that are self-generated will not be accepted unless they follow the exact same format of EPA Form 3320-1.

D. Other Reports

1. The Discharger shall report the results of any special monitoring, TREs, or other data or information that results from the Special Provisions, Section VI.C, of the Order. The Discharger shall submit such reports with the first monthly SMR scheduled to be submitted on or immediately following the report due date.

2. Notifications. To help coordinate ongoing project review by the Central Coast Water Board and California Coastal Commission, data and reports submitted to the Central Coast Water Board as part of this Order shall also be submitted to the individual listed below:

Tom Luster
California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, CA 94105

3. Notifications. The regulations for the Monterey Bay National Marine Sanctuary at 15 CFR Part 922.132 prohibit discharges from within the boundaries of the MBNMS. Discharges occurring outside the MBNMS that subsequently enter and injure Sanctuary resources or qualities are similarly prohibited. In order to protect the health of the MBNMS, the permittee must immediately notify the MBNMS office at 888-902-2778 for any spills that are likely to enter ocean waters. In addition to facilitating potential enforcement investigations, the MBNMS seeks to track this information in order to evaluate existing and direct the implementation of new management measures. The Discharger shall send annual reports to MBNMS staff and notify MBNMS staff prior to changes in Facility Design Flow, specifically, before going to Permit Phase 2 and Permit Phase 3. All correspondence shall be sent to the individual listed below:

Permit Coordinator
Monterey Bay National Marine Sanctuary
299 Foam Street Monterey, CA 93940

ATTACHMENT F – FACT SHEET – TABLE OF CONTENTS

LIST OF TABLES

ATTACHMENT F – FACT SHEET

As described in Section II of this Order, this Fact Sheet includes the legal requirements and technical rationale that serve as the basis for the requirements of this Order.

I. PERMIT INFORMATION

The following table summarizes administrative information related to the Facility.

Table F-1. Facility Information

WDID	3272006001
Discharger	Moss Landing Commercial Park and Moss Landing Cement Company, LLC
Name of Facility	Moss Landing Cement Company Facility
Facility Address	7697 Highway 1
	Moss Landing, CA 95039
	Monterey County
Facility Contact, Title and Phone	Sam Bose, Director of Operations (408) 340-4600 Brent Constantz, Managing Member (408) 340-4600
Authorized Person to Sign and Submit Reports	Sam Bose, Director of Operations (408) 340-4600
Mailing Address	PO Box 777, Moss Landing, CA 95039
Billing Address	PO Box 777, Moss Landing, CA 95039
Type of Facility	Green Cement Plant
Major or Minor Facility	Major
Threat to Water Quality	2
Complexity	B
Pretreatment Program	NA
Reclamation Requirements	NA
Facility Permitted Flow	Phase 1 = 0.04 million gallons per day (mgd) (daily average), 0.05 mgd (daily maximum) Phase 2 = 24 mgd (daily average), 25 mgd (daily maximum) Phase 3 = 56 mgd (daily average), 60 mgd (daily maximum)
Facility Design Flow	Phase 1 = 0.04 mgd (daily average), 0.05 mgd (daily maximum) Phase 2 = 24 mgd (daily average), 25 mgd (daily maximum) Phase 3 = 56 mgd (daily average), 60 mgd (daily maximum)
Watershed	NA
Receiving Water	Pacific Ocean (Monterey Bay)
Receiving Water Type	Pacific Ocean

A. Moss Landing Cement Company, LLC is the operator of the Moss Landing Cement Company Plant. Moss Landing Commercial Park, LLC owns the property at 7697 Highway 1, Moss Landing, CA, on which the facility is located. Together Moss Landing Cement Company, LLC and Moss Landing Commercial Park, LLC are referred to as the Discharger. The facility extracts calcium and magnesium from seawater and by precipitation processes produces cement or an intermediate product for the production of cement.

For the purposes of this Order, references to the "discharger" or "permittee" in applicable federal and state laws, regulations, plans, or policy are held to be equivalent to references to the Discharger herein.

B. The facility is a green cement plant, which is operated at the location of the former National Refractories and Minerals Corporation cement plant and discharges calcium and magnesium depleted seawater to Monterey Bay within the Monterey Bay National Marine Sanctuary (waters of the United States).

C. The Discharger filed a Report of Waste Discharge and submitted an application to renew the facility's Waste Discharge Requirements (WDRs) and National Pollutant Discharge Elimination System (NPDES) permit on May 9, 2008. A site visit to assist with development of this Order was conducted on September 25, 2008.

II. FACILITY DESCRIPTION

A. Description of Wastewater and Treatment or Controls

Seawater is pumped from Moss Landing Harbor by up to nine 100-horsepower pumps through two intake lines to the facility. Seawater, which contains calcium chloride and magnesium chloride ($CaCl_2$ and $MgCl_2$), is combined with dolime, lime, brucite (magnesium hydroxide tailings from historical operations of the National Refractories and Minerals Corporation), sodium hydroxide, sodium carbonate, fly ash, and/or calcium and magnesium-bearing silicate materials such as olivine and serpentine. The Discharger's precipitation process also utilizes carbon dioxide (CO_2), sparged from flue gases of the neighboring Moss Landing Power Plant. Following precipitating reactions, the seawater mixture will be directed to as many as seven 3-million gallon (capacity) tanks where settling of precipitated solids will occur. Settled material will be dried to be sold to the construction industry as green cement or as a cement supplement. Calcium and magnesium depleted seawater, decanted from the thickening tanks, will be discharged back to Monterey Bay through Discharge Point 001.

If necessary, chlorine can be added at the seawater intake to prevent microbiological fouling. No scale inhibitors, chelants, or other cleaning compounds will be used. In the event of plant shut down, intake pumps can be shut off and flow within the plant will be held in one or more of the on-site ponds. Well water may be used for washing production equipment.

Initially, the Discharger plans to operate a pilot-scale operation with a daily average discharge of 0.04 mgd and a daily maximum discharge of 0.05 mgd. This Phase 1 operation will be followed by a prototype operation with a daily maximum discharge of 25 mgd, and ultimately, by a full-scale operation with discharge of up to 60 mgd. Modifications to operational procedures and equipment will likely be required after Phase 1 and/or Phase 2 based on the experience of the earlier phases of operation.

This facility and its discharge will be similar to that of the National Refractories and Minerals Corporation which has occupied the same location. Both operations extract minerals from seawater for the manufacture of cement, with a difference being the use of carbon dioxide from an external source by the Moss Landing Cement Company.

Only the discharge of calcium and magnesium depleted seawater will occur under this permit. The previous permit also authorized the discharge of domestic wastewater and industrial storm water. Neither of the two latter sources is addressed in this permit. Domestic wastewater generated at the Moss Landing Commercial Park will be treated in a septic system and leach field. Discharge of storm water must be authorized by State Water Resources Control Board's Water Quality Order 97-03-DWQ, NPDES General Permit No. CAS000001 (*Waste Discharge Requirements for Discharges of Storm Water Associated with Industrial Activities Excluding Construction Activities*).

Water Board staff evaluated the potential effects of entrainment and impingement using a volumetric approach that compared the Moss Landing Cement Plant project to previous 316(b) studies at the adjacent Moss Landing Power Plant (MLPP). The proposed discharge in Phase 1 (maximum flow 0.05 mgd or 35 gpm) would have a flow about 24,500 times lower than the combined maximum intake volume of the MLPP cooling water system (approximately 1226 MGD). For comparison to the maximum Phase 1 flow of 35 gpm, the circulating pump on a standard small V8 GM-based sterndrive engine uses approximately 50 gpm of Moss Landing Harbor seawater for cooling. The proposed maximum discharge flows in Phase 2 (maximum flow 25 mgd) and Phase 3 (maximum flow 60 mgd) would have flows about 49 and 20 times lower, respectively, than the combined maximum intake volume of the MLPP cooling water system. Based on review of entrainment modeling studies (Fecundity Hind casting, Adult Equivalent Losses, and Empirical Transport Model) at MLPP, the relatively low flows of Moss Landing Harbor water through the Moss Landing Cement Plant would have negligible potential impingement and entrainment impacts.

B. Discharge Points and Receiving Waters

Wastewater is discharged from Discharge Point 001 to the Monterey Bay near Moss Landing Harbor, waters of the United States, through a 620-foot (189 m), 51-inch (inside diameter) outfall/diffuser system. The last 130 feet of pipe consists of a diffuser section, which has 32 nozzles placed to gradually diffuse the discharge to the ocean environs.

The Discharger's diffuser sustained damages during the 1989 Loma Prieta earthquake. Studies conducted by the Moss Landing Marine Laboratories at that time determined there is low potential for significant environmental impact because of the damage. The outfall/diffuser system is visually inspected on an annual basis during normal operations. The Discharger continues to use the existing outfall/diffuser system without repair. The minimum initial dilution factor was determined to be 33:1 (seawater: effluent). The Discharger currently allows the Moss Landing Marine Laboratories and Monterey Bay Aquarium Research Institute to use its outfall. These dischargers are not subject to or authorized to discharge pursuant to this Order. Similarly, this Order does not authorize discharges to Monterey Bay, via Discharge Point 001, by any tenant of the Moss Landing Commercial Park other than the Moss Landing Cement Company, LLC. The Discharger has established and will maintain an effluent compliance monitoring location that is prior to any other sources entering the outfall line.

The receiving water for this discharge is part of the Monterey Bay National Marine Sanctuary, designated as such on September 15, 1992. The purpose of the National

Marine Sanctuaries Program is to protect areas of the marine environment which possess conservation, recreational, ecological, historical, research, educational, or aesthetic qualities of special national significance. The first priority of the Program is the long-term protection of resources within designated sanctuaries. The Monterey Bay Sanctuary has been recognized for its unique and diverse biological and physical characteristics.

C. Summary of Existing Requirements and Self-Monitoring Report (SMR) Data

Effluent limits contained in the previous Order for Discharge Point 001 are presented in the following tables.

Table F-2. Effluent Limitations for Conventional and Non-Conventional Pollutants

Parameter	Units	Effluent Limitations		
		Average Monthly	Average Weekly	Daily Maximum
TSS	mg/L	60	--	90
	lb/day	30,000		45,000
Oil & Grease	mg/L	25	40	75
Settleable Solids	mL/L	1.0	1.5	3.0
Turbidity	NTU	75	100	225
Acute Toxicity	TUa	1.5	2.0	2.5
pH	pH Units	6.0 – 9.0		

Table F-3. Effluent Limitations for Toxic Pollutants for the Protection of Marine Aquatic Life

Pollutant	Unit	6-Month Median	Daily Maximum	Instantaneous Maximum
Arsenic	mg/L	0.2	0.99	2.6
Cadmium	mg/L	0.03	0.2	0.34
Chromium (+6)	mg/L	0.07	0.3	0.68
Copper	mg/L	0.04	0.34	0.95
Lead	mg/L	0.07	0.3	0.68
Mercury	mg/L	1.0	5.4	13.0
Nickel	mg/L	0.2	0.68	1.7
Selenium	mg/L	0.51	2.0	5.1
Silver	mg/L	0.02	0.09	0.23
Zinc	mg/L	0.4	2.5	6.5
Cyanide	mg/L	0.17	0.68	1.7
Total Residual Chlorine	mg/L	0.07	0.3	2.0
Ammonia (as N)	mg/L	20.4	81.6	204.0
Chronic Toxicity	TUc	---	34.0	---
Phenolic Compounds (non-chlorinated)	mg/L	1.0	4.08	10.2
Chlorinated Phenolics	mg/L	0.03	0.14	0.34
Endosulfan	µg/L	0.3	0.61	0.92
Endrin	µg/L	0.07	0.14	0.20
HCH	µg/L	0.14	0.27	0.41

Pollutant	Unit	6-Month Median	Daily Maximum	Instantaneous Maximum
Radioactivity	Not to exceed limits specified in Title 17, Division 1, Chapter 5, Subchapter 4, Group 3, Article 3, Section 30253 of the California Code of Regulations. Reference to Section 30253 is prospective, including future changes to any incorporated provisions of federal law, as the changes take effect.			

Table F-4. Effluent Limitations for Toxic Pollutants for the Protection of Human Health (Non-Carcinogens)

Pollutant	Unit	30-day Average
Acrolein	mg/L	7.5
Antimony	mg/L	41.0
Bis(2-Chloroethoxy)Methane	mg/L	0.15
Bis(2-Chloroisopropyl)Ether	mg/L	41.0
Chlorobenzene	mg/L	19.0
Chromium (III)	g/L	6.5
Di-n-Butyl Phthalate	g/L	0.12
Dichlorobenzenes [1]	g/L	0.18
1,1-Dichloroethylene	g/L	0.24
Diethyl Phthalate	g/L	1.1
Dimethyl Phthalate	g/L	28.0
4,6-Dinitro-2-methylphenol	mg/L	7.5
2,4-Dinitrophenol	mg/L	0.14
Ethylbenzene	g/L	0.14
Fluoranthene	mg/L	0.51
Hexachlorocyclopentadiene	mg/L	2.0
Isophorone	µg/L	5.1
Nitrobenzene	mg/L	0.17
Thallium	mg/L	0.48
Toluene	µg/L	2.9
1,1,2,2-Tetrachloroethane	µg/L	0.041
Tributylin	µg/L	0.048
1,1,1-Trichloroethane	µg/L	18.0
1,1,2-Trichloroethane	µg/L	1.5

Table F-5. Effluent Limitations for Toxic pollutants for the Protection of Human Health (Carcinogens)

Pollutant	Unit	30-day Average
Acrylonitrile	µg/L	3.4
Aldrin	ng/L	0.75
Benzene	mg/L	0.20
Benzidine	ng/L	2.3
Beryllium	µg/L	1.1
Bis(2-chloroethyl) ether	µg/L	1.5
Bis(2-ethylhexyl) phthalate	mg/L	0.12

Pollutant	Unit	30-day Average
Carbon Tetrachloride	mg/L	0.031
Chlordane	ng/L	0.78
Chloroform	mg/L	4.4
DDT	ng/L	5.8
1,4-Dichlorobenzene	mg/L	0.61
3,3-Dichlorobenzidine	µg/L	0.28
1,2-Dichloroethane	mg/L	4.4
Dichloromethane	mg/L	15.0
1,3-Dichloropropene	mg/L	0.30
Dieldrin	µg/L	1.4
2,4-Dinitrotoluene	mg/L	0.088
1,2-Diphenylhydrazine	µg/L	5.4
Halomethanes	mg/L	4.4
Heptachlor	µg/L	0.024
Hexachlorobenzene	ng/L	7.1
Hexachlorobutadiene	mg/L	0.48
Hexachloroethane	mg/L	0.085
N-nitrosodimethylamine	mg/L	0.25
N-nitrosodiphenylamine	mg/L	0.085
PAHs	µg/L	0.30
PCBs	ng/L	0.65
TCDD Equivalents	ng/L	0.13
Tetrachloroethylene	mg/L	3.4
Toxaphene	ng/L	7.1
Trichloroethylene	mg/L	0.92
2,4,6-Trichlorophenol	µg/L	9.9
Vinyl Chloride	mg/L	1.2

D. Compliance Summary

There has been no discharge from this facility since 2001.

E. Planned Changes

The Discharger intends to resume operations at this facility in three phases of operation, with Phase 3, the intended long-term mode of operation, to be accomplished during the anticipated five-year term of this Order. Phase 1 of operations will be a pilot scale operation and will result in a daily average discharge rate of 0.04 mgd and a daily maximum discharge rate of 0.05 mgd. Phase 2 will result in daily average and daily maximum discharge rates of 24 and 25 mgd; and Phase 3 will result in a daily average and daily maximum discharge rates of 56 and 60 mgd, respectively. There is no set schedule for initiation of Phases 2 and 3; however, the Discharger expects to be in Phase 3 of operations during the five-year term of this Order.

Section VI. C. 6. b of this Order establishes a requirement for the Discharger to perform a Discharge Characterization Study during Phase 1 of operations. The Regional Water Board must review results of this study and provide written confirmation to the Discharger that characteristics of the discharge are as contemplated by this Order before the Discharger will become authorized to discharge in its Phase 2 of operations.

III. APPLICABLE PLANS, POLICIES, AND REGULATIONS

The requirements contained in the proposed Order are based on the requirements and authorities described in this section.

A. Legal Authorities

This Order is issued pursuant to the federal Clean Water Act (CWA) section 402 and implementing regulations adopted by the USEPA, and Chapter 5.5, Division 7 of the California Water Code (CWC). It shall serve as an NPDES permit for point source discharges from this facility to surface waters. This Order also serves as WDRs pursuant to CWC Article 4, Chapter 4, Division 7.

B. California Environmental Quality Act (CEQA)

Pursuant to California Water Code section 13389, this action to adopt an NPDES permit is exempt from the provisions of CEQA, Public Resources Code sections 21100-21177.

C. State and Federal Regulations, Policies, and Plans

1. **Water Quality Control Plans.** The Regional Water Board has adopted a *Water Quality Control Plan for the Central Coast Region* (the Basin Plan) that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters within the Region. To address ocean waters, the Basin Plan incorporates by reference the *Water Quality Control Plan for Ocean Waters of California* (the Ocean Plan), which was adopted in 1972 and amended in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The most recent amendment to the Ocean Plan was adopted by the State Water Resources Control Board (the State Water Board) on April 21, 2005, and became effective on February 14, 2006.

   The Basin Plan implements State Water Board Resolution No. 88-63, which establishes State policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply (MUN). Because of very high levels of total dissolved solids (TDS) in marine waters, the receiving waters for discharges from the Moss Landing Cement Company facility meet an exception to Resolution No. 88-63, which precludes waters with TDS levels greater than 3,000 mg/L from the MUN designation. Beneficial uses established by the Basin Plan and the Ocean Plan for the coastal waters between Soquel Point and the Salinas River, including Monterey Bay, are described in section II. H of the Order.

   Requirements of this Order implement the Basin Plan and Ocean Plan.

2. **Thermal Plan.** The State Water Board adopted a *Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Water and Enclosed Bays and Estuaries of California* (Thermal Plan) on May 18, 1972, and amended this plan on September 18, 1975. This plan contains the following temperature objective for existing discharges to enclosed bays and coastal waters of California.

   Elevated temperature waste discharges shall comply with limitations necessary to assure protection of beneficial uses.

   The Ocean Plan defines elevated temperature wastes as:

   Liquid, solid, or gaseous material discharged at a temperature higher than the natural temperature of receiving water.

3. **California Ocean Plan**. The State Water Board adopted the *Water Quality Control Plan for Ocean Waters of California, California Ocean Plan* (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21. 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the Pacific Ocean.

4. **Alaska Rule.** On March 30, 2000, USEPA revised its regulation that specifies when new and revised state and tribal water quality standards become effective for CWA purposes. [65 Fed. Reg. 24641 (April 27, 2000), codified at 40 CFR 131.21] Under the revised regulation (also known as the Alaska Rule), new and revised standards submitted to USEPA after May 30, 2000 must be approved by USEPA before being used for CWA purposes. The final rule also provides that standards already in effect and submitted to USEPA by May 30, 2000, may be used for CWA purposes, whether or not approved by USEPA.

5. **Antidegradation Policy.** NPDES regulations at 40 CFR 131.12 require that State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16, which incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that the existing quality of waters be maintained unless degradation is justified based on specific findings. The Regional Water Board's Basin Plan implements and incorporates by reference both the State and federal antidegradation policies. The permitted discharge is consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16.

6. **Anti-Backsliding Requirements.** Sections 402(o)(2) and 303(d)(4) of the Clean Water Act (CWA) and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require that effluent limitations in a reissued permit must be as stringent as those in the previous permit, with some exceptions in which limitations may be relaxed.

D. Impaired Water Bodies on CWA 303 (d) List

CWA section 303 (d) requires states to identify specific water bodies where water quality standards are not expected to be met after implementation of technology-based effluent limitations on point sources. For all 303 (d) listed water bodies and pollutants, the Regional Water Board must develop and implement TMDLs (Total Maximum Daily Loads) that will specify WLAs (Waste Load Allocations) for point sources and Load Allocations for non-point sources.

The State's 2006 303(d) list of impaired water bodies, which was approved by USEPA in June 2007, does not identify Monterey Bay in the vicinity of the discharge as impaired.

E. Other Plans Policies and Regulations

1. **Discharges of Storm Water.** For the control of storm water discharged from the site of the facility, the Order requires, if applicable, the Discharger to seek authorization to discharge under and meet the requirements of the State Water Resources Control Board's Water Quality Order 97-03-DWQ, NPDES General Permit No. CAS000001 (*Waste Discharge Requirements for Discharges of Storm Water Associated with Industrial Activities Excluding Construction Activities*).

IV. RATIONALE FOR EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

The CWA requires point source dischargers to control the amount of conventional, non-conventional, and toxic pollutants that are discharged into the waters of the United States. The control of pollutants discharged is established through effluent limitations and other requirements in NPDES permits. NPDES regulations establish two principal bases for effluent limitations. At 40 CFR 122.44 (a) permits are required to include applicable technology-based limitations and standards; and at 40 CFR 122.44 (d) permits are required to include water quality-based effluent limitations (WQBELs) to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water. When numeric water quality objectives have not been established, but a discharge has the reasonable potential to cause or contribute to an excursion above a narrative criterion, WQBELs may be established using one or more of three methods described at 40 CFR 122.44 (d) - (1) WQBELs may be established using a calculated water quality criterion derived from a proposed State criterion or an explicit State policy or regulation interpreting its narrative criterion; 2) WQBELs may be established on a case-by-case basis using USEPA criteria guidance published under CWA Section 304 (a); or 3) WQBELs may be established using an indicator parameter for the pollutant of concern.

A. Discharge Prohibitions

1. Discharge Prohibition III. A (No discharge to Monterey Bay at a location other than as described by the Order). The Order authorizes a single, specific point of discharge to Monterey Bay; and this prohibition reflects CWA section 402's prohibition against discharges of pollutants except in compliance with the Act's permit requirements, effluent limitations, and other enumerated provisions. This prohibition is also retained from the previous permit.

2. Discharge Prohibition III. B (Discharges in a manner, except as described by the Order, are prohibited). Because limitations and conditions of the Order have been prepared based on specific information provided by the Discharger and specific wastes described by the Discharger, the limitations and conditions of the Order do not adequately address waste streams not contemplated during drafting of the Order. To prevent the discharge of such waste streams that may be inadequately regulated, the Order prohibits the discharge of any waste that was not described to and contemplated by the Regional Water Board during the process of permit reissuance.

3. Discharge Prohibition III. C. (Discharges to Monterey Bay shall not exceed defined maximum discharge rates). As limitations and conditions of the Order have been prepared based on specific information provided by the Discharger and specific wastes described by the Discharger, the limitations and conditions of the Order may not adequately address waste streams that were not contemplated during drafting of the Order. In particular, section VI. C. 6. b of the Order requires the Discharger to more fully characterize its discharge; and through review of that characterization data, the Regional Water Board will need to confirm its understanding of the character of the discharge before it will authorize a discharge at the higher Phase 2 rate.

4. Discharge Prohibition III. D. (Discharge of any radiological, chemical, or biological warfare agent or high level radioactive waste is prohibited). This prohibition restates a discharge prohibition established in section III. H. of the Ocean Plan.

5. Discharge Prohibition III. E. (Discharge of sludge or sludge digester supernatant to the Ocean is prohibited). This prohibition restates a discharge prohibition established in section III. H. of the Ocean Plan.

6. Discharge Prohibition III. F (Overflows and bypasses prohibited). The discharge of untreated or partially treated wastewater from the Discharger's collection, treatment, or disposal facilities represents an unauthorized bypass pursuant to 40 CFR 122.41 (m), or an unauthorized discharge, which poses a threat to human health and/or aquatic life, and therefore, is explicitly prohibited by the Order.

7. Discharge Prohibition III.G. (Discharge of domestic wastewater is prohibited). Based on information provided by the Discharger, the Regional Water Board understands that there will be no component of domestic wastewater in discharges from this facility. This prohibition acknowledges that understanding and provides protection of the receiving water, as the Regional Water Board has not included other common limitations and conditions in the Order for the control of domestic wastewater.

8. Discharge Prohibition III.H. (Discharge of storm water is prohibited). Based on information provided by the Discharger, the Regional Water Board understands that there will be no storm water component in discharges from this facility. This prohibition acknowledges that understanding and provides protection for the receiving water, as the Regional Water Board has not included other common limitations and conditions in the Order for the control of storm water.

9. Discharge Prohibition III.I. (Discharge of chemical additives is prohibited). Based on information provided by the Discharger, the Regional Water Board understands that no chemicals will be added to the discharge, except for dolomite, lime, and other similar inorganic materials. The Regional Water Board also understands that no organic (carbon containing) materials, except carbon dioxide and carbonate ion, will be added to the discharge. This prohibition acknowledges the Regional Water Board's understanding that a very limited number of similar inorganic materials can be introduced to the facility's discharge and provides protection for the receiving water, as the Regional Water Board has not included limitations and conditions in the Order for the control of such chemical additives.

10. Discharge Prohibition III.J. (Discharge of wastewater containing added coloration is prohibited). Based on information provided by the Discharger, the Regional Water Board understands that the discharge will be of the same color as incoming seawater. Because the facility's process of removing calcium and magnesium from seawater relies on precipitation reactions, this prohibition is meant to prohibit carryover of precipitated solids in the discharge, as well as post-precipitation reactions that could cause coloration of the receiving water in the vicinity of the outfall.

11. Discharge Prohibition III. K. (Discharge of wastewater to receiving water at a temperature that adversely affects beneficial uses is prohibited.) Based on information provided by the Discharger, the Regional Water Board understands that the temperature of seawater will not be significantly raised as it moves from the intake location to the facility's outfall in Monterey Bay within the Monterey Bay National Marine Sanctuary. The Thermal Plan requires that such discharges do not cause natural water temperature to increase to assure protection of the beneficial uses. Based on the Discharger's description of its process, and based generally on the objectives of the Thermal Plan, the Regional Water Board has established this prohibition to prevent thermal impacts to the receiving water.

B. Technology-Based Effluent Limitations

1. Scope and Authority

NPDES regulations at 40 CFR 122.44 (a) require that permits include applicable technology-based limitations and standards. Where the USEPA has not yet developed technology based standards for a particular industry or a particular pollutant, CWA Section 402 (a) (1) and USEPA regulations at 40 CFR 125.3 authorize the use of best professional judgment (BPJ) to derive technology-based effluent limitations on a case-by-case basis. When BPJ is used, the permit writer must consider specific factors outlined at 40 CFR 125.3.

The State Water Board, in Table A of the Ocean Plan, has also established technology based requirements for conventional pollutants (suspended and settleable matter, oil and grease, turbidity, and pH), which are applicable to this facility as an industrial discharger for which Effluent Limitations Guidelines have not been established.

2. Applicable Technology-Based Effluent Limitations

Technology-based effluent limitations applicable to Discharge Point 001 during Phases 1, 2, and 3 and established by the Order are summarized as follows.

Table F-6. Summary of Technology-Based Effluent Limitations

Parameter	Units	Monthly 30-Day Average	Weekly 7-Day Average	Instantaneous Maximum
Oil and Grease	mg/L	25	40	75
Settleable Solids	ml/L	1.0	1.5	3.0
TSS	mg/L	60 [1]	--	--
Turbidity	NTU	75	100	225
pH	s.u.	Within 6.0 to 9.0 at all times		

[1] Discharger shall, as a 30-day average, remove 75% of suspended solids from the influent stream before discharging wastewaters to the ocean, except that the effluent limitation to be met shall not be lower then 60 mg/L.

C. Water Quality-Based Effluent Limitations (WQBELs)

1. Scope and Authority

NPDES regulations at 40 CFR 122.44 (d) require that permits include limitations more stringent than applicable federal technology-based requirements where necessary to achieve applicable water quality standards, including numeric and narrative objectives within a standard.

The process for determining “reasonable potential” for discharges to cause or contribute to an exceedance of a water quality standard and for calculating WQBELs, when necessary, is intended to protect the designated uses of receiving waters as specified in the Basin and Ocean Plans, and achieve applicable water quality objectives and criteria that are contained in the Basin Plan and in other applicable State and federal rules, plans, and policies, including applicable water quality criteria from the Ocean Plan.

Where reasonable potential has been established for a pollutant, but there is no numeric criterion or objective for the pollutant, WQBELs must be established in accordance with the requirements of 40 CFR 122.44 (d) (1) (vi), using (1) USEPA criteria guidance under CWA section 304 (a), supplemented where necessary by other relevant information; (2) an indicator parameter for the pollutant of concern; or (3) a calculated numeric water quality criterion, such as a proposed state criterion or policy interpreting the state’s narrative criterion, supplemented with other relevant information.

2. Applicable Beneficial Uses and Water Quality Criteria and Objectives

Beneficial uses for ocean waters of the Central Coast Region are established by the Basin Plan and the Ocean Plan and are described by Section II. (Findings) H of the Order.

Water quality criteria applicable to ocean waters of the Region are established by the Ocean Plan, which includes water quality objectives for bacterial characteristics, physical characteristics, chemical characteristics, biological characteristics, and radioactivity. The water quality objectives from the Ocean Plan are incorporated as receiving water limitations into this Order. In addition, Table B of the Ocean Plan contains numeric water quality objectives for 83 toxic pollutants for the protection of marine aquatic life and human health.

3. Determining the Need for WQBELs

Procedures for performing a Reasonable Potential Analysis (RPA) for ocean dischargers are described in Section III. C. and Appendix VI. of the Ocean Plan. The typical procedure is a statistical method that projects an effluent data set that accounts for long term variability of pollutants in the effluent, limitations associated with sparse data sets, and uncertainty associated with censored data sets. The procedure assumes a lognormal distribution of an existing effluent data set, and compares the 95th percentile concentration, at a 95 percent confidence level, with the applicable water quality criterion from Table B of the Ocean Plan. A finding of reasonable potential results when the 95th percentile concentration exceeds the applicable criterion.

When effluent data are not available, as in the circumstances of this facility, the Regional Water Board may decide that WQBELs are necessary after a review of such information as the facility or discharge type, solids loading, lack of dilution, potential toxic effects, fish tissue data, 303 (d) status of the receiving water, or the presence of threatened or endangered species or their critical habitat, or other information.

Without recent effluent data, the Regional Water Board has determined that effluent limitations from the previous permit for all Ocean Plan Table B toxic pollutants will be retained but will be updated in this Order to reflect changes in water quality criteria established by the current (2005) Ocean Plan. The importance given to certain of the Table B pollutants (e.g., chlorine, whole effluent chronic toxicity, and the metals As, Cd, Cr^{+6}, Cu, Pb, Hg, Ni, Se, Ag, and Zn) by the Regional Water Board is reflected in the compliance monitoring frequencies established in the Monitoring and Reporting Program.

4. WQBEL Calculations

As described by Section III. C of the Ocean Plan, effluent limits for Table B pollutants are calculated according to the following equation.

$$Ce = Co + Dm (Co - Cs)$$

where:

Ce = the effluent limitation (µg/L)

Co = the water quality objective to be met at the completion of initial dilution (µg/L)
Cs = background seawater concentration
Dm = minimum probable initial dilution expressed as parts seawater per part wastewater

For this facility, Dm is unchanged from Order No. 01-030 (Dm = 33). Initial dilution is the process that results in the rapid and irreversible mixing of the discharge with ocean water at the outfall.

As site-specific water quality data are not available for the ambient water, in accordance with Table B implementing procedures, Cs equals zero for all pollutants, except the following:

Table F-7. Background Seawater Concentrations

Pollutant	Background Seawater Concentration (µg/L)
Arsenic	3
Copper	2
Mercury	0.0005
Silver	0.16
Zinc	8

Implementing provisions at Section III. C of the Ocean Plan requires that, in addition to concentration-based limits, effluent limitations for Table B pollutants be expressed in terms of mass. The Order therefore includes mass-based effluent limitations, which are based on flows of: 0.05, 25, and 60 mgd for Phases 1, 2, and 3 of operation, respectively.

Effluent limitations for the Table B pollutants are tabulated in Section IV. A. 1 of this Order.

5. Whole Effluent Toxicity (WET)

Whole effluent toxicity (WET) protects the receiving water quality from the aggregate toxic effect of a mixture of pollutants in the effluent. WET tests measure the degree of response of exposed aquatic test organisms to an effluent. The WET approach allows for protection of the narrative "no toxics in toxic amounts" criterion while implementing numeric criteria for toxicity. There are two types of WET tests: acute and chronic. An acute toxicity test is conducted over a short time period and measures mortality. A chronic toxicity test is conducted over a longer period of time and may measure mortality, reproduction, and growth.

Implementing provisions of section III. C. of the Ocean Plan express a preference for chronic toxicity limitations when the minimum initial dilution of a discharge is less than 100:1, and therefore, the Regional Water Board is establishing effluent limitations for chronic, not acute, whole effluent toxicity for the facility.

D. Final Effluent Limitations

Final, technology-based and water quality-based effluent limitations established by the Order are discussed in sections IV.B. and IV.C. of this fact sheet.

1. Satisfaction of Anti-Backsliding Requirements

The Order retains both technology and water quality based effluent limitations established by the previous permit, and therefore, applicable anti-backsliding provisions of the Clean Water Act and of NPDES regulations are satisfied.

2. Satisfaction of Antidegradation Policy

The Order does not authorize increases in the concentration or mass of pollutants discharged from the facility, and therefore, is consistent with applicable anti-degradation policy expressed by NPDES regulations at 40 CFR 131.12 and by State Water Board Resolution No. 68-16.

3. Stringency of Requirements for Individual Pollutants

This Order contains both technology-based and water quality-based effluent limitations for individual pollutants. The technology-based effluent limitations consist of restrictions on TSS, settleable solids, turbidity; oil and grease, and pH. Restrictions on these pollutants are discussed in section IV. B of the Fact Sheet. In addition, this Order contains effluent limitations more stringent than the minimum, technology-based requirements that are necessary to meet water quality standards. These limitations are not more stringent than required by the CWA.

Final, technology and water quality-based effluent limitations are summarized in sections IV. A of the Order.

E. Interim Effluent Limitations

The Order does not establish interim effluent limitations and schedules for compliance with final limitations. Interim limitations are authorized only in certain circumstances, when immediate compliance with newly established final WQBELs is not feasible. Interim effluent limitations are not authorized for WQBELs, which are based on water quality criteria of the Ocean Plan.

F. Land Discharge Specifications

This section of the standardized permit is not applicable.

G. Reclamation Specifications

This section of the standardized permit is not applicable.

V. RATIONALE FOR RECEIVING WATER LIMITATIONS

A. Surface Water

Receiving water quality is a result of many factors, some unrelated to the discharge. This Order considers these factors and is designed to minimize the influence of the discharge on the receiving water. Receiving water limitations within the proposed Order generally include the receiving water limitations of the previous Order; however, these limitations have been supplemented and modified to reflect all applicable, general water quality objectives of the Ocean Plan (2005).

B. Groundwater

Groundwater limitations established by the Order include general objectives for groundwater established by the Basin Plan for the Central Coast Region.

VI. RATIONALE FOR MONITORING AND REPORTING REQUIREMENTS

NPDES regulations at 40 CFR 122.48 require all NPDES permits to specify recording and reporting of monitoring results. CWC sections 13267 and 13383 authorize the Water Boards to require technical and monitoring reports. The MRP, Attachment E of this Order, establishes monitoring and reporting requirements to implement federal and State requirements. Following is the rationale for the monitoring and reporting requirements contained in the MRP for this facility.

A. Influent Monitoring

Intake seawater monitoring is established by the Order for pH, temperature, turbidity, specific conductivity, settleable solids, TDS, and Ocean Plan Table B metals to allow comparison with effluent concentrations and thereby determine whether significant amounts of pollutants are being added to seawater that is discharged from the facility.

B. Effluent Monitoring

Effluent monitoring is required for all pollutants and pollutant parameters which have effluent limitations established in section IV.A. of the Order. In addition some effluent monitoring is required to provide further characterization of discharges from this facility.

C. Whole Effluent Toxicity Testing Requirements

Whole effluent toxicity (WET) protects the receiving water quality from the aggregate toxic effect of a mixture of pollutants in the effluent. A chronic toxicity test is conducted over a longer period of time and may measure mortality, reproduction, and growth. Section III. C. 3. c. (4) of the Ocean Plan requires dischargers to conduct chronic toxicity testing if the minimum initial dilution of the effluent is below 100:1. This Order includes routine monitoring requirements for chronic toxicity in the MRP (Attachment E) as specified in the Ocean Plan.

Chronic toxicity is to be calculated using the following formula:

$$TUc = \frac{100}{NOEL}$$

Where: No Observed Effect Level (NOEL) is expressed as the maximum percent effluent or receiving water that causes no observable effect on a test organism, as determined by the result of a critical life stage toxicity test as listed in Appendix II of the Ocean Plan.

D. Receiving Water Monitoring

1. Surface Water

The Order requires the Discharger to participate in a receiving water monitoring program. The Discharger has indicated a willingness to participate in a regional monitoring program in the Monterey Bay, such as CCLEAN. The receiving water monitoring program may be revised based on program development.

2. Groundwater

This section of the standardized permit template is not applicable.

E. Other Monitoring Requirements

1. Video Tape Survey of Diffuser and Diffuser Area

The requirements of this provision are retained from the previous permit. A video tape reconnaissance survey of the diffuser and diffuser area shall be conducted annually. Surveys shall occur during periods of safe diving conditions and water clarity conducive to good video taping. The surveys shall include the diffuser and bottom area within at least 20 feet on each side of the diffuser. The videotape shall be submitted to the Regional Water Board and shall be accompanied by a diver narrative describing bottom conditions, any fish or macroinvertebrates, and any apparent effects of the outfall.

VII. RATIONALE FOR PROVISIONS

A. Standard Provisions

Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment D to the Order.

NPDES regulations at 40 CFR 122.41 (a) (1) and (b - n) establish conditions that apply to all state-issued NPDES permits. These conditions must be incorporated into the permits either expressly or by reference. If incorporated by reference, a specific citation to the regulations must be included in the Order. 40 CFR 123.25 (a) (12) allows the State to omit or modify conditions to impose more stringent requirements. In accordance with 40 CFR123.25, this Order omits federal conditions that address enforcement authority

specified in 40 CFR 122.41 (j) (5) and (k) (2), because the enforcement authority under the Water Code is more stringent. In lieu of these conditions, this Order incorporates by reference Water Code section 13387 (e).

B. Special Provisions

1. Reopener Provisions

The Order may be modified in accordance with the requirements set forth at 40 CFR 122 and 124, to include appropriate conditions or limits based on newly available information, or to implement any new State water quality objectives that are approved by the USEPA. As effluent is further characterized through additional monitoring, and if a need for additional effluent limitations becomes apparent after additional effluent characterization, the Order will be reopened to incorporate such limitations.

2. Special Studies and Additional Monitoring Requirements

The Order requires the facility to maintain a Toxicity Reduction Work Plan. When toxicity monitoring measures chronic toxicity above the effluent limitation established by the Order, the Discharger is required to resample and retest. When all monitoring results are available, the Executive Officer can determine whether to initiate enforcement action, whether to require the Discharger to implement toxicity reduction evaluation (TRE) requirements, or whether other measures are warranted.

3. Best Management Practices and Pollution Prevention

Pollution minimization requirements are based on section III. C. 9 of the Ocean Plan. The Discharger is required to develop a Pollutant Minimization Program only if required to do so in writing by the Executive Officer.

4. Construction, Operation, and Maintenance Specifications

This section of the standardized permit template is not applicable.

5. Special Provisions for Municipal Facilities (POTWs Only)

This section of the standardized permit template is not applicable.

6. Other Special Provisions

a. Discharges of Storm Water

The Order does not address discharges of storm water from the facility, except to require coverage by and compliance with applicable provisions of General Permit No. CAS000001 - *Waste Discharge Requirements for Discharges of Storm Water Associated with Industrial Activities*.

b. Phase 1 Discharge Characterization Study.

During Phase 1 of operations, the Discharger is required to more completely characterize its discharge. Although the Regional Water board understands the discharge to be simply calcium and magnesium depleted seawater, this additional characterization work is designed to provide more data regarding the Ocean Plan Table B pollutants, and to look for pollutants attributable to stack gases from the Moss Landing Power Plant and/or to residuals of the precipitation process which will remove calcium and magnesium from seawater. Effluent monitoring during Phase 1 will include analysis for such pollutants as 1,3-butadiene, acetaldehyde, formaldehyde, naphthalene, propylene oxide, xylenes, and total organic carbon (TOC) – pollutants not included in Table B of the Ocean Plan but sometimes present in air emissions from natural gas-fired power plants. (USEPA, *AP-42, Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources*, Tables 3.1 - 2a and 3.1 – 3, (Fifth Edition, 1995).

Although the Regional Water Board does not anticipate these pollutants to be present within the discharge, this analysis is required to ensure protection of the receiving water. Certain other pollutants (acrolein, benzene, ethylbenzene, PAHs, toluene, and lead) may also be present in air emissions of gas fired power plants; however, these pollutants are listed in Table B of the Ocean Plan.

7. Compliance Schedules

The Order does not establish interim effluent limitations and schedules of compliance with final limitations.

VIII. PUBLIC PARTICIPATION

The Central Coast Regional Water Quality Control Board considered the issuance of waste discharge requirements (WDRs) that serve as a National Pollutant Discharge Elimination System (NPDES) permit for the Facility. As a step in the WDR adoption process, the Regional Water Board staff developed tentative WDRs. The Regional Water Board encouraged public participation in the WDR adoption process.

A. Notification of Interested Parties

The Regional Water Board notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for the discharge and provided them with an opportunity to submit their written comments and recommendations. Notification was provided in Moss Landing, California and through publication in the Monterey Herald on December 26, 2008. Additionally, the draft waste discharge requirements were mailed to interested parties on December 19, 2008.

B. Written Comments

The Central Coast Regional Water Quality Control (Water Board) received the following comment letters by 5:00 p.m. on January 26, 2009:

1. Support letter from Monterey Bay Aquarium Research Institute

2. Support letter from Moss Landing Marine Laboratories
3. Support letter from Monterey County Supervisor Mr. Louis Calcagno
4. Authorization letter from Monterey Bay National Marine Sanctuary

C. Public Hearing

The Regional Water Board held a public hearing on the tentative WDRs during its regular Board meeting on the following date and time and at the following location:

Date: **March 19, 2009**
Time: **11:00 a.m.**
Location: **Watsonville City Council Chambers**
275 Main Street – 4th Floor
Watsonville, CA 95076

Interested persons were invited to attend. At the public hearing, the Regional Water Board heard testimony, pertinent to the discharge, WDRs, and permit.

D. Waste Discharge Requirements Petitions

Any person aggrieved by this action of the Central Coast Water Board may petition the State Water Board to review the action in accordance with Water Code section 13320 and California Code of Regulations, title 23, sections 2050 and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of the order, except that if the thirtieth day following the date of the order falls on a Saturday, Sunday, or state holiday, the petition must be received by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the internet at http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

E. Information and Copying

The Report of Waste Discharge (ROWD), related documents, tentative effluent limitations and special provisions, comments received, and other information are on file and may be inspected at the address above at any time between 8:00 a.m. and 5:00 p.m., Monday through Friday. Copying of documents may be arranged through the Regional Water Board by calling (805) 549-3147.

F. Register of Interested Persons

Any person interested in being placed on the mailing list for information regarding the WDRs and NPDES permit should contact the Regional Water Board, reference this facility, and provide a name, address, and phone number.

G. Additional Information

Requests for additional information or questions regarding this Order should be directed to Peter von Langen at (805) 549-3688 or PvonLangen@waterboards.ca.gov.

103009

Notice of Approved Administrative Permit

Monterey County Planning Services Manager

Project Title: MOSS LANDING CEMENT CO.
Project File No. PLN080420
Project Location: 7687 HIGHWAY 1

NOTICE IS HEREBY GIVEN that on Wednesday, October 28, 2009 the Planning Services Manager of the County of Monterey Resource Management Agency approved the above referenced application for a Administrative Permit in accordance with Chapter 20.76 (Coastal Administrative Permits) of Title 20,, Monterey County Code. The project allows the following development and/or use: **COASTAL ADMINISTRATIVE PERMIT FOR THE ESTABLISHMENT AND OPERATION OF A GREEN CEMENT PLANT PILOT PROJECT (TWO YEAR PERMIT) IN EXISTING INDUSTRIAL BUILDINGS (APPROXIMATELY 170,00 SQUARE FEET ON ASSESSOR'S PARCEL NUMBER 133-172-013-000), AND THE INSTALLATION OF A FLUE GAS TRANSFER PIPELINE CONNECTING TO EXHAUST STACKS (ON ASSESSOR'S PARCEL NUMBER 133-181-011-000). THE PROPERTY IS LOCATED AT THE SOUTHEAST CORNER OF DOLAN ROAD AND HIGHWAY 1, MOSS LANDING, MOSS LANDING COMMUNITY PLAN AND NORTH COUNTY LAND USE PLAN, COASTAL ZONE.**

Note: This project is located in the Coastal Zone and is appealable to the Board of Supervisors. It is not appealable to the Coastal Commission.

The appeal must be filed in writing no later than 5:00 PM **Monday, November 9, 2009.**

FOR ADDITIONAL INFORMATION CONTACT:
JOE SIDOR, Project Planner
(831) 755-5262 or sidorj@co.monterey.ca.us

Monterey County Resource Management Agency - Planning Department
168 West Alisal St 2nd Floor, Salinas, CA 93901
(831) 755-5025

Date Printed: 10/28/2009

Before the Director of the RMA-Planning Department in and for the County of Monterey, State of California

In the matter of the application of:
MOSS LANDING CEMENT COMPANY (PLN080420)
RESOLUTION NO. 080420
Resolution by the Monterey County Director of the RMA-Planning Department:

1) Categorically exempting PLN080420 per CEQA Guidelines Section 15301; and
2) Approving a Coastal Administrative Permit for the establishment and operation of a green cement plant pilot project (two year permit) in existing industrial buildings (approximately 170,000 square feet on Assessor's Parcel Number 133-172-013-000), and the installation of flue gas transfer pipeline connecting to exhaust stacks (on Assessor's Parcel Number 133-181-011-000).

(PLN080420, REVX-173 LLC, Southeast Corner of Dolan Road and Highway 1, Moss Landing, Moss Landing Community Plan and North County Coastal Land Use Plan, APNs: 133-172-013-000 and 133-181-011-000)

The Moss Landing Cement Company application (PLN080420) came on for public hearing before the Monterey County Director of the RMA-Planning Department on October 28, 2009. Having considered all the written and documentary evidence, the administrative record, the staff report, oral testimony, and other evidence presented, the Director of the RMA-Planning Department finds and decides as follows:

FINDINGS

1. **FINDING:** **CONSISTENCY** – The Project, as conditioned, is consistent with the applicable plans and policies which designate this area as appropriate for development.

EVIDENCE: a) During the course of review of this application, the project has been reviewed for consistency with the text, policies, and regulations in:

- the Monterey County General Plan,
- North County Coastal Land Use Plan,
- North County Coastal Implementation Plan,
- Monterey County Zoning Ordinance (Title 20)
- Monterey County Subdivision Ordinance (Title 19)
- Moss Landing Community Plan

No conflicts were found to exist. No communications were received during the course of review of the project indicating any inconsistencies with the text, policies, and regulations in these documents.

b) The property/project site is located at the southeast corner of Dolan Road and Highway 1, Moss Landing (Assessor's Parcel Number 133-172-013-000), Moss Landing Community Plan and North County Coastal Land Use Plan. The parcel is zoned Heavy Industrial [HI (CZ)], which allows change of heavy industrial uses within a structure

provided the new use will not change the nature or intensity of the use of the structure as a principal use allowed, Coastal Administrative Permit required. Therefore, the project is an allowed land use for this site.

c) The project planner conducted a site inspection on December 11, 2008, to verify that the project on the subject parcel conforms to the plans listed above.

d) The proposed project is located in existing industrial buildings, and will have no effect on special-status species, sensitive habitat, or other significant biological resources (North County Coastal LUP Policy 2.3.2.1). No tree removal is proposed, and there is no evidence that any cultural resources would be disturbed (North County Coastal LUP Policy 2.9.1).

e) General Development Plan: Pursuant to Section 20.28.030..E, the requirement for a General Development Plan (GDP) is waived by the Director of Planning. There is no potential significant adverse impact from the development, and requiring a GDP will not further the purpose of the applicable chapter in Title 20. The project involves a pilot project for the establishment and operation of a green cement plant in existing industrial buildings. The operation is similar in nature to the prior brick refractory use allowed by the North County Coastal Land Use Plan and the Moss Landing Community Plan (Chapter 5, Sections 5.2.1.A.2 and 5.5). The duration of the project is for a designated and limited timeframe (two years), and the production amounts will be limited during the pilot project (Condition Nos. 3 and 4).

f) No public hearing was held because there was no evidence of public controversy or public opposition to the proposed use. No written request for a public hearing was made. Monterey County Zoning Ordinance (Title 20), Section 20.76.060A.

g) The project was not referred to the North County Coastal Land Use Advisory Committee (LUAC) for review. Based on the current LUAC Procedure guidelines adopted by the Monterey County Board of Supervisors per Resolution No. 08-338, this application did not warrant referral to the LUAC because it does not include development requiring CEQA review, does not involve a Lot Line Adjustment, does not require the issuance of a Variance, and does not involve a Design Approval subject to review by the Zoning Administrator or Planning Commission.

h) The application, project plans, and related support materials submitted by the project applicant to the Monterey County RMA - Planning Department for the proposed development found in Project File PLN080420.

2. **FINDING:** **SITE SUITABILITY** – The site is physically suitable for the use proposed.

EVIDENCE: a) The project has been reviewed for site suitability by the following departments and agencies: RMA - Planning Department, North County Fire Protection District, RMA - Public Works Department, Environmental Health Division, Water Resources Agency, and Monterey Bay Unified Air Pollution Control District. There has been no indication from these departments/agencies that the site is not

suitable for the proposed development. Conditions recommended have been incorporated.

b) The site has been designated and developed for heavy industrial uses since the 1940s. Prior to the subject project, the site was used for the production of refractory brick. The existing structures on the property are well suited to this similar use.

c) Adequate infrastructure exists on the site to support the proposed level of use (see Finding No. 3).

d) Staff conducted a site inspection on December 11, 2008, to verify that the site is suitable for this use.

e) The application, project plans, and related support materials submitted by the project applicant to the Monterey County RMA - Planning Department for the proposed development found in Project File PLN080420.

3. **FINDING:** **HEALTH AND SAFETY** - The establishment, maintenance, or operation of the project applied for will not under the circumstances of this particular case be detrimental to the health, safety, peace, morals, comfort, and general welfare of persons residing or working in the neighborhood of such proposed use, or be detrimental or injurious to property and improvements in the neighborhood or to the general welfare of the County.

EVIDENCE: a) The project was reviewed by the RMA - Planning Department, North County Fire Protection District, RMA - Public Works Department, Environmental Health Division, Water Resources Agency, and Monterey Bay Unified Air Pollution Control District. The respective departments/agencies have recommended conditions, where appropriate, to ensure that the project will not have an adverse effect on the health, safety, and welfare of persons either residing or working in the neighborhood.

b) Necessary public facilities are available. The site is served by existing septic systems and water system. The Environmental Health Division reviewed the project relative to water and septic, and recommended approval subject to four conditions (Condition Nos. 8 – 11).

c) Preceding findings and supporting evidence for PLN080420.

4. **FINDING:** **NO VIOLATIONS** - The subject property is in compliance with all rules and regulations pertaining to zoning uses, subdivision, and any other applicable provisions of the County's zoning ordinance. No violations exist on the property.

EVIDENCE: a) Staff reviewed Monterey County RMA - Planning Department and Building Services Department Monterey County records and is not aware of any violations existing on subject property.

b) Staff conducted a site inspection on December 11, 2008, and researched County records to assess if any violation exists on the subject property.

c) There are no known open violations on the subject parcel.

d) The application, plans and supporting materials submitted by the project applicant to the Monterey County Planning Department for the proposed development are found in Project File PLN080420.

5. **FINDING:** **CEQA (Exempt):** - The project is categorically exempt from environmental review and no unusual circumstances were identified to exist for the proposed project.

EVIDENCE: a) California Environmental Quality Act (CEQA) Guidelines Section 15301, categorically exempts the operation and minor alteration of existing public or private structures and facilities involving negligible or no expansion of use beyond that existing at the time of the lead agency's determination.

b) The applicant proposes, for a designated timeframe and at limited production levels, to establish and operate a pilot project cement plant in existing industrial buildings (Condition Nos. 3, 4, and 5). The pilot project will involve approximately 15 employees per shift, and produce approximately 80 tons of test product per day, or approximately 2,400 tons per month. Truck traffic will be limited to no more than three trucks per day. The approximate number of employees on-site during a shift will be 15. No off-site hauling will be allowed between 6 – 9 am and 4 – 7 pm. Production of cement is similar to the prior use of refractory brick manufacturing. As a limited pilot project, the cement operation will be significantly less than the brick operation. Therefore, the proposed development is consistent with Section 15301.

c) No adverse environmental effects were identified during staff review of the development application during a site visit on December 11, 2008.

d) Exceptions to exemptions listed in Section 15300.2.a-f are inapplicable. The project does not involve: alterations to a designated historical resource, a hazardous waste site, unusual circumstances that would result in a significant effect, development that would result in a cumulatively significant impact, nor development in a particularly sensitive environment.

e) See preceding and following findings and supporting evidence.

6. **FINDING:** **PUBLIC ACCESS** – The project is in conformance with the public access and recreation policies of the Coastal Act (specifically Chapter 3 of the Coastal Act of 1976, commencing with Section 30200 of the Public Resources Code) and Local Coastal Program, and does not interfere with any form of historic public use or trust rights.

EVIDENCE: a) No access is required as part of the project as no substantial adverse impact on access, either individually or cumulatively, as described in Section 20.144.150 of the Monterey County Coastal Implementation Plan can be demonstrated.

b) The subject property is not described as an area where the Local Coastal Program requires public access (Figure 6, Shoreline Access/Trails Map, in the North County Coastal Land Use Plan).

c) No evidence or documentation has been submitted or found showing the existence of historic public use or trust rights over this property.

d) The application, plans and supporting materials submitted by the project applicant to the Monterey County Planning Department for the proposed development are found in Project File PLN080420.

e) The project planner conducted a site inspection on December 11, 2008.

7. **FINDING:** **APPEALABILITY** - The decision on this project may be appealed to the Board of Supervisors, and not the California Coastal Commission.

EVIDENCE: a) Board of Supervisors: Section 20.86.030 of the Monterey County Zoning Ordinance (Title 20) allows an appeal to be made to the Board of Supervisors by any public agency or person aggrieved by a decision of an Appropriate Authority other than the Board of Supervisors.

b) Coastal Commission: Section 20.86.080.A of the Monterey County Zoning Ordinance (Title 20). The project is not subject to appeal by/to the California Coastal Commission because it does not involve development meeting the listed criteria.

DECISION

NOW, THEREFORE, based on the above findings and evidence, the Director of the RMA-Planning Department does hereby:

A. Categorically exempt PLN080420 per CEQA Guidelines Section 15301; and

B. Approve a Coastal Administrative Permit for the establishment and operation of a green cement plant pilot project (two year permit) in existing industrial buildings (approximately 170,000 square feet on Assessor's Parcel Number 133-172-013-000), and the installation of flue gas transfer pipeline connecting to exhaust stacks (on Assessor's Parcel Number 133-181-011-000), in general conformance with the attached sketch **(Exhibit 2)** and subject to the conditions **(Exhibit 1),** both exhibits being attached hereto and incorporated herein by reference.

PASSED AND ADOPTED this 28th day of October, 2009.

for MIKE NOVO, Director of the RMA-Planning Department

COPY OF THIS DECISION MAILED TO APPLICANT ON OCT 3 0 2009

THIS APPLICATION IS APPEALABLE TO THE BOARD OF SUPERVISORS.

IF ANYONE WISHES TO APPEAL THIS DECISION, AN APPEAL FORM MUST BE COMPLETED AND SUBMITTED TO THE CLERK TO THE BOARD ALONG WITH THE APPROPRIATE FILING FEE ON OR BEFORE NOV 0 9 2009

THIS PROJECT IS LOCATED IN THE COASTAL ZONE AND IS NOT APPEALABLE TO THE COASTAL COMMISSION. FOR FURTHER INFORMATION, CONTACT THE COASTAL COMMISSION AT (831) 427-4863 OR AT 725 FRONT STREET, SUITE 300, SANTA CRUZ, CA.

This decision, if this is the final administrative decision, is subject to judicial review pursuant to California Code of Civil Procedure Sections 1094.5 and 1094.6. Any Petition for Writ of Mandate must be filed with the Court no later than the 90th day following the date on which this decision becomes final.

NOTES

1. You will need a building permit and must comply with the Monterey County Building Ordinance in every respect.

   Additionally, the Zoning Ordinance provides that no building permit shall be issued, nor any use conducted, otherwise than in accordance with the conditions and terms of the permit granted or until ten days after the mailing of notice of the granting of the permit by the appropriate authority, or after granting of the permit by the Board of Supervisors in the event of appeal.

   Do not start any construction or occupy any building until you have obtained the necessary permits and use clearances from the Monterey County Planning Department and Building Services Department office in Salinas.

2. This permit expires 2 years after the above date of granting thereof unless construction or use is started within this period.

RESOLUTION 080420 Monterey County Resource Management Agency Planning Department Condition Compliance and/or Mitigation Monitoring Reporting Plan	Project Name: **MOSS LANDING CEMENT CO.** File No: **PLN080420** APNs: **133-172-013-000 & 133-181-011-000** Approved by: **RMA – Director of Planning** Date: **October 28, 2009**
**Monitoring or Reporting refers to projects with an EIR or adopted Mitigated Negative Declaration per Section 21081.6 of the Public Resources Code.*	

Permit Cond. Number	*Mitig. Number*	*Conditions of Approval and/or Mitigation Measures and Responsible Land Use Department*	*Compliance or Monitoring Actions to be performed. Where applicable, a certified professional is required for action to be accepted.*	*Responsible Party for Compliance*	*Timing*	*Verification of Compliance (name/date)*
RMA – Planning Department						
1.		**PD001 - SPECIFIC USES ONLY** This Coastal Administrative Permit (PLN080420) allows the establishment and operation of a green cement plant pilot project in existing industrial buildings (approximately 170,000 square feet on Assessor's Parcel Number 133-172-013-000), and the installation of flue gas transfer pipeline connecting to exhaust stacks (on Assessor's Parcel Number 133-181-011-000). The property is located at the southeast corner of Dolan Road and Highway 1, Moss Landing, Moss Landing Community Plan and North County Coastal Land Use Plan. This permit was approved in accordance with County ordinances and land use regulations subject to the following terms and conditions. Any use or construction not in substantial conformance with the terms and conditions of this permit is a violation of County regulations and may result in modification or revocation of this permit and subsequent legal action. No use or construction other than that specified by this permit is allowed unless additional permits are approved by the appropriate authorities. **(RMA-Planning Department)**	Adhere to conditions and uses specified in the permit. Neither the uses nor the construction allowed by this permit shall commence unless and until all of the conditions of this permit are met to the satisfaction of the Director of the RMA - Planning Department. To the extent that the County has delegated any condition compliance or mitigation monitoring to the Monterey County Water Resources Agency, the Water Resources Agency shall provide all information requested by the County and the County shall bear ultimate responsibility to ensure that conditions and mitigation measures are properly fulfilled.	Owner / Applicant RMA - Planning WRA RMA - Planning	Ongoing, unless otherwise stated.	
2.		**PD002 – NOTICE - PERMIT APPROVAL** The applicant shall record a notice which states: "A permit (Resolution **080420**) was approved by the Director of the RMA-Planning Department for Assessor's Parcel Number **133-172-013-000** on October 28, 2009. The permit was granted subject to twelve (13) conditions of approval which run with the land. A copy of the permit is on file with the Monterey County RMA	Obtain appropriate form from the RMA-Planning Department. The applicant shall complete the form and furnish proof of recordation of this notice to the RMA - Planning Department.	Owner / Applicant RMA-Planning	Prior to the commence-ment of use.	

Permit Cond. Number	Mitig. Number	Conditions of Approval and/or Mitigation Measures and Responsible Land Use Department	Compliance or Monitoring Actions to be performed. Where applicable, a certified professional is required for action to be accepted.	Responsible Party for Compliance	Timing	Verification of Compliance (name/date)
		- Planning Department." **(RMA-Planning Department)**				
3.		**PD010 - EROSION CONTROL PLAN AND SCHEDULE (NON-STANDARD)** The excavation of magnesium hydroxide from the tailings pond (white lake area) shall incorporate the recommendations of an Erosion Control Plan as reviewed by the Director of RMA – Planning and Director of Building Services. All cut and/or fill slopes exposed during the course of excavation/collection operations shall be covered or otherwise treated to control erosion during the course of operations, subject to the approval of the Director of RMA - Planning and Director of RMA - Building Services. The erosion control plan shall include Best Management Practices for the prevention and control of erosion, siltation and dust following collection/excavation. This program shall be approved by the Director of RMA - Planning and Director of RMA - Building Services. **(RMA - Planning Department and RMA - Building Services Department)**	An Erosion Control Plan shall be submitted to the RMA - Planning Department and the RMA - Building Services Department prior to commencement of use.	Owner / Applicant	Prior to the commence-ment of use.	
			The applicant shall submit quarterly reports to the RMA – Planning Department, demonstrating compliance with the Erosion Control Plan.	Owner / Applicant	Ongoing	
4.		**PD032 - PERMIT TIME/YEAR & DATE (NON-STANDARD)** The permit shall be granted for a time period of two years, to expire on October 28, 2011. The applicant shall remove the flue gas transfer pipeline prior to the expiration date, unless a separate permit application has been submitted at least 30 days prior to the expiration date to extend the pilot project or request a permanent operation. **(RMA – Planning Department)**	The applicant shall submit a status report at least 30 days prior to the expiration date.	Owner / Applicant	As stated in the conditions of approval.	
5.		**PDSP001 – TEST PRODUCTION LIMITS (NON-STANDARD)** The amount of green cement product produced for testing during the pilot project shall not exceed 80 tons per day, or 2,400 tons per month. **(RMA – Planning Department)**	The applicant shall submit quarterly reports to the RMA – Planning Department, demonstrating compliance.	Owner / Applicant	Ongoing	
6.		**PDSP002 – OPERATIONS (NON-STANDARD)** Cement produced during the testing process will be stored on-site, and gradually shipped off-site for further testing at other facilities outside of Monterey County. Truck traffic will use Dolan Road and Highway 101 for access to and from the site, and will be limited to no more than three trucks per day. No off-site hauling will be allowed between 6 – 9 am and 4 – 7	The applicant shall submit quarterly reports to the RMA – Planning Department, demonstrating compliance.	Owner / Applicant	Ongoing	

Permit Cond. Number	*Mitig. Number*	*Conditions of Approval and/or Mitigation Measures and Responsible Land Use Department*	*Compliance or Monitoring Actions to be performed. Where applicable, a certified professional is required for action to be accepted.*	*Responsible Party for Compliance*	*Timing*	*Verification of Compliance (name/date)*
		pm. The maximum number of employees on site during any shift will be 15. **(RMA – Planning Department)**				
7.		**PDSP003 – MBUAPCD PERMITS (NON-STANDARD)** The applicant will obtain any required permit(s) from the Monterey Bay Unified Air Pollution Control District (MBUAPCD) before commencing operations. **(RMA-Planning Department)**	The applicant shall contact and obtain required clearances and/or permits from the MBUAPCD for the proposed project. Submit evidence to the RMA-Planning Department that clearance and/or permits have been obtained.	Owner / Applicant	Prior to commence ment of use.	
RMA – Public Works Department						
8.		**PWSP001 – ENCROACHMENT** Obtain an encroachment permit from the Department of Public Works to install a pipeline across Dolan Road.**(Public Works)**	Applicant shall obtain an encroachment permit from DPW prior to issuance of grading permit.	Owner / Applicant	Prior to issuance of grading permit.	
Health Department Environmental Health Division						
9.		**EH28 - HAZ MAT BUSINESS RESPONSE PLAN** Comply with Title 19 of the California Code of Regulations and Chapter 6.95 of the California Health and Safety Code (Hazardous Material Registration and Business Response Plans) as approved by the Director of Environmental Health. **(Environmental Health)**	Contact the Hazardous Materials Program of the Division of Environmental Health.	Owner / Applicant	Continuous	
10.		**EH30 - HAZARDOUS WASTE CONTROL** Comply with Title 22, Division 4.5 of the California Code of Regulations and Chapter 6.50 of the California Health and Safety Code (Hazardous Waste Control) as approved by the Director of Environmental Health. **(Environmental Health)**	Contact the Hazardous Materials Program of the Division of Environmental Health.	Owner / Applicant	Continuous	
11.		**EH31 - HAZ MAT RMP** Submit a Risk Management Plan to the Director of Environmental Health for review and approval. The RMP shall comply with Title 19, Chapter 4.5 of the California Code of Regulations and Chapter 6.95, Article 2 of the California Health & Safety Code. **(Environmental Health)**	Submit plan to the Hazardous Materials Program of the Division of Environmental Health for review and approval.	Owner / Applicant	Prior to commence ment of operation.	
12.		**EH34 - HAZ MAT SPCC** Submit a site Spill Prevention Control Countermeasure (SPCC) Plan to the California Regional Water Quality Control Board for storage of petroleum products (i.e. diesel, oil, and	Submit plan to the Hazardous Materials Program of the Division of Environmental Health for review and approval.	Owner / Applicant	Prior to commence ment of operation.	

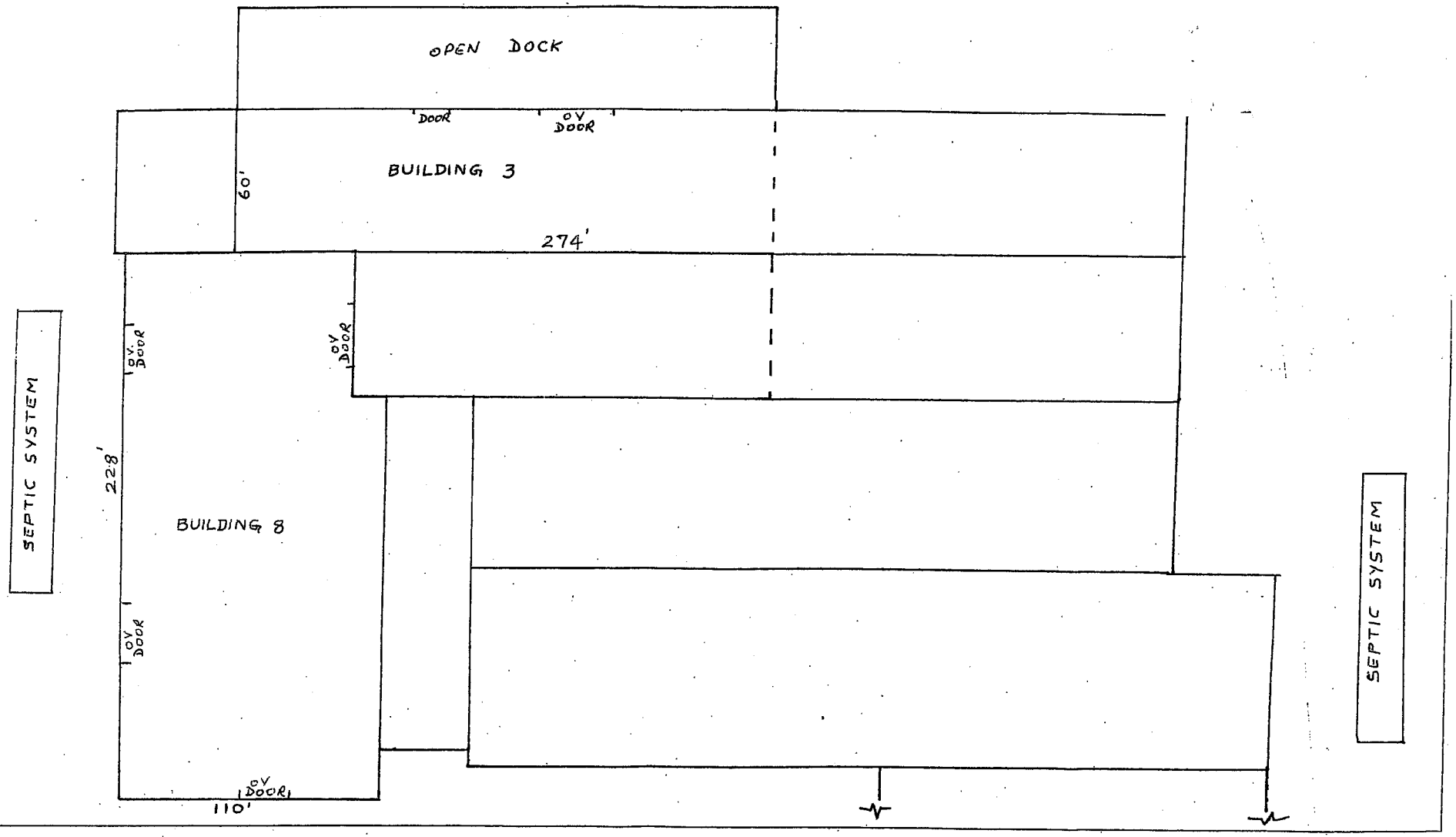
Permit Cond. Number	*Mitig. Number*	*Conditions of Approval and/or Mitigation Measures and Responsible Land Use Department*	*Compliance or Monitoring Actions to be performed. Where applicable, a certified professional is required for action to be accepted.*	*Responsible Party for Compliance*	*Timing*	*Verification of Compliance (name/date)*
		gasoline) in above ground storage tanks greater than 650-gallon capacity or for cumulative storage of more than 1320 gallons. The Plan shall meet the standards as per Title 26, Division 22, Article 3, Sections 66264.30-66264.56 (Preparedness and Prevention). **(Environmental Health)**				
Fire Agency (North County Fire Protection District)						
13.		**FIRE030 – FIRE EXTINGUISHERS (NON-STANDARD)** The applicant shall ensure availability of fire extinguishers in accordance with F2 occupancy requirements. **(North County Fire Protection District)**	Applicant shall schedule fire dept. clearance inspection.	Owner / Applicant	Prior to occupancy or commence ment of use.	

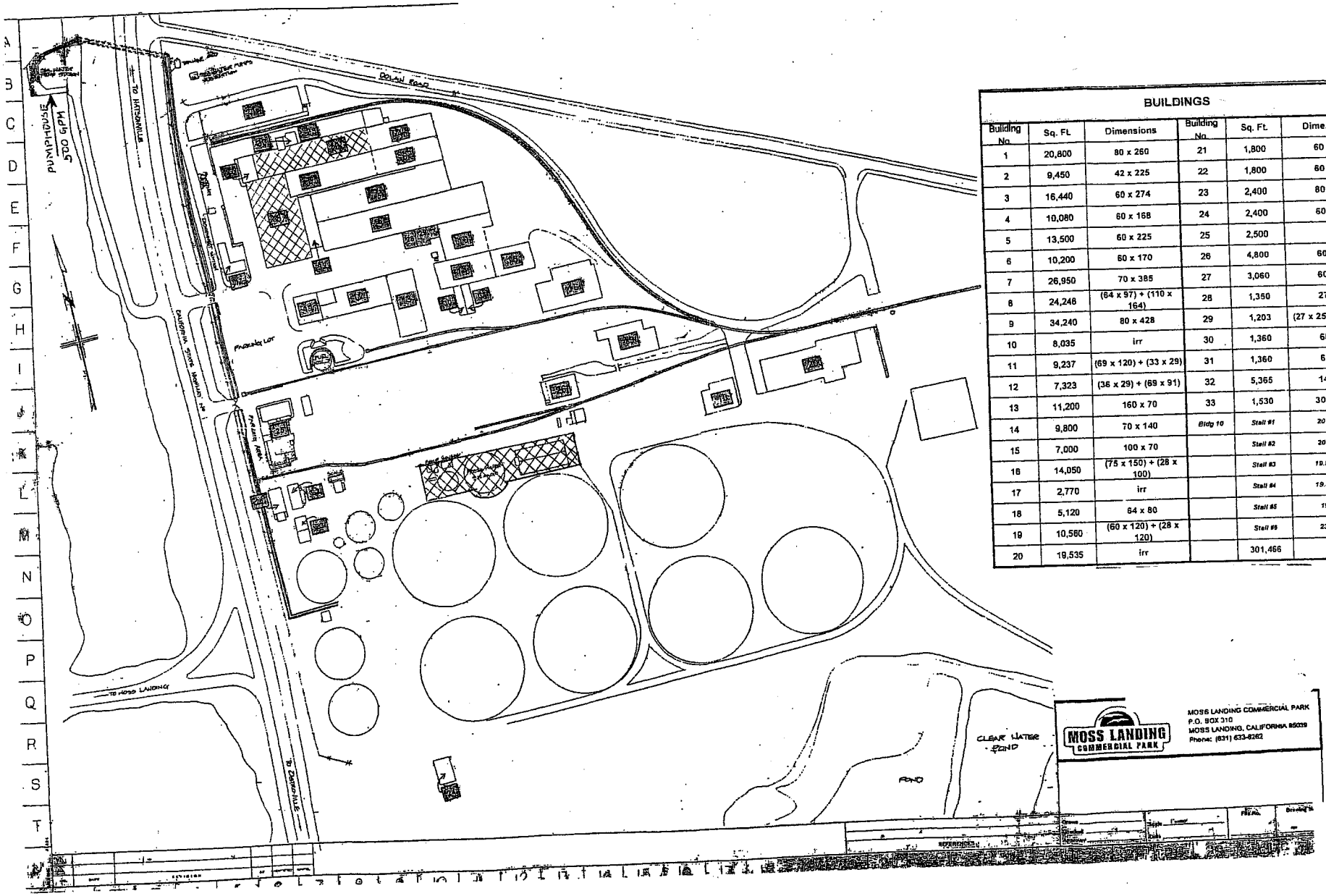
END OF CONDITIONS

carollo engineers

BY_____ DATE_____ SUBJECT_____ SHEET NO.____ OF____

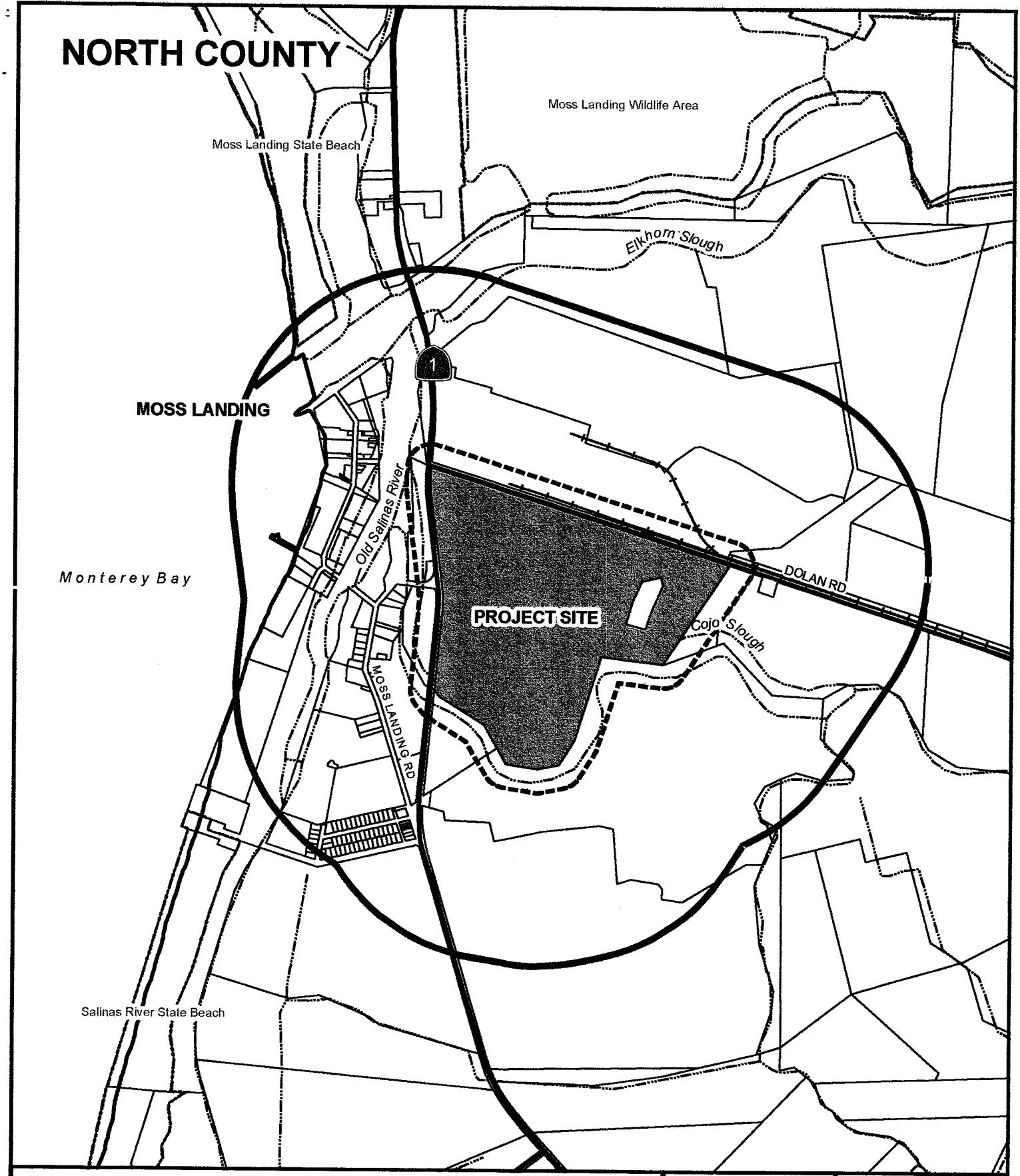
CHKD. BY_____ DATE_____ JOB NO._____





BUILDINGS

Building No	Sq. Ft.	Dimensions	Building No	Sq. Ft.	Dimensions
1	20,800	80 x 260	21	1,800	60 x 30
2	9,450	42 x 225	22	1,800	60 x 30
3	16,440	60 x 274	23	2,400	80 x 30
4	10,080	60 x 168	24	2,400	60 x 40
5	13,500	60 x 225	25	2,500	irr
6	10,200	60 x 170	26	4,800	60 x 80
7	26,950	70 x 385	27	3,060	60 x 51
8	24,248	(64 x 97) + (110 x 164)	28	1,350	27 x 50
9	34,240	80 x 428	29	1,203	(27 x 25) + (22 x 24)
10	8,035	irr	30	1,360	68 x 20
11	9,237	(69 x 120) + (33 x 29)	31	1,360	68 x 20
12	7,323	(36 x 29) + (69 x 91)	32	5,365	145 x 37
13	11,200	160 x 70	33	1,530	30 x 51 irr
14	9,800	70 x 140	*Bldg 10*	*Stall #1*	*20 x 35 (700)*
15	7,000	100 x 70		*Stall #2*	*20 x 35 (700)*
16	14,050	(75 x 150) + (28 x 100)		*Stall #3*	*19.5 x 35 (683)*
17	2,770	irr		*Stall #4*	*19.5 x 35 (683)*
18	5,120	64 x 80		*Stall #5*	*19 x 35 (665*
19	10,580	(60 x 120) + (28 x 120)		*Stall #6*	*23 x 35 (805)*
20	19,535	irr		301,466	TOTAL



APPLICANT: MOSS LANDING CEMENT CO

APN: 133-172-013-000 **FILE #** PLN080420

300' Limit 2500' Limit City Limits

N

0 1,000

Feet

MONTEREY COUNTY CALIFORNIA • 1850 •

MONTEREY COUNTY

Planning and Building Inspection Department
168 W. Alisal, 2nd Floor, Salinas, CA 93901 Phone: (831) 755-5025 Fax: (831) 757-9516

Instructions for Completing and Recording Indemnification Agreements, Permit Approval Notices, and Other Documents

This form provides instructions for completing the Indemnification Agreements and Permit Approval Notices that are required as a condition of approval for all applicable planning permits. The owner(s) or lessee(s) of the subject property will need to sign and record these documents according to the instructions below prior to the issuance of a building permit or commencement of any activity granted by the planning permit or, in the case of a subdivision, the recording of the final map.

Because these are legal documents that will be reviewed and signed by County Counsel, please make sure that you follow these instructions exactly. Completing these forms incorrectly will delay the clearance of these conditions. If you have any questions, call your project planner or the planner-of-the-day at (831) 755-5025.

I. INDEMNIFICATION AGREEMENT

1. **Type the legal description** for the subject property on a separate sheet of paper, **or** obtain a copy of the legal description. Label this document as **Exhibit "A"**. A property's legal description can be found on or attached to the deed to the property. If you do not have the deed to your property, a copy can be obtained from the County Recorder's Office.

2. **Label** a single-sided copy of your planning permit resolution (Findings & Decision) as Exhibit "B".

3. **Staple** Exhibit "A" and Exhibit "B" to the back of the Indemnification Agreement.

4. **Print clearly or type the name** of the owner(s)/lessee(s) in the blank in the first paragraph of the document and on the 3rd page of the document in the section labeled "Print or type Owner(s) Name". If there is more than one owner or lessee, enter the all the names. If the owner/lessee is not an individual, then the person(s) signing must indicate their capacity to sign (i.e. trustee, president, treasurer, etc.). If the owner/ lessee is a corporation, 11c, or other artificial entity, the document **must** contain the signature and title of two corporate officers: (one by the Chair, President, or Vice-President **AND** one by the Treasurer, Secretary or Financial Officer). If such officers do not exist, special and additional documentation will be required to substantiate the authority of the signing parties. This may entail additional time and expense.

5. Take the document and all associated exhibits to a Notary Public. The owner(s)/lessee(s) can now **sign the document (in blue ink) in front of the Notary Public.**

6. **Submit the notarized Indemnification Agreement** with all attachments to the project planner. The project planner will obtain County Counsel and Director of Planning and Building Inspection signatures, after which you will be called to pick up the document for delivery to the County Recorder's Office for recording.

II. PERMIT APPROVAL NOTICE

1. **Type the legal description** for the subject property on a separate sheet of paper, **or** obtain a copy of the legal description. Label this document as **Exhibit "A"**. A property's legal description can be found on or attached to the deed to the property. If you do not have the deed to your property, a copy can be obtained from the County Recorder's Office.

2. **Print clearly or type the name** of the owner(s)/lessee(s) in the blank in the space provided. If there is more than one owner or lessee, enter the all the names. If the owner/lessee is not an individual, then the person(s) signing must indicate their capacity to sign (i.e. trustee, president, treasurer, etc.). If the owner/ lessee is a corporation, 11c, or other artificial entity, the document **must** contain the signature and title of two corporate officers: (one by the Chair, President, or Vice-President **AND** one by the Treasurer, Secretary or Financial Officer). If such officers do not exist, special and additional documentation will be required to substantiate the authority of the signing parties. This may entail additional time and expense.

3. Take the document and all associated exhibits to the Notary Public and the owner/lessee can now **sign the document (in blue ink) in front of the Notary Public** as was done for the Indemnification Agreement.

4. This document is now ready for recording. The Permit Approval Notice does not require any additional signatures.

5. Your project planner will call you when the other signatures for the Indemnification Agreement have been obtained and the document is ready to record. Pick up the signed Indemnification Agreement from your planner and take it and the Permit Approval Notice to the County Recorder's Office for recording. This will satisfy these conditions. If your project includes a Mitigation Monitoring Agreement, appropriate fees shall be required payable to Monterey County Planning and Building Inspection at the time that you pick up the signed agreement prior to recordation. **If you would like to expedite the clearance of these conditions you can request a receipt from the Recorders Office at the time of recordation and submit the receipt to your project planner as evidence of recordation.**

III. OTHER DOCUMENTS THAT REQUIRE RECORDING

Certain permits may contain additional conditions that require the recording of documents in addition to the Indemnification Agreement and Permit Approval Notice. These may include Mitigation Monitoring Agreements, deed restrictions, deed notices, and/or certain types of easements. The procedure for satisfying these conditions is very similar to the ones for Indemnification Agreements and Permit Approval Notices. All documents must have legal descriptions and notarized signatures. Ask your planner if you have any questions when completing these other forms. Additional documentation may require additional time to ensure legal adequacy of signatures and action.

NOTES:

- All documents to be recorded must be on 8 ½" X 11" paper.
- All pages must be single-sided.
- All documents must be signed by the owner(s) or Lessee(s) before a notary public.
- Except for the signatures, all entries must be typed (preferable) or clearly printed.
- All signatures must be in blue ink
- For questions, call your project planner at (831) 755-5025 or for questions regarding the recordation process itself (fees, document format, etc.) call the Monterey County Recorder at (831) 755-5041.

(Recording Instructions.doc: 7/08/03)

NOTICE OF APPEAL (BOS)

Monterey County Code
Title 19 (Subdivisions)
Title 20 (Zoning)
Title 21 (Zoning)

No appeal will be accepted until a written decision is given. If you wish to file an appeal, you must do so on or before NOV 0 9 2009 ***(10 days after written notice of the decision has been mailed to the applicant).***

Date of decision OCT 2 8 2009.

1. Please give the following information:
   a) Your name _____
   b) Address _____
   c) Phone Number _____

2. Indicate your interest in the decision by checking the appropriate box:
   - ☐ Applicant
   - ☐ Neighbor
   - ☐ Other (please state) _____

3. If you are not the applicant, please give the applicant's name:
   _____

4. Indicate the file number of the application that is the subject of the appeal and the decision making body.
   File Number _____ Type of Application _____ Area _____
   a) Planning Commission: _____
   b) Zoning Administrator: _____
   c) Subdivision Committee: _____
   d) Administrative Permit: _____

5. What is the nature of your appeal?

a) Are you appealing the approval ☐ or the denial ☐ of an application? (Check appropriate box)

b) If you are appealing one or more conditions of approval, list the condition number and state the condition(s) you are appealing. (Attach extra sheets if necessary).

_____

_____

_____

6. Check the appropriate box(es) to indicate which of the following reasons form the basis for your appeal:

☐ There was a lack of fair or impartial hearing; or

☐ The findings or decision or conditions are not supported by the evidence; or

☐ The decision was contrary to law.

You must next give a brief and specific statement in support of each of the bases for appeal that you have checked above. The Board of Supervisors will ***not*** accept an application for appeal that is stated in generalities, legal or otherwise. If you are appealing specific conditions, you must list the number of each condition and the basis for your appeal. (Attach extra sheets if necessary).

_____

_____

_____

_____

7. As part of the application approval or denial process, findings were made by the decision making body (Planning Commission, Zoning Administrator, Subdivision Committee or Director of Planning and Building Inspection). In order to file a valid appeal, you must give specific reasons why you disagree with the findings made. (Attach extra sheets if necessary).

_____

_____

_____

_____

8. You are required to submit stamped addressed envelopes for use in notifying interested persons that a public hearing has been set for the appeal. The Planning and Building Inspection Department will provide you with a mailing list.

9. Your appeal is accepted when the Clerk to the Board's Office accepts the appeal as complete on its face, receives the filing fee ***($4,698.840)*** and stamped addressed envelopes.

APPELLANT SIGNATURE _____ **DATE** _____

ACCEPTED _____ **DATE** _____

(Clerk to the Board)

Linda S. Adams
Secretary for
Environmental Protection

Department of Toxic Substances Control

Maureen F. Gorsen, Director
1001 "I" Street
P.O. Box 806
Sacramento, California 95812-0806

Arnold Schwarzenegger
Governor

ATTN: SAM BOSE
MOSS LANDING CEMET COMPANY LLC
PO BOX 777
MOSS LANDING CA 95039

EPA ID Number Issued: December 18, 2008
Location Address:
7697 HIGHWAY 1
MOSS LANDING CA 9503996

PERMANENT RECORD - DO NOT DESTROY
YOUR CALIFORNIA EPA IDENTIFICATION NUMBER IS:

CAL000339079

This is to acknowledge that a permanent California Environmental Protection Agency Identification (EPA ID) Number has been assigned to your place of business.

An EPA ID Number is assigned to a person or business at a specific site. It is only valid for the location and person or business to which it was assigned. If your business has multiple generation sites, each site must have its own unique number. If you stop handling hazardous waste, move your business, change ownership, change mailing address, or change the type or amount of waste you handle, you must notify the Department of Toxic Substances Control immediately. If your business has moved, your EPA ID Number must be canceled. A new number must be obtained for your new location if you continue to generate hazardous waste.

This EPA ID Number must be used for all manifesting, record keeping, and reporting requirements. Please retain this notice in your files.

Department of Toxic Substances Control
Office of Data Evaluation and Environmental Indicators
Generator Information Services Section
Telephone: (916) 255-1136 or California Only Toll-free Number: (800) 618-6942

Operator's Initials: PMIKLAT

version: April 2008

Appendix D

Revision Log

Calera Corporation
Moss Landing, California

Form D-2 Revision Log

Revision Date	Section(s)	Description

URS

www.urscorp.com

Appendix C – Task 4.4 Risk Analysis Report (EIV)

Environmental Information Volume

Moss Landing Materials Demonstration Plant

CALERA

May 13, 2010

URS

Environmental Information Volume

Moss Landing Materials Demonstration Plant

May 13, 2010

Prepared by:

URS

REPORT LIMITATIONS

URS Corporation (URS) has prepared this Environmental Information Volume in accordance with the contract scope of work, using reasonable efforts to attempt to identify areas of potential liability associated with the site. URS' services in the development of this report were conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the same professions currently practicing in the same locality under similar conditions, and no other guaranty, warranty, or representation, either expressed or implied, is included or intended herein.

The conclusions in this report were based solely on a visual review of the study area and on readily available records, interviews, and other secondary sources. URS has made no independent investigation of the accuracy of these secondary sources, and has assumed them to be accurate and complete. URS does not warrant the accuracy or completeness of information provided by secondary sources.

This report is intended to be used in its entirety. No excerpts may be taken to be representative of the findings of this assessment. Opinions and recommendations presented in this report apply to site conditions and features, as they existed at the time of the site visit, and those that are reasonably foreseeable.

The Environmental Information Volume was prepared for Calera's sole use; no other parties shall rely on this report without expressed written consent from URS.

TABLE OF CONTENTS

Page

TABLES

FIGURES

APPENDICES

LIST OF ACRONYMS AND ABBREVIATIONS

$\mu g/m^3$	micrograms per cubic meter
AFC	Application for Certification
ANSI/ASME	American National Standards Institute/American Society for Mechanical Engineers
AQMP Air	Quality Management Plan
ARRA	American Recovery and Reinvestment Act
ATC	authority to construct
BACT	best available control technology
CAP	Coastal Administrative Permit
CCC	California Coastal Commission
CFR	Code of Federal Regulations
CAA	Clean Air Act of 1970
CAAQS	California Ambient Air Quality Standards
Calera Calera	Corporation
Cal/OSHA	California Occupational Safety and Health Commission
CARB	California Air Resources Board
CCAA	California Clean Air Act
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CEQA California	Environmental Quality Act of 1970
CERCLA	Comprehensive Environmental Response and Compensation Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFBS	coal-fired boiler simulator
CH_4 methane	
CHRIS	California Historical Resources Information System
CIWMA	California Integrated Waste Management Act
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CO carbon	monoxide
CO_2 carbon	dioxide
CRHP	California Register of Historic Places
CWA Clean	Water Act
dBA A-weighted	decibel(s)
DNL	Day-Night Average Sound Level (L_{dn})
DNSC	Defense National Stockpile Center
DOE	U.S. Department of Energy
DTSC	California Department of Toxic Substances Control
EAP	emergency action plan
EDR	Environmental Data Resources Inc.
EIV	Environmental Information Volume
EJ environm	ental justice
EMP	Environmental Management Plan
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
GHG greenhouse	gas
gpd/ft	gallons per day per foot
HFC h	ydrofluorocarbon
HSP	health and safety plan
HWCL	California Hazardous Waste Control Law
IGSM	Salinas Valley Integrated Groundwater and Surface Water Model
K hy	draulic conductivity
kg kilogram	

L_{dn}	day-night sound level
LCP local	coastal program
LUST	Leaking Underground Storage Tank
MBUAPCD	Monterey Bay Unified Air Pollution Control District
mg/L	milligrams per liter
MLCC	Moss Landing Cement Company
MLMDP	Moss Landing Materials Demonstration Plant
MLPPP	Moss Landing Power Plant Project
MMBtu/hr	million British Thermal Units per hour
MPWMD	Monterey Peninsula Water Management District
NAAQS	National Ambient Air Quality Standards
NAHC	California Native American Heritage Commission
NCCAB	North Central Coast Air Basin
NCFPD	North County Fire Protection District
NCLUP	North County Land Use Plan
NEPA	National Environmental Policy Act of 1969
NFIP	National Flood Insurance Program
NFPA	National Fire Protection Association
NO_2 nitrogen	dioxide
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NWIC	Northwest Information Center
O_3 ozone	
OSHA	Occupational Safety and Health Administration
PG&E	Pacific Gas and Electric Company
PM particulate	matter
PM_{10}	particulate matter of 10 microns or less in diameter
$PM_{2.5}$	particulate matter less than or equal to 2.5 microns in diameter
ppm parts	per million
PSD	Prevention of Significant Deterioration
PTO	permit to operate
RCRA	Resource Conservation and Recovery Act
RO reverse	osmosis
RWQCB	Regional Water Quality Control Board
SCFH	standard cubic feet per hour
SCFM	standard cubic feet per minute
SCM	supplementary cementitious materials
SIP	state implementation plan
SMARTS	Stormwater Multi-Application Report Tracking System
SO_2 sulfur	dioxide
SVGB	Salinas Valley Groundwater Basin
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
T transm	issivity
TCE trichloroethene	
TDS	total dissolved solids
TMDL	Total Maximum Daily Load
USACE	U.S Army Corps of Engineers
USC U.S.	Code
U.S. EPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST undergro	und storage tank
VOC	volatile organic compound

EXECUTIVE SUMMARY

The Calera Corporation (Calera), headquartered in Los Gatos, California, is proposing to construct a facility, referred to as the Moss Landing Materials Demonstration Plant (MLMDP), for research and development on the beneficial use of carbon dioxide. The facility would test and optimize aggregates and cementitious products that are created through an innovative process of mineralizing carbon dioxide from power plant flue gas. The Moss Landing Cement Company (MLCC), which is a special-purpose company wholly owned by Calera, would operate the MLMDP. The MLMDP would be built in Moss Landing, within unincorporated Monterey County, California.

The proposed MLMDP site is in an industrial area on the east side of Highway 1, on portions of an industrial site leased from the Moss Landing Commercial Park. Calera currently operates the Moss Landing Pilot Plant (Pilot Plant) and the Moss Landing Absorption Demonstration Plant (Absorption Demonstration Plant) on the site. The Pilot Plant encompasses the complete process of absorption of carbon dioxide and the creation of aggregates and cementitious products scaled at 1:1,000 to a commercial plant. The Absorption Demonstration Plant includes the first (front-end) stage of Calera's process scaled at 1:100 to a commercial plant, and captures carbon dioxide from a slip stream of flue gas produced by the adjacent Moss Landing Energy Facility natural-gas–fired combined-cycle power plant.

Calera has requested U.S. Department of Energy (DOE) funding under the Innovative Concepts for Beneficial Reuse of Carbon Dioxide Program for detailed design, construction, and operation of the MLMDP. The purpose of the Innovative Concepts for Beneficial Reuse of Carbon Dioxide Program is to stimulate pilot-scale field testing of carbon dioxide use technologies to provide information on the cost and feasibility of larger-scale implementation and operation of these technologies. The need for the project is to develop economically-viable technologies that would reduce carbon dioxide emissions without adversely affecting energy use. Calera would demonstrate an innovative process to directly mineralize carbon dioxide in flue gas to carbonates and convert them to materials directly usable in the construction industry. The MLMDP would be the second (back-end) stage of Calera's two-part carbonate mineralization process. Calera would use the information it gathers during the project to scale up its full carbonate mineralization and conversion technology to commercial scale at other locations. Calera expects that the aggregates and cementitious products generated in the MLMDP would be sold for use in the construction industry once the technology is implemented at a commercial scale.

This Environmental Information Volume (EIV) presents the Proposed Action (DOE funding of the MLMDP), as well as potential alternatives to this action. Furthermore, the EIV provides an overview of the potential direct, indirect, and cumulative environmental (i.e., natural, cultural, and social) impacts of the Proposed Action and its alternatives from construction, operation, and maintenance. Additionally, the EIV presents a list of agencies that should be contacted during subsequent environmental coordination and compliance, as well as a list of compliance requirements. The EIV also discloses known concerns regarding potential liability to the DOE. As discussed in the EIV, based on information provided, there are no known judgments or suits filed against Calera, and no known obligations would be transferred to the DOE as a result of its funding of the proposed project. Furthermore, Calera would agree to a hold harmless clause in agreements with DOE pertaining to the proposed project.

The EIV includes measures to mitigate potential impacts, and identifies permit and coordination requirements. In summary, when considered along with proposed measures and required compliance, impacts to resources are less than substantial.

1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

This section provides an introduction to Proposed Action and describes the project objectives and project needs.

1.1 INTRODUCTION

The Calera Corporation (Calera) is proposing to construct a research and development facility for the beneficial use of carbon dioxide that would be called the Moss Landing Materials Demonstration Plant (MLMDP). The facility would test and optimize aggregates and cementitious products that are created through an innovative process of mineralizing carbon dioxide from power plant flue gas. The Moss Landing Cement Company (MLCC), which is a special-purpose company wholly owned by Calera, would operate the MLMDP. The MLMDP would be built in Moss Landing, in unincorporated Monterey County, California, as shown on Figure 1-1.

The proposed MLMDP site is in an industrial area on the east side of Highway 1, 10.6 miles northwest of Salinas and 2.3 miles northwest of Castroville within the Bolsa Nueva Y Moro Cojo Spanish Land Grant, Township 13 South, Range 2 East, as depicted on the "Moss Landing Calif." U.S. Geological Survey topographic quadrangle map. The area of the MLMDP site is approximately 42 acres; it consists of a portion of the Moss Landing Commercial Park (Assessor's Parcel Number 133-172-013-000) as shown on Figure 1-2. Adjacent land uses include Dolan Road and the Moss Landing Energy Facility to the north, undeveloped land to the east, Moro Cojo Slough and undeveloped land to the south, and Highway 1 and marina, commercial (e.g., restaurant) uses to the west. The Moss Landing State Wildlife Area and Elkhorn Slough National Estuarine Sanctuary are approximately 0.5 mile northeast of the MLMDP site.

The MLCC currently operates the Moss Landing Pilot Plant, which encompasses the complete process of absorption of carbon dioxide and the creation of aggregates and cementitious products. The Moss Landing Pilot Plant is scaled at 1:1,000 to a commercial plant. The MLCC also operates a demonstration plant at the site of the first (front-end) stage of Calera's process scaled at 1:100 to a commercial plant. The demonstration plant is called the Moss Landing Absorption Demonstration Plant (Absorption Demonstration Plant). The Absorption Demonstration Plant captures carbon dioxide from a slip stream of flue gas produced by the adjacent Moss Landing Energy Facility natural gas–fired combined-cycle power plant. The Absorption Demonstration Plant uses a source of base/high-alkalinity material plus calcium and/or other divalent cations to capture and convert the carbon dioxide into solid carbonates.

Calera has requested U.S. Department of Energy (DOE) funding under the Innovative Concepts for Beneficial Reuse of Carbon Dioxide Program for detailed design, construction, and operation of the MLMDP. The MLMDP is the second (back-end) stage of Calera's two-part carbonate mineralization process. Product slurry produced in the Absorption Demonstration Plant would be received by the proposed MLMDP and would be converted into aggregates and cementitious products. These beneficial-use products would be tested and optimized to maximize their marketability and value. Calera would use the information it gathered during the MLMDP project to scale up its full carbonate mineralization technology to commercial scale at other locations. Calera expects that the aggregates and cementitious products generated in the MLMDP would be sold for use in the construction industry once the technology is implemented at a commercial scale. However, a commercial-scale plant is not part of this project. The Absorption Demonstration Plant and MLMDP are collectively referred to as the Moss Landing Demonstration Plant.

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Source: Hillshade, USGS, 2001; State parks, Cal State Parks - Acquisition and Development Division, 2009; USFWS Lands, USFWS, Region 1, Division of Refuge Planning, 2004; USDA, 2009; Roads, communities and streams, ESRI, 2005.

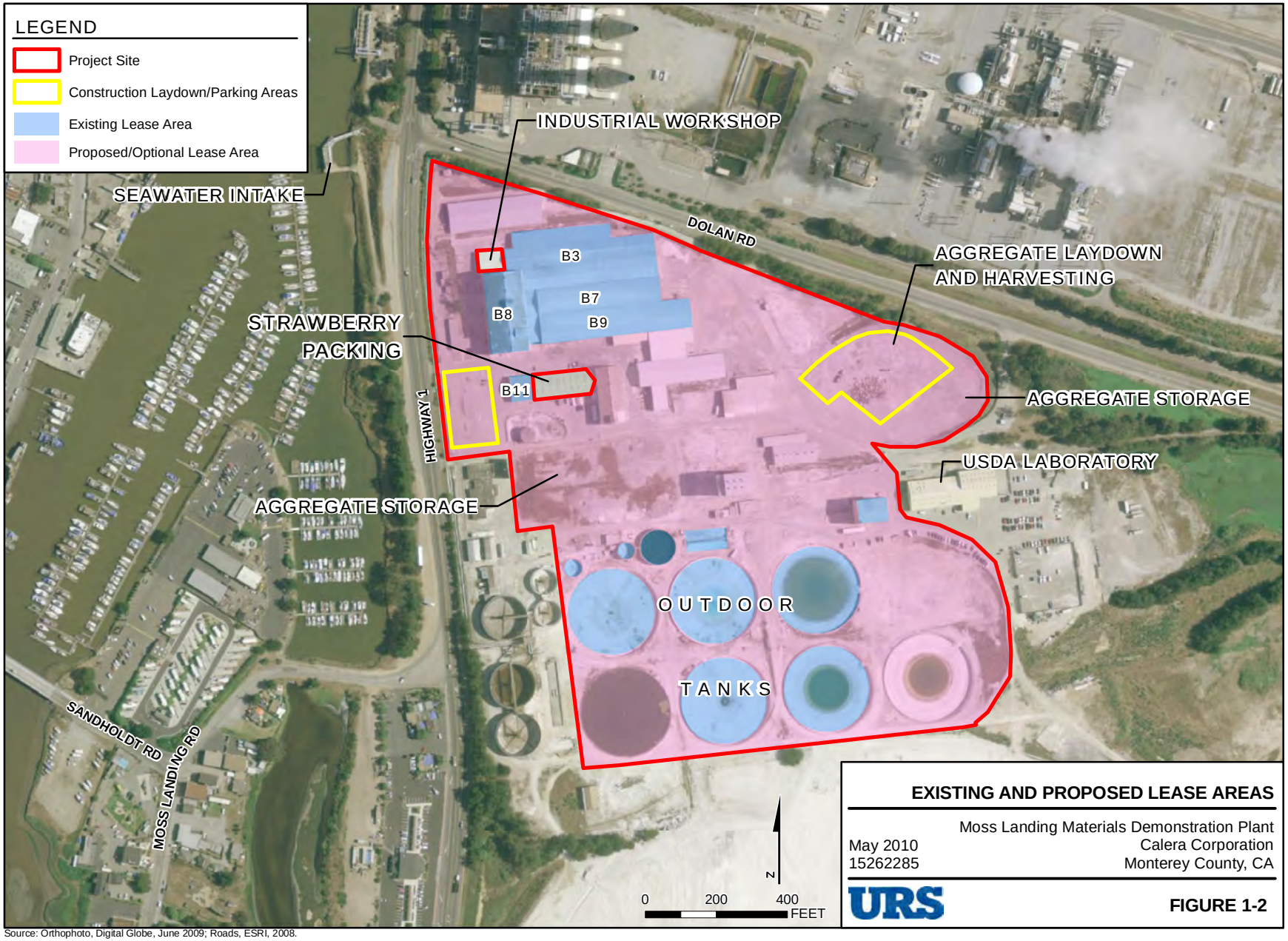
PROJECT VICINITY

Moss Landing Materials Demonstration Plant
Calera Corporation
Monterey County, CA

May 2010
15262285

URS

FIGURE 1-1



EXISTING AND PROPOSED LEASE AREAS

Moss Landing Materials Demonstration Plant
May 2010 — Calera Corporation
15262285 — Monterey County, CA

URS

FIGURE 1-2

Source: Orthophoto, Digital Globe, June 2009; Roads, ESRI, 2008.

1.2 PROJECT OBJECTIVES

The American Recovery and Reinvestment Act (ARRA) was established in 2009 to stimulate the economy and to create and retain jobs. Pursuant to ARRA, DOE issued a Funding Opportunities Announcement in June 2009 to spur investment in industrial carbon capture and sequestration and clean technology. DOE is allocating up to $100 million for innovative concepts for beneficial use of carbon dioxide. The awards are part of $1.4 billion in funding allocated under the ARRA for projects that will capture carbon dioxide from industrial sources.

The purpose of the Innovative Concepts for Beneficial Reuse of Carbon Dioxide Program is to stimulate pilot-scale field testing of carbon dioxide use technologies to provide information on the cost and feasibility of larger-scale implementation and operation of these technologies. The objective is to demonstrate innovative concepts, including carbon mineralization to carbonates, directly through conversion of carbon dioxide in flue gas. To receive DOE funding, the carbonates produced from mineralization processes must result in permanent storage of carbon dioxide through end uses. "Use" of carbon dioxide is defined as the permanent conversion of carbon dioxide from flue gas into another form, such as solid carbonates (i.e., mineralization), plastics, or fuels.

Calera's proposed project would be consistent with the objectives of the DOE's Innovative Concepts for Beneficial Reuse of Carbon Dioxide Program.

1.3 PROJECT NEED

The need for the project is to develop economically viable technologies that will reduce carbon dioxide emissions without adversely affecting energy use. Calera would demonstrate an innovative process to directly mineralize carbon dioxide in flue gas to carbonates and convert them to materials directly usable in the construction industry. The MLMDP would be the second (back-end) stage of Calera's two-part carbonate mineralization process. Calera would use the information it gathers during the project to scale up its full carbonate mineralization and conversion technology to commercial scale at other locations. Calera expects that the aggregates and cementitious products generated in the MLMDP would be sold for use in the construction industry once the technology is implemented at a commercial scale.

2.0 ALTERNATIVES

This section discusses the alternatives considered but dismissed from further evaluation and the alternatives carried forward for analysis.

2.1 ALTERNATIVES CONSIDERED BUT DISMISSED FROM DETAILED EVALUATION

Calera Corporation (Calera) initially considered application for federal financial assistance for the installation of a process to convert slurry—which contains carbon dioxide captured from flue gas—into aggregates and cementitious products at a facility adjacent to an existing power plant at several locations, including Moss Landing (Monterey County, California), Trona (San Bernardino County, California), and Sunbury (Snyder County, Pennsylvania). After considering factors such as existing infrastructure, staffing, permits, site capacity, proximity to in-use front-end processes (e.g., absorber demonstration), and proximity to Calera's Los Gatos headquarters and laboratories, Calera selected a portion of the Moss Landing Commercial Park site for its Proposed Action (Figures 1-2 and 2-1). No alternative sites were carried forward for detailed evaluation.

After selecting the Moss Landing Commercial Park site, Calera completed an initial fatal flaws environmental analysis for use of different portions of the commercial park. The use of areas immediately east and south of the proposed project limits was considered but dismissed from further evaluation because these areas posses wildlife habitat, likely waters of the United States (under the jurisdiction of the U.S. Army Corps of Engineers), potential wetlands, potentially unstable soils, and other concerns.

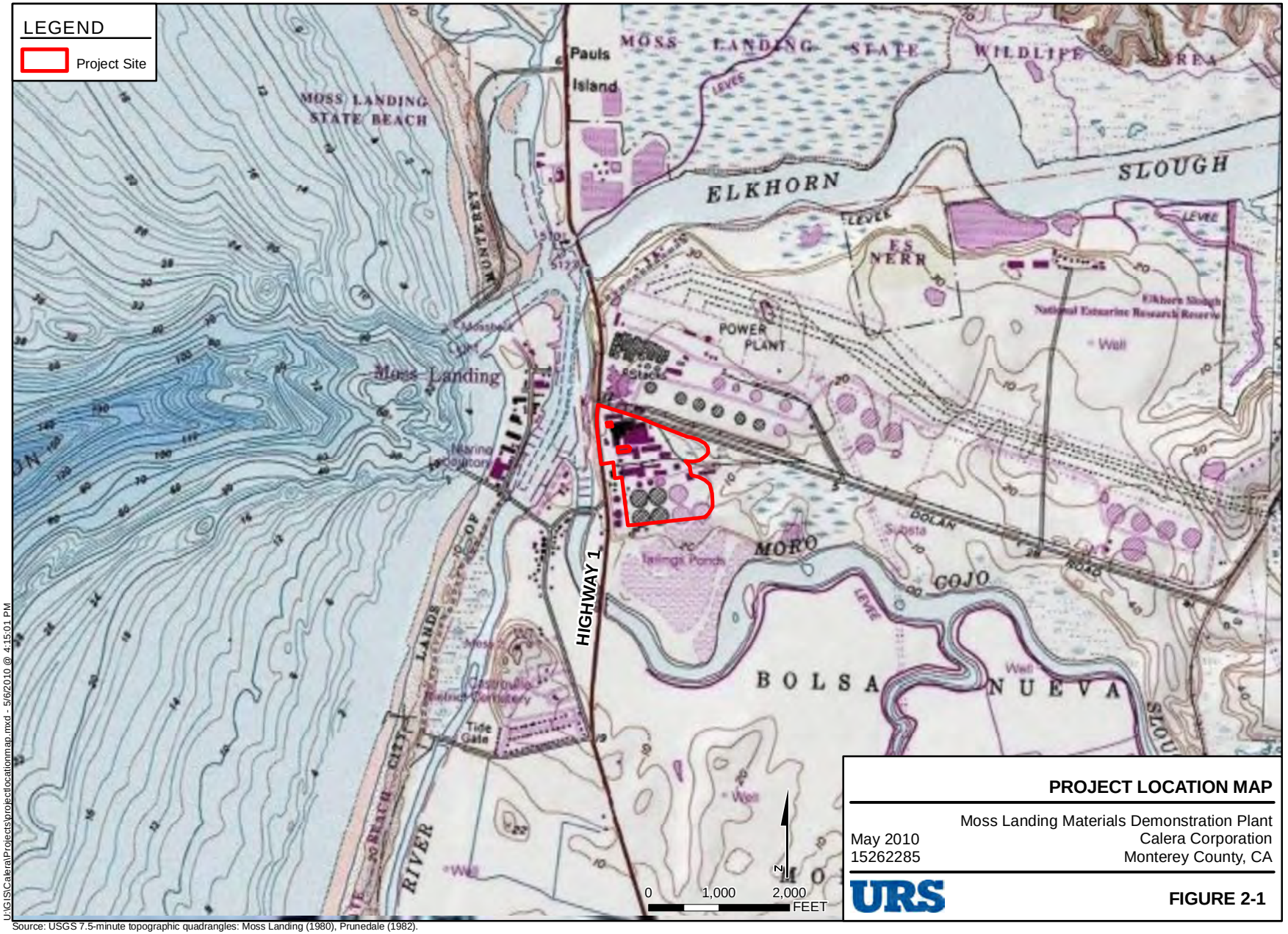
2.2 ALTERNATIVES CARRIED FORWARD FOR EVALUATION

Three alternatives were identified for detailed evaluation: a No Action Alternative, Alternative 1 (the Proposed Action), and Alternative 2 (alternative source of funding). These alternatives are described below.

2.2.1 No Action Alternative

Under the No Action Alternative, the Department of Energy (DOE) would not provide funding to Calera, no additional funding would be secured, and activities at the site would continue as they do at present. Calera would operate the Moss Landing Pilot Plant (Pilot Plant) and the Moss Landing Absorption Demonstration Plant (Absorption Demonstration Plant). The Pilot Plant would continue to run the complete process involving the absorption of carbon dioxide and the creation of small amounts of aggregates and cementitious products scaled at 1:1,000 to a commercial plant. Under this alternative, the Absorption Demonstration Plant would continue to operate scaled at 1:100 to a projected commercial plant. Similar to the Pilot Plant, the Absorption Demonstration Plant would continue to capture carbon dioxide intermittently from flue gas produced by the adjacent Moss Landing Energy Facility natural gas–fired combined-cycle power plant and use a base/high-alkalinity material plus calcium and/or other divalent cations to capture and convert the carbon dioxide into solid carbonates. Under this alternative, no conversion of process output to aggregates and cementitious products at scales larger than that produced by the Pilot Plant would occur. Plant operations would continue under current permits and authorities. Liquid and solid waste generated by the Pilot Plant and the Absorption Demonstration Plant would be used for testing or would be recycled on site or disposed of in accordance with all applicable local, state, and federal regulations.

The No Action Alternative would not meet the purpose and need of the project because this alternative would not fulfill DOE's objective to demonstrate innovative concepts, such as carbon mineralization to carbonates, for beneficial carbon dioxide reuse. However, this alternative provides a benchmark against which to compare Alternatives 1 and 2.



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Source: USGS 7.5-minute topographic quadrangles: Moss Landing (1980), Prunedale (1982).

PROJECT LOCATION MAP

Moss Landing Materials Demonstration Plant
May 2010 — Calera Corporation
15262285 — Monterey County, CA

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FIGURE 2-1

2.2.2 Alternative 1: Proposed Action

The Proposed Action is the granting of Phase 2 federal financial assistance to Calera for final design, construction, and operation of the Moss Landing Materials Demonstration Plant (MLMDP). The financial assistance would be granted through the DOE's Innovative Concepts for Beneficial Reuse of Carbon Dioxide program. The DOE grant represents 50 percent of the total cost of the Proposed Action. The MLMDP would convert output from the Absorption Demonstration Plant into aggregates and cementitious products, which would be tested and optimized to maximize marketability and value. The Absorption Demonstration Plant and MLMDP are collectively referred to as the Moss Landing Demonstration Plant. An overview of the Proposed Action is provided below; a detailed description—which includes confidential and proprietary information—is provided in Appendix A.

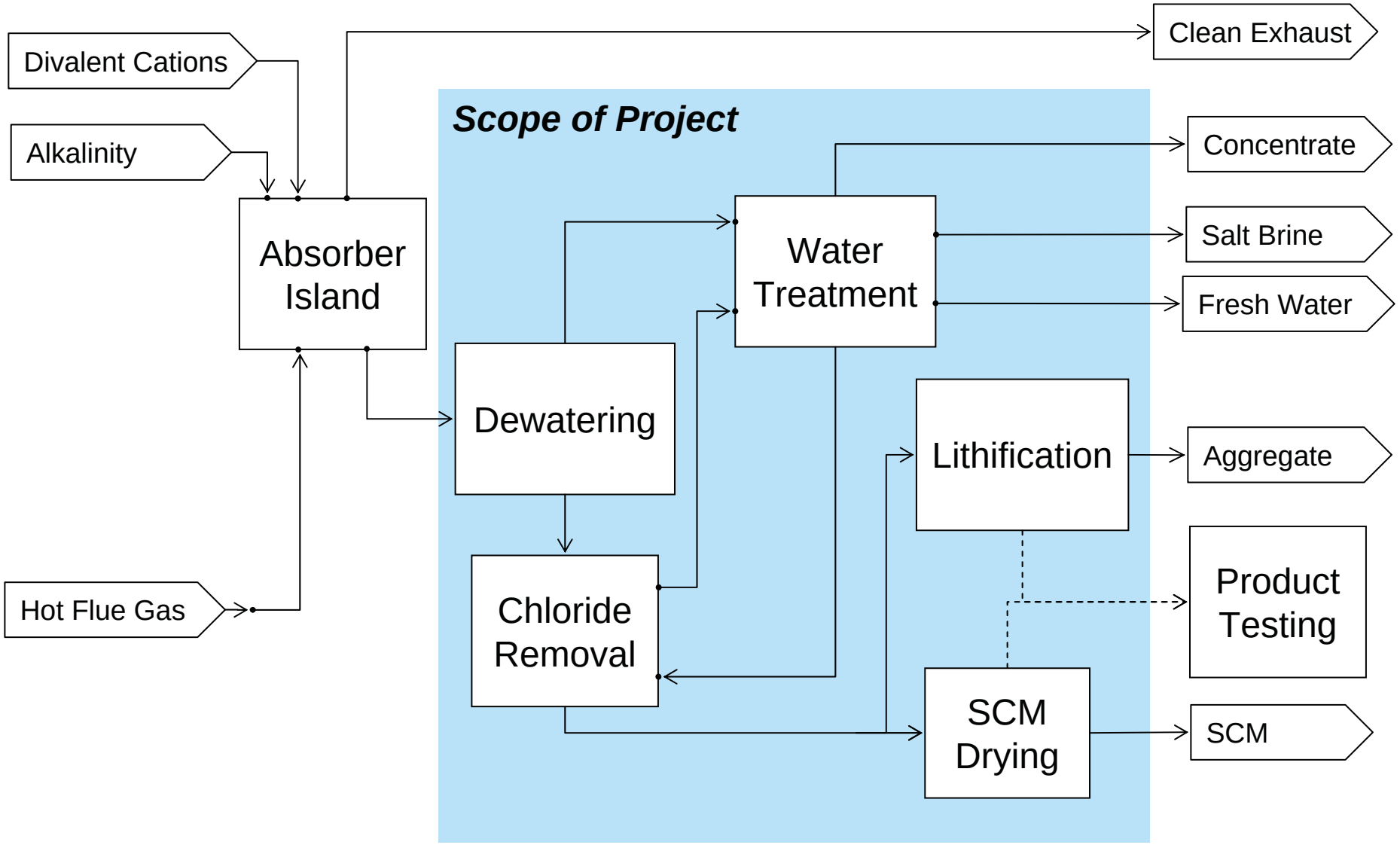
2.2.2.1 Process Description

A simplified block flow diagram of the MLMDP process is presented in Figure 2-2. The MLMDP process would begin with slurry from an existing absorber product surge tank within the Absorption Demonstration Plant.[1] This slurry would be pumped to the primary slurry dewatering units, where it would be dewatered to form a liquid supernatant and thickened slurry. The thickened slurry would then be sent to the slurry holding tank, and the liquid supernatant would be sent to the supernatant surge tank, from which it would be pumped to an existing, outdoor, supernatant storage tank.

Slurry from the slurry holding tank would be pumped into secondary slurry dewatering units, which would continue the dewatering process; then the slurry would be pumped to a lithification unit and/or drying units. The supernatant would be recycled into the process to reduce process water consumption and to use unreacted base and alkali. An integrated system consisting of electrodialysis, reverse osmosis, and a series of filtration steps may be used. The lithification unit would further dewater the slurry; water would be removed as vapor.

A binder would be added to some of the dewatered slurry, and the slurry would be moved by dump truck for spreading at an aggregate drying and harvesting area. Leachate would be decanted and sediment allowed to settle; this sediment is expected to be collected and subjected to testing for potential applications. The decanted water would be discharged into a tank. After the material had dried, it would be harvested using a scraper or dozer. A mobile crushing unit that would incorporate available dust and noise suppression equipment would be used approximately once per month to crush the material into aggregate. The crushed material would be sifted into distinct classifications and stored on site in outdoor storage bays. Because of the site's proximity to Monterey Bay, the aggregate stored in the bays might be exposed to salts in the air. If the intended use of the aggregate is for concrete, it would be washed before use in a wash bay. If the intended use of the aggregate is for landscaping or base rock, there would be no need to wash the aggregate. The water for dust control during harvesting would come from existing recycled process water. This water would also be used for aggregate washing. Once used for washing, the water would be collected and transferred to an existing outdoor tank. The MLMDP would use groundwater that is piped from the existing well. By using enhanced water recycling methods, the amount used would be less than or equal to what is currently used by the Moss Landing Cement Company (MLCC). Seawater may also be periodically used in accordance with existing permits. Calera's overall goal for the MLMDP is to achieve zero liquid discharge.

[1] Calera operates the existing Pilot Plant, Absorption Demonstration Plant, and an Electrochemistry Pilot Plant on site. The Absorption Demonstration Plant provides the "front-end" of the process, capturing carbon dioxide from a slip stream of flue gas produced by the adjacent Moss Landing Energy Facility and converting the carbon dioxide into solid carbonates. A detailed description of the Pilot Plant and the Absorption Demonstration Plant are included in Appendix A. Facilities (e.g., plant arrangement), operations (e.g., process, water supply), and maintenance of the Pilot Plant and the Absorption Demonstration Plant would not be altered by, and would continue regardless of, DOE funding.



BLOCK FLOW DIAGRAM

Moss Landing Materials Demonstration Plant
May 2010 — Calera Corporation
15262285 — Monterey County, CA

URS

FIGURE 2-2

5/11/10 vsa ...T:\Calera\Fig 2-2_block flow dia.ai

After secondary slurry dewatering, some slurry may also be briquetted, which involves adding a binder and pressing the slurry solids into formed briquettes. Various binders are expected to be tried. Briquettes would be sieved to sort various briquette sizes and trucked to outdoor storage bays.

Some of the slurry would also be transferred to drying units including a spray dryer, a swirl dryer, and/or a rotary drum. These units would be used to dewater the slurry to greater than 99.9 percent solids by weight to create supplementary cementitious materials (SCM). SCM would be conveyed to one of three SCM storage silos by pneumatic conveyor. SCM would periodically be blown through hoses into trucks for hauling.

2.2.2.2 Plant Arrangement

All new facilities would be within the limits of the existing Moss Landing Commercial Park site. The site and areas adjacent to the north, east, and south of the site are zoned "Heavy Industrial, HI (CZ)"; therefore, the proposed plant arrangement modifications would comply with existing zoning requirements (see Sections 3.5 and 4.5, Land Use).

The dewatering equipment associated with the MLMDP would be included in Building 3 and Building 8 on the site; these buildings are currently used for the Pilot Plant and the Absorption Demonstration Plant. Buildings 5, 7, and 9 are currently leased by the MLCC and may also by used for the MLMDP. The existing outdoor storage tanks, some of which are used for the Pilot Plant and the Absorption Demonstration Plant would also be used for the MLMDP.

Three silos would be constructed in the vicinity of the perimeter of existing buildings for the storage of SCM. The top of the silos would be below the roof line of the existing buildings. An aggregate lay down area would be constructed east of the existing building complex. This lay down area would be used for the construction of outdoor pads; it would have a concrete berm/curb around the perimeter and separate leachate collection and water collection systems. Slurry would be spread in 60-foot by 60-foot pads to allow for additional drying of material. Six of these pads are expected to be constructed side by side. Material would be placed on top of previously spread material in the pads until the height of the product reaches approximately 6 feet. After harvesting and sifting, the aggregate would be stored in three-sided uncovered bays—each of which would be approximately 8 feet tall.

2.2.2.3 Project Construction

As described above, the following facilities would be constructed as part of the Proposed Action: three silos to store SCM; an aggregate lay down, drying, and harvesting area; and three-sided uncovered bays for storage of aggregate and briquettes. The total construction cost is estimated to be approximately $31 million, including labor and equipment. At least $3 million of this amount is anticipated to be purchased locally.

No offsite linears, such as water or gas lines, are expected to be constructed for implementation of the MLMDP, with the exception of the existing site utility line connection, which may need to be upgraded. Excavations would be needed within existing structures for the installation of equipment. The excavated material would be placed around the existing facility to fill existing rough grades; construction is not anticipated to require the import of soil.

Calera would commence site mobilization after receipt of all building, development, and environmental permits for the MLMDP. Site preparation work would include site grading and storm water control. Crushed rock would be used for temporary roads and laydown and work areas that are not currently paved. Onsite construction and commissioning is expected to occur over 7 months, commencing in fall/

winter 2010 and completed in spring/summer 2011.[2] The majority of construction operations are expected to take place between 6:00 a.m. and 6:00 p.m. However, longer workdays or workweeks may be necessary to make up for schedule delays or to complete critical construction activities. During the start-up and testing phase of the project, some activities may continue 24 hours per day, 7 days per week. All construction activity, access, and staging is expected to occur within the MLCC site, and all construction deliveries would occur on existing roads, within the construction hours stated above.

Projected construction staff is expected to include an average of 48 workers throughout the approximately 6-month-long construction period, with an estimated peak of approximately 77 workers for a period of 3 months. Approximately 18 workers are expected to be present for the 1-month-long commissioning period. The onsite workforce would include construction craft, engineers, and operators. The majority of construction workers are anticipated to commute daily to the project site. Given the size of the labor force within commuting distance of the site, less than 10 percent of the construction laborers are expected to relocate for the construction period. It is expected that enough construction workers and laborers are available within the region to meet project demands during the construction period.

Portions of the MLCC site would be used for construction laydown, offices, and parking. Mobile trailers or similar suitable facilities (e.g., modular offices) would be used as construction offices for contractor and subcontractor personnel. Site access would be controlled for personnel and vehicles. The construction laydown and parking areas would be graded (as necessary) and surfaced with crushed rock, which would provide erosion protection. As necessary, temporary security fences would be installed for access control. If needed, a construction Storm water Pollution Prevention Plan would be prepared and implemented. The plan would include best management practices to minimize erosion, such as the use of strategically placed berms, swales, and culverts to redirect runoff toward stormwater retention basins. After construction, disturbed areas would be cleaned up, but the crushed rock surfacing and fencing may remain in place.

Construction access to the site would be through the MLCC main site entrance, accessed from Dolan Road. The primary route to the project site is Highway 101 to Dolan Road. Construction materials would be delivered to the MLCC site by truck. The primary delivery route is anticipated to be Highway 101 to State Route 156 (west) to State Route 183 (north) to Dolan Road (west). Oversized equipment delivery route would include Highway 101 to San Miguel Canyon Rd (north) to Castroville Boulevard (west) to Dolan Road (west). Alternative routes for oversized equipment would include Highway 156 (west) to Highway 1 (north) to Dolan Road (east). The specific route would be determined in consultation with the California Highway Patrol and Caltrans. An estimated average of approximately 48 construction staff vehicle roundtrips would be required, with a peak level of about 77 construction staff vehicle round trips per day.

Temporary utilities would be provided for the construction offices, the laydown area, and the project site. Area lighting would be provided and strategically located for safety and security. Construction water would be supplied by existing water sources. Average daily use of construction water is estimated to be 250 gallons, with an estimated maximum water usage of 1,500 gallons per month over a 3-month peak construction period. Services provided during construction would include environmental health and safety training; site security; site first aid; sanitary facilities; trash collection and disposal; and disposal of hazardous materials and waste in accordance with local, state, and federal regulations.

Hazardous materials used during construction would consist of typical construction materials, such as solvents and lubricants. Hazardous materials and commodities for use on site would be inventoried and stored indoors in approved, industry standard containers. Warehouse personnel would maintain the records for these materials. Nonhazardous refuse and construction rubbish would be sorted and stored in

[2] The schedule has been estimated based on a single shift, a 10-hour workday, and a 50-hour workweek.

containers until removed from the MLCC site for recycling or disposal. A local vendor would arrive on site with approved equipment to fuel generators, trucks, and construction equipment, when necessary. Hazardous waste generated during the construction period would be placed in properly identified and approved storage bins until it is recycled or disposed of off site in accordance with applicable local, state, and federal regulations.

The existing site-specific health and safety plan (HSP) would be supplemented to include the MLMDP. The HSP would describe the information and procedures that the onsite personnel would follow to complete the work, including the procedures established in the project Environmental Management Plan. The HSP would outline the requirements for control of construction safety hazards, in compliance with safety standards and protection of public health, and would provide specific guidance for doing so. Prior to the start of construction, the contractor would coordinate with local emergency responders to inform them of construction and identify contact points for emergencies, including notification of the hazardous materials unit. An emergency evacuation procedure would be communicated to all personnel.

2.2.2.4 Project Operations and Maintenance

Operation of the MLMDP would require approximately 18 additional full-time personnel (i.e., approximately 6 additional staff would be employed for each of up to three shifts operated each day). MLMDP operations would likely be consistent with the operation of the Absorption Demonstration Plant, which runs up to 24 hours each day. When the plant is not operating, personnel would be present, as necessary, to prepare the plant for start-up, shutdown, or maintenance. Existing operational security and safety procedures would be followed during operation of the MLMDP; these procedures would be augmented with new procedures, as described in the Environmental Management Plan. Operation of the MLMDP would include continued testing and refinement of processes and monitoring of components and end products. Once operation provides sufficient data to allow for commercial scale-up, the facility is expected to continue to operate as a research and development facility for Calera. Operation of process equipment is expected to require a capacity of approximately 1 to 2 megawatts, which is anticipated to be provided through the use of propane or an upgrade to the existing site utility connection.

Liquid output streams are expected to be reused within the Moss Landing Demonstration Plant or in related processes at the MLCC site. Specific liquid output streams include calcium-rich water, sodium chloride–rich water, and freshwater streams. The calcium-rich water stream would be recirculated to dilute or dissolve the incoming divalent cation stream. The sodium chloride–rich stream would be used in Calera's electrochemical process. Freshwater would be reused within the process. Solid products are expected to consist primarily of calcium carbonate; with small quantities of magnesium carbonate, calcium sulfate, and other materials resulting from impurities in feed stock or trace pollutants in flue gas. These materials are expected to be used in testing and/or sold for use in concrete mixtures.

During operations, storm water runoff from outdoor storage areas would be contained. The containment would have a manual controlled discharge, whereby all contained water in the storage area would be captured and tested prior to release to the stormwater system currently in place for the Moss Landing Commercial Park. Floor drains and process water would be kept separate from rain water runoff.

Calera would implement the following fugitive dust-control measures during operation at the project site to minimize the formation of fugitive dust: bagho uses would be used to suppress dust from process equipment, water would be sprayed on the outdoor aggregate production when in use, and vehicle speeds on unpaved roads would be limited to 10 miles per hour.

Maintenance activities associated with the MLMDP would be expected to be limited to equipment cleaning, testing, and maintenance per product specifications, good housekeeping, and Calera process

requirements. Preventative maintenance would be conducted to ensure safe operations. Other facilities maintenance is the responsibility of the Moss Landing Commercial Park, as owners of the site.

2.2.2.5 Project Demolition and Decommissioning

Calera anticipates that it would run the MLMDP for the foreseeable future and at this time has no plans for demolition or decommissioning. Once the useful life of the facility is complete, any demolition and decommissioning would be completed according to local, state, and federal permits and requirements and would be conducted in compliance with any agreements (e.g., MLCC lease).

2.2.3 Alternative 2

Under Alternative 2, no DOE funding would be received. However, Calera would pursue and obtain alternative sources of funding for the construction, operation, and maintenance of the MLMDP. All processes; the plant arrangement; and project construction, operations, maintenance, and demolition and decommissioning would be as described above for the Proposed Action. An increased level of uncertainty would be associated with identifying alternative sources of funding, and for the purpose of analyzing this alternative, it is assumed that funding would not be secured for up to 3 years. Therefore, impacts from Alternative 2 would generally be the same as those described for the Proposed Action, but would occur later in time and might not include some of the mitigation and monitoring requirements resulting from federal involvement.

3.0 AFFECTED ENVIRONMENT

Section 3 provides descriptions of the affected environment for the following resource areas: atmospheric conditions/air quality, water quality /quantity/hydrologic conditions, ge ologic/soil conditions, solid and hazardous waste, l and use, noise, hist oric/cultural resources, vi sual resources, ecology , socioeconom ic conditions, and health and safety factors.

3.1 ATMOSPHERIC CONDITIONS/AIR QUALITY

This section describes the regulatory setting and existing conditions for this resource area.

3.1.1 Regulatory Setting

This section describes the federal, state, and local regulatory settings.

3.1.1.1 Federal

The federal Clean Air Act (CAA) of 1 970, 42 USC 740 1 et seq. , as am ended in 1 977 and 199 0, is t he basic federal statute governing air pollutio n and its control. The provi sions of the CAA that are potentially re levant to the project alternatives in clude the National Am bient Air Quality S tandards (NAAQS), Prevention of Significant Deterioration (PSD) Requirements, and General Conformity rule.

National Ambient Air Quality Standards

NAAQS have been adopt ed for seven criteria pollutants—ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur di oxide (SO_2), particulate matter of 10 microns or less in diameter (PM_{10}), particulate matter of 2.5 microns or less in diameter ($PM_{2.5}$), and airborne lead. The NAAQS may include primary or secondary standards. Pri mary standard s set lim its to protect public health and secondar y standards set li mits to pr otect public welfar e. Av eraging periods vary by criteria pollutants based on potential health and welfare effects of each pollutant. The NAAQS are enforced by the states via local air quality agencies. States may choose to adopt their own air quality standards, but state standards must be at least as stringent as federal standards. Table 3.1-1 lists the NAAQS.

The U .S. Environmental Protection Ag ency (U.S. EPA) evaluates whet her the criter ia air pollutant leve ls within a geographic area m eet the NA AQS. Areas that violate air quality s tandards are designated as nonattainment areas for the rele vant pollutants. N onattainment are as are som etimes furthe r c lassified by degree (marginal, moderate, serious, severe, and extrem e for O_3, and moderate and serious for CO and PM_{10}). Areas that c omply with air quality st andards a re designated as a ttainment areas for the relevant pollutants. Areas that have been redesignated from nonattainment to attainment are considered maintenance areas. Areas of uncertain status are generally designated as unclassifiable but are treat ed as atta inment areas for regulatory purposes. Federal law requires states to develop plans, known as state implementation plans (SIPs), describing how they would attain the NAAQS. SIPs are approved by the U.S. EPA and are federally enforceable.

Prevention of Significant Deterioration

In addition t o the NAAQS described above, the federal PSD pr ogram has b een est ablished to protect against deterioration of air qualit y in th ose areas th at already meet the N AAQS. Specifical ly, the PS D program establishes allow able concentr ation increas es for attainment pollutants due to new emission sources that are classified as major so urces. Th ese increases all ow econom ic growth, whil e preserving the existing air qualit y, protecting publ ic health and welfare, and protecting Class I areas (national parks and wilderness areas).

Table 3.1-1
State and Federal Ambient Air Quality Standards

Ambient Air Quality Standards						
Pollutant	**Averaging Time**	**California Standards** [1]		**Federal Standards** [2]		
		Concentration [3]	**Method** [4]	**Primary** [3,5]	**Secondary** [3,6]	**Method** [7]
Ozone (O_3)	1 Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	—	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 µg/m^3)		0.075 ppm (147 µg/m^3)		
Respirable Particulate Matter (PM10)	24 Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		—		
Fine Particulate Matter (PM2.5)	24 Hour	No Separate State Standard		35 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	15.0 µg/m^3		
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m^3)	None	Non-Dispersive Infrared Photometry (NDIR)
	1 Hour	20 ppm (23 mg/m^3)		35 ppm (40 mg/m^3)		
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		—	—	—
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm (57 µg/m3)	Gas Phase Chemiluminescence	0.053 ppm (100 µg/m^3)	Same as Primary Standard	Gas Phase Chemiluminescence
	1 Hour	0.18 ppm (339 µg/m^3)		0.100 ppm (see footnote 8)	None	
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	—	Ultraviolet Fluorescence	0.030 ppm (80 µg/m^3)	—	Spectrophotometry (Pararosaniline Method)
	24 Hour	0.04 ppm (105 µg/m^3)		0.14 ppm (365 µg/m^3)	—	
	3 Hour	—		—	0.5 ppm (1300 µg/m^3)	
	1 Hour	0.25 ppm (655 µg/m^3)		—	—	—
Lead[9]	30 Day Average	1.5 µg/m^3	Atomic Absorption	—	—	—
	Calendar Quarter	—		1.5 µg/m^3	Same as Primary Standard	High Volume Sampler and Atomic Absorption
	Rolling 3-Month Average[10]	—		0.15 µg/m^3		
Visibility Reducing Particles	8 Hour	Extinction coefficient of 0.23 per kilometer — visibility of ten miles or more (0.07 — 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.		**No Federal Standards**		
Sulfates	24 Hour	25 µg/m^3	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride[9]	24 Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

See footnotes on next page ...

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1. California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended particulate matter—PM10, PM2.5, and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

2. National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24 hour standard is attained when the expected number of days per calender year with a 24-hour average concentration above 150 $\mu g/m^3$ is equal to or less than one. For PM2.5, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact U.S. EPA for further clarification and current federal policies.

3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

4. Any equivalent procedure which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.

5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

6. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

7. Reference method as described by the EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the EPA.

8. To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm (effective January 22, 2010).

9. The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

10. National lead standard, rolling 3-month average: final rule signed October 15, 2008.

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The PSD regulations define a major stationary source as any source type belonging to a list of 28 source categories that emits, or has the potential to emit 100 tons per year or more of any pollutant regulated under the federal CAA, or any other source type that has the potential to emit such pollutants in amounts equal to or greater than 250 tons per year. If a source is considered major for PSD purposes because of one pollutant, then PSD review is applicable for those other pollutants emitted from the source in amounts greater than the PSD significance levels. The PSD regulations require major stationary sources to undergo a preconstruction review that includes an analysis and implementation of best available control technology (BACT), a PSD increment consumption analysis, an ambient air quality effects analysis, and analysis of air quality-related values (i.e., effects on soils, visibility, and vegetation).

General Conformity

Section 176(c) of the federal CAA contains requirements that apply specifically to federal agency actions, including actions receiving federal funding. This section of the CAA requires federal agencies to ensure that their actions are consistent with the CAA and applicable state air quality management plans. Federal agencies are required to evaluate their proposed actions to ensure that they would not cause or contribute to new violations of any NAAQS, that they would not increase the frequency or severity of any existing violations of the NAAQS, and that they would not delay the timely attainment of the NAAQS.

U.S. EPA has promulgated separate rules that establish conformity analysis procedures for transportation-related actions and for other (general) federal agency actions. The general conformity rule requires a formal conformity determination document for federally sponsored or funded actions in nonattainment or maintenance areas when the net increase in direct and indirect emissions of nonattainment or maintenance pollutants exceeds specified *de minimis* thresholds (40 CFR 93). The project is in an area that is designated as a federal attainment area for all criteria pollutants.

Federal Greenhouse Gas Regulations

Endangerment and "Cause or Contribute" Findings. In Massachusetts v. U.S. Environmental Protection Agency, et al., 549 U.S. 497 [2007]), the United States Supreme court ruled that greenhouse gas (GHG) does fit within the CAA's definition of a pollutant, and that the U.S. EPA does have the authority to regulate GHG. On April 17, 2009, the Proposed Endangerment and Cause or Contribute Findings for Green House Gases under the Clean Air Act was signed. The endangerment finding proposes that the projected concentrations of six GHGs in the atmosphere threaten the public health and welfare of current and future generations. The cause or contribute finding proposes that the combined emissions of carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs) from new motor vehicles and motor vehicle engines contribute to the atmospheric concentration of key GHGs and the threat of climate change.

Mandatory Reporting of GHG Emissions. On September 22, 2009, the U.S. EPA published the final rule that requires mandatory reporting of GHG emissions from large sources in the U.S. The rule amends CAA Regulations under 40 CFR Parts 86, 87, 89, 90 and 94 and provides a new section, Part 98. The reporting would be used by U.S. EPA to collect accurate and comprehensive emissions data to inform future policy decisions. The final rule requires that facilities that emit 25,000 metric tons or more per year of GHG emissions submit annual reports to U. S. EPA under Subpart C of the Rule. The gases covered by the final rule are CO_2, CH_4, N_2O, HFCs, perfluorocarbons, sulfur hexafluoride, and other fluorinated gases including nitrogen trifluoride (NF_3) and hydrofluorinated ethers.

3.1.1.2 State

California Clean Air Act

In addition to the federal CAA, air quality in California is also governed by the California Clean Air Act (CCAA). The CCAA, as amended in 1992, requires all air districts in the state to endeavor to achieve and maintain the California Ambient Air Quality Standards (CAAQS). The California Air Resources Board (CARB) administers the CCAA statewide. CARB is responsible for ensuring implementation of the federal CAA within the state, and establishing the CAAQS. It is also responsible for setting emission standards for vehicles sold in California and for other emission sources, such as consumer products and certain off-road equipment. CARB also establishes passenger vehicle fuel specifications. In addition, CARB oversees the functions of local air pollution control districts and air quality management districts, which in turn administer activities for controlling stationary emission sources at the regional and county levels. The CCAA is administered by CARB at the state level and by local air pollution control districts and air quality management districts at the regional level.

California Ambient Air Quality Standards

California has established ambient air quality standards that are more stringent than the comparable federal standards and that address pollutants not covered by federal ambient air quality standards including visibility-reducing particles, sulfates, and hydrogen sulfide. The CAAQS are also presented in Table 3.1-1.

Mandatory Reporting of Greenhouse Gas Emissions

The CARB approved a regulation for the mandatory reporting and verifying of GHG emissions from major sources on December 6, 2007, pursuant to the California Global Warming Solutions Act of 2006. The reporting regulation serves as a foundation to determine GHG emissions and track future changes in emission levels. California requires general stationary combustion facilities that emit greater than or equal to 25,000 metric tons of CO_2 equivalent to report and submit to CARB data on annual GHG emissions for the preceding year.

3.1.1.3 Local

The CCAA designates the Monterey Bay Unified Air Pollution Control District (MBUAPCD) as the regional agency principally responsible for comprehensive air pollution control in the North Central Coast Air Basin (NCCAB), which includes the counties of Monterey, Santa Cruz and San Benito. The MBUAPCD adopts rules and regulations for stationary sources of air pollution, establishes permitting requirements, inspects emission sources, and enforces compliance with such measures. The MBUAPCD is required to produce plans for complying with ambient air quality standards within its jurisdiction every three years.

Rules and Regulations

The proposed project is subject to the MBUAPCD rules and regulations. The paragraphs below outline the MBUAPCD rules and regulations that may apply to the project.

Regulation II: Permits. This regulation establishes the framework of the application for construction and operating permits for new or modified equipment that emits air pollutants.

Rule 200: Permits Required. New emission sources shall obtain a separate written authority to construct (ATC) for each permit unit from the Air Pollution Control Officer. An authority to construct

shall remain in effect until the permit to operate (PTO) the equipment for which the application was filed is granted or denied or the application is cancelled. An ATC and PTO would be required for the project. The Moss Landing Materials Demonstration Plant (MLMDP) would need to obtain an ATC permit for all its process equipment before installation of the project. On completion of initial compliance testing, PTOs would be issued.

Rule 207: Review of New or Modified Sources. This rule requires that the project be publicly noticed before issuance of the permits, and identifies the BACT and offset provisions. The permits would be conditioned such that compliance with the emission limits established by this rule would be continuously monitored.

Best Available Control Technology. Best Available Control Technology is defined as: a) has been contained in any SIP and approved by U.S. EPA; b) the most stringent emission limitation or control technique that has been achieved in practice for a class of source, or c) any other emission limitation or control technique that the District's Air Pollution Control Officer finds is technologically feasible and is cost-effective. BACT would apply to any air pollutant that results in an emissions increase of 25 pounds per day for NO_X as NO_2 and of volatile organic compounds; 150 pounds per day of SO_X as SO_2 and of total suspended particulates; 550 pounds per day of CO; or 82 pounds per day of PM_{10}. The emission sources that may require BACT are the dryers and aggregate crushing unit proposed as part of the Proposed Action and Alternative 2. The dryers are equipped with baghouses and the crushing unit is equipped with dust suppression equipment that represent BACT.

Offsets. Emissions offsets for new sources are required when those sources exceed the following emissions levels:

- Volatile organic compounds - 137 lbs/day
- Oxides of nitrogen - 137 lbs/day
- Sulfur oxides - 150 lbs/day
- Carbon Monoxide - 550 lbs/day
- Total Suspended Particulates - 150 lbs/day
- Particulate Mater less than 10 microns - 82 lbs/day

The emission offsets provided shall be adjusted according to the distance of the offsets from the project site. The ratios range from 1:1 to 2.5:1, depending on the relative offset location, air pollutant attainment status, and interpollutant trading.

Regulation IV: Prohibitions

Rules 400, 402, 403, 404, and 412, Visible Emissions, Nuisances, Particulate Matter, Sulfur Compounds and Nitrogen Oxides, and Sulfur Content of Fuels. These rules would be applicable to both the construction and operation phases and limit visible emissions, emissions that would cause a public nuisance, particulate matter emissions, sulfur compounds and NO_X from combustion equipment, and sulfur content of fuels. These rules would be part of the conditions of any permitted equipment of the project.

3.1.2 Existing Conditions

3.1.2.1 Topography and Meteorology

Air quality is affected by both the rate and location of pollutant emissions, and by meteorological conditions that influence movement and dispersal of pollutants. Atmospheric conditions, such as wind

speed, wind direction, and air temperature gradients, along with local topography, provide the link between air pollutant emissions and air quality.

The NCCAB is comprised of Monterey, Santa Cruz and San Benito Counties. The basin lies along the central coast of California and covers an area of 5,159 square miles. The northwest sector of the basin is dominated by the Santa Cruz Mountains. The Diablo Range marks the northeastern boundary, and together with the southern extent of the Santa Cruz Mountains forms the Santa Clara Valley which extends into the northeastern tip of the Basin. Farther south, the Santa Clara Valley evolves into the San Benito Valley which runs northwest-southeast and has the Gabilan Range as its western boundary. To the west of the Gabilan Range is the Salinas Valley, which extends from Salinas at its northwestern end to King City at its southeastern end. The western side of the Salinas Valley is formed by the Sierra de Salinas, which also forms the eastern side of the smaller Carmel Valley. The coastal Santa Lucia Range defines the western side of the Carmel Valley.

The semi-permanent high pressure cell in the eastern Pacific is the basic controlling factor in the climate of the air basin. In the summer, the high pressure cell is dominant and causes persistent west and northwest winds over the entire California coast. Air descends in the Pacific High forming a stable temperature inversion of hot air over a cool coastal layer of air. The onshore air currents pass over cool ocean waters to bring fog and relatively cool air into the coastal valleys. The warmer air aloft acts as a lid to inhibit vertical air movement.

The generally northwest-southeast orientation of mountainous ridges tends to restrict and channel the summer onshore air currents. Surface heating in the interior portion of the Salinas and San Benito Valleys creates a weak low pressure which intensifies the onshore air flow during the afternoon and evening.

In the fall, the surface winds become weak, and the marine layer grows shallow, dissipating altogether on some days. The air flow is occasionally reversed in a weak offshore movement, and the relatively stationary air mass is held in place by the Pacific High pressure cell, which allows pollutants to build up over a period of a few days. It is most often during this season that the north or east winds develop to transport pollutants from either the San Francisco Bay area or the Central Valley into the NCCAB.

During the winter, the Pacific High migrates southward and has less influence on the air basin. Air frequently flows in a southeasterly direction out of the Salinas and San Benito Valleys, especially during night and morning hours. Northwest winds are nevertheless still dominant in winter, but easterly flow is more frequent. The general absence of deep, persistent inversions and the occasional storm systems usually result in good air quality for the basin as a whole in winter and early spring.

Monterey Bay is a 25-mile wide inlet, which allows marine air at low levels to penetrate the interior. The Salinas Valley is a steep-sloped coastal valley which opens out on Monterey Bay and extends southeastward with mountain ranges of two to three thousand feet elevation on either side. The broad area of the valley floor near the mouth is 25 miles wide, narrowing to about 6 miles at Soledad, which is 40 miles inland, and to 3 miles wide at King City, which is about 60 miles from the coast. At Salinas, near the northern end of the Valley, west and northwest winds occur about one-half the time during the entire year. Although the summer coastal stratus rarely extends beyond Soledad, the extended sea breeze, which consists of warmer and drier air currents, frequently reaches far down the Salinas Valley. In the southern end of the Valley, which extends into the South Central Coast Air Basin to Paso Robles, winds are generally weaker most of the year except during storm periods.

3.1.2.2 Ambient Air Quality in the Study Area

CARB maintains ambient air monitoring stations for criteria pollutants throughout the California. The Moss Landing Cement Company (MLCC) site is in the Monterey County portion of the NCCAB and, as stated above, is under the jurisdiction of the MBUA PCD. Ambient air quality is monitored at seven MBUAPCD-operated monitoring stations in Salinas, Hollister, Carmel Valley, Santa Cruz, Scotts Valley, Davenport, and Watsonville. In addition, the National Park Service operates a station at the Pinnacles National Monument and an industry consortium operates a station in King City. The data are used to determine attainment status and define air quality trends. The station closest to the MLCC site is the Salinas station, which is approximately 12 miles southeast of the project site. This station measures all the criteria pollutants except SO_2. The closest and only station that measures SO_2 in the NCCAB is the Davenport station in Santa Cruz County. Table 3.1-2 summarizes the results of ambient monitoring, including the maximum recorded concentrations and the number of violations, at the stations from the latest three years of available data.

CO. The data indicate that maximum 1-hour average CO levels comply with the NAAQS of 35 parts per million (ppm) and CAAQS of 20 ppm. These limits have not been exceeded in the last three years. The maximum 1-hour concentration was 2.5 ppm in 2006. The data also show that maximum recorded 8-hour average CO levels comply with the NAAQS of 9 ppm and the CAAQS of 9.0 ppm within the last three years. These limits have not been exceeded in the last three years. The maximum 8-hour concentration was 1.15 ppm in 2007.

O_3. The data indicate that maximum 1-hour average O_3 levels comply with the CAAQS of 0.09 ppm. This limit has not been exceeded in the last three years. The maximum 1-hour concentration was 0.078 ppm in 2008. The data also show that maximum recorded 8-hour average O_3 levels comply with the NAAQS of 0.075 ppm and the CAAQS of 0.070 ppm within the last three years. These limits have not been exceeded in the last three years. The maximum 8-hour concentration was 0.067 ppm in 2008.

NO_2. The data indicate that maximum 1-hour average NO_2 levels comply with the NAAQS of 0.100 ppm and CAAQS of 0.18 ppm. These limits have not been exceeded in the last three years. The maximum 1-hour concentration was 0.067 ppm in 2006. The data also show that the annual NO_2 levels comply with the NAAQS of 0.053 ppm and the CAAQS of 0.030 ppm within the last three years. These limits have not been exceeded in the last three years. The annual concentration was 0.007 ppm in all three years.

PM_{10}. The data indicate that maximum 24-hour average PM_{10} levels exceeded the CAAQS of 50 micrograms per cubic meter ($\mu g/m^3$) once in 2006 and twice in 2008. The NAAQS of 150 $\mu g/m^3$ was never exceeded. The maximum 24-hour concentration was 52 $\mu g/m^3$ in 2008. The data also show that maximum recorded annual levels of PM_{10} exceeded the CAAQS of 20 $\mu g/m^3$ in 2008. The maximum annual concentration was 20.6 $\mu g/m^3$ in 2008.

$PM_{2.5}$. The data indicate that maximum 24-hour average $PM_{2.5}$ levels did not exceed the NAAQS of 35 $\mu g/m^3$ within the last three years. The maximum 24-hour concentration was 19.2 $\mu g/m^3$ in 2007. The data also show that maximum recorded annual levels of $PM_{2.5}$ did not exceed the NAAQS of 15.0 $\mu g/m^3$ and the CAAQS of 12 $\mu g/m^3$. The maximum annual concentration was 7.1 $\mu g/m^3$ in 2006 and 2008.

SO_2. The data indicate that maximum 24-hour average SO_2 levels comply with the NAAQS of 0.14 ppm and CAAQS of 0.04 ppm. These limits have not been exceeded in the last three years. The maximum 24-hour concentration was 0.005 ppm in all three years.

Table 3.1-2
Ambient Criteria Pollutant Concentration Data
at Air Quality Monitoring Stations Closest to the Project

Air Pollutant	Standard/Exceedance	867 E. Laurel Drive, Salinas, Monterey County			Center Street, Davenport, Santa Cruz County		
		2006	2007	2008	2006	2007	2008
Carbon Monoxide (CO)	Maximum 1-hour Concentration (ppm)	2.5	2.0	2.2			
	# Days exceed Federal 1-hour Standard	0	0	0			
	# Days exceed California 1-hour Standard	0	0	0			
	Maximum 8-hour Concentration (ppm)	1.04	1.15	0.89			
	# Days exceed Federal 8-hour Standard	0	0	0			
	# Days exceed California 8-hour Standard	0	0	0			
Ozone (O_3)	Maximum 1-hour Concentration (ppm)	0.066	0.067	0.078			
	# Days exceed California 1-hour Standard	0	0	0			
	Maximum 8-hour Concentration (ppm)	0.057	0.058	0.067			
	# Days exceed Federal 8-hour Standard	0	0	0			
	# Days exceed California 8-hour Standard	0	0	0			
Nitrogen Dioxide (NO_2)	Maximum 1-hour Concentration (ppm)	0.067	0.050	0.049			
	# Days exceed Federal 1-hour Standard	0	0	0			
	# Days exceed California 1-hour Standard	0	0	0	NA		
	Annual Arithmetic Mean (ppm)	0.007	0.007	0.007			
	# Days exceed Federal Annual Standard	0	0	0			
	# Days exceed California Annual Standard	0	0	0			
Respirable Particulate Matter (PM_{10})	Maximum 24-hour Concentration ($\mu g/m^3$)	51.0	39.0	52			
	# Days exceed Federal 24-hour Standard	0	0	0			
	# Days exceed California 24-hour Standard	1	0	2			
	Annual Arithmetic Mean ($\mu g/m^3$)	17.9	18.2	20.6			
	# Days exceed California Annual Standard	NA	NA	NA			
Fine Particulate Matter ($PM_{2.5}$)	Maximum 24-hour Concentration ($\mu g/m^3$)	14.7	19.2	17.8			
	# Days exceed Federal 24-hour Standard	0	0	0			
	Annual Arithmetic Mean ($\mu g/m^3$)	7.1	7.0	7.1			
	# Days exceed Federal Annual Standard	0	0	0			
	# Days exceed California Annual Standard	0	0	0			
Sulfur Dioxide (SO_2)	Maximum 24-hour Concentration (ppm)	NA			0.005	0.005	0.005
	# Days exceed Federal 24-hour Standard				0	0	0
	# Days exceed California 24-hour Standard				0	0	0

Source: California Air Resources Board, 2010 (http://www.arb.ca.gov/adam/welcome.html)
U.S. EPA AIRData (for 1-Hour CO only): (http://www.epa.gov/air/data/geosel.html)

NA = Not Applicable

3.1.2.3 Attainment Status of the Study Area

The MLCC site is in the NCCAB. The NCCAB is designated a federal attainment and/or unclassified area for all of the criteria pollutants. It is designated as a state nonattainment area for O_3 and PM_{10} and attainment for the other criteria pollutants. Table 3.1-3 shows the designation status of the NCCAB for each criteria pollutant for both the NAAQS and the CAAQS.

Table 3.1-3
Attainment Status for the North Central Coast Air Basin

Pollutant	State Standards	National Standards
Ozone (O_3) Nonattainment		Unclassified/Attainment
Inhalable Particulates (PM_{10})	Nonattainment	Unclassified
Fine Particulates ($PM_{2.5}$)	Attainment	Unclassified/Attainment
Carbon Monoxide (CO)	Monterey Co. – Attainment San Benito Co. – Unclassified Santa Cruz Co. - Unclassified	Unclassified/Attainment
Nitrogen Dioxide (NO_2)	Attainment	Unclassified/Attainment
Sulfur Dioxide (SO_2)	Attainment	Unclassified/Attainment
Lead	Attainment	Unclassified/Attainment

Source: http://www.arb.ca.gov/desig/desig.htm

3.1.2.4 State Implementation Plan

The NCCAB is presently being guided by the following portions of the California SIP: (1) the 2008 Air Quality Management Plan (AQMP) which was adopted in August 2008. It is the MBUAPCD's AQMP for achieving the 2006 California O_3 standard; (2) the 2007 Federal Maintenance Plan, adopted May 2007. It is the MBUAPCD's AQMP for maintaining the 1997 federal O_3 standard; and (3) the 2005 Particulate Matter Plan, adopted December 2005. It represents the MBUAPCD's AQMP for particulate matter made in response to Senate Bill 656.

3.1.2.5 Current Emission Inventory

CARB maintains an annual emission inventory for each county and air basin in California. The inventory for the NCCAB comprises of data submitted to CARB by the MBUAPCD plus estimates for certain source categories, which are provided by CARB staff. The most recent published inventory data for the NCCAB is summarized in Table 3.1-4.

3.1.2.6 Existing Project Site Permit Status and Emissions

Currently, Calera Corporation (Calera) operates the Pilot Plant and Absorption Demonstration Plant under the MBUAPCD ATCs 14006 and 14024 granted as of December 23, 2008 and amended on February 9, 2009 as 14006A; and 14024A, and 14417 granted as of September 22, 2009. The equipment for which ATC 14006 was issued is a spray dryer with dedicated ventilation system that consists of (1) an electrically heated spray dryer with a capacity of 9 kilograms (kg) of water per hour with a dedicated ventilation system, and (2) a 12-inch Micron-Master jet mill with a Torid TD-162 dust collector. ATC

Table 3.1-4
1988 Estimated Annual Average Emissions for the NCCAB
(Tons per Day)

Source Category	TOG	ROG	CO	NO_X	SO_X	PM	PM_{10}	$PM_{2.5}$
Stationary Sources								
Fuel Combustion	4.0	1.5	13.1	16.6	0.8	1.1	1.1	1.1
Waste Disposal	227.2	1.5	0.3	0.0		0.0	0.0	0.0
Cleaning and Surface Coatings	3.8	3.4		-	-	-	0.0	0.0
Petroleum Production and Marketing	3.0	2.4		0.0	-	-	-	-
Industrial Processes	0.7	0.7	13.8	2.7		1.3	6.8	3.3
Total Stationary Sources	238.8	9.4		27.2	19.3	2.1	7.9	4.4
Areawide Sources								
Solvent Evaporation	16.8	15.9		-	-	-	-	-
Miscellaneous Processes	58.5	11.7	177.7	6.1	0.2		125.1	71.5
Total Areawide Sources	75.3	27.6	177.7	6.1	0.2		125.1	71.5
Mobile Sources								
On-road Motor Vehicles	19.2	17.5	179.9	39.7	0.1		1.8	1.7
Other Mobile Sources	9.8	9.0		65.3	13.2	0.1	1.1	1.1
Total Mobile Sources	29.0	26.4	245.2	53.0	0.2		2.9	2.8
Natural (Nonanthropogenic) Sources								
Natural Sources	82.0	73.4	43.5	1.5	0.5	4.7	4.5	3.8
Total Natural (Nonanthropogenic Sources)	82.0	73.4		43.5	1.5	0.5	4.7	4.5	3.8
Grand Total	**425.1**	**136.8**	**493.6**	**79.9**	**3**	**140.6**	**83.2**	**33.5**

Source: California Air Resources Board, 2010.

14024 was issued for a research-and-development scale cement production facility consisting of tanks, valves, and piping for the production of green cement by sequestering CO_2 along with the minerals contained in seawater. CO_2 is provided for the process from a combination of CO_2 cylinders and coal burning fireplace. ATC 14006A replaces ATC 14006 with the installation and operation of a second spray dryer system that consists of a NIRO 12.5N spray dryer with a capacity of 140 kg of water per hour, LPG fired with a maximum heat input of 750,000 BTU/hr, with a Fischer-Closteram SB-40-503-8 dust collector. ATC 14024A replaces ATC 14024 with the combustion of high sulfur fuel. ATC 14417 was issued for the installation of a custom CO_2 absorber designed for a nominal flue gas flow rate of 100,000 standard cubic feet per minute (SCFM).

The primary emission sources for these processes and their permitted equipment are the Absorption Demonstration Plant absorber and the Pilot Plant coal-fired boiler simulator (CFBS). The flue gas that leaves the absorber originates from the stack of the neighboring Moss Landing Energy Facility. The 20,000 SCFM of gas entering the process has been calculated to contain 2.66 tons/hr of CO_2, 0.31 lb/hr of NO_X, 0.008 lb/hr of CO, and 0.003 lb/hr of SO_X. During startup or in the event of an upset, the gas would pass through the absorber substantially unaltered. This represents the worst case emissions of NO_X, CO, SO_X, and CO_2. During standard operation, the absorber is projected to remove 80 percent of the CO_2, 95 percent of the SO_X, and a small (approximately 5 percent) portion of the NO_X. The absorber employs a mist eliminator, which reduces mist and associated particulate matter emissions to 10.7 lb/hr of droplets and 1.0 lb/hr of associated solids (particulate matter).

The CFBS may burn different types of coal. The CFBS emissions are shown in Table 3.1-5. With the pilot plant absorber in operation, the CO_2 emission is expected to be reduced by 80 percent, the SO_X emission is expected to be reduced by 95 percent and NO_X emission is expected to be reduced by 5 percent.

Table 3.1-5
Pilot Plant CFBS Emissions

CFBS Data	Type of Coal Burned	
	Bituminous	Subbituminous
Uncontrolled Flue Gas Emissions (lb/hr)		
CO_2 205.	28	208.54
SO_X 2.48		0.82
NO_X 0.46		0.57
PM_{10} 0.31		0.39
Controlled Flue Gas Emissions (lb/hr)		
CO_2 41.0	6	41.71
SO_X 0.12		0.04
NO_X 0.43		0.54
PM_{10} 0.31		0.39

3.1.2.7 Class I Areas

There are two Class I areas within the NCCAB. They are the Pinnacles National Monument, which is 35 miles southeast of the project site, and the Ventana National Wilderness area, which is 29 miles south of the project site.

3.2 WATER QUALITY/QUANTITY/HYDROLOGIC CONDITIONS

3.2.1 Regulatory Setting

A number of federal, state, and local laws and regulations address water quality and quantity as well as floodplains and wetlands, as described below:

3.2.1.1 Water Quality/Quantity

Federal Regulations

Clean Water Act Section 402[p]. The Clean Water Act (CWA) (33 USC § 1257 et seq.) requires states to set standards to protect water quality. The objective of the federal CWA is to restore and maintain the chemical, physical, and biological integrity of the nation's waters. Specific sections of the CWA control discharge of pollutants and wastes into marine and aquatic environments.

Clean Water Act Section 404 Permit for Fill Material in Waters and Wetlands. Section 404 of the act regulates the discharge of dredged or fill material into waters of the United States, including rivers, streams and wetlands. The term "discharge of dredged and fill material" has been defined broadly to include the construction of any structure involving rock, soil, or other construction material. The limits of non-tidal waters extend to the Ordinary High Water line, defined as the line on the shore established by the fluctuation of water and indicated by physical characteristics such as a natural line impressed on the bank, shelving, changes in the character of the soil, destruction of terrestrial vegetation, presence of litter or debris, or other appropriate means. A Section 404 permit is required for any activities involving excavation of, or placement of fill material into, waters of the United States or adjacent wetlands. Site specific or general (nationwide) permits for such discharges to waters of the United States are issued by the U.S Army Corps of Engineers (USACE) and are certified by the Regional Water Quality Control Boards (RWQCBs). The USACE, in reviewing 404 Permit applications, stresses avoidance of impacts, minimization of unavoidable impacts, and mitigation for unavoidable impacts, in that order.

Section 402 National Pollutant Discharge Elimination System (NPDES) Program. Point source discharges to surface water are regulated by Section 402 of the CWA through requirements set forth in specific or general NPDES permits. NPDES requirements apply to discharges of pollutants into navigable waters from a point source and discharges of dredged or fill material into navigable waters. Stormwater discharges during construction and operation of a facility and incidental non-stormwater discharges associated with construction also fall under this act and are addressed through a general NPDES permit. In California, requirements of the CWA regarding regulation of point source discharges and stormwater discharges are delegated to the State Water Resources Control Board (SWRCB) and administered by the nine RWQCBs. The Central Coast RWQCB implements the statewide policy in the study area. Under California's NPDES program, any waste discharger subject to the NPDES program must obtain a specific NPDES permit or coverage under a general NPDES permit from the local RWQCB. The permits typically include criteria and water quality objectives and require periodic effluent sampling.

Section 401 Clean Water Quality Certification. Under Section 401 of the Act, water quality certification is required from the state for any activity that requires a federal permit or license that may result in discharge into navigable waters. The certification must indicate that the activity will comply with the applicable state water quality standards. Under Section 401, states are required to establish water quality standards for all state waters. For the project study area, applications for certification under CWA Section 401 are processed by the Central Coast RWQCB. A Section 401 certification would be necessary to obtain a Section 404 permit for discharge into waters subject to USACE jurisdiction.

Section 303(d) Water Quality Impairments. Under Section 303(d) of the Act, each state is required to develop effluent limitations for waters within its boundaries where water quality standards are not met. The state must establish priority rankings for these waters and develop Total Maximum Daily Loads (TMDLs) to improve water quality. Seasonal variations in loading and a margin of safety are considered when TMDLs are established. In California, the SWRCB and RWQCBs prepare the Clean Water Act Section 303(d) List of Water Quality Limited Segments Requiring TMDLs. The U.S. EPA approved California's 2006 303(d) List on June 28, 2007 (SWRCB, 2009).

Rivers and Harbors Act (33 USC 401 et seq.) Section 10. Section 10 of the Rivers and Harbors Act of 1899 requires approval from USACE for the construction of any structure over or in navigable waters of the United States. USACE also regulates the excavation, dredging or deposition of material in a navigable water and any obstruction or alteration in a navigable water. Work adjacent to navigable waters requires permits under Section 10 of this act if structures or work alter the course, location, condition, or capacity of the water body.

State Regulations

Porter-Cologne Water Quality Act (Water Code § 13000 et seq.). The Porter-Cologne Water Quality Control Act of 1969 (Porter-Cologne Act) established the SWRCB and nine RWQCBs as the primary state agencies with regulatory authority over water quality and surface water rights allocation. Requirements of the Porter-Cologne Act are implemented by the SWRCB at the state level and the RWQCBs at the regional level. The SWRCB, as authorized by the Porter-Cologne Act, promulgated regulations in the CCR Subchapter 15, Title 23 designed to protect water quality from the effects of waste discharges to land. Under Subchapter 15, wastes that cannot be discharged directly or indirectly to waters of the state (and therefore must be discharged to land for treatment, storage, or disposal) are classified to determine specifically where such wastes may be discharged. This classification requirement would apply to dredged material or fill that would be disposed in an upland environment.

State Water Resources Control Board. Applicable water quality protection regulations include SWRCB Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Water in California," which generally restricts dischargers from reducing the water quality of surface water and groundwater. SWRCB Resolution No. 88-63, "Sources of Drinking Water Policy," specifies that all groundwater occurrences in California are to be protected as existing or potential sources of municipal and domestic supply.

Regional Water Quality Control Boards: Basin Plans and Water Quality Objectives. Under the provisions of the Porter-Cologne Act and the CWA, the Central Coast RWQCB regulates water quality in the project area. The Water Quality Control Plan for the Central Coast Basin ("Basin Plan") (Central Coast RWQCB, 1994) designates beneficial uses for specific surface water and groundwater resources, establishes water quality objectives to protect those uses, and sets forth policies to guide the implementation of programs to attain the objectives. Pursuant to the Porter-Cologne Act, the Central Coast RWQCB is authorized to issue individual permits to allow for discharge of specified quantities and qualities of waste to land or surface waters. The limitations placed on the discharge are designed to ensure compliance with water quality objectives in the Basin Plan. To obtain a permit, the discharger must submit a Report of Waste Discharge and meet the requirements of the California Environmental Quality Act of 1970 (CEQA) (California Public Resources Code Section 21000 et seq.). All dischargers must submit monitoring reports. The RWQCB can use this approach to regulate any discharge to surface waters. The discharger would be responsible for providing enough information regarding the chemicals and volumes to be discharged and receiving waters to allow preparation of a permit.

In 1972, the SWRCB adopted the Water Quality Control Plan for Ocean Waters of California: California Ocean Plan (Ocean Plan). This plan is applicable to point source discharges to the Pacific Ocean and

established water quality objectives to protect beneficial uses of ocean waters. The current Ocean Plan was most recently amended in 2005.

The Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (Thermal Plan) was adopted by the SWRCB in 1995. This plan establishes temperature requirements for existing and new discharges in California coastal waters, interstate waters, enclosed bays, and estuaries.

The SWRCB also regulates activities that could result in adverse impacts to groundwater quality. Policies and regulations by the SWRCB, either under CWA authority or other state-derived authority, are implemented and enforced by the RWQCB. Groundwater-related activities governed by NPDES permits or waste discharge requirements issued by the RWQCB include aquifer re-injection, reclaimed water irrigation, and design of waste management facilities, including wastewater treatment plants. The RWQCB also oversees local implementation of underground storage tank management programs and other programs related to the prevention and control of groundwater impacts.

In general, SWRCB policy prohibits degradation of groundwater quality, and in cases where impacts occur, the Central Coast RWQCB typically requires restoration of impacted aquifers such that residual concentrations do not exceed the U.S. EPA's Maximum Contaminant Levels for drinking water. In cases where the aquifer is hydraulically connected to a surface water body, water quality criteria for fresh water aquatic habitats may be imposed as standards for cleanup and restoration efforts.

Regional Water Quality Control Boards: Construction Activities, NPDES General Construction Permit. Surface water quality is regulated by the NPDES, developed by the U.S. EPA in accordance with Section 303 of the CWA. In California, the NPDES program is administered by the SWRCB, with implementation and enforcement by the RWQCBs. The NPDES program, designed to protect surface water quality, is applicable to all discharges to waters of the United States, including storm water discharges associated with municipal drainage systems, construction activities, industrial operations and point sources. In general, the NPDES permit program is designed to control, minimize or reduce surface water impacts.

For any construction project that will result in the disturbance of 1 acre or more, a project must comply with the NPDES Construction Activities Storm Water General Permit (2009-0009-DWQ permit. Construction activities subject to the permit include clearing, grubbing, grading, stockpiling, and excavation activities. The project applicant must submit permit registration documents electronically before commencement of construction activities in the Storm water Multi-Application Report Tracking System (SMARTS). The permit registration documents consist of the Notice of Intent, Risk Assessment, Post-Construction Calculations, a Site Map, a Storm Water Pollution Prevention Plan (SWPPP), a signed certification statement by the Licensed Responsible Person, and the first annual fee. The General Permit requires the preparation and implementation of a SWPPP for construction activities. The plan must describe best management practices to prevent erosion and stormwater pollution during construction activities. Best management practices include erosion controls, sediment controls, and other controls to prevent stormwater from contacting pollutants. The SWPPP must also include a stormwater monitoring program.

Regional Water Quality Control Boards: Industrial activities, NPDES General Industrial Permit. SWRCB Order 97-03-DWQ, General Storm Water Permit for Industrial Activities, regulates industrial storm water discharges under the NPDES Program and in accordance with the CWA. The regulations require that storm water associated with industrial activity (storm water) that discharges either directly to surface waters or indirectly through municipal separate storm sewers must be regulated by an NPDES permit. All permit holders are required to prepare a SWPPP that describes the BMPs to be implemented to prevent the discharge of polluted storm water off site. In addition, permit holders are required to

sample and analyze their storm water runoff during a minimum of two storm events each rainy season. A no-exposure exemption can be authorized for those light industry facilities where all industrial activities are conducted inside buildings and where all materials stored and handled are not exposed to storm water.

Local Regulations

Monterey County General Plan: Chapter 5, Water Resources. To conserve and enhance the water supplies in the County and adequately plan for the development and protection of these resources and their related resources for future generations.

> Policy 5.1.2: Land use and development shall be accomplished in a manner to minimize runoff and maintain groundwater recharge in vital water resource areas

Monterey County General Plan: Chapter 21, Water Quality. To ensure the County's water quality is protected and enhanced to meet all beneficial uses, including domestic, agricultural, industrial, recreational, and ecological.

> Policy 21.2.1: The County shall require all new and existing development to meet federal, state, and County water quality regulations.

Monterey County Code: Chapter 16.08, Grading Ordinance. Sets forth requirements for grading and excavations.

Monterey County Code: Chapter 16.12, Erosion Control. Requires that specific design considerations be incorporated into projects to reduce the potential of erosion and that an erosion control plan be approved by the County prior to initiation of grading activities.

Monterey County Coastal Implementation Plan 20.144.070, Water Resources Development Standards. These regulations set forth development standards which, to protect the water quality of surface water resources and groundwater aquifers, control new development to a level that can be served by identifiable, available, and long-term water supplies, and protect streams, estuaries, and wetlands from excessive sedimentation resulting from land use and development practices in the watershed areas.

Monterey County Health Department. To protect groundwater quality, the well program is responsible for the permitting of the construction, destruction, and repairs/ modification of domestic, irrigation, agricultural, cathodic protection, observation, test, or monitoring wells (Monterey County Health Department, 2008; from ESA, 2009).

3.2.1.2 Floodplains/Wetlands

Federal: Floodplain Management/Wetlands

10 CFR Part 1022: DOE Compliance with Floodplain and Wetland Environmental Review Requirements. The DOE's policies and procedures for floodplain and wetland environmental review requirements outline the agency's responsibilities under Executive Orders 1988 and 11990—as discussed below.

Executive Order 11988: Floodplain Management (23 CFR 650, Subpart A). The U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) is delegated to map the designated floodplains along major streams and rivers and administer the National Flood Insurance Program (NFIP) for communities that have enacted local ordinances restricting development within the

100-year floodplain. Executive Order 11988 requires projects with federal funding or involvement to evaluate alternatives to floodplain encroachment and avoid adverse impacts to floodplain functions.

Flood Disaster Protection Act (42 USC 4001–4128; 23 CFR 650 Subpart A; and 23 CFR 771). The Flood Disaster Protection Act of 1973 establishes the National Flood Insurance Program to enable interested parties to purchase insurance against loss resulting from physical damage to or loss of real property or personal property as a result of flooding. This act substantially increases the coverage area authorized under the NFIP and provides for prompt identification and communication of information concerning flood-prone areas. Under this act, State or local communities are required to participate in the NFIP and establish flood ordinances that reduce or avoid flood losses, and property owners within special flood hazard areas are require to purchase flood insurance if they are being assisted by federally supported (funded, supervised, regulated, or insured) programs or agencies.

Federal National Flood Insurance Program. FEMA is responsible for determining flood elevations and developing the Flood Insurance Rate Maps, which are used in the NFIP. Participation in the NFIP provides an opportunity for property owners in the community to purchase flood insurance, provided that the community complies with FEMA requirements for maintaining flood protection and managing development in the floodplain. Within designated floodplains, the community must not permit any development, new construction or encroachment, which would cause an increase in the 100-year (base) flood elevation. FEMA defines a significant increase to mean a maximum one foot rise in the base flood elevation.

Clean Water Act Section 404 Permit for Fill Material in Waters and Wetlands. This section of the CWA, as described in *Section 3.2.1.1, Water Quality/Quantity* gives the USACE authority to regulate discharges of dredge or fill material into waters of the United States, including wetlands.

EO 11990: Protection of Wetlands. EO 11990, Protection of Wetlands, requires Federal agencies to take action to minimize the destruction or modification of wetlands by considering both direct and indirect impacts to wetlands. Furthermore, EO 11990 requires that Federal agencies proposing to fund a project that could adversely affect wetlands must consider alternatives to avoid such effects. Work involving wetlands is subject to Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the CWA, as described above in *Section 3.2.1.1, Water Quality/Quantity*.

State Regulations

Cobey-Alquist Flood Plain Management Act (Water Code § 8400 et seq.). The Cobey-Alquist Flood Plain Management Act (Sections 8400 through 8415) establishes mandatory floodplain management objectives, prohibiting inappropriate development that may endanger life or significantly restrict the carrying capacity of designated floodways. The Act states the primary responsibility for planning, adoption, and enforcement of land use regulations to accomplish floodplain management rests with local levels of government. It is the policy of the State to encourage government to accomplish and provide the State assistance and guidance for floodplain management.

California Department of Fish and Game Policies and Guidelines, Wetlands Resources Policy. The Wetlands Resource policy provides for the protection, preservation, restoration, enhancement, and expansion of wetland habitats in California, including vernal pools. The administering agencies for the above authority are the California Department of Fish and Game, California Environmental Protection Agency, and the Central Coast RWQCB.

Local Regulations

Monterey County General Plan: Chapter 16, Flood Hazards. To minimize the risk from the damaging effects of flooding and erosion.

> Policy 16.2.4: All new development, including filling, grading, and construction, within designated 100-year floodplain areas shall conform to the guidelines of the National Flood Insurance Program and policies established by the County Board of Supervisors, with the advice of the Monterey County Flood Control and Water Conservation District.
>
> Policy 16.2.5: All new development, including filling, grading, and construction, proposed within designated floodplains shall require submission of a written assessment prepared by a qualified hydrologist/engineer on whether the development will significantly contribute to the existing flood hazard. Development shall be conditioned on receiving approval of this assessment by the Monterey County Flood Control and Water Conservation District.

Monterey County Code: Chapter 16.16, Development of Floodplains. Establishes methods of reducing flood losses such as controlling the alteration of natural floodplains and requiring new construction in the floodplain to incorporate flood-proofing measures.

3.2.2 Existing Conditions

3.2.2.1 Water Quality/Quantity

Refer to Section 3.4, Solid and Hazardous Waste, for a discussion of potential water contaminants.

Surface Water

The project site is along the Central California coast, within the Moro Cojo Slough watershed, which has a total drainage area of approximately 17 square miles. The slough runs along the southern boundary of the MLCC site property and discharges into Moss Landing Harbor and Monterey Bay. There are Moro Cojo protected lands in the vicinity; these lands comprise approximately 390 acres of restorable wetlands and are owned and managed by the Elkhorn Slough Foundation. The Moss Landing Harbor is west of the project site.

Calera currently complies with the NPDES General Industrial Permit and has prepared a SWPPP that describes the BMPs implemented at the site. To date, with the exception of the seven outdoor tanks, operations have been contained within existing buildings. The Central Coast RWQCB issued Order No. R3-2009-0002, NPDES No. CA0007005, Waste Discharge Requirements for the Moss Landing Commercial Park and Moss Landing Cement Company, Moss Landing Cement Company Facility. This permit allows the facility to discharge calcium and magnesium depleted seawater to Monterey Bay by way of the existing discharge outfall structure at a maximum daily discharge rate up to 60 million gallons per day. To date, however, the facility has contained the process effluent on site in the outdoor tanks instead of discharging to the bay.

According to the Basin Plan and the Ocean Plan, the beneficial uses of the Pacific Ocean in the vicinity of Moss Landing Harbor include water contact and non-contact recreation; industrial service supply; navigation; shellfish harvesting; commercial and sport fishing; marine habitat; rare, threatened or endangered species; and wildlife habitat. The Moss Landing Harbor and Monterey Bay are not considered suitable for municipal or domestic water supply due to elevated levels of total dissolved solids (i.e., greater than 3,000 ppm) (Central Coast RWQCB, 2009).

The salinity in Moss Landing Harbor is affected by the time of the year and the tidal flow. During dry periods, when evaporation exceeds freshwater inflow, a salinity gradient develops with higher salinity in the estuary than in the ocean. Higher salinity is also observed when residence time is much greater than a tidal cycle. Salinity measurements taken from February 2007 to April 2008 at the Moss Landing Marine Laboratories boat dock on the south side of the harbor indicate salinity ranging from 12,800 parts per million to 34,040 with an average of 32,510 parts per million (ESA, 2009).

The water quality of Moss Landing Harbor is affected by the flows into the harbor and the surrounding land use and activities, such as the use and docking of commercial fishing vessels and private recreational boats in the harbor. The water quality in Moss Landing Harbor was assessed as part of the RWQCB's Surface Water Ambient Monitoring Program. The results of this assessment indicate that contaminants of concern include elevated water nutrient (nitrogen and orthophosphate) levels, total chlordanes (sediment), and total dichlorodiphenyltrichloroethane (sediment and tissue) (Marine Pollution Studies Laboratory and Moss Landing Marine Laboratories, 2007).

Hydrogeologic Setting

The project is within the Central Coast Hydrologic Region, as defined by the State of California Department of Water Resources Bulletin 118 (DWR, 2003). The Central Coast Hydrologic Region covers approximately 7.22 million acres in central California and is divided into 50 groundwater basins that cover approximately one-third of the hydrologic region. The project lies within the Salinas Valley Groundwater Basin (SVGB), 180/400 Foot Aquifer Subbasin (Subbasin), which includes the lower reaches and mouth of the Salinas River (DWR, 2003).

The project is within the Salinas Valley, which is surrounded by the Gabilan Range on the east, by the Sierra de Salinas and Santa Lucia Range on the west, and is drained by the Salinas River, which empties into Monterey Bay on the north (DWR, 2003). Approximately 10,000 to 15,000 feet of Tertiary and Quaternary marine and terrestrial sediments, including up to 2,000 feet of saturated alluvium, have accumulated in the Salinas Valley (DWR, 2003). The northern Salinas Valley is divided into two subareas by the Monterey County Water Resources Agency: the Pressure Subarea to the west and the East Side Subarea to the east. The project lies within the Pressure Subarea, and its boundaries generally coincide with the 180/400 Foot Aquifer Subbasin (aquifers described below).

Water-Bearing Units

Two primary water-bearing units are within the Subbasin and named according to the depth in which they occur: the 180-Foot Aquifer and 400-Foot Aquifer. The 180-Foot Aquifer consists of a heterogeneous mixture of interconnected sands, gravels, and clay lenses and has a thickness ranging from 50 to 150 feet, with an average thickness of approximately 100 feet (DWR, 2003). The 180-Foot Aquifer is separated from the 400-Foot Aquifer by a zone of discontinuous aquifers and aquitards ranging in thickness from 10 to 70 feet. The 400-Foot Aquifer consists of sands, gravels, and clay lenses and has an average thickness of approximately 200 feet (DWR, 2003).

According to the Coastal Water Project Final Environmental Impact Report (ESA, 2009), the area in the vicinity of the project is underlain by westerly dipping formations, including, from shallow to deep, Quaternary Alluvium, Aromas Sands Formation, Paso Robles Formation, Purisima Formation, and the Monterey Formation. The 180-Foot Aquifer correlates with the older (deeper) portions of the Quaternary Alluvium and the upper Aromas Sands Formation (DWR, 2003). The 400-Foot Aquifer correlates with the Aromas Sands Formation and the Paso Robles Formation.

The Quaternary Alluvium consists of Pleistocene and Holocene alluvial deposits and Dune Sands and ranges from approximately 50 to 200 feet thick in the northern SVGB, in the vicinity of the project (ESA,

2009). The Salinas Aquitard, a blue-gray marine clay, is part of this unit and overlies the 180-Foot Aquifer. The Salinas Aquitard thins to the east, ranging from approximately 100 feet thick near Monterey Bay to approximately 25 feet thick near Salinas (DWR, 2003). Groundwater occurs within thick lenses of sand and gravel and in localized perched zones. Water quality from this unit is poor (CEC, 2000).

The Aromas Sands Formation underlies the Quaternary Alluvium and consists of sand units separated by confining layers of interbedded clays and silts (ESA, 2009). This formation outcrops over 10 miles east of the project area and thickens westward towards Elkhorn Slough. The lower portion of this formation, near the contact with the underlying Paso Robles Formation, is commonly stained a distinct red or brownish color (Kennedy/Jenks Consultants, 2004). This formation is the major water-bearing unit in the area and occurs between approximately 200 to 800 feet below the surface (CEC, 2000). Water quality is variable (CEC, 2000).

The Paso Robles Formation underlies the Aromas Sands Formation and consists of interbedded sand, gravel, and clay with some calcareous beds (ESA, 2009). The sediments are indicative of an alluvial fan or braided stream depositional environment (Kennedy/Jenks Consultants, 2004). The Purisima Formation conformably underlies the Paso Robles Formation and is marine in origin. It consists of continental deposits, such as gravel, sands, silts, and clays, within its upper portion and extensive shale beds at its base (ESA, 2009). It occurs at a depth of 800 to at least 1,200 feet and is characterized by poor quality, highly saline, groundwater (CEC, 2000). The Monterey Formation underlies the Purisima Formation and is primarily composed of shale and mudstone. This formation represents the base of the water-bearing sediments in the northern Salinas Valley area (Kennedy/Jenks Consultants, 2004). It yields small quantities of poor quality, highly saline, groundwater (ESA, 2009; CEC, 2000).

Aquifer Properties

Installation and testing of two shallow test wells—of unreported depth and construction detail—at the Moss Landing Energy Facility (immediately north of the MLCC site) indicated an estimated transmissivity value (T) of 14,035 square feet per day (ft^2/day) (i.e., 105,000 gallons per day per foot [gpd/ft]). This was determined to be indicative of a highly transmissive formation that is unconfined to semi-confined (CEC, 2000).

A basin wide groundwater model, the Salinas Valley Integrated Groundwater and Surface Water Model (IGSM), was developed by Montgomery Watson, Inc., for the Monterey County Water Resources Agency in 2001. IGSM simulates groundwater flow across a 650 square mile area that covers the SVGB. The model represents the stratigraphy in three layers: the 180-Foot Aquifer, 400-Foot Aquifer, and 900-Foot Aquifer, which is not beneath project area. A confining layer was simulated above the 180-Foot Aquifer, between the 180-Foot Aquifer and the 400-Foot Aquifer, and between the 400-Foot Aquifer and the 900-Foot Aquifer. The hydraulic conductivity (K) of the 180-Foot Aquifer and 400-Foot Aquifer were defined in the model ranging from 60 to 240 and 50 to 400 feet per day, respectively (ESA, 2009). As stated above, the average thicknesses of the 180-Foot Aquifer and 400-Foot Aquifer are approximately 100 feet and 200 feet, respectively. Accordingly, the estimated T values for the 180-Foot and 400-Foot Aquifer range from 6,000 to 24,000 ft^2/day (44,880 to 179,500 gpd/ft) and 10,000 to 80,000 ft^2/day (74,800 to 598,400 gpd/ft), respectively. The estimated ranges of IGSM T values bracket the T value of 14,035 ft^2/day (105,000 gpd/ft) reported for the Moss Landing Power Plant Project (CEC, 2000) and reflect the highly transmissive nature of both the 180-Foot Aquifer and 400-Foot Aquifer.

Nearby Wells

An Environmental Data Resources Inc. (EDR) report with GeoCheck® obtained for the project site lists records of two wells within 1 mile of the project: a public water supply well 0.25 to 0.5 mile west/northwest of the project and a water well that is 0.5 to 1.0 mile south of the MLCC site (Appendix C).

The well depths and construction details are not provided. The public water supply well, named Highway 1 Water System #2, was cited several times, and as recently as March 2009, for coliform contamination. The water well is a U.S. Geological Survey well, number 013S002E19H001M, and is 340 feet deep. No further information is provided for either well.

In 1974, a Fire Well for Pacific Gas and Electric Company (PG&E), also known as PG&E Well No. 8, was installed approximately 2 miles east of the MLCC site near the intersection of Dolan Road and Avila Road. This is in the vicinity of the local well used for the current water supply, but it is unknown whether it is the same well. The Fire Well was installed to a depth of 855 feet below grade and was screened in sections from 310 to 855 feet. The screened intervals are within the Aromas Sands Formation and Purisima Formation. A well test was conducted in 1974 with the pump at a depth of 280 feet and pumping at rates ranging from 460 to 1,680 gallons per minute. Drawdown during the well test ranged from 18 to 105 feet.

Groundwater Quality

Seawater intrusion and nitrate contamination are the two major issues for groundwater quality in the subbasin (DWR, 2003; ESA, 2009). The 180-Foot Aquifer and 400-Foot Aquifer are both in direct hydraulic contact with Monterey Bay (Kennedy/Jenks Consultants, 2004). Extensive groundwater production in the Salinas Valley has resulted in overdraft conditions and induced seaward intrusion into both the 180-Foot Aquifer and 400-Foot Aquifer (ESA, 2009). Seawater intrusion was first documented in the 1930s, and since this time, hydrogeologic studies have shown a regional decline in the groundwater table, which has resulted in a continuous seat o land groundwater flow direction (ESA, 2009). Groundwater flow in the northernmost region of the subbasin, in the vicinity of the project, has flowed from Monterey Bay since at least the 1930s (DWR, 2003). By 1995, seawater intruded over 5 miles inland within the 180-Foot Aquifer and over 2 miles inland within the 400-Foot Aquifer (DWR, 2003). Approximately 20,000 acres of the 180-Foot Aquifer and 10,000 acres of the 400-Foot Aquifer have been intruded by seawater, as defined by chloride levels above 500 milligrams per liter (mg/L) (DWR, 2003).

Long-term agricultural production in the Salinas Valley has contributed to an extensive non-point source of nitrate. Nitrate concentrations in many wells in the Salinas Valley exceed drinking water standards (DWR, 2003). Of 194 wells sampled during 1995 for nitrate in both the 180-Foot and 400-Foot Aquifers, 21 exceeded the drinking water standard (DWR, 2003).

Based on information provided by Calera Corporation, the salinity of the groundwater from the local well is approximately 400 ppm (i.e., mg/L) of total dissolved solids. The current California Safe Drinking Water Act, Secondary Drinking Water Standard is 250 mg/L for chloride. The chloride content of the local well groundwater is not known.

There are no water quality data available for the local well or for other nearby wells. However, based on review of the EDR report, contaminated groundwater may be present at the site as a result of previous activities in the area.

3.2.2.2 Floodplains/Wetlands

FEMA's Flood Insurance Rate Map (FIRM) Community Panel Number 06053C0070G (FEMA, 2009) shows that the site is not in the FEMA-designated 100-year floodplain (Appendix B). The site is in a shaded area of the map labeled Zone X. FEMA defines that area as "Area of moderate flood hazard, usually the area between the limits of the 100-year and 500-year floods."

Based on a field review of the project site and adjacent areas, likely wetland areas are present immediately east and south of the MLCC site, associated with a coastal brackish marsh and the Mojo Cojo Slough, respectively. However, these wetland areas are outside the MLCC site limits.

3.3 GEOLOGIC/SOIL CONDITIONS

3.3.1 Regulatory Setting

Key regulations pertaining to geologic and soils conditions that are most relevant to the proposed project are summarized below. Refer to Section 3.4, Solid and Hazardous Waste, for a discussion of potential soil contaminants.

3.3.1.1 Federal Regulations

The following federal regulations pertain to geologic/soil conditions:

National Environmental Policy Act of 1969 (NEPA) [42 USC Section 4321 et seq.]. Requires the consideration of potential environmental effects, including potential effects to geology, soils, and geologic resources, in the evaluation of any proposed Federal agency action. NEPA also obligates federal agencies to consider the environmental consequences and costs in their projects and programs as part of the planning process. General NEPA procedures are set forth in the Council on Environmental Quality (CEQ) regulations 23 CFR 771.

Clean Water Act [Section 402(p)]. Refer to Section 3.2.1 for a discussion of the Clean Water Act

Surface Mining Control and Reclamation Act of 1977. Enacted to address the need for a continuing supply of mineral resources, and to prevent or minimize the adverse impacts of surface mining to public health, property and the environment.

3.3.1.2 State Regulations

The following state regulations pertain to geologic/soil conditions:

CEQA and CEQA Guidelines (California Public Resources Code Section 15000 et seq.). Requires state and local agencies to identify the significant environmental impacts of their actions, including potential significant impacts to geology, soils, and geologic resources, and to avoid or mitigate those impacts, when feasible.

Alquist-Priolo Earthquake Fault Zoning Act (California Code of Regulations Section 2621 et seq.). Provides policies and criteria to assist cities, counties, and state agencies in the exercise of their responsibility to prohibit the location of developments and structures for human occupancy across the trace of active faults.

Seismic Hazards Mapping Act (Public Resources Code Sections 2690 to 2699.6). Requires that site-specific geotechnical investigations be performed before permitting development within the seismic hazard zones.

California Building Standards Code (Title 24 California Code of Regulations). Governs the design and construction of buildings, associated facilities and equipment and applies to buildings in California.

Porter-Cologne Water Quality Act (California Water Code Section 13000 et seq.). Refer to Section 3.2.1 for a discussion of the Porter-Cologne Water Quality Act.

3.3.1.3 Regional and Local Regulations

California Government Code Section 65302(g) requires general plans to include a safety element for the protection of the community from any unreasonable risks associated with the effects of seismically induced surface rupture, ground shaking, ground failure, tsunami, seiche, and dam failure; slope instability leading to mudslides and landslides; subsidence and other geologic hazards known to the legislative body. Monterey County has a Health and Safety Element in its General Plan, and corresponding ordinances to enforce General Plan policies related to protection of public health and welfare from geologic hazards. In general, these policies and ordinances require soils engineering and geologic-seismic analysis of developments, including public infrastructure, in areas prone to geologic or seismic hazards, and enforce the California Building Standards Codes.

3.3.1.4 Surface Mining and Reclamation Act

The California Legislature enacted the Surface Mining and Reclamation Act (SMARA) of 1975 to address the need for a continuing supply of mineral resources, and to prevent or minimize the negative effects of surface mining to public health, property, and the environment. The State has delegated the approval of reclamation plans to local agencies. The agency responsible for reclamation plans in the project study area is the Monterey County Resource Management Agency.

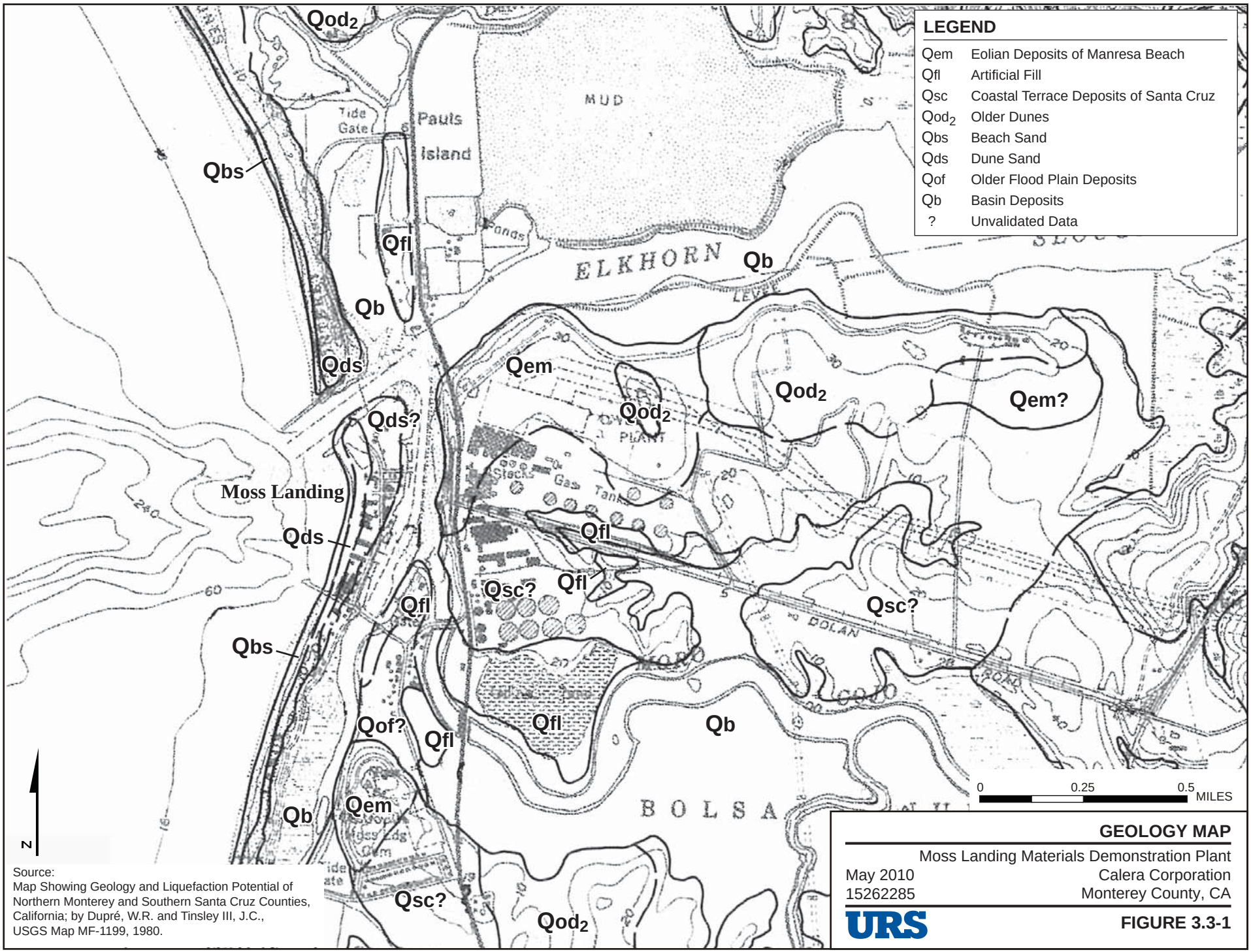
3.3.2 Existing Conditions

The MLCC site is immediately across Dolan Road from the Moss Landing Energy Facility, and bounded by California Highway 1 on the west. It is situated on a series of alluvial deposits developed by Elkhorn Slough on the north, and Moro Cojo Slough on the south. The surface geology of the site area is shown on Figure 3.3-1, after Dupré and Tinsley (1980). Most of the site is underlain by Coastal Terrace Deposits of Santa Cruz (Qsc), which consist of semi-consolidated, well-worked sand with a few relatively thin layers of gravel deposited in a near-shore high-energy marine environment. Local areas of artificial fill surround the perimeter of the site on the south and northeast. The extreme northwestern corner of the property is underlain by eolian deposits of Manresa Beach, as shown on Figure 3.3-1. This unit consists of weakly to moderately consolidated, moderately well-sorted silt and sand deposited in extensive coastal dune fields.

Although the site is in an area susceptible to strong ground shaking due to future earthquakes, it is relatively stable, and not subject to substantial geologic/seismic hazards:

- No active faults are mapped through the site so surface fault displacement is considered remote;
- The soils are relatively dense, as indicated by the 2009 geotechnical investigation (Soil Surveys, Inc., 2009);
- Although localized liquefaction and/or other forms of distress were observed seaward of the property due to the 1989 Loma Prieta earthquake (UCB/EERC – 89/14), no deformation was believed to have occurred on the project site.

The Soil Survey of Monterey County (USDA/SCS, 1978) indicates that essentially the entire property is underlain by Santa Ynez fine sandy loan, 2 to 9 percent slopes (ShC). This soil type consists of moderately well-drained materials formed on terraces in alluvium derived from sandstone and granitic rock with slow or medium runoff, and slight to moderate erosion hazard.



Source:
Map Showing Geology and Liquefaction Potential of Northern Monterey and Southern Santa Cruz Counties, California; by Dupré, W.R. and Tinsley III, J.C., USGS Map MF-1199, 1980.

GEOLOGY MAP

Moss Landing Materials Demonstration Plant
May 2010 Calera Corporation
15262285 Monterey County, CA

URS

FIGURE 3.3-1

5/06/10 vsa ...T:\Calera\Fig 3.3-1_geomap_8.5x11.ai

There is an area of artificial fill in the northeastern portion of the site, which anecdotal evidence suggests is a landfill for onsite disposal associated with previous owners of the site.

3.4 SOLID AND HAZARDOUS WASTE

3.4.1 Regulatory Setting

3.4.1.1 Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act (RCRA), 42 USC §§ 6901–6992k, provides the basic framework for the federal regulation of non-hazardous and hazardous waste. RCRA's Subtitle D establishes state responsibility for regulating non-hazardous wastes, while Subtitle C controls the generation, transfer, storage, and disposal of hazardous waste through a comprehensive "cradle to grave" system of hazardous waste management techniques and requirements. The U.S. EPA is responsible for implementing the law, and the implementing regulations are set forth in 40 CFR 260 et seq. The law allows U.S. EPA to delegate the administration of the RCRA programs to the various states provided that the state programs meet or are more stringent than the federal requirements. California's program was authorized by U.S. EPA on August 1, 1992, and the California Environmental Protection Agency's Department of Toxic Substances Control (DTSC) is responsible for administering the program.

3.4.1.2 Code of Federal Regulations

49 CFR Parts 172 and 173 provide for the controls for hazardous waste shipments that will be shipped off site over the state highways and roads. Part 172 lists and classifies those materials that the Department of Transportation has designated as hazardous materials for purposes of transportation and prescribes the requirements for shipping papers, package marking, labeling, and transport vehicle placarding applicable to the shipment and transportation of those hazardous materials. Part 173 Includes definitions of hazardous materials for transportation purposes; requirements to be observed in preparing hazardous materials for shipment by air, highway, rail, or water, or any combination thereof; and inspection, testing, and retesting responsibilities for persons who retest, recondition, maintain, repair and rebuild containers used or intended for use in the transportation of hazardous materials. The U.S. Department of Transportation and the California Highway Patrol are responsible for its administration and enforcement.

3.4.1.3 State Guidance: California Hazardous Waste Control Law

Nonhazardous solid waste is regulated under the California Integrated Waste Management Act (CIWMA) of 1989 (Public Resources Code § 40000 et seq.). State and local efforts in source reduction, recycling, and land disposal safety are coordinated through CIWMA. CIWMA requires each county to submit an integrated waste management plan to the state. Monterey County, solid waste haulers, and disposal sites will all comply with CIWMA requirements. CIMWA affects facility operations to the extent that hazardous wastes are not to be disposed of with nonhazardous wastes.

As stated previously, RCRA allows states to develop their own programs to regulate hazardous waste. California has developed its own program by passage of the California Hazardous Waste Control Law (HWCL), California Health and Safety Code § 25100 et seq. California's HWCL includes non-RCRA (California) hazardous wastes. The law specifies two hazardous waste criteria (the Soluble Threshold Limit Concentration and the Total Threshold Limit Concentration) that are not required under RCRA but are used by California in the waste determination process to assess whether a waste is a California Hazardous Waste if RCRA does not apply. Primary authority for the statewide administration and enforcement of California's HWCL rests with the DTSC. However, local government often provides most regulatory functions covering those who generate hazardous waste.

3.4.1.4 Local Guidance

The Monterey County Health Department, Environmental Health Division is designated by the California Integrated Waste Management Board as the Local Enforcement Agency. The Local Enforcement Agency is responsible for administering and enforcing laws and regulations relating to the collection, handling, storage, and disposal of solid waste materials in Monterey County.

3.4.2 Existing Conditions

3.4.2.1 Nonhazardous Solid Wastes

Nonhazardous wastes that are generated consist of operational wastes such as metal; wood; paper; cardboard; plastic; glass; non hazardous materials containers, and are removed from the site and disposed of by a commercial waste management company.

3.4.2.2 Hazardous Wastes

Based on information provided by Calera, approximately 20 pounds per year of solid hazardous waste is generated at the site as part of the existing site operations. Calera is a Small Quantity Generator (California EPA identification number CAL000339079). Hazardous waste is removed from the site and disposed of by a licensed, commercial, hazardous materials contractor.

Additional study was completed to determine the potential for hazardous materials from previous activities at the site to be present. Information about the potential for the presence of hazardous wastes at the site was obtained through a review of available regulatory database web sites, through a review of an environmental database prepared by EDR for the site (EDR, 2010; Appendix C), information provided by Calera, and a site reconnaissance.

Under its previous ownership (Kaiser Aluminum & Chemical Corporation and National Refractories [Kaiser Refractories and Mineral Plant]), the site was listed in the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) No Further Remedial Action Planned database in the EDR report (EDR, 2010; Appendix C) prepared for the site. The archived sites in the CERCLIS No Further Remedial Action Planned database are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of U.S. EPA's knowledge, assessment at a site has been completed and that U.S. EPA has determined no further steps will be taken to list this site on the National Priorities List, unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based on available information, the location is not judged to be a potential National Priorities List site.

The site is also listed on the Leaking Underground Storage Tank (LUST) database list in the EDR report. Based on the information in the EDR report, there were two LUST cases at the facility. One case (Global ID T0605300243) associated with a release of diesel from an underground storage tank (UST) was investigated and closed in February 2000 and has a status listing of "case closed". The second case (T0601993703) associated with a release of gasoline from a UST is listed with a "pollution characterization" status. There is no indication that the gasoline release case has been closed.

The site is also listed on the HAZNET database list because previous owners disposed of hazardous waste from the site. The different materials disposed included unspecified oil-containing waste and empty containers of 30 gallons or more.

In addition to review of the information contained in the EDR report, URS also searched the State Water Resources Control Board's Geotracker web site, which contains information on facilities undergoing environmental investigation and remediation under the oversight of one of the Regional Water Quality Control Boards. The Moss Landing Commercial Park, which is the former National Refractories and Minerals site, is listed in the Geotracker database as a Spills, Leaks, Investigation and Cleanup (SLIC case SL0605374136) case. The Summary section of the listing indicates the potential contaminants of concern as chromium and trichloroethene (TCE). A letter in the case file from the Central Coast Regional Water Quality Control Board to the Defense National Stockpile Center (DNSC) indicates that the DNSC stored chromite on a portion of the Moss Landing Commercial Park property but has removed and disposed off site. The letter indicates that the DNSC is going to remove residual chromite that has mixed with site soil as part of the final remedial action. With the exception of the summary listing TCE as a potential contaminant of concern, there is no information in the case file relating to TCE contamination. It is understood that the chromite stockpile was located to the east of the MLCC site.

In the community involvement section of the Geotracker case file, the site is listed as a Category 2 site. The Geotracker web page indicates that Category 2 sites include larger industrial or commercial sites with significant soil and groundwater contamination. At these sites, the groundwater plume extends off site beyond the public right-of-way (or is assumed to extend off site until investigation shows otherwise). This category includes many solvents sites. A few LUST sites will fall into this category. This category also includes:

- Sites where moderate public concern or interest exists (or is anticipated).
- RCRA analogous sites, where the Applicant has agreed to follow an oversight process that is equivalent to the RCRA corrective action program - California's Land Reuse and Revitalization Act (CLRRA) sites, where a buyer or landowner has applied for liability relief pursuant to this Brownfield legislation.

Based on anecdotal information, the area in the northeastern portion of the site was previously used as a landfill for onsite materials associated with past uses.

The information presented above indicates the potential for contaminated soils and/or hazardous materials to be present in areas where USTs leaked or residual concentrations of contaminants may still be present from previous storage of chromite at the site. However, no additional information is readily available beyond that reviewed on the Geotracker or Envirostor web sites for the former National Refractories and Minerals site.

On May 3, 2010, correspondence was sent to the Monterey County Environmental Health Division Administration, the Central Coast Regional Water Quality Control Board, and the Department of Toxic Substances Control requesting a review of files regarding hazardous materials use, storage, and handling for the MLCC property. To date, no responses have been received.

3.5 LAND USE

This section describes existing land use, land use designations, zoning, and open space and recreational uses in the vicinity of the MLCC site. Applicable adopted local plans and policies and local planning actions and permits that are expected to be required for the project are also identified.

3.5.1 Regulatory Setting

3.5.1.1 State

Because the MLCC site is within the State Coastal Zone, development is regulated by the California Coastal Commission (CCC), pursuant to the California Coastal Act of 1976. The CCC requires that a local coastal program (LCP) be prepared by the local jurisdiction for such lands and that it include a land use plan which may be the relevant portion of the local general plan, including any maps necessary to administer it, and the zoning ordinances, zoning district maps, and other supporting documents necessary to implement the land use plan. The CCC-certified LCP for Monterey County coastal areas, including the project site, is described below.

3.5.1.2 Local

General Plan

The 1982 General Plan currently applies to unincorporated areas of Monterey County. Applicable General Plan land use goals, objectives and policies from Chapter 4, Area Development, which address industrial uses, are listed in Table 3.5-1. An updated plan is also being prepared; the 2010 Draft Monterey County General Plan is a county-wide plan that will ultimately apply to non-coastal areas of the County.

Local Coastal Program

The North County Land Use Plan (NCLUP) Local Coastal Program serves as the guiding land use document for the coastal zone within unincorporated Monterey County, which runs from the Marina City limits to the Santa Cruz County boundary at the Pajaro River (Monterey County, 1995).

Chapter 4 of the LCP, Land Use and Development, addresses land use and Chapter 5, Moss Landing Community Plan, includes policies specific to Moss Landing and designates preferred land uses. Applicable plan policies that address land use in the project area are included in Table 3.5-2.

Chapter 5 of the NCLUP Local Coastal Program also establishes preferred land uses within Moss Landing area, shown on Figure 3.5-1. The land use designation for the MLCC site is Heavy Industry, Coast Dependent. Lands immediately adjacent to the site are designated as follows from north to south: Heavy Industry, Coast Dependent to the north (across Dolan Road); Heavy Industry, Coast Dependent and Resource Conservation, Wet Lands and Coastal Strand, to the east; Heavy Industry, Coast Dependent to the south; and Heavy Industry, Coast Dependent and Commercial, Recreation and Visitor Serving to the west (across Highway 1).

North County Coastal Implementation Plan

The Monterey County Coastal Implementation Plan has six parts, two of which pertain to the MLCC site. These parts are Part I (Monterey County, 2000), which includes Title 20 of the Zoning Ordinance (discussed under County Zoning below) and Part 2 (Monterey County, 1988), entitled Regulations for Development in the North County Land Use Plan Area (Chapter 20.144). Applicable development standards from Part 2 are listed in Table 3.5-3.

Table 3.5-1
Monterey County 1982 General Plan Goals, Objectives and Policies

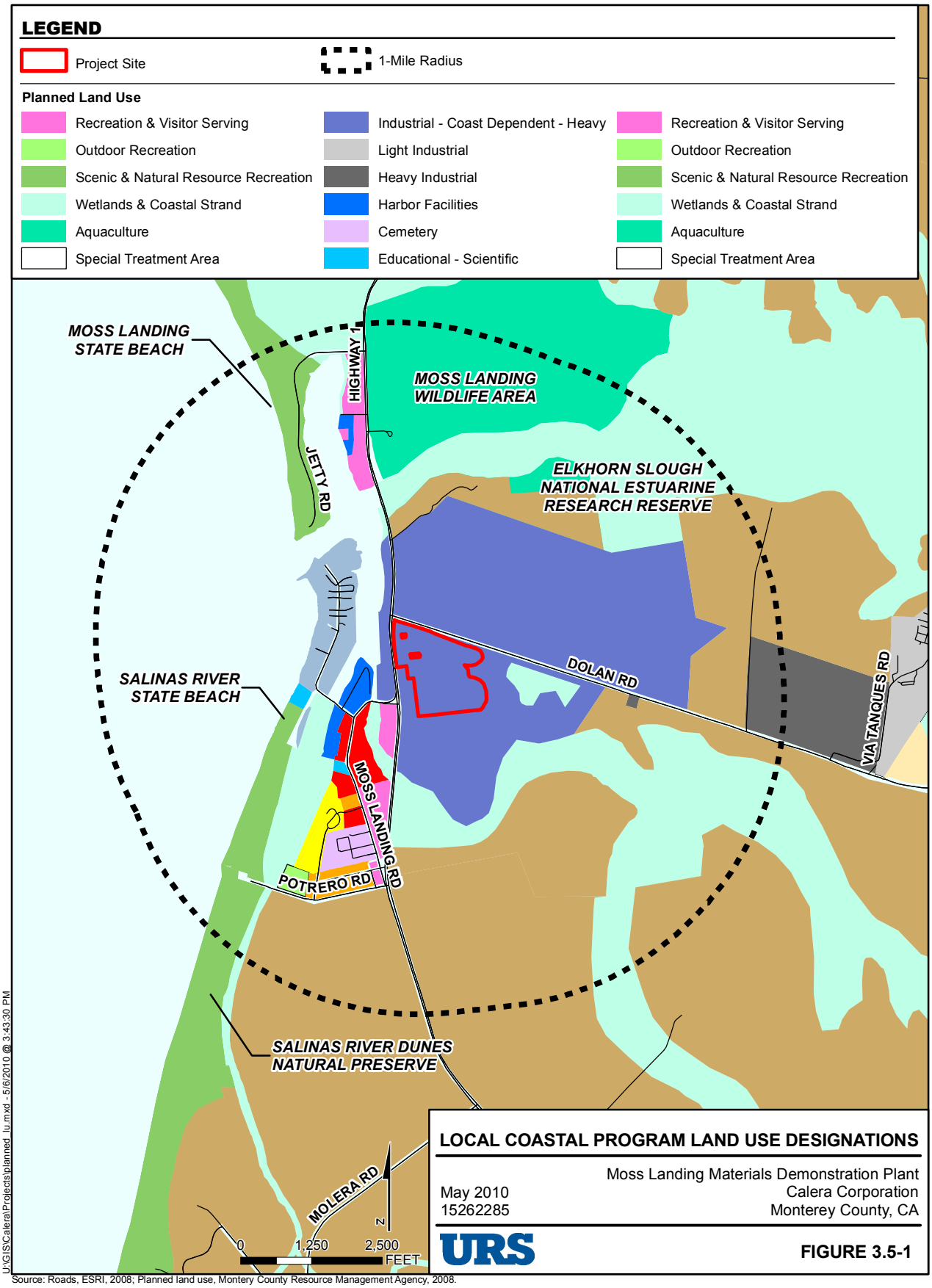
Goal/ Objective/ Policy No.	Goal/Objective/Policy
Goal 29	To encourage industrial development which maintains the quality of the environment and is economically beneficial to the area, located in close proximity to major transportation routes, and which is compatible with surrounding land uses.
Objective 29.1	Designate sites for industrial development which will maintain the County's environmental quality and encourage the expansion of the economic base.
Policy 29.1.1	Industrial development which is compatible with Monterey County's environment shall be encouraged.
Policy 29.1.2	The County shall require that industrial areas be as compact as possible and, where feasible, designate planned industrial park areas.
Policy 29.1.3	To maintain a healthy environment, the County shall allow only those industries which do not violate the County's environmental quality standards.
Policy 29.1.4	The County shall work to minimize nuisances in industrial areas.
Objective 29.2	Ensure adequate access for industrial land uses.
Policy 29.2.1	The County shall designate industrial land use locations which provide adequate access to appropriate transportation facilities and resources.
Policy 29.2.2	Industrial areas shall be designated which have adequate and convenient access to population centers except where safety factors are involved.
Objective 29.3	Ensure that industrial areas are compatible with and protected from surrounding proposed and existing land uses.
Policy 29.3.1	Industrially designated areas shall be compatible with surrounding land uses.
Policy 29.3.2	The County shall designate an amount of industrial land sufficient to meet foreseeable industrial needs.
Policy 29.3.3	The County shall discourage the conversion of designated vacant industrial lands to other permanent land uses.
Policy 29.3.4	In designating industrial areas, the County shall consider the proximity of other compatible land uses which have similar levels of utility and service requirements.

Source: Monterey County 1985.

Table 3.5-2
Local Coastal Program Policies

Section	Regulation
4.3.5, 6	Industrial uses shall be near major transportation facilities and population centers. The only industrial facilities appropriate for the area are coastal or agriculture-dependent industries which do not demand large quantities of fresh water and contribute low levels of air and water pollution. Industries not compatible with the high air quality needed for the protection of agriculture shall be restricted.
4.3.6, F. Industry, 4	A basic standard for all new or expanded industrial uses is the protection of North County's natural resources. Only those industries determined to be compatible with the limited availability of fresh water and the high air quality required by agriculture shall be allowed. New or expanded industrial facilities shall be sited to avoid impacts to agriculture or environmentally sensitive habitats.
5.5.2, 2	Future expansion, improvement or other development including fuels conversions at PG&E or Kaiser Refractories and Mineral Plant, and any other heavy industry in the area shall be considered in accordance with master plans for these facilities. This master plan requirement shall not apply to emergency or administratively approved developments under section 30624 of the Coastal Act. The master plans shall be developed by the respective industries and submitted to Monterey County for review and approval before approval by the County of any required permits for these industries. The master plans shall address the long range development and operation of the facilities including physical expansion and new construction, major operational changes, changes in fuels or fuel delivery systems, circulation or transportation improvements, electrical power transmission, alternative development opportunities, environmental considerations, potential mitigation of adverse environmental impacts and conformance to all other policies of the NCLUP Local Coastal Program and other State and Federal regulations. Subsequent to approval of these master plans, permit requests not in conformity with the master plans shall be considered only on completion and approval of necessary amendments to the master plan.
5.5.2, 3	The least environmentally damaging alternative should be selected for onsite modernization and upgrading of existing facilities. When selection of the least environmentally damaging alternative is not possible for technical reasons, adverse environmental effects of the preferred alternative shall be mitigated to the maximum extent.
5.5.2, 4	Modernization and expansion of industrial facilities shall be compatible with existing community land use patterns and circulation system capacities, planning objectives, and local air quality regulations in effect at the time of the granting of such approval for said expansion by the appropriate agencies.
5.5.2, 7	To reduce traffic hazards, Highway 1 access for PG&E and Kaiser Refractories and Mineral Plant should be eliminated except in emergency. Major access for each facility should be developed on Dolan Road. This may require improvements to Dolan Road and Highway 1.

Source: Monterey County, 1995


LEGEND
Project Site
1-Mile Radius
Planned Land Use
Recreation & Visitor Serving
Outdoor Recreation
Scenic & Natural Resource Recreation
Wetlands & Coastal Strand
Aquaculture
Special Treatment Area
Industrial - Coast Dependent - Heavy
Light Industrial
Heavy Industrial
Harbor Facilities
Cemetery
Educational - Scientific
Recreation & Visitor Serving
Outdoor Recreation
Scenic & Natural Resource Recreation
Wetlands & Coastal Strand
Aquaculture
Special Treatment Area
MOSS LANDING STATE BEACH
HIGHWAY 1
MOSS LANDING WILDLIFE AREA
JETTY RD
ELKHORN SLOUGH NATIONAL ESTUARINE RESEARCH RESERVE
SALINAS RIVER STATE BEACH
DOLAN RD
VIA TANQUES RD
MOSS LANDING RD
POTRERO RD
SALINAS RIVER DUNES NATURAL PRESERVE
MOLERA RD
N
0
1,250
2,500
FEET
LOCAL COASTAL PROGRAM LAND USE DESIGNATIONS
Moss Landing Materials Demonstration Plant
May 2010
Calera Corporation
15262285
Monterey County, CA
URS
FIGURE 3.5-1
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Source: Roads, ESRI, 2008; Planned land use, Montery County Resource Management Agency, 2008.

Table 3.5-3
Regulations for Development in the North County Land Use Plan Area

Section	Regulation
20.144.140.A.3	New development shall not be permitted to include subsurface disposal of hazardous or toxic chemicals. As such, development must comply with Titles 22 and 23 of the Public Resources Code and with applicable sections of the Monterey County Code pertaining to toxics and hazardous substances, as administered by the County Health Department. Appropriate studies shall be required and conditions of approval applied by the Health Department as needed to assure compliance.
20.144.140.B.5.c	Development of new or expanded industrial facilities shall only be permitted where able to meet the following criteria: 1) The industry shall be of a coastal or agriculture-dependent type. 2) The industry shall not use quantities of water that will exceed or adversely impact the safe, long-term yield of the local aquifer, as determined through a hydrologic report prepared in accordance with Section 20.144.070.D. 3) Where not preempted by the exclusive authority of a state or federal agency, the County shall require that the industry shall contribute only low levels of air and water pollution and shall reduce project pollution to the lowest levels possible for the particular industry and circumstance. All available and feasible mitigation measures shall be incorporated into project design, as a condition of project approval, where such measures will minimize the amount of air and/or water pollution. Appropriate professional studies shall be required as necessary to assess possible pollution levels and to provide mitigation measures. 4) The industrial use shall incorporate appropriate buffer zones where located adjacent to agricultural areas, as per Section 20.144.080.D.6. 5) The development shall meet visual resource, environmentally sensitive habitat, and other development standards of this ordinance (Ref. Policy 4.3.5.6 and 4.3.6.F.l & F.4).
20.144.160.C	In development of industrial/commercial facilities, the applicant shall apply the best available control technology to a new stationary source or modification of an existing source of pollution for each affected pollutant to be emitted as a waste product of production. All development must conform to the most current permitted pollutant levels as established by the Monterey County Board of Supervisors and administered by the Monterey Bay Unified Air Pollution Control District. As a condition of approval, all development of a commercial/industrial nature which proposes to emit harmful and potentially harmful pollutants will be required to submit evidence to the Planning Department that a permit for such emission has been secured for the project from the Monterey Bay Unified Air Pollution Control District.
20.144.160.C.1.a	Coastal dependent industrial facilities shall expand within existing sites before offsite expansion shall be considered. Commercial fishing activities and aquaculture shall have priority over other types of coastal-dependent industrial uses in industrial areas (Ref. Policy 5.5.2.1 Moss Landing Community Plan).
20.144.160.C.1.b	The National Refractories industrial facility at Moss Landing is permitted to expand within the existing site. This expansion is subject to conforming to all other requirements of this implementation ordinance and other State and Federal regulations and all applicable County requirements for the processing of discretionary and ministerial permits.(Ref. Policy 5.5.2.1 Moss Landing Community Plan).
20.144.160.C.1.k	All new heavy industry must be coastal-dependent (Ref. Policy 5.5.2.10 Moss Landing Community Plan).

Source: Monterey County, 1988.

County Zoning

The Monterey County Coastal Implementation Plan Part I, Title 20 Zoning Ordinance[1] specifies the zoning and development standards for the project area. The MLCC site is zoned Heavy Industrial Zoning District, HI (CZ), as shown in Figure 3.5-2. The purpose of this district is to provide a district which will assure an environment conducive to the development and protection of modern industry, research institutions and administrative facilities, all well designed and properly landscaped, which are not dependent on pedestrian traffic.

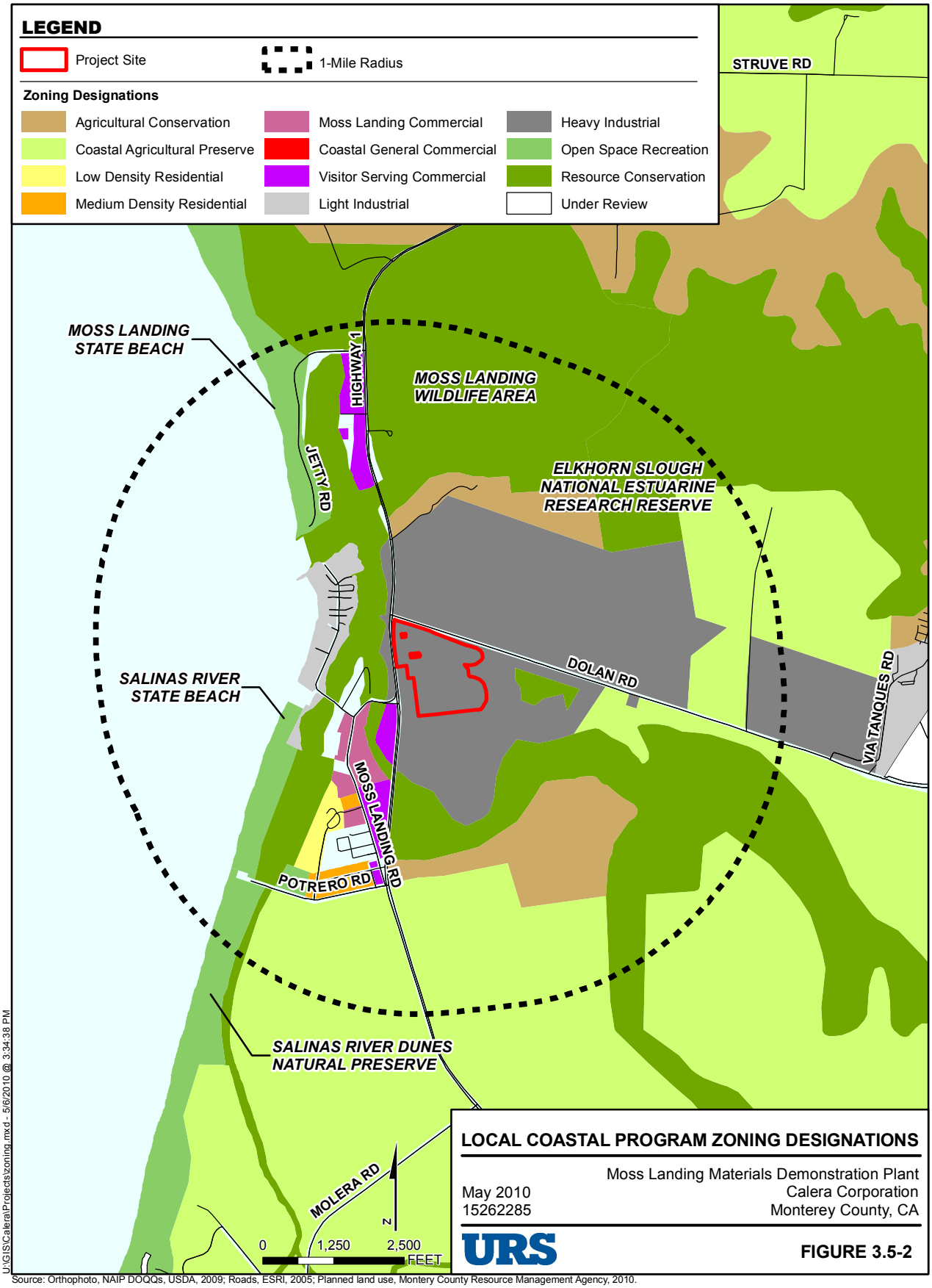
Standards included in Chapter 20.28, Regulations for Heavy Industrial Zoning Districts or HI (CZ) Districts, include:

- A General Development Plan may be required for development. If a Plan exists for the site, new development, expansion and physical changes to the site must be in conformance with the Plan.
- Coastal Development Permits may be required for certain situations, and are required for development which will cause a significant environmental impact.
- Site Development Standards:
  - Height of structures is generally limited to 35 feet unless superseded by a structure height limit noted on the zoning map. Additional height may be permitted with a Use Permit;
  - Building site coverage up to maximum of 50 percent excluding parking and landscaping;
  - Landscaping covering a minimum of 10 percent of the site;
  - Lighting plan requirements; and
  - Parking, sign and building area requirements.

Monterey Bay Sanctuary Scenic Trail Master Plan

The Monterey Bay Sanctuary Scenic Trail Master Plan identifies a recommended alignment for a continuous trail from Pacific Grove to the Pajaro River at the Santa Cruz County boundary. The trail will be a link in California Coastal Trail, connecting Santa Cruz and Monterey Counties with the rest of the California Coast. The Master Plan identifies an existing Class II bikeway along Dolan Road, north of the project site and proposes a new Class I bikeway through Moss Landing, designated as Segments 15 A and B. These segments would be west of the project site, along Highway 1, from Sandholdt Road at Moss Landing Road, north past the Moss Landing Energy Facility to Highway 1 at Jetty Road (Alta Design + Planning, 2007).[2]

[1] Monterey County, 2000. Monterey County Coastal Implementation Plan Part I, Title 20 Zoning Ordinance. Adopted 2000.
[2] A Class I bikeway provides bicycle travel on a paved right-of-way completely separated from any street or highway. A Class II bike lane is a striped lane on a street or highway.



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Source: Orthophoto, NAIP DOQQs, USDA, 2009; Roads, ESRI, 2005; Planned land use, Montery County Resource Management Agency, 2010.

LOCAL COASTAL PROGRAM ZONING DESIGNATIONS

Moss Landing Materials Demonstration Plant
Calera Corporation
Monterey County, CA

May 2010
15262285

URS

FIGURE 3.5-2

3.5.2 Existing Conditions

3.5.2.1 Regional Setting

The MLCC site is on the southeast corner of the intersection of Highway 1 and Dolan Road in Moss Landing within the northern portion of unincorporated Monterey County, California. Highway 156 is approximately 3 miles southeast of the MLCC site. The Moss Landing Community, including the MLCC site, is within the State Coastal Zone.

Counties within the region include Santa Cruz County, approximately 4 miles to the north across the Pajaro River, and San Benito County, approximately 10 miles to the east near Highway 156/101. The closest incorporated areas to the MLCC site are Salinas, approximately 10.6 miles to the southeast, Watsonville, approximately 7.5 miles to the north, and Marina, approximately 7.5 miles to the south. Unincorporated communities within the project vicinity include Castroville and Oak Hills, which are approximately 2.5 and 3.8 miles to the southeast, respectively.

The area is characterized by open space and agricultural uses and scattered coastal and inland communities. Agriculture is the main economic activity in the area and the Pajaro Valley, Salinas Valley, and Springfield Terrace are extensively farmed with row crops.

Industrial uses also occur in Moss Landing, including fish and shellfish processing, boat building, the Moss Landing Energy Facility, aquaculture, agricultural packing plants, and auto wrecking areas.

Several important natural landforms and features are in the vicinity of the MLCC site, including beaches, wetlands and waterways. Elkhorn Slough is approximately 0.5 mile north/northeast of the MLCC site. Part of the slough and surrounding area is within the Moss Landing State Wildlife Area as well as the Elkhorn Slough National Estuarine Research Reserve. The 1,400-acre Research Reserve is managed by the California Department of Fish and Game in cooperation with the National Oceanic and Atmospheric Administration and offers trails, an interpretative center, and channels for canoeing and boats for bird and wildlife viewing excursions.

Moro Cojo Slough is approximately 0.5 mile south of the MLCC site, and areas south of the slough are within the Elkhorn Slough Foundation habitat conservation lands.

Two rivers, the Pajaro and the Salinas, flow through the coastal zone and Carneros Creek forms the major freshwater contributory to Elkhorn Slough. A portion of the Salinas River flows north into Elkhorn Slough, approximately 0.5 mile west of the MLCC site. The land west of the river has beaches and is referred to as the Island.

Several state parks and wildlife areas are in the vicinity of the MLCC site. From north to south of the MLCC site, these parks include: Zmudowski Beach State Park approximately 1.75 miles to the northwest; Moss Landing State Beach approximately 0.5 mile to the northwest; and Salinas River State Park approximately 0.5 mile to the southwest.

Regional airports within the vicinity include: the Watsonville Municipal Airport approximately 9 miles to the north; Salinas Municipal Airport approximately 13 miles to the southeast; and Marina Municipal Airport approximately 8.5 miles to the south. Monterey Peninsula Airport is farther south.

Fort Ord Public Lands, which are approximately 12 miles south of the MLCC site, are the closest federal land and are administered by the military.

3.5.2.2 Land Uses in the Site Vicinity

Moss Landing is a coastal community with recreational boating facilities and coastal-dependent industries. Coastal-dependent, light industrial uses are on the Island, and visitor-serving commercial uses are along portions of the west side of Highway 1. The community has historic, scenic, harbor, and environmentally sensitive habitat resources. Low- to medium-density residential uses occur along Moss Landing Road, west of Highway 1.

The approximately 42-acre MLCC site is in a relatively flat industrial area of the Moss Landing Community, referred to as the Moss Landing Commercial Park. Highway 1 generally serves as the western boundary for the MLCC site and Dolan Road serves as the northern site boundary. An unmaintained railroad spur is also north of the site, adjacent to Dolan Road, and extends into the Moss Landing Commercial Park. The site formerly housed the Kaiser Refractories and Minerals Plant, which produced magnesia and refractory brick, both coastal-dependent processes that used seawater and dolomite from the nearby Natividad Quarry in Salinas.

The MLCC site is currently used for industrial uses, including the Moss Landing Pilot Plant and the Moss Landing Absorption Demonstration Plant, both operated by Calera. The operations of these facilities are further described in Appendix A, Project Description. Other land uses on the Moss Landing Commercial Park site include strawberry packing operations, an industrial workshop, and a U.S. Department of Agriculture laboratory.

Immediately adjacent land uses include: the Moss Landing Energy Facility to the north across Dolan Road; resource conservation lands to the east; unused portions of the Moss Landing Commercial Park and Moro Cojo Slough to the south; and Moss Landing Harbor and Marina, a commercial campground, cemetery, residential and commercial including restaurants uses to the west and southwest (see Figure 3.5-3).

Sensitive receptor land uses generally include schools, day care centers, libraries, hospitals, residential area, and parks. Sensitive receptors in the project vicinity are listed in Table 3.5-4.

3.6 NOISE

This section describes the regulatory setting and existing conditions for this resource area. Background information regarding fundamentals of acoustics including sound propagation and measurement is contained in Appendix D.

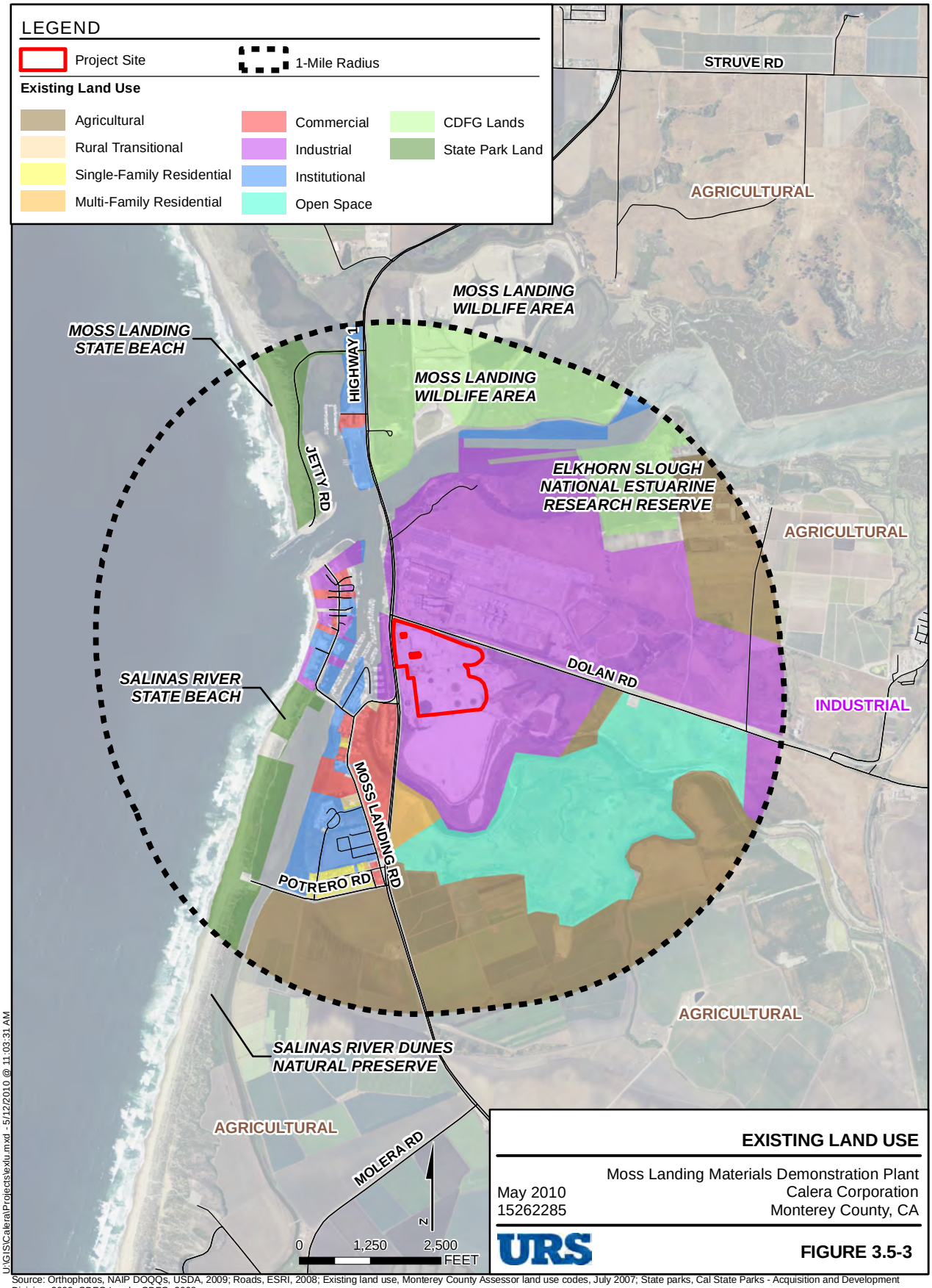
3.6.1 Regulatory Setting

3.6.1.1 Noise Standards and Regulations

Federal Standards and Regulations

A number of laws and guidelines at the federal level direct the consideration of a broad range of noise and vibration issues. Because the project does not fall within the purview of the Federal Energy Regulatory Commission the Proposed Action is not directly subject to federal noise regulations other than the Occupational Safety and Health Administration (OSHA). For perspective, several of the more significant noise-related federal regulations and guidelines are provided below:

National Environmental Policy Act (42 USC 4321, et seq.) (PL-91-190) (40 CFR § 1506.5). NEPA is the basic national charter for protection of the environment including the noise environment. It



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Source: Orthophotos, NAIP DOQQs, USDA, 2009; Roads, ESRI, 2008; Existing land use, Monterey County Assessor land use codes, July 2007; State parks, Cal State Parks - Acquisition and Development Division, 2009, CDFG Lands, CDFG, 2008.

EXISTING LAND USE

Moss Landing Materials Demonstration Plant
May 2010 — Calera Corporation
15262285 — Monterey County, CA

URS

FIGURE 3.5-3

Table 3.5-4
Location of Sensitive Receptors Relative to MLCC Site

Use	Approximate Distance From MLCC Site	Location/Direction from MLCC Site
North of MLCC Site		
Moss Landing Wildlife Area	1,900 feet	North
Moss Landing State Park	2,500 feet	North off Jetty Road
Elkhorn Slough National Estuarine Research Reserve	3,200 feet	Northeast
Residences	2,000 feet	North off Highway 1
East of MLCC Site		
Harbor Chapel	5,600 feet	East off Dolan Road
Residences	5,700 feet	Northeast off Elkhorn Road
Residences	7,280 feet	East off Dolan Road and Via Tanques Road
South of the MLCC Site		
Lodge/hotel	1,500 feet	Southwest on Moss Landing Road
Residences	2,800 feet	Southwest on Moss Landing Road
Single residence	4,200 feet	near Moss Landing Road and Highway 1 to the south
West of MLCC Site		
Residents living on boats moored in Moss Landing Harbor	300 feet	West off Highway 1
Residence	700 feet	West on Moss Landing Road
Campground	800 feet	West off Sandholdt Road
Salinas River State Park	1,900 feet	West off Sandholdt Road
Moss Landing Marine Labs facilities and classrooms	1,000 feet 2,800 feet	West off Sandholdt Road Southwest off Moss Landing Road

establishes policy, sets goals, and provides means for carrying out the policy. It also contains "action-forcing" provisions to ensure that federal agencies act according to the letter and spirit of the Act. The regulations that follow provide guidance to federal agencies regarding what they must do to comply with the procedures and achieve the goals of the Act.

Noise Control Act of 1972 (42 U.S.C 4910). This Act establishes a national policy to promote an environment for all Americans free from noise that jeopardizes their health and welfare. To accomplish this, the Act establishes a means for the coordination of Federal research and activities in noise control, authorizes the establishment of Federal noise emissions standards for products distributed in commerce, and provides information to the public respecting the noise emission and noise reduction characteristics of such products.

U.S. EPA Recommendations in "Information on Levels of Environmental Noise Requisite to Protect Health and Welfare with an Adequate Margin of Safety," NTIS 550\9-74-004, U.S. EPA, Washington, D.C., March 1974. In response to a federal mandate, the U.S. EPA provided guidance in this document, commonly referenced as the, "Levels Document," that establishes a Day-Night Average Sound Level (DNL or L_{dn}) of 55 A-weighted decibel (dBA) dBA as the requisite level, with an adequate margin of safety, for areas of outdoor uses including residences and recreation areas. This document does not constitute U.S. EPA regulations or standards, but identifies safe levels of environmental noise exposure without consideration of costs for achieving these levels or other potentially relevant considerations. It is intended to "provide State and Local governments as well as the Federal Government and the private sector with an informational point of departure for the purpose of decision making." The agency is careful to stress that the recommendations contain a factor of safety and do not consider technical or economic feasibility issues, and therefore should not be construed as standards or regulations.

Federal Energy Regulatory Commission Guidelines on Noise Emissions from Compressor Stations, Substations, and Transmission Lines (18 C.F.R 157.206(d)5). These guidelines require that:

> "the noise attributable to any new compressor stations, compression added to an existing station, or any modification, upgrade or update of an existing station, must not exceed an L_{dn} of 55 dBA at any pre-existing noise sensitive area (such as schools, hospitals, or residences)."

This policy was adopted based on the U.S. EPA-identified level of significance of 55 L_{dn} dBA.

Federal Highway Administration Noise Abatement Procedures (23 CFR Part 772). The purpose of 23 CFR Part 772 is to provide procedures for noise studies and noise abatement measures to help protect the public health and welfare, to supply noise abatement criteria, and to establish requirements for information to be given to local officials for use in the planning and design of highways. It establishes five categories of noise sensitive receptors and prescribes the use of the Hourly equivalent sound level as the criterion metric for evaluating traffic noise impacts.

OSHA Occupational Noise Exposure; Hearing Conservation Amendment (CFR 48 (46), 9738 – 9785 (1983). The standard stipulates that protection against the effects of noise exposure shall be provided for employees when sound levels exceed 90 dBA over an 8-hour exposure period. Protection shall consist of feasible administrative or engineering controls. If such controls fail to reduce sound levels to within acceptable levels, personal protective equipment shall be provided and used to reduce exposure of the employee. Additionally, a Hearing Conservation Program must be instituted by the employers whenever employee noise exposure equals or exceeds the Action Level of an 8-hour time-weighted average sound level of 85 dBA. The Hearing Conservation Program requirements consist of periodic area and personal noise monitoring, performance and evaluation of audiograms, provision of hearing protection, annual employee training, and record keeping.

The most relevant federal guidelines applicable to community noise exposure are those provided by the U.S. EPA in "Information of Levels on Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety." (U.S. EPA 550/9-74-004). It should be noted that this document does not constitute U.S. EPA regulations or standards, but rather, identifies safe levels of environmental noise exposure without consideration for achieving these levels or other potentially relevant considerations. It is intended to "provide State and Local governments as well as the Federal Government and the private sector with an informational point of departure for the purpose of decision making." These guidelines are not adopted or recommended by the State of California or any local jurisdiction. The agency is careful to stress that the recommendations contain a factor of safety and do not consider technical or economic feasibility issues needed to implement these guidelines.

State of California Standards and Regulations

The California Department of Health Services has studied the correlation of noise levels and their effects on various land uses and has established guidelines for evaluating the compatibility of various land uses as a function of community noise exposure. The State of California requires that all municipalities prepare and adopt a comprehensive long-range General Plan. General Plans must contain a Noise Element (California Government Code Section 65302(f) and Section 46050.1 of the Health and Safety Code). The requirements for the Noise Element of the General Plan include describing the noise environment quantitatively using a cumulative noise metric such as Community Noise Equivalent Level (CNEL) or DNL, establishing noise/land use compatibility criteria, and establishing programs for achieving and/or maintaining land use compatibility. Noise elements shall address all major noise sources in the community including mobile and stationary noise sources.

Appendix D, Table D-1 presents general State of California guidelines for environmental noise levels and land use compatibility. These guidelines are used by many agencies, environmental planners, and acoustical specialists as a starting point to evaluate the potential for noise impact on and by the project and methods for achieving noise-compatibility with respect to the nearby existing uses.

Occupational exposure to noise is regulated by Cal/OSHA in Title 8, Group 15, Article 105, Sections 5095-5100. The standard standards specified by Cal/OSHA are based on federal guidelines and stipulate that protection against the effects of noise exposure shall be provided when sound levels exceed 90 dBA over an 8-hour exposure period. Protection shall consist of feasible administrative or engineering controls. If such controls fail to reduce sound levels to within acceptable levels, personal protective equipment shall be provided and used to reduce exposure of the employee. Additionally, a Hearing Conservation Program must be instituted by the employers whenever employee noise exposure equals or exceeds the Action Level of an 8-hour time-weighted average sound level of 85 dBA. The Hearing Conservation Program requirements consist of periodic area and personal noise monitoring, performance and evaluation of audiograms, provision of hearing protection, annual employee training, and record keeping.

CEQA requires identification of "significant" environmental impacts and their feasible mitigation. Section XI of Appendix G of CEQA Guidelines (Title 14 Cal. Code Regs., Appendix G) lists some indicators of potentially significant impacts that include the following:

a. exposure of persons to or generation of noise levels in excess of standards established in the local General Plan or noise ordinance, or applicable standards of other agencies,

b. exposure of persons to or generation of excessive ground- borne vibration or ground-borne noise levels,

c. a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project,

d. a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project,

e. for a project within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, the project exposes people residing or working in the project area to excessive noise level, and,

f. for a project within the vicinity of a private airstrip, the project exposes people residing or working in the project area to excessive noise levels.

CEQA does not define a threshold of "significant increase" regarding noise exposure; however, based on human response and commonly applied industry standard, the following thresholds of significance would be applied to the Proposed Action as set forth by CEQA guidelines, a significant impact related to operational noise would result if:

- The project causes the ambient noise level measured at the property line of affected uses to increase by 3 dBA in CNEL to or within the "normally unacceptable" or "clearly unacceptable" noise/land use compatibility category; or

- The project causes any 5 dBA or greater noise increase.

Local Standards and Regulations

The MLCC site is in Monterey County. The Safety Element of the Monterey County General Plan contains the Monterey County Noise Element. The Noise Element provides a blueprint that contains goals and policies that guide the physical development of the unincorporated areas under each respective county's discretionary land use authority. The General Plan also influences the development of incorporated cities, state and federal lands within the counties that bear relation to the county's planning.

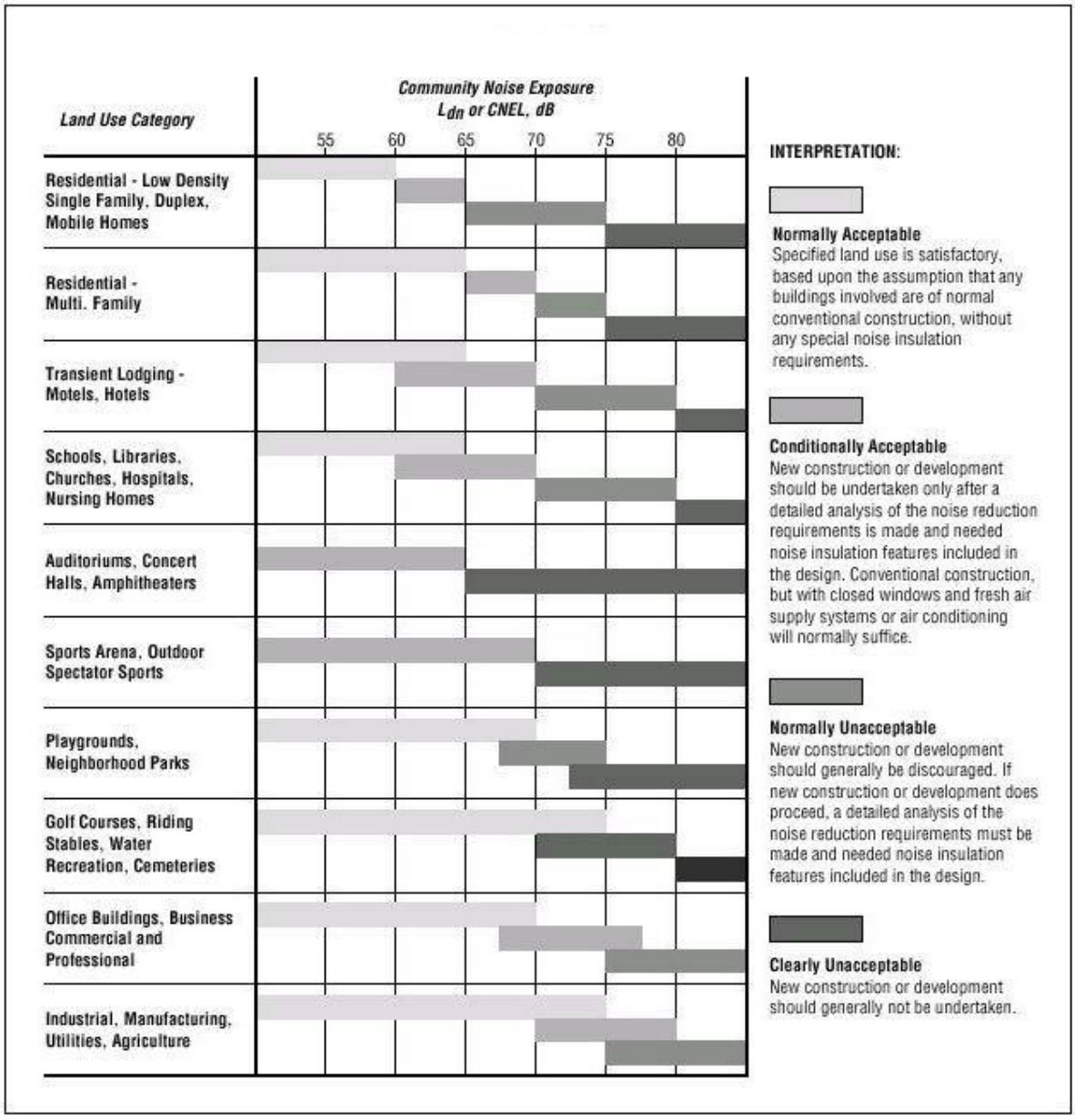
The Noise Element of the Monterey County General Plan is designed to limit the exposure of the community to excessive noise levels by specifying noise guidelines at noise-sensitive receptors. Within the Noise Element, exterior noise guidelines are established for noise-sensitive land use areas. These standards are defined in terms of L_{dn} at the nearest affected land use. The most restrictive standards are for residential land uses. Exhibit 3.6-1 represents the noise standards in Monterey County.

Exhibit 3.6-1 indicates that the noise levels in Monterey County should not exceed an L_{dn} of 60 dBA at the exterior of single-family residences over a 24-hour period. There are no construction noise exempt times listed in the Noise Ordinance or the Noise Element for the County of Monterey. The Monterey County Noise Ordinance states, "No person shall, within the unincorporated limits of the County of Monterey, operate any machine, mechanism, device, or contrivance which produces a noise level exceeding 85 dBA measured 50 feet therefrom. The prohibition in this section shall not apply to aircraft nor to any such machine, mechanism, device or contrivance which is operated in excess of 2,500 feet from any occupied dwelling unit."

3.6.2 Existing Conditions

The MLCC site is in an industrial area within an unincorporated part of Monterey County, California. The MLCC site is approximately 42 acres and includes Assessor's Parcel Number 133-172-013-000.

Exhibit 3.6-1
State of California Community Noise Exposure Guidelines



Adjacent land uses include Dolan Road and the Moss Landing Energy Facility to the north; undeveloped land to the east; Moro Cojo Slough and undeveloped land to the south; and Highway 1, marina, commercial, and restaurants uses to the west. The Moss Landing State Wildlife Area and Elkhorn Slough National Estuarine Sanctuary are approximately 0.5 mile northeast of the MLCC site.

3.6.2.1 Noise-Sensitive Receptors

Noise-sensitive receptors are defined as areas where there is a reasonable degree of sensitivity to noise. These areas include residential areas, hospitals, schools, churches, libraries, sensitive species habitat and other areas where quiet is an important attribute of the environment. The noise-sensitive receptors in the vicinity of the MLCC site include a series of homes west and southwest of the MLCC site along Moss Landing Road. The nearest noise-sensitive receptor along Moss Landing Road is a single-family home that is 700 feet west of the MLCC site. Additional nearby residences include boats moored in the Inner Channel of Moss Landing Harbor, some of which serve as residences. The nearest boat in the harbor is approximately 300 feet from the MLCC site boundary. A bed and breakfast called Captain's Inn at Moss Landing is 1,500 feet southwest of the MLCC site. Captain's Inn at Moss Landing is along Moss Landing Road. There is another noise-sensitive receptor to the north of the MLCC site. This single-family home is along an unnamed road north of the Moss Landing Energy Facility and 750 feet east of Highway 1. This noise-sensitive receptor is 2,000 feet north of the MLCC site. This home is north of the Moss Landing Energy Facility.

All of the noise-sensitive receptors are in Monterey County and are subject to Monterey County noise standards. Table 3.6-1 lists the coordinates for each noise-sensitive receptor location potentially impacted by the Proposed Action. "R-1" represents the home along Moss Landing Road that is nearest to the MLCC site. "R-2" represents the nearest location to the MLCC site where a boat could be in the harbor. "R-3" represents Captain's Inn at Moss Landing and "R-4" represents the home that is 2,000 feet north of the MLCC site. This residence is the northeastern-most home in the community. The table also lists the distances to the Proposed Action site boundary for each respective noise-sensitive receptor.

Table 3.6-1
Distances to Project Site from Noise-Sensitive Receptor Locations

Site ID	Latitude	Longitude	Distances (in feet) from Project Boundary
R-1	36º48'02.6" N	121º47'05.7" W	700
R-2	36º47'58.9" N	121º47'03.0" W	300
R-3	36º47'49.3" N	121º47'11.6" W	1,500
R-4	36º34'33.5" N	121º46'55.4" W	2,000

3.6.2.2 Ambient Noise

For an Application for Certification (AFC) that was completed in the year 2000 for the Moss Landing Power Plant Project, ambient noise level measurements were conducted at noise-sensitive receptors in the area near the MLMDP site. In the AFC, it is stated that "The (ambient noise level) survey results show a high, steady level of background noise ranging from 53 to 58 dBA with little variance from day to night." This statement shows that noise levels are considered to be homogeneous as measurements were completed at several noise-sensitive receptors in the area. Current ambient noise levels in the vicinity of

the Moss Landing Power Plant Project and the MLMDP sites are likely similar to the ambient noise levels that were obtained for the AFC for the Moss Landing Power Plant Project.

3.7 HISTORIC/CULTURAL RESOURCES

3.7.1 Regulatory Setting

Numerous laws, regulations, and statutes on both the federal and State levels seek to protect and target the management of cultural resources. These include the: Antiquities Act of 1906; Historic Sites Act of 1935; Reservoir Salvage Act of 1960; National Historic Preservation Act of 1966; National Environmental Policy Act of 1969; Executive Order 11593 (Projection and Enhancement of the Cultural Environment, 5/13/1971); 36 CFR 800 and CFR 60 (Advisory Council on Historic Preservation: Protection of Historic and Cultural Properties, Amendments to Existing Regulations, 1/30/1979, National Register of Historic Places, Nominations by States and Federal Agencies, Rules and Regulations, 1/9/1976); Revisions to 36 CFR 800 (Protection of Historic Properties, 1/10/1986); Archaeological and Historical Preservation Act of 1974; American Indian Religious Freedom Joint Resolution of 1978; Archaeological Resources Protection Act of 1979; Native American Graves Protection and Repatriation Act of 1990; and the California Environmental Quality Act. Collectively these regulations and guidelines establish a comprehensive program for the identification, evaluation, and treatment of cultural resources.

There are a number of federal, state, and local regulatory criteria regarding the documentation and treatment of cultural resources. Cultural resources are defined as buildings, sites, structures, or objects, that may have historical, architectural, archaeological, cultural, and/or scientific importance. These criteria are discussed below:

3.7.1.1 Federal Evaluation Criteria

The four evaluation criteria to determine a resource's eligibility to the National Register of Historic Places (NRHP), in accordance with the regulations outlined in 36 CFR 800, are identified at 36 CFR 60.4. These evaluation criteria, listed below, are used to help determine what properties should be considered for protection from destruction or impairment resulting from project-related activities (36 CFR 60.2). The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

- Resources that are associated with events that have made a significant contribution to the broad patterns of our history; or
- Resources that are associated with the lives of persons significant in our past; or
- Resources that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- Resources that have yielded, or may be likely to yield, information important in prehistory or history (36 CFR 60.4).

3.7.1.2 State Evaluation Criteria

In considering impact significance under CEQA, the significance of the resource itself must first be determined. At the state level, consideration of significance as "a unique archaeological resource" is

measured by cultural resource provisions considered under Public Resources Code Section 21083.2, CEQA Guidelines Sections 15064.5 and 15126.4, and the criteria regarding resource eligibility to the California Register of Historic Places (CRHP). Generally under CEQA, a historical resource (these include built-environment historic and prehistoric archaeological resources) is considered significant if it meets the criteria for listing on the CRHP. These criteria are set forth in CEQA Guidelines Section 15064.5 and defined as any resource that:

- Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
- Is associated with lives of persons important in our past;
- Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
- Has yielded, or may be likely to yield, information important in prehistory or history.

If an archaeological site does not meet the criteria for inclusion on the CRHP but does meet the definition of a unique archaeological resource as outlined in the California Public Resource Code (§ 21083.2), it is entitled to special protection or attention under CEQA. A unique archaeological resource implies an archaeological artifact, object, or site about which it can be clearly demonstrated that—without merely adding to the current body of knowledge—there is a high probability that it meets one of the following criteria:

- The archaeological artifact, object, or site contains information needed to answer important scientific questions, and there is a demonstrable public interest in that information;
- The archaeological artifact, object, or site has a special and particular quality, such as being the oldest of its type or the best available example of its type; or
- The archaeological artifact, object, or site is directly associated with a scientifically recognized important prehistoric or historic event or person.
- A non-unique archaeological resource indicates an archaeological artifact, object, or site that does not meet the above criteria. Impacts to non-unique archaeological resources and resources that do not qualify for listing on the CRHP receive no further consideration under CEQA.
- A non-unique archaeological or paleontological resource is given no further consideration, other than the simple recording of its existence, by the lead agency.

Section 15064.5 of the CEQA Guidelines also assigns special importance to human remains and specifies procedures to be used when Native American remains are discovered. These procedures are detailed under California Public Resources Code Section 5097.98. Specifically, CEQA Guidelines Section 15064.5, subdivision (e), requires that excavation activities be stopped whenever human remains are uncovered and that the county coroner be called in to assess the remains. If the county coroner determines that the remains are those of Native Americans, the Native American Heritage Commission must be contacted within 24 hours. At that time, Section 15064.5, subdivision (d), directs the lead agency to consult with the appropriate Native American as identified by the Native American Heritage

Commission and directs the lead agency (or applicant), under certain circumstances, to develop an agreement with the Native Americans for the treatment and disposition of the remains.

Section 15065.4(e)(1) and (2) of the CEQA Guidelines provides the following guidance with regard to the accidental discovery of human remains:

In the event of the accidental discovery or recognition of any human remains in any location other than a dedicated cemetery, the following steps should be taken:

1. There shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until:

    a. The coroner of the County must be contacted to determine that no investigation of the cause of death is required, and

    b. If the coroner determines the remains to be Native American:

        i. The coroner shall contact the Native American Heritage Commission within 24 hours.

        ii. The Native American Heritage Commission shall identify the person or persons it believes to be the most likely descended from the deceased Native American.

        iii. The most likely descendent may make recommendations to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98, or

2. Where the following conditions occur, the landowner or his authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity on the property in a location not subject to further subsurface disturbance.

    a. The Native American Heritage Commission is unable to identify a most likely descendent or the most likely descendent failed to make a recommendation within 24 hours after being notified by the commission;

    b. The descendent identified fails to make a recommendation; or

    c. The landowner or his authorized representative rejects the recommendation of the descendent, and the mediation by the Native American Heritage Commission fails to provide measures acceptable to the landowner.

Senate Bill 18 (Government Code Section 65352.3) now requires local governments to consult with Native American tribes before the adoption or amendment of a general plan or specific plan proposed on or after March 1, 2005.

3.7.1.3 Conformity of Federal and State Evaluation Criteria

The criteria for eligibility for the CRHP are very similar to those that qualify a property for the NRHP, which is the significance assessment tool used under the National Historic Preservation Act of 1966. The

criteria of the NRHP apply when a project has federal involvement that includes issuance of permits. State cultural resources significance criteria may also apply when resources fall under the jurisdiction of a state and/or local agency. A property that is eligible for the NRHP is also eligible for the CRHP. All potential impacts to significant resources under a federal agency must be assessed and addressed under the procedures of Section 106 of the National Historic Preservation Act of 1966, set forth at 36 CFR 800.

3.7.2 Cultural Setting

As a background to discussion of cultural resources within the project vicinity, overviews of prehistory, ethnography, and history are provided below.

3.7.2.1 Prehistory

Human settlement of the Monterey Bay/Central Coast region probably began sometime during the early Holocene. Ten thousand years ago, the mean sea level was lower; the coastline at that time being situated over 30 miles west of the present coastline. Sea levels rose, and by 8000 years ago, marine waters began to inundate previously dry locales. Except for brief periods, the mean sea level has been at or above its present level since 6000 years before present (Moratto, 1984:221-223). Radiocarbon studies from archaeological sites in northern Santa Clara County have yielded dates of circa 8000 B.C. Data for later occupations are more common. Radiocarbon dates from several sites within the areas surrounding and between the San Francisco and Monterey Bays range between circa 5000 and 2000 B.C. Data from these sites indicate that extensive but sparse populations of hunter-gatherers occupied these areas before 2000 B.C. Sites from this period are within the interior hills and valleys and on the bay and ocean shores. These sites are characterized by earth and/or sand midden deposits. Faunal materials indicate that shellfish were an important, but not dominant, source of food during this period. Hunting and vegetal food processing were of greater importance. Milling stones and large projectile points are characteristic artifacts.

Sometime between the years 2500-2000 B.C., Utian-speaking peoples initially occupied what is now eastern Contra Costa County and then expanded westward to the San Francisco Bay. These peoples are characterized as part of the Berkeley Pattern by Fredrickson (1973). Moratto states that these peoples were ancestral Costanoans (1984:279). Between the years 2000 and 1000 B.C., Bayshore and marsh adapted peoples began to settle in the bay area. By circa 1500 B.C., Utian people had settled the area around the south end of San Francisco Bay, from which they expanded southward to Monterey Bay. By circa 500 B.C., Costanoans occupied essentially the same territory that they would until they were displaced by Euro-Americans.

3.7.2.2 Ethnography

At the time of historic contact, the peoples inhabiting the Monterey Bay area spoke dialects of Costanoan. Together with the Miwokan languages, Costanoan comprises the Utian Family of languages. In turn, the Utian Family is part of the larger Penutian Linguistic Stock (Kroeber, 1976; Levy, 1978; Moratto, 1984; Shipley, 1978; Milliken, 1995). Costanoan speakers divided themselves into a number of politically distinct tribelets; however, the quantity, names, and territories of these tribelets are the source of some confusion. The current study area was inhabited by the Awaswas (Levy, 1978) who appear to have occupied the coast from the modern day community of Aptos, north to Año Nuevo, and east to the crest of the Santa Cruz Mountains.

At European contact, the Costanoan peoples of the central California coast practiced a hunting and gathering lifeway, using a wide variety of resources. Deer, elk, rabbit, quail, geese, ducks, robins, and rodents were taken, using bows and arrows, snares, and nets. Numerous species of mollusk were taken

and a variety of fish. Plant resources included a variety of herbs and bulbs gathered in the spring, grass seeds in the summer, and acorns in the fall (Levy, 1978).

3.7.2.3 Regional History

As a result of the Cabrillo expedition of 1542 and 1543, the southbound passage of the Manila Galleon along the coast after 1565, and subsequent voyages of exploration by Cermmenho in 1597 and Vizcaino in 1602, the California coastline was familiar to navigators by the end of the sixteenth century (Donley et al., 1979). Conversely, the interior of the central coast region remained unknown until the eighteenth century. Initial European exploration of the region was initiated in 1769 and lasted until 1810. During this period, a number of Spanish expeditions penetrated the territory occupied by the Costanoan peoples. Between 1769 and 1776, forays led by Portola, Ortega, Fages, Fages and Crespi, Anza (two expeditions), Rivera, and Moraga were carried out. At least two of these, the Portola (1769) and Rivera (1774) expeditions, passed directly through the Moss Landing area (Beck and Haase, 1974).

Spanish annexation and colonization of Alta California produced profound changes in the cultures of the indigenous population. The missions resettled and concentrated the aboriginal hunter-gatherer population into agricultural communities. As a consequence of the concentration of population, coupled with the indigenous population's lack of immunity to European diseases, the mission tribes were decimated by common diseases, which were generally not fatal to Europeans. It has been estimated that the Costanoan population declined from 10,000 or more in 1770 to less than 2,000 in 1832 (Levy, 1978:486).

Jurisdiction over Alta California was established by the Mexican Empire in April of 1822. During the Mexican Period (1822-1848), control over this remote area by the central and local Mexican authorities was never strong. The Mexican Period was one of a slow disintegration of control by the Mexican government. In 1833, the mission lands were secularized and expropriated (Donley et al., 1979). The former mission lands were given out as private ranches during the ensuing years in the form of land grants.

A major factor leading to the disintegration of Mexican control of California was pressure from the United States. Initial contacts were made by private citizens, such as the November 1826 visit by Jedediah Smith to the San Gabriel Mission. Settlement by United States citizens greatly increased after discovery of gold in 1848. California became part of the United States as a consequence of the Mexican War of 1846-1847. The territory was formally ceded in the treaty of Guadelupe Hidalgo in 1848 and was admitted as a state in 1850 (Bethel, 1969).

3.7.3 Existing Conditions

3.7.3.1 Native American Tribal and Religious Practices

The California Native American Heritage Commission (NAHC) was contacted by facsimile, dated April 23, 2010, requesting a review of the Sacred Lands File as well as a list of local native American groups and individuals who may have knowledge of and/or concerns for cultural resources within the project vicinity. As of this date, no response from the NAHC has been received. As such, no local Native American groups or individuals have been contacted either. A copy of the NAHC request letter is appended to this report (Appendix E). Any future response received from the NAHC as well as future correspondence with local Native American groups and individuals identified by the NAHC would be collected.

3.7.3.2 Historic Areas

On April 20, 2010, an in-house record search at the Northwest Information Center (NWIC) was conducted of the California Historical Resources Information System (CHRIS). The purpose of the

record search was to identify previously conducted cultural resource studies within the study area, and previously recorded cultural resources within a 1-mile radius of the proposed project site. In addition, a review of historic aerial photographs and topographic maps was completed as a means to identify potential areas of increased cultural sensitivity. The historic maps and photographs were obtained from an EDR report requested for the MLCC site (EDR, 2010) and are presented in Appendix C.

Seven previously conducted cultural studies have been completed within the study area (Appendix F). Reports are available on file with the NWIC. None of these studies included the entire MLCC site. The results of the NWIC record search indicate that one cultural resource (CA-MNT-235) is adjacent to and thirteen cultural resources are within a 1-mile radius of, the MLCC site. Seven previous cultural resource studies include at least a portion of the MLCC site. CA-MNT-235 was originally recorded in 1949; however, no information was provided about the site's exact location, extent, or its constituents (Pilling, 1949). A subsequent study by Snethkamp (1991) identified a shell scatter in the vicinity of the purported location of CA-MNT-235 (Appendix G). The scatter was encountered in a highly disturbed context between Highway 1 and the MLCC site. Snethkamp (1991) concluded that the shell scatter was a redeposit, and likely associated with CA-MNT-235, which was apparently destroyed by the construction of Highway 1 and the original National Refractories and Minerals Plant (Leach-Palm, 1999). Due to the extensive development and lack of native surface visibility, it is unknown whether intact subsurface portions of the site remain within the MLCC site.

The NWIC search also identified thirteen cultural resources within a 1-mile radius of the MLCC site (Appendix H). These resources include prehistoric shell middens, prehistoric habitation sites, a prehistoric shell scatter, a prehistoric shell and historic trash scatter, and three built environment resources. CA-MNT-229, a prehistoric habitation site with documented human remains, is approximately 0.25-mile north of the MLCC site, has been determined eligible for registry in the CRHP and the NRHP, and is currently listed in the CRHP. Built environment resources P-27-2171 and P-27-2172 have been recommended as ineligible for listing in the NRHP (McLean and Urbas, 1999). The results of test excavations at CA-MNT-731/H determined the site ineligible for listing in the NRHP (Jones et al., 1996).

U.S. Geological Survey (USGS) quadrangle maps from 1914, 1954, 1968, and 1980 were reviewed. The 1914 Capitola 15' USGS quadrangle depicts the study area, but shows no development such as buildings or structures. The map does, however, depict the Pajaro Consolidated Rail Road and the alignment of Highway 1, which is adjacent to the MLCC site. The 1954 Moss Landing 7.5 minute USGS quadrangle shows dramatic changes to the landscape of the study area; the refractory plant is depicted as a series of buildings, structures, four large sludge tanks, and a tailings pond. The 1968 Moss Landing 7.5 minute USGS quadrangle depicts an extension of the footprint of the refractory plant—including additional buildings and structures, and three additional sludge tanks. Expansion of the site continued; the 1980 version of the quadrangle shows an increased tailings pond footprint and additional structures.

A review of historic aerial photographs (1931, 1948, 1956, 1968, and 1971) was also completed. The 1931 aerial does not depict any buildings or structures. However, by 1948, the refractory plant had been constructed and several buildings, four tanks, and the tailings pond can be clearly seen. The 1956 aerial depicts the plant's extension to the east. The 1968 and 1971 aerials show further expansion east and the modification and/or expansion of several buildings associated with the plant. The onsite structures have not been evaluated for eligibility of listing in the National Register of Historic Places.

3.8 VISUAL RESOURCES

Visual resources include public viewsheds and scenic resources—including state scenic highways. Effects on visual resources can result from alterations to the landscape, changes to the environment

surrounding sensitive areas, or an increase in light pollution. The following characterization of the landscape and identification of key view points is based on aerial photography, site visits, and consultation with applicable planning documents.

The range of influence for visual resources is defined as the area encompassing locations from which the proposed project would be visible. The distance from which the MLCC site, and features considered as part of the alternatives, would be visible depends on local topography, weather conditions, the presence of intervening structures, and the height of proposed and existing structures. For this analysis, the range of influence is generally within an approximately 2- to 3-mile radius of the project site.

3.8.1 Regulatory Setting

3.8.1.1 Federal

There is no federally managed land with visual resource management objectives is within or immediately adjacent to the project site. Further, there are no U.S. Department of Interior Bureau of Land Management or U.S. Forest Service visual resource management classifications or designated scenic vistas in the range of influence.

3.8.1.2 State

Section 30251 Scenic and Visual Qualities of the California Coastal Act (2009) states that scenic and visual qualities of coastal areas shall be considered and protected as a resource. Further, permitted development shall be sited and designed to protect views to and from the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character of the surrounding areas and, where feasible, to restore and enhance visual quality in visually degraded areas.

3.8.1.3 Local

Local Coastal Program

The *North County Land Use Plan* Local Coastal Program serves as the guiding land use document for the coastal zone within unincorporated Monterey County, which runs from the Marina City limits to the Santa Cruz County boundary at the Pajaro River (Monterey County, 1982). Applicable Plan policies that address visual resources in the project area are listed below.

- **Chapter 2. Resource Management.**

  2.2 Visual Resources

  2.2.2 General Policy

  1. Views to and along the ocean shoreline from Highway One, Molera Road, Struve Road and public beaches, and to and along the shoreline of Elkhorn Slough from public vantage points shall be protected. The least visually obtrusive portion of a parcel should be considered the most desirable site for the location of new structures. Structures should be located where existing topography and vegetation provide natural screening.

  5. Structures should be located to minimize tree removal, and grading for the building site and access road. Disturbed slopes should be restored to their

previous visual quality. Landscape screening and restoration should consist of plant and tree species complementing the native growth of the area.

2.2.4 Recommended Actions

6. Elkhorn Slough should be officially designated as a State Scenic Waterway and the visual character of the adjacent scenic corridor should be preserved and where feasible, restored.[3]

- **Chapter 5. Moss Landing Community Plan.** Chapter 5 of the Local Coastal Program, Moss Landing Community Plan, establishes the land uses within Moss Landing area and contains specific policies for the area. This plan designates certain areas as Scenic and Natural Resource Recreation lands. These uses are defined as low intensity recreational and educational uses that are compatible with the natural resources of the area and require a minimum level of development accommodating basic user needs. Within the project vicinity, portions of the Moss Landing Harbor area (west of the Old Salinas River and approximately 0.25 mile west of the project site) and Moss Landing State Beach (approximately 0.5 mile northwest of the project site) are designated as Scenic and Natural Resource Recreation lands. No portions of the MLCC site are designated as scenic lands.

5.6 Visual Resources and Community Character

5.6.3 Specific Policies

6. Views of the Moss Landing community, harbor and dunes from Highway 1 should be protected through regulation of landscaping and siting of new development adjacent to the highway to minimize the loss of visual access.

7. A Moss Landing Community Design Review Committee shall be formed to provide guidance to the County in the consideration of development proposals. In cooperation with the County, the committee should develop design review criteria and standards to ensure that new development is visually compatible with natural features, historical resources, and the unique character of Moss Landing. Design standards should include criteria regulating height, bulk, siting, structural design, shape, color, texture and materials used in new buildings, and should also address landscaping requirements. Once developed, these criteria shall be used by both the Committee and the County in reviewing development proposals.

County Zoning

The project site is zoned Heavy Industrial Zoning District, HI (CZ). The Monterey County Coastal Implementation Plan Part I, Title 20 Zoning Ordinance (Monterey County, 2000) contains development standards that address the visual quality within the HI (CZ) Districts. These standards and regulations include:

[3] The county has designated Elkhorn Slough as an official "Scenic Waterway." However, no protective land use regulations come with these designations (Scharffenberger Land Planning & Design, 1999). No official state listing of the Elkhorn Slough as a Scenic Waterway was found.

- **20.28.070 Site Development Standards.**

  D. Landscaping Requirements. All developments allowed shall have landscaping covering a minimum of 10 percent of the site area subject to a plan approved by the Director of Planning and Building Inspection. The landscaping shall be in place before the commencement of use.

  E. Lighting Plan Requirements. All exterior lighting shall be unobtrusive, harmonious with the local area and constructed or located so that only the area intended is illuminated and offsite glare is fully controlled. The location, type and wattage of the exterior lighting must be approved by the Director of Planning and Building Inspection before the issuance of building permits or the establishment of the use.

- **20.28.080 Special Regulations.**

  A. Manufacturing and Fabrication Operations. All manufacturing and fabrication operations shall be conducted within structures. All equipment and material storage areas shall be screened by solid walls, fences, or by adequate plantings of not less than 6 feet in height.

County Development Standards

The Monterey County Coastal Implementation Plan, Part 2 contains several development standards that apply to the project (Monterey County, 1988). Additionally, the project site is within a public viewshed, as defined by the Plan. The Public Viewshed is comprised of the area visible from major public use areas and scenic corridors. The Viewshed applicable to the MLCC site is comprised of views from Highway 1, Highway 156, Elkhorn Slough Road, Elkhorn and Moro Cojo Sloughs, beaches, dunes, and wetlands, and views to and along the ocean shoreline from Highway 1, Molera Road, Struve Road, and public beaches, and views to and along the shoreline of Elkhorn Slough.

Section 20.144.030, Visual Resources Development Standards contains a requirement for onsite inspection by a Monterey County planner for industrial uses, to determine conformance with policies of the land use and development standards of the Implementation Plan. Standards for siting of structures, landscaping and lighting are summarized below:

1. The location and siting of structures shall allow for their maximum screening from public view.

2. The design of structures, including fencing, shall … blend with the rural setting.

3. Landscaping and lighting shall be unobtrusive and blend with the rural setting.

4. The structures shall be modified for bulk, size, and height where necessary to protect and minimize visibility from the public viewshed.

Section 20.144.160, Moss Landing Community Development Standards, also provides standards that would apply to the project including:

- **D. Visual Resources and Community Character**

  1. Public Viewshed Determination

     a. Visibility will be considered in terms of normal, unaided vision in any direction for any amount of time at any season. The standard for review is the objective determination of whether any portion of the proposed development is visible from or impedes the visual access to the Moss Landing community, harbor and dunes from Highway 1 or any other public viewing area. Views of the Moss Landing community, harbor and dunes from Highway 1 shall be protected through regulation of landscaping and siting of new development adjacent to the highway to minimize the loss of visual access from Highway 1 to the areas of the Moss Landing Community, the dunes and the harbor area (Ref. Policy 5.6.3.6 Moss Landing Community Plan). With development located in the viewshed of the Moss Landing Community, the harbor and dunes areas as viewed from Highway 1, the project planner shall make an onsite investigation to determine whether the project will affect the visual access to the areas noted above.

Monterey Bay Sanctuary Scenic Trail Master Plan

The Monterey Bay Sanctuary Scenic Trail Master Plan identifies a recommended alignment for a continuous trail from Pacific Grove to the Pajaro River at the Santa Cruz County boundary. The trail will be a link in California Coastal Trail, connecting Santa Cruz and Monterey Counties with the rest of the California Coast. The trail will provide new and enhanced access to scenic and natural resources along the Monterey coastline. Access and scenic vistas may be enhanced with interpretive signage as well as visitor facilities such as shade structures and benches.

The Master Plan identifies an existing Class II bikeway along Dolan Road, north of the project site and proposes a new Class I bikeway through Moss Landing, designated as Segments 15A and B. These segments would be west of the project site, along Highway 1, from Sandholdt Road at Moss Landing Road, north past the Moss Landing Energy Facility to Highway 1 at Jetty Road (Alta Design + Planning, 2007).[4]

3.8.2 Existing Conditions

The MLCC site is in a relatively flat industrial area in the Moss Landing Community. The MLCC site is generally shielded from views on and west of Highway 1 in the immediate vicinity of the site by existing vegetation (Appendix I, Photo points 1 and 2). However, some of the features at the site are taller than the vegetation or are present in areas of vegetative gap and are therefore visible to motorists (Appendix I, Photo point 3). Similar to the vegetation along Highway 1, the Dolan Road corridor is also sporadically lined with vegetation (Appendix I, Photo points 4 and 5). Along Dolan Road, a green chain linked fence provides a moderately notable linear feature that parallels the roadway and contributes to the pattern of strong linear features from the roadway, a utility line, and a rail line. Additionally, a small formally landscaped area is near the MLCC entrance (Appendix I, Photo point 6). The site itself is at a higher elevation than Dolan Road. Structures on the site are constructed of a variety of materials, comprising varied shapes and sizes. Dominant colors include grays of cement and aggregate surfacing, tans, yellows, and greens of the buildings (Appendix I, Photo point 7). The southernmost portion of the MLCC site is

[4] A Class I bikeway provides bicycle travel on a paved right-of-way completely separated from any street or highway. A Class II bike lane is a stripped lane on a street or highway.

comprised of an expansive, flat area, dominated by the homogeneous white materials that comprise the area (Appendix I, Photo point 8).

Highway 1 and Dolan road serve as the western and northern MLCC site boundaries, respectively. A railroad spur is also north of the MLCC site, adjacent to Dolan Road. Adjacent land is comprised of industrial uses to the north (Moss Landing Energy Facility); undeveloped land to the east; the Moro Cojo Slough and undeveloped and agricultural lands to the south; and Moss Landing Harbor, cemetery, a commercial campground, and residential and commercial uses to the west.

The more expansive project vicinity is also characterized by wetlands, beaches, open space wildlife and agricultural lands, transportation features, some residential and commercial uses, and recreational uses including marine and harbor uses. There are several parks and wildlife areas in the project vicinity. The Moss Landing State Wildlife Area and Elkhorn Slough National Estuarine Research Reserve are approximately 0.5 mile northeast of the project site. The 1,400-acre reserve is managed by the California Department of Fish and Game in cooperation with the National Oceanic and Atmospheric Administration and contains trails, an interpretative center, channels for water recreation (i.e., canoeing), and float boats for bird and wildlife viewing. The Elkhorn Slough Foundation owns approximately 390 acres of wetlands and coastal habitat immediately south of the project site, across Moro Cojo Slough. Salinas River State Park and Moss Landing State Beach are less than 0.5 mile southwest and northwest of the project site, respectively.

Throughout Monterey County portions of Highway 1 are designated as Scenic Highway and an All American Road. However, while the portion of the roadway within the vicinity has been determined an eligible State Scenic Highway, it has not officially designated as such. To become officially designated as a State Scenic Highway, Monterey County would need to apply to Caltrans for scenic highway approval and adopt a Corridor Protection Program.

3.8.2.1 Project Area Views

The following section is based on the visual analysis in the California Energy Commission's Final Staff Assessment (Part 1), *Application For Certification for the Moss Landing Power Plant Project* [Moss Landing Energy Facility], May 2000 (99-AFC-4), as well as a field visit to the project site and vicinity. In general, development or alterations of the landscape since the issuance of the Staff Assessment have been minor. Representative views in the project vicinity can be seen from along Highway 1, from Highway 156 along the western edge of Castroville, from public beaches and parks, Elkhorn Slough, Pajaro Dunes (near Palm Beach State Park) and other significant recreation areas.

Far Views toward the Site

As seen from Castroville, approximately 2.5 miles to the southeast, the view toward the MLCC site is generally of flat agricultural lands. The existing MLCC site buildings and features, as well as the stacks of the Moss Landing Energy Facility are barely visible on the horizon. From the Pajaro Dunes—approximately 5 miles to the north—the view towards the MLCC site includes views of the beach, dunes, Pajaro River in the foreground, native vegetation along the coastal beach, and trees in the background. The adjacent Moss Landing Energy Facility is barely visible on the horizon.

Views from Highway 1 toward the Site

Along Highway 1 from a site approximately 2 miles to the north of the project site, near Struve Road, the view towards the project area consists of agricultural fields and sporadic trees. The adjacent Moss Landing Energy Facility is slightly visible, but blocks views of the MLCC site. Along Molera Road, approximately 1 mile south of the MLCC site, the view towards the project area consists of linear features

of the roadway and adjacent utility line, agricultural fields and sporadic trees. The site is visible in the distance. Refer to Appendix I, Photo points 9 through 12 for representative views from Highway 1.

Near Views toward the Site

As seen from the Elkhorn Slough Reserve Visitor Center, approximately 3 miles east of the site, the view toward the project site consists of generally flat to rolling terrain. Trees, and frequent fog and haze screen portions of the industrial uses in the surrounding area.

As seen from Salinas River State Beach parking area, approximately 0.5 mile west of the site, the view consists of flat lands with some coastal rolling hills. Views include the harbor, existing marina, commercial and industrial uses.

From the Moss Landing State Beach approximately 0.5 mile to the northwest of the site, the view toward the site includes Elkhorn Slough Inlet, Moss Landing Harbor and views of the existing Moss Landing Energy Facility. The MLCC site is obscured by the larger and more dominant Moss Landing Energy Facility, which is immediately to the north (Appendix I, Photo point 13).

Project Site

The area immediately surrounding the MLCC site area to the north is strongly characterized by industrial uses of the adjacent Moss Landing Energy Facility natural–gas-fired combined-cycle power plant. As described in the North County Land Use Plan, "Moss Landing is one of the most easily identifiable coastal communities in California. The 550-foot [Moss Landing Energy Facility] stacks serve as a landmark feature that unmistakably marks the location of the community from any approach (Monterey County, 1982)." Areas immediately to the east include complex views of high interest featuring water features, and associated lush, green, heavily vegetated and relatively undisturbed irregular forms; however, industrial, utility, and transportation features interrupt or frame these views (Appendix I, Photo points 14 through 16). Areas immediately west of the project site, and west of Highway 1 contain various commercial uses, including restaurants and marinas. From this area, portions of the site are visible above or in gaps along existing vegetation (Appendix I, Photo points 17 and 18). Current outdoor lighting at the site includes pole-mounted lighting along interior access roads and adjacent to outdoor storage tanks and existing buildings; and ambient night-time lighting related to industrial activities at the adjacent Moss Landing Energy Facility.

3.9 ECOLOGY

3.9.1 Regulatory Setting

A number of federal, state, local laws, ordinances, regulations, and standards are applicable or potentially applicable to ecological resources in the study area.

3.9.1.1 Federal

Endangered Species Act of 1973 and Implementing Regulations, 16 USC § 1531 et seq., 50 CFR § 17.1 et seq. The Endangered Species Act includes provisions for the protection and management of federally listed threatened or endangered plants and animals and their designated critical habitats. Section 10(1)(A) of the Endangered Species Act requires a permit to take threatened or endangered species during lawful project activities. The administering agency for the above authority is the U.S. Fish and Wildlife Service (USFWS) for terrestrial, avian, and most aquatic species and the National Marine Fisheries Service for anadromous species.

Section 7 of Fish and Wildlife Coordinating Act, 16 USC 742 et seq., and Endangered Species Act, 16 USC 1531 et seq., and 50 CFR 17. Section 7 requires consultation if any project facilities could jeopardize the continued existence of an endangered or threatened species, and issuance of a Biological Opinion that also authorizes incidental take of a threatened or endangered species. The applicability of this act depends on federal jurisdiction over some aspect of the project. The administering agencies for the above authority are the USFWS and the National Oceanic and Atmospheric Administration.

Migratory Bird Treaty Act 16 USC §§ 703-711. This Act includes provisions for protection of migratory birds, including the non-permitted take of migratory birds. The administering agencies for the above authority are the USFWS and the California Department of Fish and Game (CDFG).

Refer to Section 3.2.1 for a discussion of the Clean Water Act.

3.9.1.2 State

California Endangered Species Act of 1984, Fish and Game Code §§ 2050–2098. The California Endangered Species Act includes provisions for the protection and management of plant and animal species listed as endangered or threatened, or designated as candidates for such listing. The California Endangered Species Act includes a consultation requirement "to ensure that any action authorized by a state lead agency is not likely to jeopardize the continued existences of any endangered or threatened species…or result in the destruction or adverse modification of habitat essential to the continued existence of the species" (§ 2090). Plants of California declared to be endangered, threatened, or rare are listed at 14 CCR § 670.2. Animals of California declared to be endangered or threatened are listed at 14 CCR § 670.5. 14 CCR § 15000 et seq. describes the types and extent of information required to evaluate the effects of a proposed project on biological resources of a project site. Section 2081 also requires a permit to authorize incidental take of species listed as threatened or endangered. The administering agency for the above authority is CDFG.

Fish and Game Code, Fully Protected Species: § 3511, Fully Protected Birds; § 4700, Fully Protected Mammals; § 5050, Fully Protected Reptiles and Amphibians; § 5515, Fully Protected Fishes. The Fish and Game Code prohibits the taking of listed plants and animals that are Fully Protected in California. The administering agency for the above authority is CDFG.

Fish and Game Code § 1930, Significant Natural Areas. Section 1930 of the Fish and Game Code designates certain areas such as refuges, natural sloughs, riparian areas, and vernal pools as significant wildlife habitats. These Significant Natural Areas are listed in CDFG's California Natural Diversity Database (CNDDB). The administering agency for the above authority is CDFG.

Fish and Game Code § 1580, Designated Ecological Reserves. In Section 1580 of the Fish and Game Code, the CDFG Commission designates land and water areas as significant wildlife habitats to be preserved in natural condition for the general public to observe and study. The administering agency for the above authority is CDFG.

Fish and Game Code § 1600, Streambed Alteration Agreement. Section 1600 of the Fish and Game Code requires authorization for activities that impact waterways, including impacts to vegetation and wildlife from sediment, diversions, and other disturbances. The administering agency for the above authority is the CDFG.

Native Plant Protection Act of 1977, Fish and Game Code § 1900 et seq. The Native Plant Protection Act designates state rare and endangered plants and provides specific protection measures for identified populations. The administering agency for the above authority is the CDFG.

CDFG Policies and Guidelines, Wetlands Resources Policy. The Wetlands Resource policy provides for the protection, preservation, restoration, enhancement, and expansion of wetland habitats in California, including vernal pools. The administering agencies for the above authority are the CDFG, California Environmental Protection Agency, and the Regional Water Quality Control Board.

Public Resource Code §§ 25500 and 25527. Sections 25500 and 25527 of the Public Resource Code prohibits constructing facilities in certain areas of critical concern for biological resources, such as ecological preserves, wildlife refuges, estuaries, and unique or irreplaceable wildlife habitats of scientific or educational value. If there is no alternative, strict criteria are applied. The administering agencies for the above authority are the USFWS and CDFG.

20 California Code of Regulations §§ 1702(q) and (v). 20 CCR 1702(q) and (v) protects "areas of critical concern" and "species of special concern" identified by local, state, or federal resource agencies within the project area, including the California Native Plant Society. The administering agencies for the above authority are the USFWS and CDFG.

14 California Code of Regulations Section 15000 et seq. 14 CCR Section 15000 et seq. describe the types and extent of information required to evaluate the effects of a proposed project on biological resources of a project site. The administering agencies for the above authority are the USFWS and CDFG.

3.9.1.3 Local

Municipal Code, County of Monterey, California: Chapter 16.60, Preservation of Oak Trees and Other Protected Trees. Chapter 16.60 describes the size and types of trees that are protected from removal without a permit from the county of Monterey. The administering agencies for the above authority are the Monterey County Planning and Building Departments.

3.9.2 Existing Conditions

A walking survey of the MLCC site was conducted on April 15, 2010 by a qualified biologist. The walking survey included the existing structures, proposed and alternate lay down areas for the aggregate during the drying process, solution tanks, and an overview of the surrounding properties. The proposed laydown area—in the northeast portion of the site, just south of Dolan Road—is a raised paved area with some weedy vegetation growing in cracks and fissures in the pavement. The only native species seen within the paved area was salt grass (*Distichlis spicata*). The immediate area north of the raised paved area is a steep slope, covered with a mixture of landscaping and opportunistic plant species; at the toe of the slope a small drainage swale on the south side of Dolan Road likely drains into the Moro Cojo Estuary. To the east, the slope descends to an existing MLCC site access road. Larger tree species (*Cupressus* spp. and *Eucalyptus* spp.) and backwater features of the Moro Cojo Estuary are present farther to the east. The areas to the south and west of the proposed laydown area are part of the industrial developed area. The aggregate storage areas are paved and almost completely denuded, with minimal weedy species. Based on the timing and length of the survey, the biological information obtained is not exhaustive; however, based on the proposed activities and the existing conditions of the project area and alternate areas, additional surveys are not required.

Four of the existing outdoor tanks are being used as part of the ongoing operations associated with the Pilot Plant and Absorption Demonstration Plant activities. One tank is used for well water storage and is frequented by numerous individuals and species of birds; the second tank is used to store the supernatant and other process water and no birds or other wildlife were observed in or around it during the April survey. This tank may be an "attractive nuisance" to wildlife (birds in particular) because of the very

basic solution that is stored here. The precipitate outdoor tanks are being covered with netting by MLCC to avoid potential impacts to the local birds.

Sensitive resources were identified within 1 mile and 5 miles of the MLCC site using a records search of CNDDB. The CNDDB identifies sensitive habitats and rare, threatened or endangered plants and wildlife that have been documented (Figures 3.9-1 through 3.9-3). The CNDDB is not all-inclusive because not all species detected have been properly documented and/or entered into the database. However, this area shows good coverage based on the diversity and number of records for this area.

3.9.2.1 Sensitive Resources at the Project Site

The MLCC site has been historically and is currently used for industrial purposes and the majority of the project area is hardscape (e.g., buildings, asphalt, concrete, structures with little to no habitat value for plants or wildlife). However, the site is on the western end of a peninsula formed by the Elkhorn Slough to the north and the Moro Cojo Slough to the south.

3.9.2.2 Sensitive Resources in the Project Vicinity

The CNDDB identifies five sensitive habitat types within 5 miles of the project site: central dune scrub, central maritime chaparral, northern coastal salt marsh, coastal brackish marsh, and coastal and valley freshwater marsh. Only the coastal brackish marsh habitat is found within 1 mile of the project site (Figure 3.9-1). Figure 3.9-4 shows all of the CNDDB records for within approximately 1 mile of the project site.

Sensitive Habitats: Elkhorn and Moro Cojo Sloughs

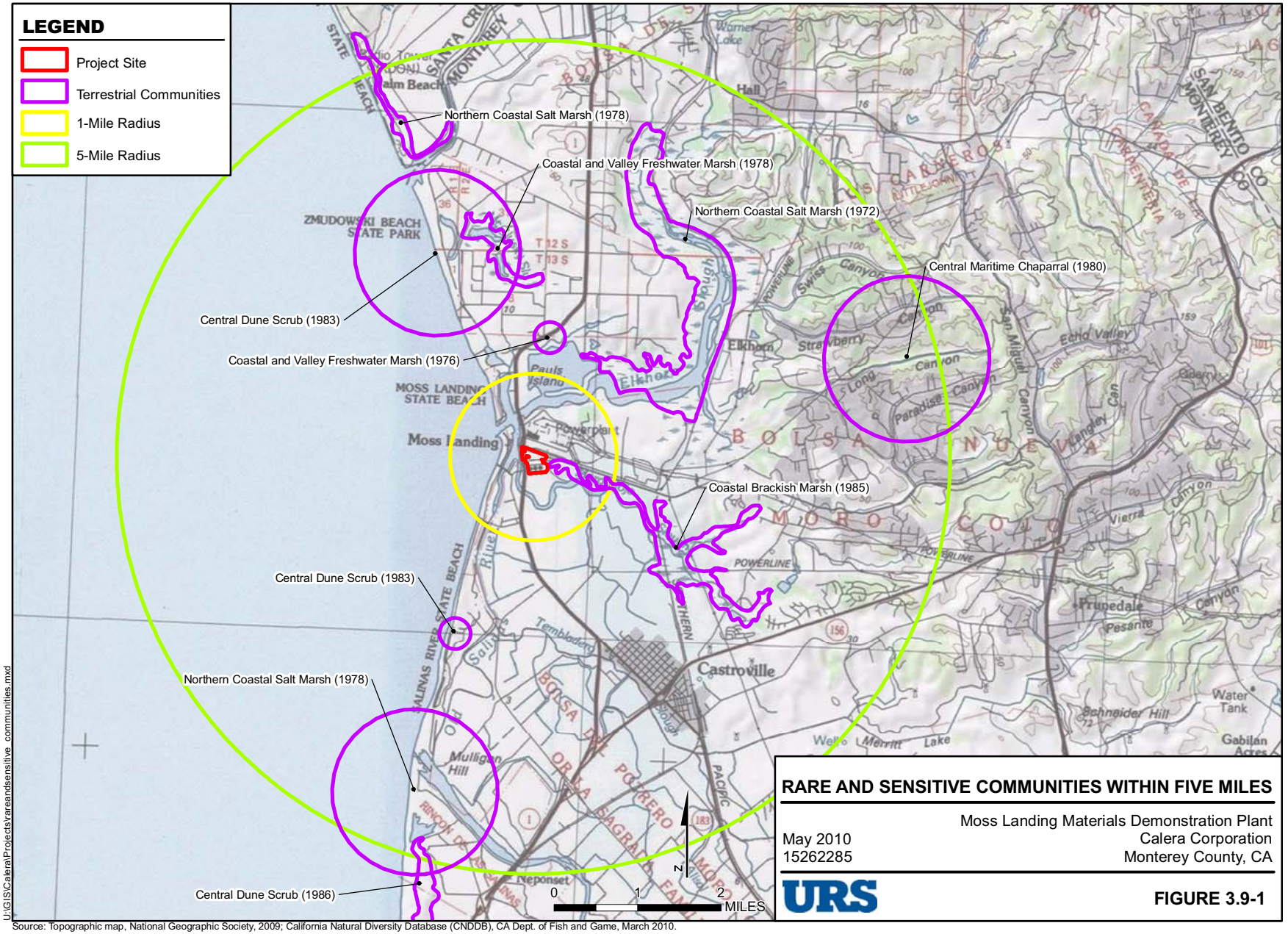
The Elkhorn Slough and Moro Cojo Slough are two branches of one of the largest remaining estuarine wetlands in central California. The Elkhorn Slough, the larger northern branch, is fairly healthy and is largely protected. The Moro Cojo Slough is smaller and has been more heavily impacted by encroachment of agriculture and development. The main threat to these two sloughs is from infilling, erosion, and competition with non-native species.

Within the Elkhorn Slough, there are two CDFG Marine Protected Areas: the Elkhorn Slough State Marine Reserve and the Elkhorn Slough State Marine Conservation Area. Collectively, these areas encompass 1.57 square miles and have 5.8 miles of along-shore span (CDFG, 2007). Within 5 miles of the site there are additional protected lands within the Elkhorn Slough area including the Elkhorn Slough Preserve, Kirby Park, Moss Landing State Wildlife Area, Elkhorn Slough National Estuarine Research Reserve, and Elkhorn Slough National Estuarine Sanctuary.

Within the Moro Cojo Slough is the Moro Cojo Estuary State Marine Reserve, a CDFG Marine Protected Area that is immediately to the south and east of the project site (CDFG, 2007). The Moro Cojo flows under Highway 1 south of the project site, turns north, and then under Moss Landing Road. Once crossing under Moss Landing Road, the Moro Cojo flows through the Moss Landing Marina parallel to the Highway 1 to the west of the project site. Calera's existing, permitted, water intake is in the Moss Landing Marina area south of where the Moro Cojo converges with the Elkhorn Slough and the estuary mouth.

Special-Status Species

This section discusses pertinent plant and wildlife species that are listed as endangered, threatened, or sensitive by the USFWS and/or CDFG.



RAREAND SENSITIVE COMMUNITIES WITHIN FIVE MILES

Moss Landing Materials Demonstration Plant
Calera Corporation
Monterey County, CA

May 2010
15262285

URS

FIGURE 3.9-1

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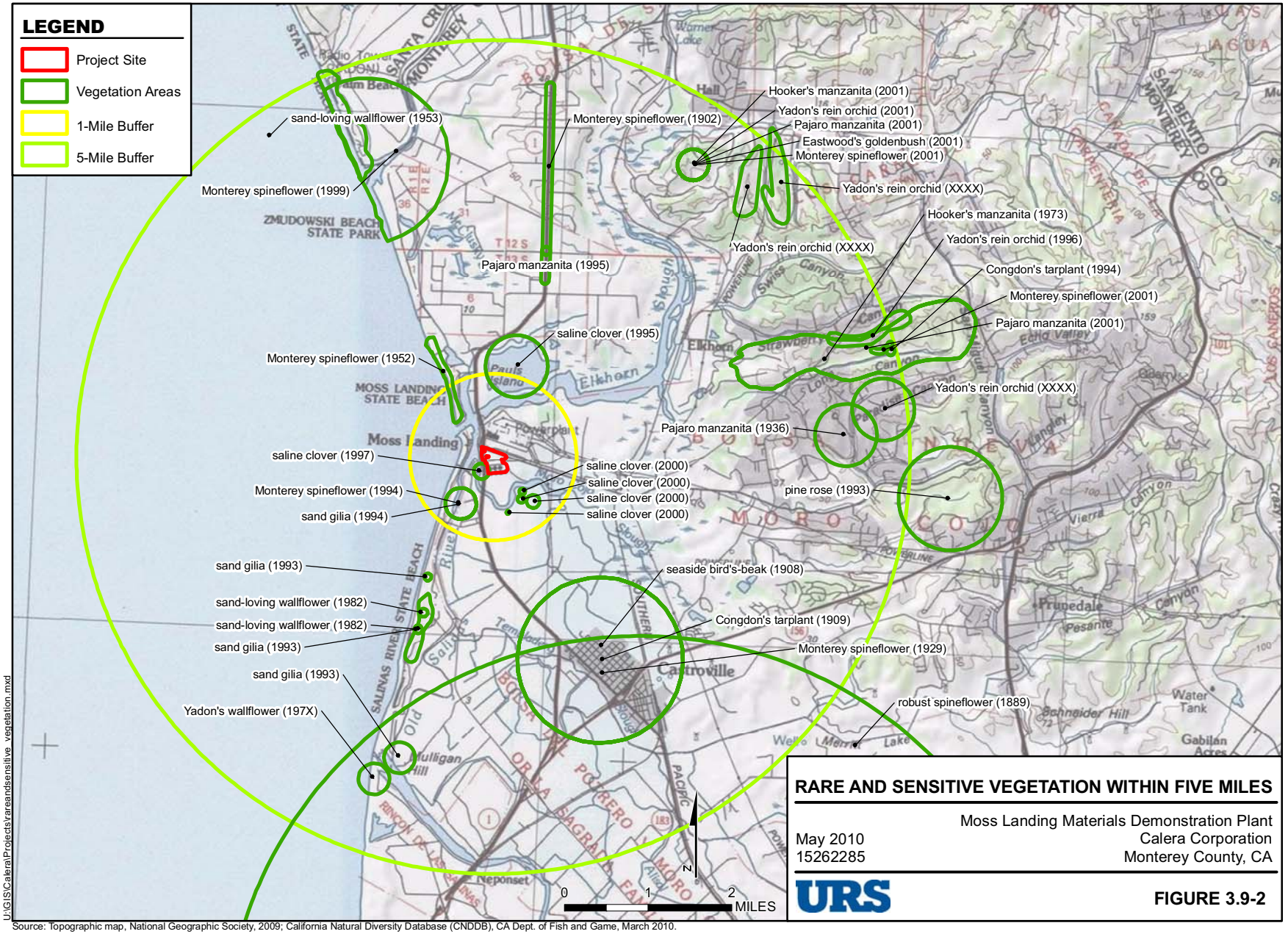
Source: Topographic map, National Geographic Society, 2009; California Natural Diversity Database (CNDDB), CA Dept. of Fish and Game, March 2010.



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RARE AND SENSITIVE VEGETATION WITHIN FIVE MILES

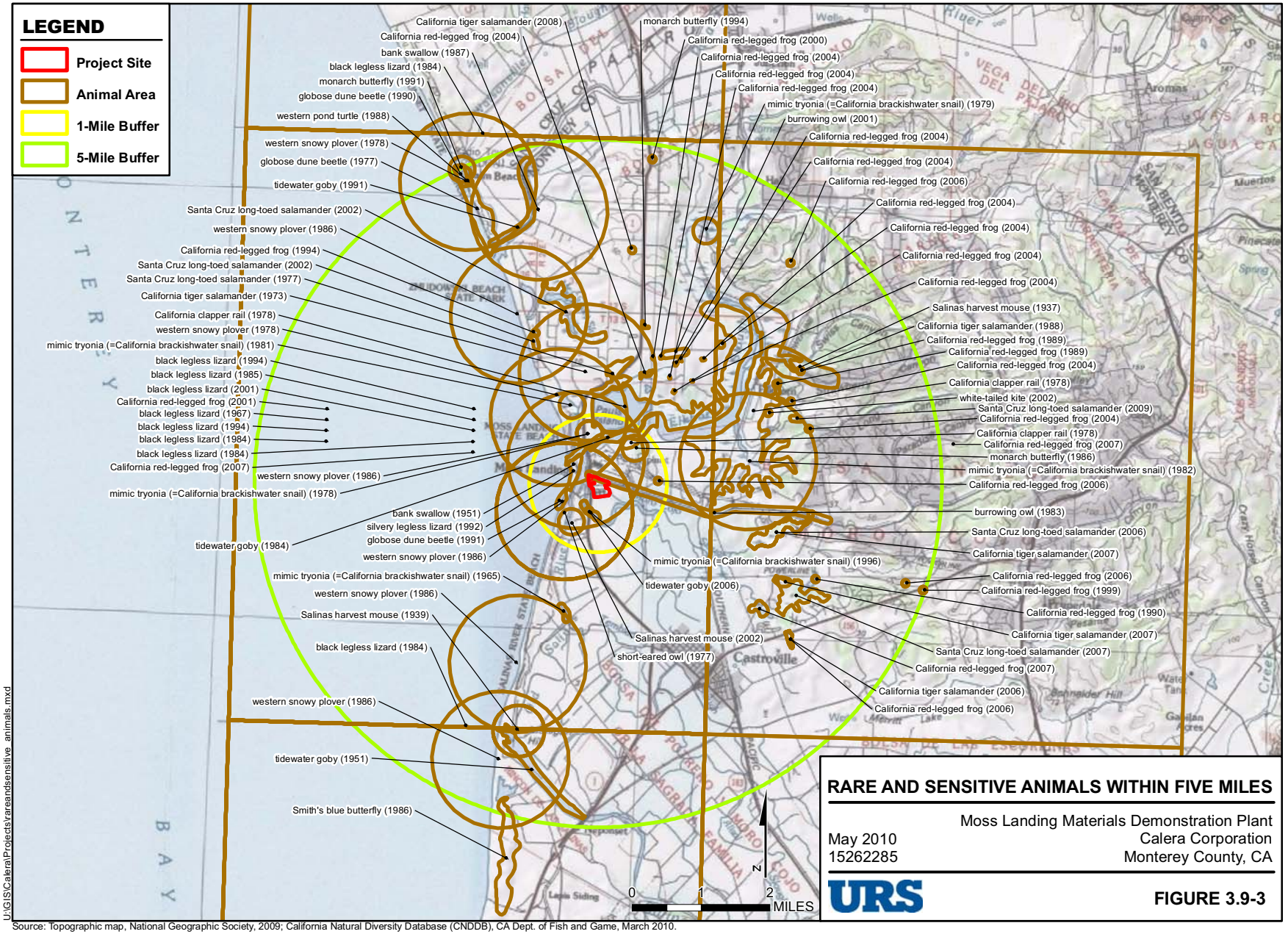
Moss Landing Materials Demonstration Plant
Calera Corporation
Monterey County, CA

May 2010
15262285

URS

FIGURE 3.9-2

Source: Topographic map, National Geographic Society, 2009; California Natural Diversity Database (CNDDB), CA Dept. of Fish and Game, March 2010.



RAREAND SENSITIVE ANIMALS WITHIN FIVE MILES

Moss Landing Materials Demonstration Plant
Calera Corporation
Monterey County, CA

May 2010
15262285

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FIGURE 3.9-3

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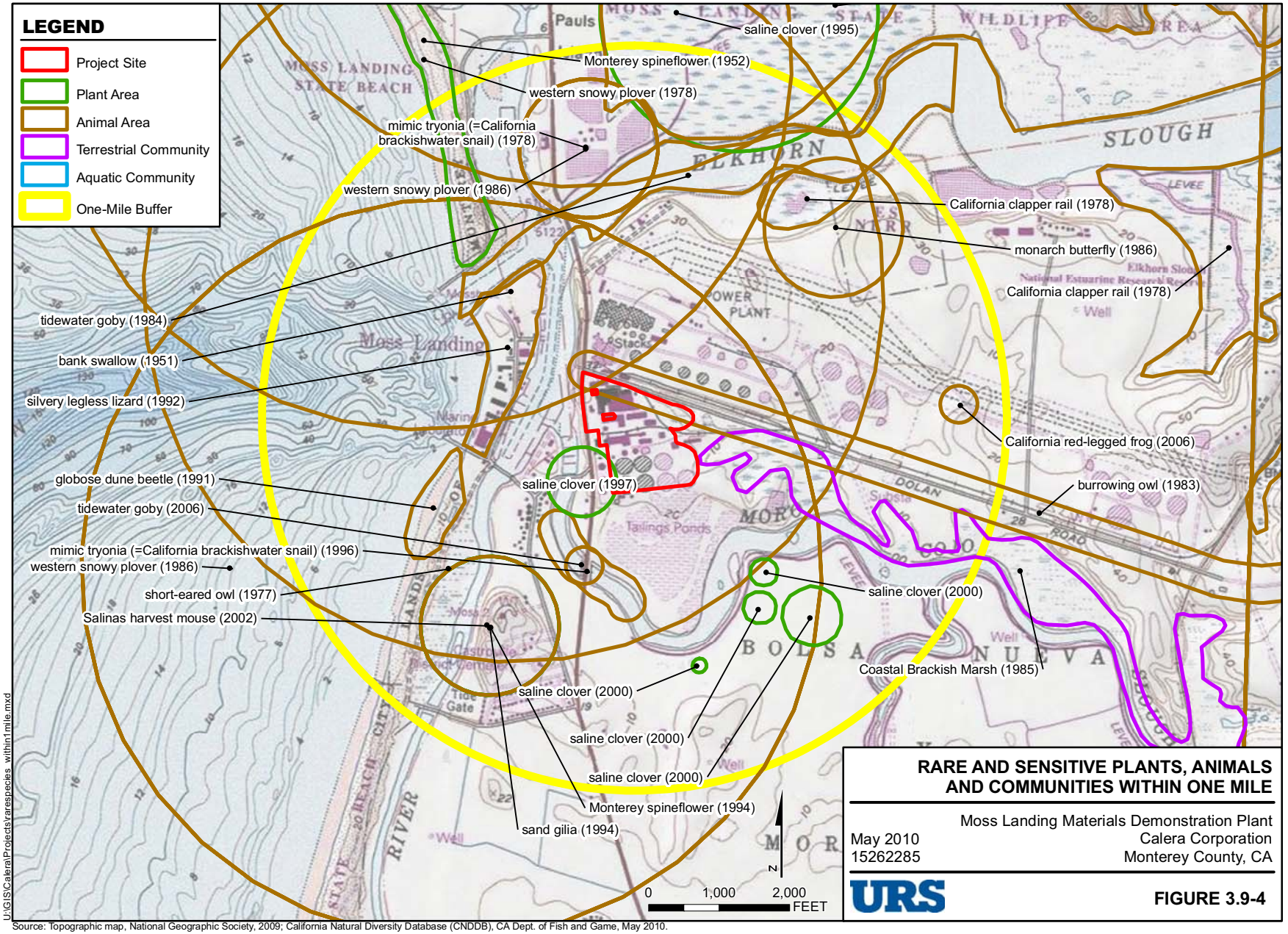
Source: Topographic map, National Geographic Society, 2009; California Natural Diversity Database (CNDDB), CA Dept. of Fish and Game, March 2010.



Source: Topographic map, National Geographic Society, 2009; California Natural Diversity Database (CNDDB), CA Dept. of Fish and Game, May 2010.

Federally Listed Plants. The CNDDB documents five federally listed plant species within 5 miles of the project site, two of which have been documented within 1 mile of the project site (Appendix J, Table 1; Figures 3.9-2 and 3.9-4).

Monterey spineflower (*Chorizanthe pungens* var. *pungens*) is a federally threatened, California Native Plant Society (CNPS) List 1B.2 species in the buckwheat family (Polygonaceae). It is an annual herb that flowers from April to June and is found in Pleistocene marine sand deposits and dunes in the Monterey Bay. Monterey spineflower is generally associated with dune scrub, maritime chaparral, and in riparian communities with sandy deposits. This species is endemic to the central coast of California, and occurs in Santa Cruz and Monterey counties. Primary threats to this species include: urban development, agricultural conversion, and the spread of non-native species.

Robust spineflower (*Chorizanthe robusta* var. *robusta*) is a federally threatened, CNPS List 1B.1 species in the buckwheat family (Polygonaceae). It is an annual herb that flowers from April to July and is found in sandy to gravelly soil in the Monterey Bay. Robust spineflower is generally associated with maritime chaparral, dune scrub, coastal marine sand deposits and sandstone outcroppings in the southern Santa Cruz Mountains. This species is endemic to the central coast of California, and occurs in Santa Cruz, Monterey, and Marin counties. Primary threats to this species include: urban development, agricultural conversion, and the spread of non-native species.

Yadon's wallflower (*Erysimum menziesii* ssp. *Yadonii*) is a federal and state endangered, CNPS List 1B.1 species in the mustard family (Brassicaceae). It is a perennial herb that flowers from March to June and is found on the seaward edge of stabilized foredunes and coastal strand. Yadon's wallflower is restricted to four populations in the vicinity of the Marina Dunes near the Salinas River in Monterey County. Primary threats to this species include: urban development, sand mining, and recreation activities.

Sand gilia (*Gilia tenuiflora* ssp. *Arenaria*) is a federally endangered and state threatened CNPS List 1B.2 species in the phlox family (Polemoniaceae). It is an annual herb that flowers from May to June and is found in open sand areas with little litter or vegetation cover that are protected from strong winds and salt spray. Sand gilia is found in coastal dune scrub and maritime chaparral habitats in the Monterey Bay. Monterey spineflower and Yadon's wallflower typically grow alongside sand gilia. Primary threats to this species include: urban development, sand mining, spread of non-native species, and recreation activities.

Yadon's rein orchid (*Piperia yadonii*) is a federally endangered CNPS List 1B.1 species in the orchid family (Orchidaceae). It is a perennial herb with a buried tuber that flowers from June to August. This species is found in three different habitats: maritime chaparral, Monterey Pine forest, and Monterey Cypress forest. When found in forested communities, this species is found in areas where there is herbaceous understory and the forest canopy is open. All occurrences of Yadon's rein orchid are within 6 miles of the Pacific Ocean and are only in Monterey County.

Federally Listed Wildlife. The CNDDB documents the following seven federally listed species within 5 miles of the project site, five of which are documented within 1 mile of the project site (Appendix K).

Smith's blue butterfly (*Euphilotes enoptes smithi*) is a federally endangered species. It is endemic to coastal sand dunes, serpentine grasslands, and cliff-side chaparral habitats in Monterey, San Mateo, and Santa Cruz counties. The Smith's blue butterfly is dependant on buckwheat (*Eriogonum parvaflorum* and *E. latifolium*) to complete its lifecycle. The primary threat to this species is from loss of these host plants through habitat modification and/or destruction (USFWS, 1984).

Tidewater goby (*Eucyclogobius newberryi*) is a federally endangered species and state species of special concern found within the brackish shallow lagoons and the lower reaches of streams of coastal California.

The primary threat to this species is from the degradation of water quality, erosion and in-filling of coastal wetlands.

Santa Cruz long-toed salamander (*Ambystoma macrodactylum croceum*) is a federally and state endangered and state fully protected species. Santa Cruz long-toed salamander is only found within the coastal areas of eastern Monterey Bay. This species has been severely impacted by the loss and degradation of breeding habitat and the agricultural and sub-urban conversion of land in this area.

California tiger salamander (*Ambystoma californiense*) is a federally threatened, state species of special concern, and a candidate state endangered species. Historically the California tiger salamander was associated with native grasslands and bred in vernal pools; however, the conversion and modification of the state's grasslands have impacted this species. This species spends most of its lifecycle in ground squirrel and gopher holes.

California red-legged frog (*Rana draytonii*) is a federally threatened species and state species of special concern. California red-legged frog is the largest native frog to the region but has been severely impacted by loss of streams and drainages, the introduction of non-native predators, and degradation of water quality. This species' preferred natural habitat includes rivers, streams, and drainages with deep, slow-flowing pools with overhanging vegetation and root masses but this species can been found in cattle ponds, road side ditches, and other heavily modified water features.

California clapper rail (*Rallus longirostris obsoletus*) is a federally and state endangered bird that is closely tied to large, well established coastal wetlands. Breeding and long-term survival is dependant on dense vegetation throughout the tidal prism; without good vegetation cover, clapper rails are easily predated by other predatory birds or large mammals.

Western snowy plover (*Charadrius alexandrinus nivosus*) is a federally threatened bird species that is closely linked to open, un-vegetated areas. In coastal areas, breeding occurs on sandy beaches above the high high-tide line though large un-vegetated areas have the potential to support breeding plovers.

During the April 15, 2010, site survey, three California sea otters (federally threatened and state fully protected, *Enhydra lutris nereis*) were seen in the Moss Landing Marina just north of Moss Landing Road, within 1 mile of the project site. The California sea otter frequents the shallow coast areas with developed kelp beds, back bays, and estuaries but rarely ventures onto land or out into open water. Sea otters were severely impacted by over hunting for their pelts and the collapse of the kelp beds.

State-Listed Plants and Wildlife. The CNDDB search indicates that there are three state-listed plant species within 5 miles of the project site, one of which (sand gilia) was found within 1 mile of the project site (Appendix J). The CNDDB records search also indicates that there are three state-listed wildlife species and one candidate state-listed wildlife species within 5 miles of the project site; three of which have been documented within 1 mile of the project site (Appendix K).

Sensitive Federal Species. The CNDDB records search indicates that the western burrowing owl (*Athene cunicularia hypugea*), a federal Species of Special Concern, was documented within 1 mile of the project site (Appendix K).

Sensitive State Species. Nine state species of special concern have been documented in the CNDDB within 5 miles of the project site. Eight of the nine species have been documented within 1 mile of the project site (Appendix K). Also, four state fully protected species have been documented with 5 miles of the project site; two of which have been documented with 1 mile of the project site.

3.10 SOCIOECONOMIC CONDITIONS

Socioeconomics encompasses the effects of changes in population, housing and the local economy from direct and indirect project effects and addresses the potential for environmental justice (EJ) issues.

3.10.1 Regulatory Setting

A number of federal and state laws and guidelines apply to socioeconomics. Relevant laws and guidelines are described below.

3.10.1.1 Federal Guidance

The Uniform Relocation Assistance and Real Property Acquisition Act of 1970

The Uniform Relocation Assistance and Real Property Acquisition Act of 1970 (Uniform Act) addresses the need for consistent and equitable treatment of persons displaced from their homes, farms, or businesses by federally assisted programs.

Title VI of the Civil Rights Act of 1964

Title VI of the Civil Rights Act of 1964 directs federal agencies to ensure that no person is excluded from participation in, denied benefits of, or subject to discrimination under any program or activity receiving federal financial assistance on the basis of race, color, religion, national origin, sex, age, or handicap. Title VI is supplemented by EO 12898.

Executive Order 12898: Federal Actions to Address Environmental Justice in Minority and Low-Income Populations

EO 12898 was designed to supplement Title VI of the Civil Rights Act of 1964; this EO requires Federal agencies, such as the U.S. Department of Energy, to consider EJ issues in their policies, activities, and procedures. The EO requires Federal agencies to identify and address as appropriate, as part of project planning and decision making, the occurrence of disproportionately high and adverse effects on minority and low-income populations. A Presidential Memorandum accompanying EO 12898 directed to the heads of all departments and agencies states, "each Federal agency shall analyze the environmental effects, including human health, economic, and social effects, of Federal actions, including effects on minority communities and low-income communities, when such analysis is required by NEPA." The memorandum particularly emphasizes the importance of NEPA's public participation process, directing that "each Federal agency shall provide opportunities for community input in the NEPA process." Agencies are further directed to "identify potential effects and mitigation measures in consultation with affected communities, and improve the accessibility of meetings, crucial documents, and notices."

3.10.1.2 State Guidance

No specific state guidelines address population, socioeconomics, or EJ. However, state law recognizes the vital role local governments play in the supply and affordability of housing. Each county and city in California is required to adopt a comprehensive, long-term general plan to guide its physical development. The State Housing Element Law (Government Code Article 10.6, Sections 65580–65590), enacted in 1969, mandates that local governments adequately plan to meet the existing and projected housing needs of all economic segments of the community. The law acknowledges that, for the private market to adequately address housing needs and demand, local governments must adopt land use plans and regulatory systems that provide opportunities for, and do not unduly constrain, housing development.

As a result, housing policy in the state rests largely on the effective implementation of local general plans and, in particular, local housing elements.

3.10.2 Existing Conditions

3.10.2.1 Population

The project site is in the unincorporated area of Monterey County, within the Moss Landing Community. As of 2010, there are 109,509 persons within the unincorporated areas of the County; the total County population is 445,309 persons (Association of Monterey Bay Area Governments, 2008). By 2015, the population is anticipated to grow to 111,105 persons in the unincorporated areas, and 466,606 persons in the total area, of the County.

U.S. Census data were queried to obtain information about population characteristics within the Census Tracts in the project vicinity, as well as information from Monterey, Benito, and Santa Cruz counties and for the U.S. as a whole for comparison purposes. Twelve Census Tracts are within the project vicinity (Figure 3.10-1). Where major differences between the counties and the country as a whole exist, a discussion is provided; however, where the population percentages are similar, the analysis only compares the project vicinity with Monterey County.

Monterey County has a substantially greater minority population than the national average (60 percent compared to 31 percent) and it has the highest minority population of the three-county area (54 percent in San Benito and 35 percent in Santa Cruz) (Tables 3.10-1 and 3.10-2). Within the Census Tracts that comprise the project vicinity, the percentage of minority populations is 56 percent. However, the minority population within the project vicinity is slightly less than that within the county as a whole (60 percent). Certain Tracts (e.g., 10101, 10201, and 10400) have very high levels of minority population, exceeding the percentages of the comparative geographies by over 30 percent. Within the Census Tracts that constitute the project vicinity, similar to Monterey County the minority population is predominantly composed of the Hispanic population (42 percent of total population within the project vicinity and 47 percent of total population within the county). Census Tracts 10101, 10201, and 10400 have Hispanic populations that comprise 74 to 87 percent of their respective populations.

The population aged 60 years and older is approximately 11 percent of the total population within the project vicinity, slightly less than the 13 percent within the county as a whole. However, Census Tracts 10302 and 12301 have percentages of elderly populations that exceed the comparative geographies by 7 to 11 percent. The disabled population is approximately 17 percent of the population within the project vicinity as well as within the county as whole. The percent below the poverty level in the project vicinity is approximately 12 percent, which is slightly less than the percent below the poverty level within the county as a whole. One Census Tract (i.e., 10101) reports 21 percent of the population below the poverty level, notably higher than the comparative geographies. Within the project vicinity, female heads of households are approximately 23 percent of the householders in family households, which is similar to the percentage within the county as a whole.

3.10.2.2 Housing

There are approximately 39,726 housing units within the unincorporated areas of Monterey County and a total of approximately 140,980 housing units within the entire County (California Department of Finance, 2009). The county has a vacancy rate of approximately 7.86 percent. By 2015, within the unincorporated area of the county, the number of housing units is anticipated to increase to 44,442 units and for the county as a whole, the anticipated number of units is 156,061 units.

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CENSUS TRACTS WITHIN 5 MILES

Moss Landing Materials Demonstration Plant
May 2010 — Calera Corporation
15262285 — Monterey County, CA

URS

FIGURE 3.10-1

Source: Orthophotos, Digital Globe, 1993-2009, USDA, 2009; Roads and place names, ESRI, 2005; Census Tracts, US Census Bureau Tiger Data, 2000.

Table 3.10-1
2000 Racial and Ethnic Demographics

Area	Total Population	White		African American		Native American		Asian		Pacific Islander		Other Race		Two or More Races		Hispanic[a]	
		#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Monterey County Census Tracts within 5-mile Radius																	
10101	4,756	455	10	14	0	28	1	81	2	0	0 0 0			41	1	4,137	87
10201	4,979	1,064	21	4	0 0		0	164 3		0	0	29 1		46	1	3,672	74
10202	4,193	2,211	53	62	1 0		0	93	2	18	0	27 1		69	2	1,713	41
10302	1,174	618	53	23	2	0	0	12	1	0	0 0 0			43	4	478	41
10303	396	168	42	0	0	0	0	0	0	0	0 0 0			89	22	139	35
10304	4,384	2,759	63	70	2	72	2	250 6		15	0	22 1		80	2	1,116	25
10305	4,499	3,358	75	63	1	62	1	77	2	9	0 0 0			108	2	822	18
10400	6,693	571	9	79	1	20	0	143 2		0	0	12 0		82	1	5,786	86
10504	4,385	1,410	32	154	4 0		0	293 7		26	1	0	0	184	4	2,318	53
12301	1,065	790	74	8	1	0	0	87	8	6	1 0 0			38	4	136	13
14301	3,825	1,751	46	341	9	15	0	692	18	93 2		27	1	224 6 682			18
14302	4,179	2,014	48	319	8 0		0	922	22	116	3	29 1		205	5	574	14
Average of Census Tracts	**3,711**	**1,431**	**43.8**	**95**	**2.4**	**16**	**0.4**	**235**	**6.1**	**24**	**0.6**	**12**	**0.3**	**101**	**4.5**	**1,798**	**42.1**
Monterey County 401,76	2	161,630	40	14,089	4	1,828	0	23,412 6		1,580	0	1,177 0		9,658	2	188,388	47
San Benito County	53,234	24,338	46	502	1	265	0	1,014	2	87	0 147 0			1,301	2	25,580	48
Santa Cruz County 255,60	2	167,347	65	2,302	1	1,203	0	8,118	3	415	0 760 0			6,885	3	68,572	27
United States	281,421,906	194,514,140	69	33,707,230	12	2,091,206	1	10,067,813	4	342,743	0 447,55	2 0		5,012,741	2	35,238,481	13

Source: U.S. Department of Commerce, Bureau of the Census. *Census 2000, Summary File 3*.
Note: See table notes for 3.10-2.
[a] "Hispanic" refers to ethnicity and is derived from the total population, not as a separate race; i.e., it is calculated differently from the other columns in this table.

Table 3.10-2
2000 Total Minority, Age 60 Years and Over, Below Poverty Level, Disabled, and Female Head of Household Populations

Area	Total Population	Total Minority[a]		Age 60 Years and Over		Total Population for Whom Disabled Is Determined	Disabled		Total Population for Whom Poverty Is Determined	Below Poverty Level		House-holds[b]	Female Head of Household	
		#	%	#	%		#	%		#	%		#	%
Monterey County Census Tracts within 5-mile Radius														
10101	4,756	4,301	90	316	7	4,250	854	20	4,683	980	21	898	160	18
10201	4,979	3,915	79	493	10	4,577	828	18	4,883	622	13	973	254	26
10202	4,193	1,982	47	513	12	3,956	767	19	4,165	478	11	989	224	23
10302	1,174	556	47	265	23	1,114	170	15	1,169	129	11	270	26	10
10303	396	228	58	18	5	375	0	0	387	55	14	68	7	10
10304	4,384	1,625	37	714	16	4,145	595	14	4,363	535	12	1,102	186	17
10305	4,499	1,141	25	596	13	4,222	674	16	4,499	238	5	1,192	196	16
10400	6,693	6,122	91	527	8	6,010	1,058	18	6,613	1,267	19	1,292	417	32
10504	4,385	2,975	68	414	9	3,955	730	18	4,384	430	10	1,015	380	37
12301	1,065	275	26	199	19	999	118	12	1,065	107	10	315	57	18
14301	3,825	2,074	54	442	12	3,556	518	15	3,819	230	6	1,001	252	25
14302	4,179	2,165	52	616	15	3,908	569	15	4,174	481	12	1,097	225	21
Average of Census Tracts	**3,711**	**2,280**	**56**	**426**	**11**	**3,422**	**573**	**17**	**3,684**	**463**	**12**	**851**	**199**	**23**
Monterey County	401,762	240,132	60	52,012	13	353,434	58,397	17	382,680	51,692	14	88,539	21,193	24
San Benito County	53,234	28,896	54	5,690	11	48,418	6,741	14	52,663	5,241	10	13,018	2,825	22
Santa Cruz County	255,602	88,255	35	33,401	13	238,068	32,714	14	247,530	29,383	12	57,858	15,962	28
United States	281,421,906	86,907,766	31	45,766,951	16	257,167,527	38,305,189	15	273,882,232	33,899,812	12	72,261,780	18,245,050	25

Source: U.S. Department of Commerce, Bureau of the Census. *Census 2000, Summary File 3*.
Notes: CT = Census Tract, % = Percentage.
[a] "Total Minority" is composed of all people who consider themselves Non-White racially plus those who consider themselves White Hispanic.
[b] "Households" is composed of both male and female householders in family households.
Shaded areas denote percentages higher than comparison areas' highest percentage.

3.10.2.3 Employment

As of 2010, there are approximately 79,221 jobs in the unincorporated county and approximately 196,430 jobs in cou nty as a whole . B y 20 15, employment is anticipated to grow t o 81,082 jobs within the unincorporated portio ns o f, and 20 3,660 jobs with in the whole of the coun ty. Current (2010) an d projected (2015) employment by sector is shown in Table 3.10-3.

Table 3.10-3
Current and Projected Employment by Sector

Sector	Unincorporated County		County	
	2010	2015	2010	2015
Retail 2,86	5	2,936	19,200	20,040
Service	16,003 16,8	82 69,5	60 73,3	70
Industrial 5,92	0	6,078	21,020	21,580
Public* 6,30	9	6,611	31,990	33,310
Construction 5,24	5	5,470	10,910	11,380
Agriculture	42,879 43,1	05 43,7	50 43,9	80
Total Employment	79,221	81,082	196,430	203,660

*Includes employment in education, government, and other.

Source: Association of Monterey Bay Area Governments, 2008. Monterey Bay Area 2008 Regional Forecast Population, Housing Unit and Employment Projections for Monterey, San Benito and Santa Cruz Counties to the Year 2035. Adopted by the AMBAG Board of Directors June 11.

3.10.2.4 Transportation

Access to the site is currently pr ovided through Highway 1 and Dolan Road. Dolan Road is immediately adjacent to the northwest corner of the MLCC site and is classified as a count y road (Monte rey County, 1982).[5]

Monterey-Salinas transit provides bus service to the greater Monterey and Salinas areas, from Big Sur and King City in the south to Watsonville and San Jose in the north. Two transit lines pass through Moss Landing. The Watsonville-Marina line (#27) and t he Castroville line (#28) run from the Watsonville Transit Center through Castroville to Marina Transit Exchange and Salinas Transit Center, respectively. Line 27 also runs to Moro Cojo. There is a bus stop and Park and Ride near the intersection of Highway 1 and Dolan Road, within the vicinity of the MLCC site.

3.11 HEALTH AND SAFETY FACTORS

3.11.1 Regulatory Setting

California operates its o wn Occupational Safety and Health Ad ministration. As such, Cal/OSHA regulations take precedence over the federal OSHA regulations at this site. Applicable Worker Safety and Health Laws, Ordinances, Regulations, and Standards include those listed in Table 3.11-1.

[5] County roads are two-lane roadways with access improvements to Highway 1.

Table 3.11-1
Applicable Worker Safety and Health Laws, Ordinances, Regulations, and Standards (LORS)

Administering Agency	Applicable LORS	Requirement/Compliance
California Division of Occupational Safety and Health (Cal/OSHA)	California Occupational Safety and Health Act 1973 (Title 8, CCR)	The Act establishes the Cal/OSHA and establishes minimum safety and health standards for work operations occurring in the state.
	29 CFR 1926	Contains federal health and safety regulations pertaining to construction activities.
	29 CFR 1910	Contains federal health and safety regulations pertaining to general industry.
ANSI/ASME	Boiler and Pressure Vessel Code	Provides specifications and requirements for boilers and pressure vessels.
North County Fire Protection District	Section 25500 et seq. (LaFollette Bill)	Requires that every new or modified facility that handles, treats, stores, or disposes of more than the threshold quantity of any of the listed acutely hazardous materials prepare and maintain a Risk Management Plan.
	Sections 25500 et seq. – 25541 et seq.	Requires the preparation of a Hazardous Material Business Plan that details emergency response plans for a hazardous materials emergency at the facility.
	California Fire Code	Requires the prevention, control, and mitigation of dangerous conditions related to storage, dispensing, use, and handling of hazardous materials and information needed by emergency response personnel.
NFPA	Various Standards	Industry standard for life-safety codes.

Note: Cal/OSHA has primary jurisdiction for worker health and safety in California. These regulations are provided for reference purposes and apply as referenced in Cal/OSHA regulations. ANSI/ASME = American National Standards Institute/American Society for Mechanical Engineers; Cal/OSHA = California Occupational Safety and Health Commission; CCR = California Code of Regulations; CFR = Code of Federal Regulations; NFPA = National Fire Protection Association

3.11.2 Existing Conditions

3.11.2.1 Existing Process Overview

The MLCC currently operates the Moss Landing Pilot Plant that includes the complete process of absorption of carbon dioxide and creation of aggregates and cementitious products. The Pilot Plant is scaled at 1:1,000 to a commercial scale plant. The MLCC also operates a demonstration plant at the site of the first (front end) stage of Calera's process is scaled at 1:100 to a commercial plant called the Moss Landing Absorption Demonstration Plant. The Absorption Demonstration Plant captures carbon dioxide from a slip stream of flue gas produced by the adjacent Moss Landing Energy Facility natural–gas-fired combined-cycle power plant. The Absorption Demonstration Plant uses a source of base/high alkalinity material plus calcium and/or other divalent cations to capture and convert the carbon dioxide into solid carbonates. Water supply for operation of the Absorption Demonstration Plant is primarily based on groundwater from a local well. Seawater is also periodically used as an alternative water source. The

groundwater well is approximately 2 miles east of the MLCC site and has capacity to provide up to 1,200 gallons per minute of water with a salinity of approximately 400 ppm of total dissolved solids. Major equipment associated with the Absorption Demonstration Plant is included in Building 3 and Building 8 of the MLCC site. The septic system is west of Building 8. Outdoor storage tanks located south of the building complex are expected to be used for the Absorption Demonstration Plant.

Refer to Section 3.1.2.5 for a discussion of the current emission inventory, Section 3.4 for a discussion of solid and hazardous waste, and Section 3.6.2.2 for a discussion of current ambient noise levels at the site.

4.0 ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES

Section 4 describes the environmental consequences and recommended measures for the following resource areas: atmospheric conditions/air quality, water quality/quantity/hydrologic conditions, geologic/soil conditions, solid and hazardous waste, land use, noise, historic/cultural resources, visual resources, ecology, socioeconomic conditions, and health and safety factors.

4.1 ATMOSPHERIC CONDITIONS/AIR QUALITY

4.1.1 Methodology for Determining Construction Impacts

Emissions from construction activities represent temporary impacts that are typically short in duration, depending on the size, phasing, and type of project. Air quality impacts can nevertheless be acute during construction periods, resulting in significant localized impacts to air quality.

Construction activities that directly generate 82 pounds per day or more of inhalable particulates (i.e., particulate matter of 10 microns or less in diameter [PM_{10}]) would have a significant impact on local air quality when they are located nearby and upwind of sensitive receptors.

Construction projects using typical construction equipment such as dump trucks, scrapers, bulldozers, compactors and front-end loaders that temporarily emit precursors of O_3 (VOC or NO_X), are accommodated in the emission inventories of state- and federally-required air plans and would not have a significant impact on the attainment and maintenance of O_3 ambient standards.

4.1.2 Methodology for Determining Operational Impacts

Projects which would emit 137 pounds per day or more of direct and indirect VOC or NO_X emissions would have a significant impact on regional air quality by emitting substantial amounts of O_3 precursors. Such projects would significantly impact attainment and maintenance of O_3 ambient standards. Projects which could generate 82 pounds per day or more of PM_{10} at the project site would result in substantial air emissions and have a significant impact on local air quality. Sources which directly emit 550 pounds or more per day of CO would result in substantial air emissions and have a significant impact on local air quality. Sources which directly emit 150 pounds or more per day of SO_X as SO_2 would result in substantial air emissions and have a significant impact on air quality.

4.1.3 Methodology Overview

Air quality impacts associated with construction or operation of the Proposed Action and Alternative 2 would be related to emissions from both construction and operations, with the latter occurring primarily due to process equipment of the Proposed Action/Alternative 2 and other sources such as employee vehicles and aggregate laydown areas. Construction may affect air quality as a result of (1) construction equipment exhaust emissions; (2) fugitive dust from grading, earthmoving, and building; and (3) tailpipe emissions from vehicles driven to/from the site by construction workers and delivery trucks. Construction vehicles used during implementation of the Proposed Action and Alternative 2 would consist of a combination of loaders, trucks, dozers, graders, compactors, rollers, scrapers, backhoes, excavators, water trucks, and other vehicles and equipment typically associated with construction activities. Operational emissions would result primarily from equipment such as the dryers, crushing unit, compactors, front-end loaders, air compressor, and conveyors to transfer supplementary cementitious materials (SCM) to the storage silos. Other operational emissions would come from area sources, including fugitive emissions from the aggregate laydown and harvesting areas, and aggregates and briquettes storage bays.

The following impact assessments and analyses were based on proposed construction equipment, and anticipated construction and operation schedules. Detailed information and data may be found in Appendix A. Construction and operational emissions for the Proposed Action and Alternative 2 were evaluated using the CARB OFFROAD2007 and EMFAC2007 emission factors and other emission factors obtained from publications such as U.S. Environmental Protection Agency (U.S. EPA) emission factor document AP-42.

4.1.4 Proposed Action

4.1.4.1 Construction

Construction of the Proposed Action would require limited grading, excavation, and preparation of the area that would result in the generation of fugitive dust (PM_{10}) and exhaust emissions from construction equipment. After site preparation, exhaust emissions would be generated by the equipment used in the construction of the aggregate laydown and harvesting areas, aggregate and briquette storage bays, storage silos, parking lots and construction laydown areas, and associated gravel roadways. Exhaust emissions would also be generated by the vehicles used for commuting to and from the site by the construction workers and construction material delivery vehicles.

Data used to estimate the proposed construction emissions are based on the conceptual design of the Project; the anticipated construction schedule; and numbers, types, and horsepower ratings for onsite construction vehicles and equipment.

It is anticipated that construction would begin with site grading, construction laydown and parking areas and access road construction in the fall/winter of 2010. Construction of the aggregate laydown and harvesting areas, aggregate and briquette storage areas, storage silos, installation of process equipment, and commissioning would follow with completion in the summer of 2011. The construction and commissioning would last approximately seven months.

The general emission reduction measures that would be required by the local air district are also included in the emission estimates. These measures include common dust control practices, such as watering all active grading areas and storage piles, cessation of grading in high winds, limiting vehicle speeds on unpaved roads to 15 miles per hour, and preventing the track-out of dirt from unpaved areas to paved roadways. These and other assumptions used in estimating construction emissions are provided in Appendix L.

Tables 4.1-1 through 4.1-3 present the maximum estimated daily and annual construction emissions for the Project. The emissions presented in Tables 4.1-1 to 4.1-3 include the emission reduction measures that would be incorporated in the construction of the Project. As seen in these tables, construction emissions of all pollutants are below the Monterey Bay Unified Air Pollution Control District (MBUAPCD) California Environmental Quality Act of 1970 (CEQA) construction thresholds. They are also below the emission offset thresholds and the National Environmental Policy Act (NEPA) general conformity rule does not apply since the project is in a federal attainment area for all criteria pollutants. Consequently, the construction activities associated with the project would comply with applicable air quality regulations. The impacts on air quality from the construction of the project would be temporary, local and of low intensity.

4.1.4.2 Operations

The operational emissions of the Proposed Action were calculated for the anticipated stationary, mobile and area sources. Stationary sources include a propane-fueled 18 million British Thermal Units per hour

Table 4.1-1
Construction Emissions for the Proposed Action
Estimated Daily Maximum Construction Emissions of Criteria Pollutants (lbs/day)

Activity	PM_{10}	$PM_{2.5}$	CO	ROG	NO_X	SO_X
Onsite Construction Emissions						
Onsite Combustion Emissions						
Construction Equipment	2.84 2.61		22.28	7.72	69.44	0.07
Delivery Trucks and Inspector and official vehicles	0.01	0.01	0.10 0.04 0.15			0.00
Worker Vehicles	0.01	0.00	0.47 0.04 0.04			0.00
Subtotal of Onsite Combustion Emissions	**2.86**	**2.63**	**22.84**	**7.80**	**69.63**	**0.07**
Onsite Fugitive Emissions						
Construction Equipment	2.21 0.37					
Wind Erosion of Storage Piles	0.72 0.16					
Delivery Trucks and Inspector and official vehicles	0.59	0.11				
Worker Vehicles	1.35 0.23					
Subtotal of Onsite Fugitive Emissions	**4.87**	**0.87**	**0.00**	**0.00**	**0.00**	**0.00**
Subtotal of Onsite Emissions	**7.73**	**3.50**	**22.84**	**7.80**	**69.63**	**0.07**
Offsite On-Road Emissions						
Offsite Combustion Emissions						
Delivery Trucks and Inspector and official vehicles	0.22	0.19	1.63	0.28	5.22	0.01
Worker Vehicles	0.08	0.04	7.18 0.25 0.83			0.01
Subtotal of Offsite Combustion Emissions	**0.29**	**0.23**	**8.81**	**0.54**	**6.05**	**0.01**
Offsite Paved Road Fugitive Emissions						
Delivery Trucks and Inspector and official vehicles	12.57	1.82				
Worker Vehicles	2.41 0.04					
Subtotal of Offsite Fugitive Emissions	**14.98**	**1.86**				
Subtotal of Offsite Emissions	**15.27**	**2.08**	**8.81**	**0.54**	**6.05**	**0.01**
Total Maximum Emissions	**23.00**	**5.58**	**31.65**	**8.33**	**75.68**	**0.09**

Table 4.1-2
Construction Emissions for the Proposed Action
Estimated Annual Maximum Construction Emissions of Criteria Pollutants (tons/year)

Activity	PM_{10}	$PM_{2.5}$	CO	ROG	NO_X	SO_X
Onsite Construction Emissions						
Onsite Combustion Emissions						
Construction Equipment	0.13	0.12	1.01	0.36	2.94	0.00
Delivery Trucks and Inspector and official vehicles	0.00	0.00	0.01	0.00	0.01	0.00
Worker Vehicles	0.00	0.00	0.04	0.00	0.00	0.00
Subtotal of Onsite Combustion Emissions	**0.13**	**0.12**	**1.05**	**0.37**	**2.95**	**0.00**
Onsite Fugitive Emissions						
Construction Equipment	0.13	0.02				
Wind Erosion of Storage Piles	1.44	0.32				
Delivery Trucks and Inspector and official vehicles	0.03	0.01				
Worker Vehicles	0.10	0.02				
Subtotal of Onsite Fugitive Emissions	**1.71**	**0.36**	**0.00**	**0.00**	**0.00**	**0.00**
Subtotal of Onsite Emissions	**1.84**	**0.48**	**1.05**	**0.37**	**2.95**	**0.00**
Offsite On-Road Emissions						
Offsite Combustion Emissions						
Delivery Trucks and Inspector and official vehicles	0.01	0.01	0.09	0.01	0.24	0.00
Worker Vehicles	0.01	0.00	0.55	0.02	0.06	0.00
Subtotal of Offsite Combustion Emissions	**0.02**	**0.01**	**0.65**	**0.03**	**0.30**	**0.00**
Offsite Paved Road Fugitive Emissions						
Delivery Trucks and Inspector and official vehicles	0.58	0.08				
Worker Vehicles	0.18	0.00				
Subtotal of Offsite Fugitive Emissions	**0.76**	**0.09**				
Subtotal of Offsite Emissions	**0.78**	**0.10**	**0.65**	**0.03**	**0.30**	**0.00**
Total Maximum Emissions	**2.62**	**0.57**	**1.69**	**0.40**	**3.26**	**0.00**

Table 4.1-3
Construction Emissions for the Proposed Action
Estimated Annual Maximum Construction Emissions of Greenhouse Gases
(metric tons/year)

Activity	CO_2	CH_4	N_2O	CO_2e
Onsite Construction Emissions				
Onsite Combustion Emissions				
Construction Equipment	255.85	0.03	-	256.48
Delivery Trucks and Inspector and official vehicles	0.97	0.00	0.00	0.98
Worker Vehicles	4.26	0.00	0.00	4.39
Subtotal of Onsite Emissions	**261.09**	**0.03**	**0.00**	**261.85**
Offsite On-Road Emissions				
Offsite Combustion Emissions				
Delivery Trucks and Inspector and official vehicles	29.20	0.00	0.00	29.73
Worker Vehicles	51.98	0.01	0.01	55.79
Subtotal of Offsite Emissions	**81.18**	**0.01**	**0.01**	**85.52**
Total Maximum Emissions	**342.27**	**0.04**	**0.01**	**347.37**

(MMBtu/hr) rotary dryer and/or a propane-fuel 60 MMBtu/hr spray dryer for SCM production. Mobile sources include employee vehicles, a compactor, a crushing unit, a front-end loader, and an air compressor. Area sources include the aggregate laydown and harvesting areas and the aggregate and briquette storage bays. Emission factors obtained from U.S. EPA AP-42 were used as well as the calculated flue gas composition of the neighboring power plant. The emissions calculation spreadsheets and other data are shown in Appendix M.

Tables 4.1-4 through 4.1-6 present the maximum estimated daily and annual operational emissions for the Proposed Action. As seen in these tables, operational emissions of all pollutants are below the MBUAPCD CEQA operational emission thresholds. They are also below the emission offset thresholds and the NEPA general conformity rule does not apply since the project is in a federal attainment area for all criteria pollutants. Furthermore, the project operational emissions of all pollutants are well below the Prevention of Significant Deterioration (PSD) thresholds for major sources. Thus, the project would not trigger the PSD requirements and would not impact the two Class I areas. Also, GHG emissions are well below the reporting threshold of 25,000 metric tons per year. Consequently, the operation of the project would comply with applicable air quality regulations. The impacts on air quality from the operation of the Proposed Action would be long-term, local and of low intensity.

Except for the dust suppression measures such as regular watering incorporated in the construction phase of the Proposed Action and the operation of the aggregate laydown and harvesting areas, no other measures are necessary to avoid impacts, and none are proposed.

Table 4.1-4
Operational Emissions for the Proposed Action
Estimated Daily Maximum Operational Emissions of Criteria Pollutants (lbs/day)

Activity	PM_{10}	$PM_{2.5}$	CO	ROG	NO_X	SO_X
Onsite Emissions						
Onsite Combustion Emissions						
Stationary Sources	0.16 0.05		12.92	1.25	4.08	0.00
Offroad Equipment	1.19 0.62		5.62	1.65	12.21	0.01
Worker Vehicles	2.59	0.48	0.39 0.03 0.03			0.00
Subtotal of Onsite Combustion Emissions	**3.94**	**1.15**	**18.93**	**2.93**	**16.33**	**0.01**
Onsite Fugitive Emissions						
Stationary Sources	0.00 0.00					
Aggregate Handling and Wind Erosion	0.70 0.19					
Offroad Equipment	0.58 0.07					
Worker Vehicles	2.59 0.47					
Subtotal of Onsite Fugitive Emissions	**3.87**	**0.73**	**0.00**	**3.87**	**0.73**	**0.00**
Subtotal of Onsite Emissions	**7.81**	**1.88**	**18.93**	**7.81**	**1.88**	**18.93**
Offsite On-Road Emissions						
Offsite Combustion Emissions						
Worker Vehicles	0.07	0.04	5.96 0.20 0.69			0.01
Subtotal of Offsite Combustion Emissions	**0.07**	**0.04**	**5.96**	**0.20**	**0.69**	**0.01**
Offsite Paved Road Fugitive Emissions						
Worker Vehicles	2.11 0.04					
Subtotal of Offsite Fugitive Emissions	**2.11**	**0.04**				
Subtotal of Offsite Emissions	**2.18**	**0.07**	**5.96**	**2.18**	**0.69**	**0.01**
Total Maximum Emissions	**9.98**	**1.95**	**24.90**	**3.13**	**17.02**	**0.02**

Table 4.1-5
Operational Emissions for the Proposed Action
Estimated Annual Maximum Operational Emissions of Criteria Pollutants (tons/year)

Activity	PM_{10}	$PM_{2.5}$	CO	ROG	NO_X	SO_X
Onsite Emissions						
Onsite Combustion Emissions						
Stationary Sources	0.01	0.00	0.44	0.04	0.14	0.00
Offroad Equipment	0.00	0.00	0.01	0.00	0.01	0.00
Worker Vehicles	0.01	0.01	0.98	0.07	0.09	0.00
Subtotal of Onsite Combustion Emissions	**0.02**	**0.01**	**1.43**	**0.12**	**0.24**	**0.00**
Onsite Fugitive Emissions						
Stationary Sources	0.00	0.00				
Aggregate Handling and Wind Erosion	0.06	0.02				
Offroad Equipment	0.00	0.00				
Worker Vehicles	6.52	1.19				
Subtotal of Onsite Fugitive Emissions	**6.58**	**1.21**	**0.00**	**0.00**	**0.00**	**0.00**
Subtotal of Onsite Emissions	**6.60**	**1.22**	**1.43**	**0.12**	**0.24**	**0.00**
Offsite On-Road Emissions						
Offsite Combustion Emissions						
Worker Vehicles	0.17	0.09	15.03	0.50	1.74	0.02
Subtotal of Offsite Combustion Emissions	**0.17**	**0.09**	**15.03**	**0.50**	**1.74**	**0.02**
Offsite Paved Road Fugitive Emissions						
Worker Vehicles	5.31	0.09				
Subtotal of Offsite Fugitive Emissions	**5.31**	**0.09**				
Subtotal of Offsite Emissions	**5.48**	**0.18**	**15.03**	**0.50**	**1.74**	**0.02**
Total Maximum Emissions	**12.08**	**1.41**	**16.46**	**0.62**	**1.98**	**0.02**

Table 4.1-6
Operational Emissions for the Proposed Action
Estimated Annual Maximum Operational Emissions of Greenhouse Gases
(Metric tons/year)

Activity	CO_2	CH_4	N_2O	CO_2e
Onsite Emissions				
Onsite Combustion Emissions				
Stationary Sources	6,228.78	0.32	0.11	6,269.04
Offroad Equipment	1.27	0.00	-	1.27
Worker Vehicles	122.56	0.01	0.01	126.21
Subtotal of Onsite Emissions	**6,352.61**	**0.34**	**0.12**	**6,396.52**
Offsite On-Road Emissions				
Offsite Combustion Emissions				
Worker Vehicles	1,494.88	0.36	0.33	1,604.29
Subtotal of Offsite Emissions	**1,494.88**	**0.36**	**0.33**	**1,604.29**
Total Maximum Emissions	**7,847.49**	**0.69**	**0.45**	**8,000.81**

4.1.5 Alternative 2

Under Alternative 2, no U.S. Department of Energy (DOE) funding would be received. However, Calera would pursue and obtain alternative sources of funding for the construction, operation, and maintenance of the Moss Landing Building Materials Demonstration Plant (MLMDP). All processes, plant arrangement, construction, operations, maintenance, and demolition and decommissioning would be as described above for the Proposed Action. An increased level of uncertainty would be associated with identifying alternative sources of funding, and for the purpose of analyzing this alternative, it is assumed that funding would not be secured for up to 3 years. Therefore, impacts from Alternative 2 would generally be the same as those described for the Proposed Action, but would occur later in time and may not include any mitigation or monitoring required as a result of federal involvement.

4.1.6 No Action Alternative

If the No Action Alternative were implemented, no DOE or private funding would be obtained, and the existing facilities, operations, and activities at the site would continue. Therefore, no air quality impacts would occur due to construction or operations activities.

4.1.7 Recommendations

The following recommendation is applicable to the Proposed Action and Alternative 2:

- Dust suppression measures such as regular watering would be incorporated in the construction phase, as well as the operation of the aggregate laydown and harvesting areas.

4.2 WATER QUALITY/QUANTITY/HYDROLOGIC CONDITIONS

4.2.1 Proposed Project

4.2.1.1 Water Quality/Quantity

Water Supply and Discharge: Construction

During construction, up to approximately 1,500 gallons of water per day would be used over the peak 3-month period. This demand would decrease to about 250 gallons per day over the remaining 3 months of construction and 1 month of commissioning. A truck with the capability of spraying water onto the parking and laydown areas would be used to suppress airborne dust. Similar water spraying techniques would be used when cuts are made to existing foundations.

Approximately 750 gallons of construction wastewater would be generated per day during the 3-month peak construction period. Water would be disposed of in accordance with permit and regulatory requirements.

Water Supply and Discharge: Operations

The water supply for the Proposed Action would be based on two primary water sources:

1. Low salinity groundwater from the existing local well.
2. Seawater from the existing seawater intake at Moss Landing Harbor

The local low-salinity well has a capacity to provide up to 1,200 gallons per minute (gpm) of water with salinity of approximately 400 ppm of total dissolved solids (TDS). The peak daily water demand for current operations is estimated to be approximately 350 gpm.

If seawater were to be used, the seawater would be pumped through an existing intake structure, built in the past to supply seawater to the Kaiser Refractories and Mineral Plant—the previous owner of the site. The intake pumping capacity is limited by the existing NPDES discharge permit. The California Regional Water Quality Board NPDES permit specifies seawater discharge capacity to be up to 60 million gallons per day (18,000 gpm) for the demonstration project.

The process flow rate of water through the absorber and dewatering unit would be in the range of 300 to 600 gpm. The flow rate of the effluent from the dewatering unit, after solids separation, would be about 260 to 520 gpm. Approximately 14 percent (40 to 80 gpm) of the initial water stream would be removed from the dewatering unit with precipitated solids and would eventually evaporate during drying of the solid material. The process utilizes incoming water for dissolution of process reagents (Ca, Mg, and alkalinity) and transportation of reaction products through the process equipment. The effluent from the dewatering unit would contain residual hardness and alkalinity. The effluent from the dewatering unit could be returned to the absorption step or used for production of low salinity water for beneficial use (industrial application or irrigation) using a desalination unit.

Recirculation of effluent from the dewatering step would result in an increase of water salinity, which would require partial discharge of high salinity blowdown stream and addition of lower salinity makeup water to the process. The flow and mass balance conditions required for continuous operation would be evaluated and tested during operation. It is expected that the required inflow of well water or seawater would be substantially lower that the rated flow rate of process equipment of approximately 300 to 600 gpm.

During operation mode at the high flow rate (approximately 600 gpm), the effluent from the dewatering process would have salinity of about 45,000 to 50,000 ppm of TDS. This effluent, after pretreatment, would be sent to the desalination unit. Up to approximately 50 percent of the available flow could be converted to low salinity permeate. The remaining flow (concentrate stream) would have salinity up to 80,000 to 100,000 ppm of TDS.

During operation mode at low flow rate (approximately 300 gpm), the effluent from the dewatering process would have salinity of about 75,000 to 95,000 ppm of TDS. This salinity would be too high for desalination through commercial reverse osmosis (RO) equipment. However, an integrated system consisting of electrodialysis (ED) and seawater RO could be used to convert part of this high-salinity stream to low-salinity permeate. This option would be evaluated in the framework of bench-scale testing using the pilot unit and processing using the demonstration unit at the Moss Landing Cement Company (MLCC) site.

Both the high-salinity RO concentrate and the high-salinity blow-down from the recirculation loop would be treated on site. The proposed approach would be to evaluate and implement high-pressure seawater RO, high-concentration ED and low-energy enhanced evaporation methods to achieve Calera's goal of zero liquid discharge conditions at the MLCC site.

Effects on Groundwater

Water supply for the project would continue to be provided primarily by groundwater, although a small portion of the water could be provided by seawater. Groundwater would be pumped from a local well located approximately 2 miles east of the project, north of the intersection of Dolan Road and Avila Road. Based on information provided by Calera, the local well has the capacity to pump up to 1,200 gpm. During construction, the peak water demand would be approximately 2,500 gallons per day, which is equivalent to less than 2 gpm (i.e., constant pumping rate for 24 hours). During operation, the peak daily water demand would be approximately 350 gpm, which is the same amount that is currently used. Therefore, the local well used for the water supply would be capable of meeting the water supply demands during construction and operation of this alternative. Based on existing information, groundwater is not anticipated to be encountered during construction activities.

Calera would continue to store process effluent in the below-ground storage tanks. Prior to use, the tanks would be hydraulically tested to ensure that the tanks do not leak to the subsurface.

Water Quality

The Proposed Action is not anticipated to require the discharge of dredged or fill materials into waters under the jurisdiction of the U.S. Army Corps of Engineers; therefore, no Clean Water Act Section 404 Permit or Section 401 Water Quality Certification is anticipated to be required.

The amount of ground-disturbing activities associated with the construction of the new lay down and storage area and three silos would be limited, and is estimated at less than one acre. In the event that the project construction would disturb one or more acre of land, Calera would comply with the General Construction Stormwater Permit. If construction requires grading, cutting, or moving the existing site material, silt fencing would be used to control run-off and erosion. Upon completion of construction, all temporary utilities and trailers would be removed from the site. All miscellaneous construction materials would be removed and disposed of off site.

A construction Storm Water Pollution Prevention Plan (SWPPP) is anticipated to be prepared and implemented. This plan would include best management practices (BMPs) to be used to minimize erosion. Erosion control would be accomplished during construction through the use of strategically

placed berms, swales, and culverts to redirect runoff toward storm water retention basins. Sand bags, filter bales, silt fences, and temporary dams would be installed to minimize the volume of sediment carried by storm runoff and to prevent the erosion of slopes and temporary drainage facilities. Following each significant precipitation event, a site review of the effectiveness of the erosion control plan would take place. Storm water would be retained on site in small storm water detention basins.

The project would comply with the General Industrial Stormwater Permit. During operations, stormwater collected from the curbed laydown and storage area of the plant would be routed through a small settling basin. The water would be discharged with the process wastewater to one of the tanks. The remaining solids would either be reused or disposed of at an appropriate facility.

4.2.1.2 Floodplains/Wetlands

Because no project activities would occur within the 100-year floodplain; there would be no impact to this resource. No activities would occur within potential wetland areas; additionally all potential site runoff during construction and operation would be addressed through BMPs and permits. Therefore, there would be no direct or indirect impacts to wetlands.

4.2.2 Alternative 2

4.2.2.1 Water Quality/Quantity

Under Alternative 2, no DOE funding would be received. However, Calera would pursue and obtain alternative sources of funding for the construction, operation, and maintenance of the MLMDP. Since all processes, plant arrangement, construction, operations, maintenance, and demolition and decommissioning would be as described above for the Proposed Action, potential environmental effects to water resources would be the same as those described above.

4.2.2.2 Floodplains/Wetlands

As with the Proposed Action, no work would occur within floodplains or wetlands. Use of BMPs and adherence to permit conditions would ensure no indirect impacts to wetland. Therefore, there would be no impact to floodplains or wetlands.

4.2.3 No Action Alternative

4.2.3.1 Water Quality/Quantity

Under this alternative, the Absorption Demonstration Plant would continue to operate scaled at 1:100 to a projected commercial plant and continue to use groundwater and seawater as it does currently. However, there would be no conversion of process output to aggregates and cementitious products at scales larger than that produced by the Pilot Plant. Plant operations would continue under current permits and authorities. Liquid and solid waste generated by the Pilot Plant and the Absorption Demonstration Plant would be used for testing, recycled on site, or disposed of in accordance with all applicable local, state, and federal regulations. Therefore, there would be no change in existing impacts to water quality or quantity.

4.2.3.2 Floodplains/Wetlands

No current activities occur within or affect 100-year floodplains or wetlands. The No Action Alternative would retain the current features and activities at the site and, therefore, there would be no impact to these resources as a result of this alternative.

4.2.4 Recommendations

The following recommendations are applicable to the Proposed Action and Alternative 2:

- Prior to use, the tanks would be hydraulically tested to ensure that the tanks do not leak to the subsurface.
- In the event that the project construction would disturb one or more acre of land, Calera would comply with the General Construction Stormwater Permit. If construction requires grading, cutting, or moving the existing site material, silt fencing would be used to control runoff and erosion. Upon completion of construction, all temporary utilities and trailers would be removed from the site. All miscellaneous construction materials would be removed and disposed of offsite.
- The project would comply with the General Industrial Stormwater Permit.

4.3 GEOLOGIC/SOIL CONDITIONS

4.3.1 Proposed Action

This section discusses the following potential environmental consequences: subsidence; erosion; stream diversion; floodplain and wetland intrusion; and changes in soil permeability and filtration.

For land subsidence to be an issue, the subsurface must contain materials that would compact or settle when dewatered and deep pumping of the groundwater resources (or oil and gas production) must occur. Because the Moss Landing area is subject to salt water intrusion, groundwater is pumped from well fields several miles inland. Similarly, there is no known hydrocarbon resource, so the likelihood of general land subsidence is considered remote. Further, no components of the Proposed Action would alter groundwater resources, and therefore, there would be no impacts to geologic subsidence. However, the northeastern portion of the MLCC site, where the aggregate laydown area is proposed, would be constructed on a former landfill. During an April 15, 2010, site reconnaissance, portions of this area showed signs of differential settlement and/or lateral movement. Therefore, before installation of materials that would apply a substantial surface load, a geotechnical engineering investigation should be conducted to evaluate the current stability of the landfill area and the ability to safely apply a surface load without threat of failure.

As indicated in Section 3.3.2, the soil type present at the site demonstrates a slight to moderate erosion hazard. No project-related features are anticipated to increase the hazard of erosion. Further, during construction, a construction Storm Water Pollution Prevention Plan would be prepared and implemented. This plan would include best management practices to be used to minimize erosion. Erosion control would be accomplished during construction through the use of strategically placed berms, swales, and culverts to redirect runoff toward storm water retention basins. Sand bags, filter bales, silt fences, and temporary dams would be installed to minimize the volume of sediment carried by storm runoff and to prevent the erosion of slopes and temporary drainage facilities. Grades would be designed to prevent the effects of ruts and ponding. Following each significant precipitation event, a site review of the effectiveness of the erosion control plan would take place. Storm water would be retained on site for impoundment in storm water retention basins.

Stream Diversion/Floodplain and Wetland Intrusion – no project-related feature would increase the likelihood of these phenomena, as no work would occur within streams, the 100-year floodplain, or wetlands. Further, implementation of BMPs would prevent indirect impacts to any adjacent water features.

Based on the proposed components of the project, the Surface Mining Control and Reclamation Act of 1977, and the Surface Mining and Reclamation Act of 1975 would not apply. Since no new paved areas are included in the Proposed Action, this alternative would have no adverse impact to the behavior of site conditions relative to soil permeability and filtration.

Calera would conduct baseline environmental sampling in areas where site operations would have the potential to affect subsurface conditions at the project site. Baseline sampling would include the collection and analysis of surface and near-surface samples to establish conditions before project construction.

4.3.2 Alternative 2

Under Alternative 2, the project would be funded through private means but would not receive funding from DOE. All processes, plant arrangement, construction, operations, maintenance, and demolition and decommissioning would be as described for the proposed project, and therefore the potential impacts to geology would be similar to those of the proposed project. However, because funding is assumed to be delayed by up to 3 years compared to the proposed project, the potential impacts would occur at a later time. As with the Proposed Action, Calera would conduct baseline environmental sampling in areas where site operations would have the potential to affect subsurface conditions at the project site to establish conditions before project construction.

4.3.3 No Action Alternative

Under the No Action Alternative, the DOE would not provide funding to Calera, no additional funding would be secured, and activities at the site would continue as they currently do, including the Moss Landing Pilot Plant and the Moss Landing Absorption Demonstration Plant. No construction would occur and there would be no change in the geology or soils on site.

4.3.4 Recommendations

The following recommendations are applicable to the Proposed Action and Alternative 2:

- Before installation of materials that would apply a substantial surface load, a geotechnical engineering investigation should be conducted to evaluate the current stability of the landfill area and the ability to safely apply a surface load without threat of failure.
- Calera would conduct baseline environmental sampling in areas where site operations would have the potential to affect subsurface conditions at the project site. Baseline sampling would include the collection and analysis of surface and near-surface samples to establish conditions before project construction.

4.4 SOLID AND HAZARDOUS WASTE

4.4.1 Proposed Action

Nonhazardous and hazardous solid wastes would be generated during both construction and operation of the MLMDP, as described below.

4.4.1.1 Construction Phase

During construction of the proposed MLMDP, the primary waste generated would be solid nonhazardous waste. It is anticipated that some hazardous solid waste(s) would also be generated during plant construction; however the amount that would be generated is anticipated to be small. The types of waste(s) and estimated quantities are described below and summarized in Table 4.4-1.

Table 4.4-1
Summary of Anticipated Solid Waste Streams and Management Methods

Waste Stream	Waste Characteristics	Estimated Quantity	Estimated Frequency of Generation	Waste Management Method	
				Onsite	Offsite Treatment
Construction Phase					
Scrap wood, steel, copper, aluminum, rags, abrasive materials, glass, plastic, paper, insulation, cardboard and corrugated packaging.	Nonhazardous solids	1 ton	Twice Weekly	Containerize, housekeeping	Recycle and/or Class II/III landfill disposal
Empty hazardous material containers	Hazardous solids	Less than 1 cubic yard	Monthly	Containerize and store for less than 90 days	Recycle and/or Class I/II landfill disposal
Spent welding materials	Hazardous solid	Less than 1 cubic yard	Monthly	Containerize and store for less than 90 days	Recycle and/or Class I landfill disposal
Concrete and soil	Nonhazardous	Up to 100 cubic yards	One time	Stockpile and cover	Reuse, recycle, or Disposal at a Class II/III landfill
Operation Phase					
Solids from slurry storage tank	Nonhazardous	Up to 1,000 tons	One time	Stored or containerized for potential reuse in site operations	N/A
Salts from evaporator crystallizer	Nonhazardous	Up to 240 tons	Weekly	Containerized for potential reuse in site operations	Disposal to a Class II/III landfill if not reused in site operations
Spent reverse osmosis membrane cartridges	Nonhazardous	1	Quarterly	Containerize for recycling or disposal	Reuse and disposal at a Class II/III landfill
Quality Control Laboratory waste; Paper, cardboard, plastic, glass	Nonhazardous	1 ton	Yearly	Containerize for recycling or disposal	Recycle or disposal at Class III landfill
Universal waste; fluorescent bulbs and ballasts	Hazardous solids	Up to 10 pounds	Yearly	Containerize for recycling or disposal	Disposal to a licensed Treatment, Storage, and Disposal Facility

Nonhazardous Solid Wastes

The nonhazardous solid wastes produced during construction would be collected in an onsite dumpster and picked up for disposal by a licensed waste hauler. It is anticipated that the construction debris dumpster would be emptied twice a week. The waste would be taken to an appropriate facility, where recyclable materials would be removed and the residual materials would be disposed of at an appropriate landfill.

Nonhazardous solid wastes generated during the construction phase of the proposed MLMDP would include excess scrap wood, steel, copper, aluminum, rags, abrasive materials, glass, plastic, paper, insulation, cardboard and corrugated packaging. The anticipated waste streams and their estimated quantities are described below and are summarized in Table 4.4-1. Approximately 2 tons of these wastes, are anticipated to be generated weekly during the construction phase of the proposed MLMDP. Where practical, these wastes would be recycled. All nonhazardous wastes that are not recycled would be disposed of at a Class III landfill in accordance with all federal, state, and local regulations. Quantities of nonhazardous waste generated by the Proposed Action would easily be accommodated by exiting landfills and recycling facilities.

Metal wastes would include scrap steel and aluminum used as construction aids and copper wire from wire trimming during construction activities. Where practical, ferrous and nonferrous waste metals would be recycled. Waste concrete and soil would be generated from minor trenching that may be required for the installation of utility conduits. Where practical and of acceptable quality (i.e., compliant with state standards), soil would be reused for landscaping or other related purposes. Up to 100 cubic yards of waste concrete and soil may be generated during construction activities. Concrete and soil that is not reused at the site would be recycled or disposed of at a Class II/III landfill in accordance with all federal, state, and local regulations.

Hazardous Solid Wastes

The majority of hazardous waste generated during construction would consist of spent welding materials and empty hazardous materials containers. It is anticipated that less than 1 cubic yard of each of these wastes would be generated monthly during construction activities. Quantities of hazardous waste generated by the Proposed Action would easily be accommodated by exiting Class I and recycling facilities.

The construction contractor would be considered the generator of hazardous waste associated with MLMDP construction activities and would be responsible for proper handling of all hazardous wastes in accordance with all federal, state, and local regulations. This would include all licensing requirements, training of employees where required, accumulation limits and duration, and recordkeeping and reporting requirements. Wastes that are deemed hazardous would be collected in hazardous waste accumulation containers placed near the area of generation. After the end of each workday, the accumulation containers would be moved to the contractor's licensed hazardous waste accumulation area where hazardous wastes can be stored up to 90 days after the date of generation. The construction contractor would manifest these wastes for disposal at a permitted Class I facility or recycling facility in accordance with all federal, state, and local regulations. All hazardous wastes would be removed from the site by a licensed hazardous waste management contractor.

4.4.1.2 Operation Phase

During operation and maintenance of the proposed MLMDP, nonhazardous solid wastes would be generated. These would include spent media from filtration operations and other solids from process tanks and crystallizer operations. Nonhazardous solid wastes would be recycled, to the extent practical,

and the remainder disposed of on a regular basis at a Class III landfill. The types of waste(s) and estimated quantities are described below and summarized in Table 4.4-1.

Nonhazardous Solid Wastes

The nonhazardous solid wastes produced during operation would be collected in an onsite dumpster or stored in an appropriate fashion awaiting disposal. To the extent possible, materials would be reused or recycled. Non recyclable and reusable solid wastes would be taken to an appropriate licensed facility for disposal.

Nonhazardous solid wastes generated during the operational phase of the proposed MLMDP would include solids from the slurry storage tank, salts from the evaporator crystallizer, spent filtration media (sand and resin), and general wastes such as paper, cardboard, plastic, and glass from the Quality Control Laboratory. Up to 1 ton of these wastes are likely to be generated on a weekly basis. Where practical, these wastes would be recycled or reused in onsite processes. Nonhazardous wastes that are not recycled or reused would be disposed of at a Class III landfill in accordance with all federal, state, and local regulations.

Hazardous Solid Wastes

It is anticipated that only minor quantities of hazardous solid wastes would be generated during the operation of the MLMDP. The hazardous waste(s) generated during operation would consist mainly of universal type wastes such as fluorescent lights and associated ballasts. It is anticipated that up to 10 pounds of universal waste(s) would be generated yearly during operation of the MLMDP. Hazardous solid wastes would be disposed of at a Class I landfill in accordance with all federal, state, and local regulations.

To prevent impacts to human health or the environment, procedures would be developed for the proper handling, labeling, packaging, storage, recordkeeping, and disposal of hazardous waste. The following general procedures would be employed:

- Hazardous wastes would be stored onsite for less than 90 days in accordance with the requirements of Title 22 California Code of Regulations;
- Hazardous wastes would be segregated for compatibility and stored in designated accumulation areas with appropriate secondary containment;
- Hazardous wastes would be picked up for transport only by licensed hazardous waste haulers. All hazardous wastes would be properly manifested to a permitted disposal facility;
- Hazardous waste documentation, including the biennial hazardous waste generator reports that would be submitted to the California Department of Toxic Substances Control (DTSC), would be kept onsite and accessible for inspection for a period of not less than 3 years;
- Employees would be trained in hazardous waste management, spill prevention and response, and waste minimization; and
- Procedures would be developed to reduce the quantity of hazardous waste generated. Nonhazardous materials would be substituted for hazardous materials, and wastes would be recycled where possible.

Further, Calera would conduct baseline environmental sampling in areas where site operations would have the potential to affect subsurface conditions at the project site. Baseline sampling would include the collection and analysis of surface and near-surface samples to establish conditions before project construction.

4.4.2 Alternative 2

Under Alternative 2, no DOE funding would be received. However, Calera would pursue and obtain alternative sources of funding for the construction, operation, and maintenance of the MLMDP. Because all processes, plant arrangement, construction, operations, maintenance, and demolition and decommissioning would be as described above for the Proposed Action, potential environmental effects to solid nonhazardous and hazardous wastes would be the same as those described above, but would occur later in time.

4.4.3 No Action Alternative

Under this alternative, the Moss Landing Absorption Demonstration Plant would continue to operate scaled at 1:100 to a projected commercial plant and continue to produce nonhazardous and small quantities of hazardous wastes as it does currently. However, no conversion of process output to aggregates and cementitious products at scales larger than that produced under the Moss Landing Pilot Plant would occur. Plant operations would continue under current permits and authorities. Solid waste generated by the Pilot Plant and the Absorption Demonstration Plant would be used for testing, recycled on site, or disposed of in accordance with all applicable local, state, and federal regulations. Therefore, there would be no impact to solid or hazardous wastes.

4.4.4 Recommendations

The following recommendations are applicable to the Proposed Action and Alternative 2:

- To prevent impacts to human health or the environment, procedures would be developed for the proper handling, labeling, packaging, storage, recordkeeping, and disposal of hazardous waste. The following general procedures would be employed:
  - Hazardous wastes would be stored on site for less than 90 days in accordance with the requirements of Title 22 California Code of Regulations;
  - Hazardous wastes would be segregated for compatibility and stored in designated accumulation areas with appropriate secondary containment;
  - Hazardous wastes would be picked up for transport only by licensed hazardous waste haulers. All hazardous wastes would be properly manifested to a permitted disposal facility;
  - Hazardous waste documentation, including the biennial hazardous waste generator reports that would be submitted to the California DTSC, would be kept onsite and accessible for inspection for a period of not less than 3 years;
  - Employees would be trained in hazardous waste management, spill prevention and response, and waste minimization; and

  - Procedures would be developed to reduce the quantity of hazardous waste generated. Nonhazardous materials would be substituted for hazardous materials, and wastes would be recycled where possible.

- Calera would conduct baseline environmental sampling in areas where site operations would have the potential to affect subsurface conditions at the project site. Baseline sampling would include the collection and analysis of surface and near-surface samples to establish conditions before project construction.

4.5 LAND USE

4.5.1 Proposed Action

4.5.1.1 Physically Divide an Established Community

The Proposed Action would be constructed on an approximately 42-acre site that is currently developed with heavy industrial uses. The proposed uses are compatible with existing and historical uses on the site and in the surrounding industrial area. Because heavy industrial uses are already present on the site, the Proposed Action would not result in new incompatible uses that would form a barrier in the community. Additionally, the site is currently enclosed by fencing and public access is not permitted. The project would not result in the construction of new roads, highways or other land uses that would divide existing communities. The project also would not result in visual barriers to viewsheds within the Moss Landing Community, as described in Section 4.8, Visual Resources. Therefore, the Proposed Action would not physically divide an established community.

4.5.1.2 Compatibility with Established and Planned Land Uses

As described above, the Proposed Action entails the continuation of industrial uses on an approximately 42-acre site within an area zoned for, and developed with, industrial uses. Industrial uses are also present to the north and south of the MLCC site, including the Moss Landing Energy Facility. The site has historically been used for industrial uses and the Proposed Action would not represent an expansion or intensification of these uses. It would not expand beyond the previously used or disturbed areas, or substantially change the nature or types of uses on the site. While three new silos and aggregate laydown and storage facilities would be built, these new facilities would be in proximity to existing buildings and over previously used or disturbed areas. Additionally, the majority of the operations associated with the Proposed Action would occur in existing buildings. Because the proposed use is a continuation of existing industrial uses on the site, and would not intensify or expand facilities or operations beyond historic industrial uses of the site, the proposed use would not result in land use conflicts with existing and planned uses in the area.

The Proposed Action would not conflict with the established park and recreational uses within the project vicinity. These uses are generally approximately 0.5 mile or greater from the MLCC site and include Salinas River State Beach, Moss Landing State Beach, Moss Landing Harbor, Moss Landing State Wildlife Area, and Elkhorn Slough National Estuarine Research Reserve. The Moss Landing Energy Facility is between the MLCC site and the Moss Landing State Wildlife Area and Elkhorn Slough National Estuarine Research Reserve. Additionally, the Proposed Action would not conflict or be inconsistent with the Monterey Bay Sanctuary Scenic Trail Master Plan, which anticipates a Class I bikeway along Highway 1, west of the MLCC site.

4.5.1.3 Consistency with Adopted Local Plans

The Proposed Action is consistent with the applicable policies of the County's 1982 General Plan. The Proposed Action would be entirely within portions of the existing Moss Landing Commercial Park, and would represent orderly growth and development of an existing land use. It is an economically beneficial use and would encourage the expansion of the economic base by utilizing existing vacant buildings and creating additional jobs on the site. The site is in close proximity to major transportation routes. The Proposed Action would not cause substantial adverse impacts to nearby residential uses. As described in the other sections of this Environmental Information Volume, the Proposed Action would not violate the County's environmental quality standards.

The Proposed Action would be consistent with the Local Coastal Program and its Moss Landing Community Plan, as well as the supporting North County Coastal Implementation Plan.

The operations of the Proposed Action require proximity to the Moss Landing Energy Facility to use existing outputs from the power plant. The Proposed Action may also require periodic use of the existing permitted seawater intake, and therefore, would be considered a coast-dependent use, consistent with the Local Coastal Program policy. Therefore, the proposed uses would be generally consistent with policies within these plans that address natural resources including water supply, air quality, agriculture and environmentally sensitive habitats.

The proposed expansion of industrial uses and construction of facilities is compatible with existing community land use patterns and circulation systems. Primary site access, including access to the construction laydown area and parking area, would remain from Dolan Road, consistent with policies that limit access along Highway 1.

The Proposed Action would be consistent with the Heavy Industrial (HI) CZ District. The Proposed Action is similar to existing permitted industrial uses on site, including the existing Absorption Demonstration Plant and Pilot Plant. In October 2009, Monterey County issued a Coastal Administrative Permit for Calera's existing operations. The Proposed Action is expected to require modification of this permit, a new Coastal Development Permit, or General Development Plan. The appropriate permit process would be determined in consultation with the Monterey County Planning Department. A component of these approvals would include a use permit for the height of proposed silos if the CZ District height limit of 35 feet is exceeded. However, these silos would be adjacent to existing buildings and would not exceed the height of the tallest of these buildings. Compliance with zoning requirements for landscaping, building site coverage, and parking for the overall MLCC would need to be maintained.

No habitat conservation plans or natural community conservation plans are adopted for the project area.

In conclusion, the Proposed Action would not conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project.

4.5.2 Alternative 2

Under Alternative 2, the project would be funded through private means but would not receive funding from DOE. All processes, plant arrangement, construction, operations, maintenance, and demolition and decommissioning would be as described for the Proposed Action, but would be delay by up to 3 years. Therefore, similar to the Proposed Action, no impacts to land uses would be anticipated under Alternative 2.

4.5.3 No Action Alternative

Under the No Action Alternative, the DOE would not provide funding to Calera, no additional funding would be secured, and activities at the site would continue as they currently do, including the Pilot Plant and the Absorption Demonstration Plant. No construction would occur and there would be no change in the land use setting and no impact on land uses.

4.5.4 Recommendations

The following recommendations are applicable to the Proposed Action and Alternative 2:

- The alternatives are expected to require modification of the existing Coastal Administrative Permit, a new Coastal Development Permit, or General Development Plan. The appropriate permit process would be determined in consultation with the Monterey County Planning Department.

- Compliance with zoning requirements for landscaping, building site coverage, and parking for the overall MLCC would need to be maintained.

4.6 NOISE

4.6.1 Methodology

Applicable noise regulations were discussed in Section 3.6. Table 4.6-1 summarizes the applicable regulations used to evaluate noise exposure. This table categorizes noise exposure criteria by jurisdiction for construction and operation of the Proposed Action.

Table 4.6-1
Noise Criteria: Project Operation

Jurisdiction	Noise Metric	Noise Level	Notes
State of California	CNEL	3 dBA increase in "normally unacceptable" or "clearly unacceptable" noise/land use compatibility categories	
State of California	CNEL	5 dBA increase	
Monterey County	L_{dn}	60 dBA Exterior	Single-Family Residential

4.6.2 Proposed Action

The Proposed Action is the back end of Calera's two-part process. Product slurry produced in the Moss Landing Absorption Demonstration Plant would be received by the MLMDP and converted into aggregates and cementitious products. The information gathered by Calera during the MLMDP Project would be used for scale-up of the full carbonate mineralization technology to commercial scale at other locations for the construction industry. The MLMDP Project is not a full-scale commercial plant.

Section 2.2.1 provides further details regarding the Proposed Action's process, and construction and operation activities. The majority of the entire proposed process would be conducted indoors within the MLCC site. All dewatering equipment associated with the back end of the MLMDP would be included in Buildings 3 and 8 at the MLCC site. Buildings 5, 7, and 9 as well as the storage tanks on the south side of the MLCC site would also be used for the MLMDP. Refer to Figure 2-1 for the locations of all buildings

and storage tanks. Three SCM silos would be constructed in the vicinity of the perimeter of existing buildings. An aggregate laydown area would be constructed east of the existing building complex. There are expected to be up to six pads constructed. These pads would allow for the material to dry and be harvested with the use of a scraper or dozer. A mobile crushing unit would be used approximately once a month in order to crush the material from the back end of the project into aggregate.

4.6.2.1 Project Construction

The primary noise contributors involved with the construction of the MLM DP that could potentially affect any nearby noise-sensitive receptors are as follows:

- Construction of three silos to store SCM;
- Construction of an aggregate laydown, drying and harvesting area;
- Construction of three-sided uncovered bays for storage of aggregate and briquettes; and
- Construction traffic.

Construction for the Proposed Action would begin in fall/winter 2011 and be completed by summer 2011. The majority of construction activities would occur between the hours of 6:00 a.m. and 6:00 p.m. It is estimated that workers would work 10-hour shifts and have 50-hour work weeks. Longer work days may be necessary to make up for construction schedule delays or to complete critical construction activities on time. During the start-up and testing phase of the project, some activities may continue for 24 hours a day, 7 days a week. The expected number of workers on site is expected to reach a peak of 96 workers.

Construction access to the MLCC site would be obtained through the MLCC main site entrance located along Dolan Road. Highway 1 to Dolan Road would be the primary access route for construction materials and equipment delivery.

There are no applicable construction noise exempt hours in the Monterey County Noise Ordinance or the Noise Element from the General Plan of Monterey County. The Monterey County Noise Ordinance states that no piece of machinery can be operated within 2,500 feet of a noise-sensitive receptor if the piece of the equipment has a sound level of 85 dBA at a reference distance of 50 feet.

A database of common construction activities and noise levels is available in the Federal Highway Administration's (FHWA) Roadway Construction Noise Model (RCNM) User's Guide (FHWA RCNM, Version 1.0 User's Guide). These data were obtained from empirical measurements at major construction projects and are considered to be the best data available for assessing noise from construction activities. Source noise levels from this database were used for this analysis. Additional data for noise sources not available in this database were collected at sites of similar construction activity.

SCM Silo Construction

The Proposed Action calls for the construction of three silos that would store SCM. The silos are proposed to be constructed in the vicinity of the perimeter of existing buildings. Since the pieces of construction equipment that would be used during the construction of the silos are not yet defined, a conservative assumption for a noise level at 50 feet generated by the construction of the silos was used (89 dBA). It was assumed that the construction of the silos could occur at the nearest location along the perimeter of the MLCC site, as a worst-case scenario. Using the formula that calculates the attenuation of sound due to wave divergence, the expected worst case scenarios for noise levels for silo construction are propagated out to the nearby noise-sensitive receptors. Table 4.6-2 lists the expected noise levels due to SCM silo construction only.

Table 4.6-2 SCM Silo Construction Noise Levels at Noise-Sensitive Receptors		
Site ID	**Distance to Project Boundary (feet)**	**Sound Level from Silo Construction (dBA)**
Receptor-1 700		66
Receptor-2 300		73
R-3 1,50	0	59
Receptor-4 2,000		57

Some of the equipment used during the construction of the silos would likely be louder than 85 dBA at a distance of 50 feet. In order to meet the noise standards found in the Monterey County Noise Ordinance, mitigation or a variance from the County of Monterey would be needed.

Construction of Aggregate Laydown, Drying and Harvesting Area

For the Proposed Action, an aggregate laydown area would be constructed on the east side of the existing building complex. This would include the construction of outdoor pads with a concrete berm/curb around the perimeter. There are currently six pads that are proposed for construction. The specific construction equipment used for the aggregate lay down, drying and harvesting area is not available. However, a conservative assumption for a noise level at 50 feet generated by the construction of the aggregate laydown, drying and harvesting area was used (89 dBA). Using the formula that calculates the attenuation of sound due to wave divergence, the expected worst-case scenarios for noise levels for aggregate laydown area construction are propagated out to the nearby noise-sensitive receptors. Table 4.6-3 lists the expected noise levels due to the construction of the aggregate laydown area.

Some of the equipment used during the construction of the aggregate lay down, drying, and harvesting area would likely be louder than 85 dBA at a distance of 50 feet. To meet the noise standards found in the Monterey County Noise Ordinance, mitigation or a variance from the County of Monterey would be needed.

Table 4.6-3 Aggregate Laydown, Drying, and Harvesting Area Construction Noise Levels at Noise-Sensitive Receptors		
Site ID	**Distance to Project Boundary (feet)**	**Sound Level from Aggregate Lay Down Area (dBA)**
Receptor-1 1,700		58
Receptor-2 1,300		61
Receptor-3 2,700		54
Receptor-4 2,300		56

Construction of the Bays for Storage of Aggregate and Briquettes

The aggregate that is stacked, dried, crushed and harvested at the aggregate laydown area would be stored in three-sided uncovered bays. The bays that are expected to be constructed would likely not include heavy construction equipment that would be louder than 85 dBA at a distance of 50 feet. It can be assumed that since the ambient noise levels at nearby noise-sensitive receptors is between 53 to 58 dBA,

the noise levels associated with the construction of these bays would be below ambient noise levels and would not have substantial noise impacts at noise-sensitive receptors.

Construction Traffic

The primary access and delivery roads that would be used for the Proposed Action would be Route 101, connecting with State Route 156, connecting north on State Route 183 and continuing to Dolan Road at the MLCC site entrance. During construction, the expected peak number of vehicles going to and from the MLCC site would be 88 vehicles. The peak number of truck deliveries would be five per day during construction. Based on the already high existing ambient noise levels in the area due to the existing Moss Landing Energy Facility and Highway 1, and the likely high traffic volumes along the primary access and delivery roads, there would be no substantial noise impacts due to construction traffic.

4.6.2.2 Operational Noise

The primary noise contributors involved with the operation of the MLMDP that could potentially affect any nearby noise-sensitive receptor include:

- Operations at the aggregate laydown, drying and harvesting area; and
- Project operational traffic.

Construction is expected to be completed by summer 2011. After construction is complete, the Project would be commissioned and operation could begin. There are two primary sources of operational noise that would need to be assessed: (1) noise generated at the aggregate laydown, drying and harvesting area, which would use a rock crusher and dozer/scraper, (2) increased noise levels due to operational traffic from the Proposed Action. The traffic includes additional workers and delivery trucks going to and from the MLCC site.

On Site: Aggregate Laydown, Drying, and Harvesting Area

During operation, the rock crusher and a dozer or scraper would be in operation about once a month at the aggregate laydown, drying and harvesting area. At the laydown area, slurry would be spread out on the pads and dried. The stacks would be constructed side by side on pads and material would be stacked on previously dried material until the product reaches a height of 6 feet. The material would then be stored using a scraper or dozer. Once a month, the material would be broken up into aggregate using a rock crusher. The aggregate would then be moved to the three-sided bays for storage. The dozer or scraper would likely generate a sound level between 82 to 84 dBA at a distance of 50 feet. The rock crusher would likely generate a sound level of 87 dBA at a distance of 50 feet. Table 4.6-4 lists the cumulative noise levels generated by a rock crusher and a dozer/scraper at nearby noise-sensitive receptors.

Table 4.6-4
Aggregate Laydown, Drying, and Harvesting Area Operational Noise Levels at Noise-Sensitive Receptors

Site ID	Distance to Project Boundary (feet)	Sound Level from Aggregate Lay Down Area (dBA)
Receptor-1	1,700	56
Receptor-2	1,300	59
Receptor-3	2,700	52
Receptor-4	2,300	54

The operation of breaking down the material into aggregate would take place about once a month. All of these noise levels at the respective noise-sensitive receptors would not exceed the exterior noise limit of 60 L_{dn} found in the Noise Element. However, the rock crusher would likely generate noise levels that exceed 85 dBA at a distance of 50 feet. In order to meet the noise standards found in the Monterey County Noise Ordinance, mitigation or a variance from the County of Monterey would be needed.

Operational Traffic

Operational traffic for the Proposed Action would use the same primary access and delivery roads as construction traffic. The primary access and delivery roads that would be used for the Proposed Action would be Route 101, connecting with State Route 156, connecting north on State Route 183 and continuing to Dolan Road at the MLCC site entrance. The number of delivery trucks and workers going to and from the operational MLCC site would vary by shift. There are three shifts at the plant. The day, swing and night shifts make up the three shifts. Once the MLMDP was in operation, a total of six new staff members would be going to and from the MLCC site during each shift. There would be a total of ten truck deliveries during the day shift, two truck deliveries during the swing shift, and usually no truck deliveries during the night. Based on the already high existing ambient noise levels in the area and likely high traffic volumes along the primary access and delivery roads, there would be no substantial noise impacts due to operational traffic from the Proposed Action.

To reduce construction and operational noise from the Proposed Action and ensure compliance with the Monterey County noise standards, all construction and operational equipment would be fitted with mufflers that help minimize noise levels. Noise generated at the MLCC site would be mitigated in order to meet Monterey County noise standards if the noise was from sources that are: (1) 85 dBA or above at a distance of 50 feet, and (2) within 2,500 feet of residences.

4.6.3 Alternative 2

Under this alternative, the project noise sources would be as described above for the Proposed Action. Although this alternative would occur later in time, the impacts would also be as described above. If this alternative were implemented, mitigation would be necessary to comply with Monterey County's noise ordinance for equipment operated within 2,500 feet of residences if the equipment is 85 dBA or above at a distance of 50 feet. In addition, equipment operated on the MLCC site would need to be fitted with mufflers to minimize noise levels.

4.6.4 No Action Alternative

If the No Action Alternative were implemented, no DOE or private funding would be obtained, and the existing facilitates, operations, and activities at the site would continue. As such, future noise levels in the project environs would be similar to existing noise levels and no mitigation would be necessary.

4.6.5 Recommendations

The following recommendation is applicable to the Proposed Action and Alternative 2:

- To reduce construction and operational noise from the Proposed Action or Alternative 2 and ensure compliance with the Monterey County noise standards, all construction and operational equipment would be fitted with mufflers that help minimize noise levels. Noise generated at the MLCC site would be mitigated in order to meet Monterey County noise standards if the noise was from sources that are: (1) 85 dBA or above at a distance of 50 feet, and (2) within 2,500 feet of residences.

4.7 HISTORIC/CULTURAL RESOURCES

4.7.1 Proposed Action

As discussed in Section 3.7.3.1, the NAHC's review of the Sacred Lands File failed to indicate the presence of Native American cultural resources in the study area. During subsequent environmental analysis, the DOE would send letters to Native American contacts that may have additional information about the study area, and conduct any Government to Government consultation if required. Further, under this alternative, the DOE would also complete consultation with the State Historic Preservation Officer, and any interested parties, pursuant to Section 106 of the National Historic Preservation Act.

Based on the record search and archival document review, there is a potential for significant cultural resources within the MLCC site. In addition, a review of the cultural resource studies conducted in the vicinity of the study area indicate that the proposed project site has not been surveyed in its entirety for cultural resources. Proposed project activities including the grading of a construction lay down and parking area, an aggregate lay down area, construction of three new silo buildings, and storage bays have the potential to directly and indirectly impact cultural resources that may exist within the project site.

Based upon the archival review, several structures and buildings associated with the facility were constructed as early as 1948. Under the regulatory provisions applicable to the proposed project, consideration must be made for structures, buildings, and features greater than fifty years old. Implementation of the Proposed Action would require additional cultural resources study in order to determine the potential significance of the buildings, structures, and features associated with the earliest development of the site.

Documentation indicates that the current location of CA-MNT-235 is the result of a soil redeposit. Although the original site location is unknown, it is possible the construction of the existing facility resulted in the disturbance and/or destruction of the site. Cultural soils associated with CA-MNT-235 may exist within the proposed project limits. Further, record search results indicate the presence of several prehistoric archaeological sites within a 1-mile radius of the MLCC site. These sites vary in size, integrity, and depth; however, their presence demonstrates that the vicinity was occupied prehistorically and that the area should be considered highly sensitive for cultural resources. Implementation of the Proposed Action could result in the disturbance of native soil, and potentially, cultural deposits associated with CA-MNT-235.

Due to the findings of the background research and archival review, which indicate that the study area is of high archaeological sensitivity, additional cultural resources study is recommended before the implementation of this alternative. A Phase I Cultural Resource Inventory would include the documentation of any potentially significant resources associated with the Proposed Action and would provide appropriate mitigation measures and recommendations. If potentially significant resources are documented during the Phase I study, additional cultural resources study may be required such as Extended Phase I Survey, Phase II Testing, and Phase III Mitigation.

It should be noted herein that the project site is highly disturbed from activities associated with the ongoing use of the site since its original construction. Although this alternative includes new construction and soil grading, it is likely that much of the work would occur in a highly disturbed context. In addition, the three proposed silos would be constructed in the vicinity of the perimeter of existing buildings and the tops of silos would be below the roofline of the existing buildings. Although this does not eliminate potential impacts to cultural resources, including buildings and structures, it does potentially reduce the likelihood of encountering intact subsurface cultural deposits during the activities associated with this alternative, or that visual impacts to historic properties would occur.

4.7.2 Alternative 2

Under this alternative, the project footprint and required components would be as described above for the Proposed Action. Although this alternative would occur later in time, the impacts would also be as described above. If this alternative were implemented, to meet state requirements (e.g., CEQA), a Phase I Cultural Resource Inventory —including documentation of any potentially significant resources, and associated mitigation measures and recommendations would also occur. As with the Proposed Action, if potentially significant resources are documented during the Phase I study, additional cultural resources study may be required such as Extended Phase I Survey, Phase II Testing, and Phase III Mitigation.

4.7.3 No Action

If the No Action Alternative were implemented, no DOE or private funding would be obtained, and the existing facilitates, operations, and activities at the site would continue. As such, no additional cultural resources efforts would be required, as there would be no potential to impact cultural resources as a result of this alternative.

4.7.4 Recommendations

The following recommendation is applicable to the Proposed Action and Alternative 2:

- A Phase I Cultural Resource Inventory —including documentation of any potentially significant resources, and associated mitigation measures and recommendations would occur. If potentially significant resources are documented during the Phase I study, additional cultural resources study may be required such as Extended Phase I Survey, Phase II Testing, and Phase III Mitigation.

4.8 VISUAL RESOURCES

4.8.1 Proposed Action

Features and activities associated with the Proposed Action would generally be constructed in existing buildings and structured on the project site; new features such as silos and laydown areas and storage bays, would occur within existing industrial areas. Dewatering equipment would be located in Buildings 7, 8, and 9 and the existing outdoor storage tanks located south of the building complex would be utilized. Other project-related operations may occur in other existing buildings.

New project components to be constructed may include: three silos, an aggregate laydown area, and an aggregate storage area, and possible trailers containing processing equipment. Silos and temporary trailers, if needed, would be constructed or located around the perimeter of the existing structures, and would be constructed of materials colored, or painted a color, to blend with the existing features at the site. Additionally, the height of the new structures would be at or below the roofline of existing buildings. Therefore, these structures would blend into the existing industrial features of the site, and not be highly notable to viewers outside the MLCC property.

The aggregate laydown area would be constructed east of the existing building complex and adjacent to Dolan Road (Appendix I, Photo point 19). The laydown area would include construction of outdoor pads with concrete berm/curb/or fencing around the perimeter. This laydown area would have associated leachate collection and water collection systems. It is anticipated that approximately six laydown pads (each measuring 60 feet by 60 feet) would be constructed side by side in one row. Aggregate material would be placed on the pads up to a height of approximately 6 feet above grade. The aggregate storage area would also be located east of the existing buildings, near the aggregate laydown area. The storage

areas would consist of three-sided uncovered bays approximately 8 feet tall. Additional equipment associated with the aggregate operations would be located outdoors and would include: a scraper or dozer, a mobile crushing unit, and crushed material sifters. Compliant with County ordinances, all equipment and material storage areas would be screened by solid walls, fences, or by adequate plantings of not less than 6 feet in height. This area would be temporarily visible to motorists along Dolan Road as it would be at a higher elevation, and is not consistently screened from view along roadway.

Construction activities would result in increased dust as a result of limited grading and site preparation. Calera would manage such dust through standard dust-control practices such as watering all active grading areas and storage piles—in compliance with local air district requirements. Short-term construction-period activities would result in physical changes to the project site. These changes would include installation of mobile trailers or similar facilities for offices and construction laydown and parking areas that would be graded and surfaced with crushed rock. The construction laydown and parking areas would be located west of the existing buildings, along Highway 1. Temporary security fences and gates would be installed around the construction laydown areas. However, these features would be compatible with the existing industrial features at the MLCC site's industrialized areas and would be of similar textures and forms as existing features. Furthermore, because the site does not present a cohesive visual character in terms of style, forms, lines, or textures, the new features would not present a high contrast.

The proposed project would not have a substantial impact on scenic vistas. The most visible components of the project would be the three silos, which would be at or below the roofline of existing MLCC site structures and would be of a color to blend with the exiting features at the site. The silos and other components of the project, including aggregate laydown area and aggregate storage areas, and the temporary structures and construction laydown and parking areas would blend in with the existing industrial buildings on the site and would not be highly notable as viewed from vantage points within the vicinity.

The proposed project would not introduce substantially new sources of light or glare. All additional lighting, including during the construction period, would conform to any lighting plan required by the County and would be designed to limit offsite glare and therefore would not adversely affect day or nighttime views.

The Proposed Action is not anticipated to increase the visibility of the existing exhaust plume, as operations at the plant would be in conformance with local air pollution control district rules and regulations. Crushing operations at the aggregate laydown and storage area may result in an increase of dust, which would be notable to motorists along Dolan Road. However, BMPs would minimize dust and consequently minimize potential impacts to the viewshed.

Although the MLCC site is located within a Monterey County designated public viewshed, the Proposed Action would not substantially impact views in the vicinity—including those along Highway 1, the Elkhorn Slough, the harbor or dunes. Compliance with Monterey County Coastal Implementation Plan, Parts 1 and 2 including standards for siting of structures, landscaping and lighting, would limit potential impacts from the proposed project. Additionally, the proposed project is consistent with the industrial character of the site and surrounding industrial uses and would not substantially degrade the visual character or quality of the area.

4.8.2 Alternative 2

Under Alternative 2, the project would be funded through private means but would not receive funding from DOE. All processes, plant arrangement, construction, operations, maintenance, and demolition and decommissioning would be as described for the proposed project, and therefore the potential impacts to visual resources would be similar to those of the proposed project. However, because funding is assumed

to be delayed by up to 3 years compared to the proposed project, the potential impacts would occur at a later time.

4.8.3 No Action Alternative

Under the No Action Alternative, the DOE would not provide funding to Calera, no additional funding would be secured, and activities at the site would continue as they currently do. Therefore, there would be no impact on visual resources.

4.8.4 Recommendations

The following recommendation is applicable to the Proposed Action and Alternative 2:

- Compliant with County ordinances, all equipment and material storage areas would be screened by solid walls, fences, or by adequate plantings of not less than 6 feet in height

4.9 ECOLOGY

4.9.1 Proposed Action

The majority of the proposed process would occur within existing warehouses and buildings with little or no modification to existing structures. The staging and aggregate stockpiling would occur in the paved area west of the main warehouses and/or between the warehouses and outdoor tanks. The tanks currently are being used to store fresh and seawater, along with the precipitate from the existing process.

The Proposed Action would occur within developed and/or heavily disturbed areas. Although the area is surrounded by sensitive habitats and there are records of numerous state and federally listed endangered, threatened, and species of special concern, none of these species would be directly or indirectly adversely impacted by the Proposed Action. Therefore, the Proposed Action would not directly or indirectly affect any federally listed species or their habitat; if implemented, consultation with the USWFS is not anticipated to be required.

This alternative would not impact any protected native bird species and would therefore comply with the Migratory Bird Treaty Act. A memorandum of understanding with the U.S. Fish and Wildlife Service would not be required.

The Proposed Action would reduce the amount of atmospheric carbon dioxide and, in theory, could reduce the magnitude of the greenhouse effect or global warming, though the reductions are hard to quantify. Reducing the magnitude of global warming would be beneficial to numerous species of plants, wildlife, and sensitive habitats throughout the world.

4.9.2 Alternative 2

Under Alternative 2, no DOE funding would be received. However, Calera would pursue and obtain alternative sources of funding for the construction, operation, and maintenance of the MLMDP. All processes, plant arrangement, construction, operations, maintenance, and demolition and decommissioning would be as described above for the Proposed Action. An increased level of uncertainty would be associated with identifying alternative sources of funding, and for the purpose of analyzing this alternative, it is assumed that funding would not be secured for up to 3 years. Therefore, impacts from Alternative 2 would generally be the same as those described for the Proposed Action, but would occur later in time. As with the Proposed Action, if this alternative were implemented,

consultation with the USWFS is not anticipated to be required and it would comply with the Migratory Bird Treaty Act.

4.9.3 No Action Alternative

Under the No Action Alternative, the DOE would not provide funding to Calera, no additional funding would be secured, and activities at the site would continue as they currently do. Calera would operate the Moss Landing Pilot Plant and the Moss Landing Absorption Demonstration Plant. Plant operations would continue under current permits and authorities. Because no new activities would occur, this alternative would have no impact to federal- or state-protected ecological resources.

4.9.4 Recommendations

No further measures are recommended related to ecology.

4.10 SOCIOECONOMIC CONDITIONS

4.10.1 Proposed Action

4.10.1.1 Construction Employment and Project Schedule

Projected construction staff is expected to include an average of 48 workers throughout the 6-month construction period with a peak of approximately 77 workers for a period of 3 months. The onsite workforce would consist of laborers, craftsmen, supervisory personnel, support personnel, and construction management personnel. It is expected that the majority of the construction workers would commute up to 60 minutes per day (roundtrip); based on available workforce in the County as a whole, the workforce is anticipated to be drawn from within Monterey County.

Approximately 10, 910 persons are in the construction industry in Monterey County (Association of Monterey Bay Area Governments, 2008). Additional construction industry workforce is present in the neighboring counties of Santa Cruz and San Benito. Given the size of the labor force within commuting distance of the site, less than 10 percent of the construction laborers are expected to relocate for the construction period. Temporary housing/lodging within the area includes over 300 hotels/lodging facilities in Monterey County, with approximately three facilities in Moss Landing (Monterey County Convention and Visitors Bureau, 2010), and is therefore more than adequate to meet the demands of this project.

It is expected that there would be enough construction workers/laborers available within the study area to meet project demands during the construction period. Potential demand for housing during project construction can be accommodated by the existing vacancy rates in the project vicinity and by existing motel/hotel rooms in Monterey County.

4.10.1.2 Project Operation

Operation of the proposed project would increase the number of workers on site by approximately 18 additional full-time permanent personnel, with approximately 6 additional staff being employed for each of the up to 3 shifts operated each day. Operations would primarily be consistent with operation of the Moss Landing Absorption Demonstration Plant, which is up to 24 hours each day.

It is assumed that 90 percent of the employees would already live in the area or commute to the area and up to 10 percent of the new employees (two persons) would move to the area. Based on the County's number of persons per household in 2009 (approximately 3.163 persons), the proposed project would result in an increase of approximately 6.3 persons. This population increase is well within the anticipated population increase for

Monterey County. There is adequate vacant housing stock within the County to accommodate the negligible incremental growth resulting from the proposed project. Therefore, the proposed project would not result in substantial population growth in the area, either directly or indirectly.

Additionally, the proposed project would not displace any people or housing units. The construction and operations would occur on an existing industrial site and no housing would be removed to accommodate the project. The project also would not result in indirect displacement of people or housing.

4.10.1.3 Public Services and Utilities

Given the negligible incremental increase in population and employment associated with the Proposed Action, there would be no substantial impact to public services as a result of the projected increased labor force. The small increase in population can be accommodated by existing housing and facilities and would not alter acceptable community service ratios or other performance objectives for public services. The incremental increase in the number of employees on site would not substantially increase fire, police, or ambulance emergency response times. Additionally, a site-specific health and safety plan (HSP) would be developed for the proposed project construction period and would outline requirements and provide guidance for control of construction safety hazards in compliance with safety standards and protection of public health, and would reduce the potential demand for emergency response services.

The Proposed Action would result in incremental increases in utilities including water and energy. The proposed project would primarily use groundwater that is piped from the existing well, although the amount would be the same as or less than what is currently used by the MLCC through enhanced water recycling methods. Seawater may also be periodically used in accordance with existing permits. Calera's overall goal for the project is to achieve zero liquid discharge. Therefore, the project would not require new sources of water and would not cause providers to exceed supply.

Electrical power of between 1 and 2 MW is expected to be required for operation of process equipment. In addition, fuel in the form of propane of between 18 and 60 MMBtu/hr would be required for aggregate drying activities. This additional demand for energy is not anticipated to exceed the capacity of existing providers.

The increased labor force during construction and operations may provide a small economic benefit to local businesses through the provisions of food, supplies, and other materials.

4.10.1.4 Economics

The total construction cost is estimated to be approximately $31 million, including labor and equipment. Approximately $3 million of this amount is anticipated to be purchased locally, resulting in an anticipated economic benefit to the region. Also, the increased labor force during construction and operations may provide a small economic benefit to local businesses through the purchase of food, supplies, and other materials.

4.10.1.5 Environmental Justice

Potential human health and environmental impacts are described above, as well as in Sections 4.1 through 4.12. However, as discussed in the other sections of this Environmental Information Volume, the Proposed Acton is not anticipated to result in any high adverse effects. Therefore, the proposed project would result in disproportionately high and adverse effect to any segment of the population. Because approximately 42 percent of the population in the Census Tracts comprising the project vicinity self report as Hispanic, Spanish language materials and other accommodations (e.g., translators) would be considered for future public involvement efforts, to ensure this population has an opportunity to provide input in future decision making related to the project.

4.10.1.6 Transportation

Based on the current industrial nature of the site, and limited additional workforce and changes to operational schedules; the Proposed Action is not anticipated to result in a noticeable increase in congestion or access time to community facilities, recreation areas, or residences or businesses in the area.

4.10.2 Alternative 2

Under Alternative 2, the project would be funded through private means but would not receive funding from DOE. All processes, plant arrangement, construction, operations, maintenance, and demolition and decommissioning would be as described for the proposed project, and therefore the potential impacts to socioeconomics would be similar to those of the proposed project. However, because funding is assumed to be delayed up to 3 years compared to the proposed project, the potential impacts would occur at a later time.

4.10.3 No Action Alternative

Under the No Action Alternative, the DOE would not provide funding to Calera, no additional funding would be secured, and activities at the site would continue as they currently do, including the Moss Landing Pilot Plant and the Moss Landing Absorption Demonstration Plant. No construction would occur and there would be no change in the socioeconomics setting and no economic or social impacts. Additionally, the positive benefits of the project, including the creation of jobs and associated potential increase in local spending from the additional workforce would not occur under this alternative.

4.10.4 Recommendations

The following recommendation is applicable to the Proposed Action and Alternative 2:

- Spanish language materials and other accommodations (e.g., translators) would be considered for future public involvement efforts, to ensure this population has an opportunity to provide input in future decision making related to the project.

4.11 HEALTH AND SAFETY FACTORS

4.11.1 Proposed Action

The Proposed Action would involve detailed design, construction, and operation of the MLMDP, which is the back end of Calera's demonstration process. This process would begin with slurry from the existing absorber product surge tank within the Moss Landing Absorption Demonstration Plant. This slurry would be pumped to either the Epuramat vessel and/or the Lamella, which would be the primary slurry dewatering units. Construction, operation, and maintenance activities associated with the MLMDP may expose workers to physical and chemical hazards. Potential worker exposure to these hazards would be minimized through adherence to appropriate engineering design criteria, implementation of appropriate administrative procedures, use of personal protective equipment (PPE), and compliance with applicable health and safety regulations.

Potential hazards that workers may be exposed to while working on MLMDP are presented in Table 4.11-1. Formal health and safety procedures and programs would be established and implemented for construction and operations to control the various hazards and provide for a safe workplace.

Table 4.11-1
Hazard Analysis for Construction, Operation, and Maintenance of MLMDP
(Page 1 of 2)

Activity	Exposure Potential	Potential Hazard	Control Strategies
Heavy Equipment Operation	C, O, M	Employee injury and property damage from collisions with workers and/or facility equipment.	Implement heavy equipment safety program, ensure that equipment is routinely inspected and operators are properly trained.
Trenching and Excavation	C,M	Employee injury and property damage from collapse of trenches and excavations or contact with underground utilities.	Trenching and excavation would be performed by subcontractor's using their own excavation and trenching safety program. All employees would receive training specific to excavation safety. Require digging permits before initiating excavation or trenching.
Vehicle Operation	C, O, M	Employee injury from vehicle accident or pedestrian/vehicle accident.	Incorporate vehicle safety information in general safety training.
Work at Elevation	C, O, M	Employee injury due to falls from the same level and elevated work areas.	Implement a fall protection program that requires fall protection systems whenever unprotected work is performed at greater than 6 feet.
General Project Work	C, O, M	Employee injury resulting from a slip, trip, or fall.	Maintain good housekeeping, adequate lighting, compliant stairways, and railings.
Crane and Derrick Operation	C, M	Employee injuries and property damage due to falling loads.	Implement hoisting and rigging safety program, inspect equipment routinely and ensure that operators are properly trained.
Hot Work	C, O, M	Employee injuries and property damage due to fire or explosion.	Implement fire protection and prevention program, require Hot Work permits, ensure that welders, pipe fitters, etc., are properly trained.
Working with Combustible Liquids	C, O, M	Employee injuries and property damage due to fire or explosion.	Implement fire protection and prevention program that includes proper procedures for the proper storage and use of flammable or combustible liquids.
Electrical Work	C, O, M	Employee injuries due to contact with energized parts.	Implement energy control program, including LO/TO of energized sources.
Materials Handling	C, O, M	Employee injuries due to improper lifting.	Implement an ergonomics program, and train employees in proper lifting techniques.

Table 4.11-1
MLMDP Construction, Operation and Maintenance Hazard Analysis
(Page 2 of 2)

Activity	Exposure Potential	Potential Hazard	Control Strategies
Confined Space Entries	C, M	Employee injuries due to suffocation, exposure to toxic materials, engulfment, etc.	Implement a confined space program, including permit procedures and air monitoring requirements.
Compressed Gas Storage	C, O, M	Employee injuries and equipment damage due to explosive release of pressure.	Implement a compressed gas safety program, including procedures for proper use and storage.
Power Tool Use	C, O, M	Employee injuries due to improper use, or use of damaged power tools.	Implement procedures for inspecting power tools before operation and train employees on the proper use and care of power tools.
Working with or near hazardous or toxic materials	C, O, M	Employee injuries due to exposure to hazardous and/or toxic materials.	Implement hazard communication program and exposure control procedures including: engineering controls, administrative controls, and PPE for activities that may expose employees to hazardous/toxic materials.
Working with or near noisy equipment	C, O, M	Employee overexposure to noise.	Implement a hearing conservation program to include: identifying high noise activities and sources, sound level monitoring, and PPE.
Working with or near exposed machinery	C, O, M	Employee injuries from entanglement in rotating or moving equipment.	Develop and implement machine guarding equipment LO/TO procedures.
Work outdoors.	C,O, M	Employee injury or illness from biological hazards such as ticks, snakes, spiders and wildlife.	Develop and implement procedures for outdoor work that warn employees of the potential for exposure and provide guidelines for avoidance of contact with biological hazards.
Work in weather extremes	C, O, M	Employee injury or illness due to heat or cold stress.	Develop and implement procedures for work in hot and cold environments that provide for employee monitoring, appropriate clothing and other guidance.

Note:
C = Construction Phase
O = Facility Operations
M = Facilities Maintenance
LO/TO = Lockout/tagout

The site-specific injury and illness prevention programs and safety training programs, which are intended to protect worker health and safety during construction and operation of the Proposed Action, are described in the following sections.

4.11.1.1 Injury and Illness Prevention Programs

Before beginning construction activities, Calera would develop a site-specific construction injury and illness prevention program. Once the construction of the Proposed Action is complete a site-specific injury and illness prevention program for operations and maintenance activities would be implemented.

Construction Injury and Illness Prevention Programs

Consistent with the policy of the California Occupational Safety and Health Commission (Cal/OSHA) on multi-employer work sites, each employer would be responsible for the health and safety of their own employees. Periodic health and safety audits would be conducted by Calera to verify contractor and subcontractor compliance with contractual health and safety obligations.

Construction Safety Program. The overall written construction safety program would include provisions to ensure compliance with Cal/OSHA's Injury and Illness Prevention Program (IIPP) requirements (California Code of Regulations [CCR] Title 8, Section 1509) and would include:

- A written Code of Safe Practices that relates to construction operations;
- Identification of the person or persons responsible for implementing the construction safety program;
- Posting of the Code of Safe Practices at a conspicuous location at the job site office, and providing it to each supervisor who shall have it readily available;
- A description of the system for identifying workplace hazards, including workplace inspections, job hazard analysis, and written hazard assessments;
- Periodic meetings with employee representatives, supervisors, and management to discuss safety issues, including compliance assessments, accidents, injuries, and new or modified health and safety procedures;
- A system for ensuring employee and subcontractor compliance;
- Routine "tool box" or "tailgate" safety meetings conducted with employees and supervisors;
- A system for promoting employees' feedback and suggestions for improving workplace safety;
- Procedures for promptly correcting unsafe conditions; and
- Identification of safety training and experience requirements for specific work activities.

Construction Personal Protective Equipment Program. Contractor employees would use PPE during construction as specified in the construction PPE program. Required PPE would be identified through hazard assessment and general industry standards. The specific PPE ensemble required for each job task would be specified in the job hazard analysis (JHA) for that task. The use of PPE for site activities includes, but is not limited to, the items described in Table 4.11-1. All PPE worn on site would comply with Cal/OSHA and American National Standards Institute requirements. Respiratory protection would be included in the PPE program. Employees would not be required to wear respiratory protection, or to work in areas requiring

respiratory protection until they have received a medical evaluation, respirator fit-testing, and training on the proper use, limitations, and care of respirators.

Construction Exposure Monitoring Program. An exposure monitoring program would be developed to evaluate potential employee exposures to hazardous /toxic materials. Potential exposures would be identified during the task-specific JHAs. Air monitoring may be conducted if necessary to evaluate the potential for employee exposures to the contaminants of concern. Airborne exposures would be controlled through the implementation of engineering controls, administrative controls, or PPE. Air monitoring would also be required in support of other safety programs, including confined space entry, hot work permits, and emergency response. Sound-level monitoring would also be performed as necessary during the construction phase, and initially during new facility operation to evaluate potential employee noise exposures. Odor complaints would be investigated and mitigated as needed.

Construction Emergency Action Plan. An emergency action plan (EAP) would be developed specifically for the construction phase of the Proposed Action. The EAP would designate responsibilities and actions to be taken in the event of an emergency at the site. All employees working at the site would be trained on the contents of the program. The EAP would include:

- Emergency roles and responsibilities;
- Emergency notification procedures; and
- Egress routes and mustering points.

Construction Written Safety Programs. Additional written safety programs that would be established for the construction phase include, but are not limited to:

- Hazard communication program;
- Confined space program;
- Control of hazardous energy program (Lock Out/Tag Out);
- Hearing conservation program;
- Respiratory protection program;
- Blood-borne pathogens control program;
- Injury and accident reporting and investigation program;
- Ergonomics program;
- Emergency response program, including first aid and medical services;
- Elevated work procedures;
- Heavy equipment procedures;
- Hot work procedures;
- Crane and hoist procedures;
- Compressed gas and air handling procedures;
- Subcontractor safety programs;
- Equipment inspection programs; and
- Excavation and trenching program

Operations and Maintenance Injury and Illness Prevention Programs

On completion of construction and startup of the Proposed Action and implementation of routine operations, the construction injury and illness prevention programs would transition into an operations-oriented program that reflect the hazards and controls necessary during routine operations and maintenance of MLMDP. The MLMDP program would reflect any unique hazards specifically associated with maintenance and operation of this facility.

Program outlines for the operations safety programs that would be implemented are provided below. These include: Injury and Illness Prevention Plan, Fire Protection and Prevention Plan, Emergency Action Plan, Hazardous Material Management Program, and PPE Program.

Injury and Illness Prevention Plan. The primary mitigation measures for worker hazards during normal plant operation and maintenance are contained in the IIPP, as required by 8 CCR, Section 3203. The written IIPP designates an individual who is responsible for implementing the program. It also describes safety training and procedures for tracking safety training. JHAs identify safety hazards related to work tasks and establish procedures for avoiding, correcting, reporting, and notifying employees of these hazards.

The IIPP contains the following information and procedures:

- Identity of the person(s) with authority and responsibility for implementing the program;
- A system for ensuring that employees comply with safe and healthy work practices;
- A system for facilitating employer–employee communications regarding safety;
- Procedures for identifying and evaluating workplace hazards, including inspections to identify hazards and unsafe conditions;
- Methods for correcting unhealthy/unsafe conditions in a timely manner;
- An employee training program that includes:
  - introducing the program;
  - training of new, transferred, or promoted employees;
  - training on new processes and equipment;
  - supervisors training; and
  - evaluation of contractor training.
- Methods of documenting inspections and training, and for maintaining appropriate records.

Emergency Action Plan. In addition to the incorporation of various safety and environmental features and design measures to minimize emergencies and their effects on public and worker safety, the MLMDP would have a site-specific Emergency Action Plan. The Emergency Action Plan would address potential emergencies, including chemical releases, fires, bomb threats, pressure vessel ruptures, aqueous ammonia releases, and other catastrophic events. It describes evacuation routes, alarm systems, points of contact, assembly areas, responsibilities, and other actions to be taken in the event of an emergency. The plan includes a layout map, a fire extinguisher list, and a description of arrangements with local emergency response agencies for responding to emergencies.

Hazardous Materials Management Program. Several chemicals would be stored and used during operation of the MLMDP. The storage and handling of chemicals would follow applicable regulations to minimize risk to workers and the surrounding community. Chemicals would be identified and stored in appropriate chemical storage facilities. Bulk chemicals would be stored in aboveground storage tanks; other chemicals would be stored in their delivery containers. Chemical storage and chemical feed areas would be surrounded by temporary or permanent containment or curbing to contain leaks and spills. The containment areas would be sized to hold an appropriate volume (considering the potential for the local hazard contingencies) as designated by a California registered Professional Engineer.

Safety showers and emergency eyewash stations or bottles would be provided at all chemical treatment and storage areas, laboratories, and battery rooms in accordance with 8 CCR requirements (within 50 feet, or 10 seconds of travel time). Standard PPE for use during chemical handling activities would be provided. First-aid kits, fire blankets and evacuation stretchers are located in work areas around the plant. Standard PPE would be readily available for use during minor chemical spill containment and cleanup

activities by plant personnel. Adequate supplies of absorbent material would also be available onsite for minor spill cleanup. A hazardous material emergency response team, trained in managing the accidental release of the chemicals used and stored at the plant, would be available through contract. Emergency contact numbers would be available to summon assistance from these contractors and for notification of local agencies. These procedures would be detailed in the Emergency Action Plan.

Personal Protective Equipment Program. PPE requirements for work at MLMDP would be identified during the job hazard analyses process. The PPE requirements would be developed and incorporated into the site-specific injury and illness prevention program. The PPE program would include the following:

- Hazard analysis and prescription of PPE;
- Personal protective devices;
- Head protection;
- Eye and face protection;
- Body protection;
- Hand protection;
- Foot protection;
- Safety belts and life lines;
- Protection for electric shock; and
- Respiratory protective equipment.

Operations and Maintenance Written Safety Program. Additional written safety programs would be developed and implemented as necessary to address hazards that are identified with operation and maintenance of MLMDP. These programs would be made components of the overall operations and maintenance injury and illness prevention program for the MLMDP facility. These programs include, but are not limited to, the following:

- Blood-Borne Pathogens Control Program;
- Hazard Communication Program;
- Hearing Conservation Program
- Hazardous Energy Control Program;
- Confined Space Entry Program;
- Safe Work Practices Program;
- Ergonomics Program;
- General Facility Safety Procedures:
  - Compressed Gas Safety Procedures;
  - Heavy Equipment Safety Procedures;
  - Hand Tools and Equipment Guarding Procedures;
  - Hoist and Rigging Safety Procedures;
  - Slips, Trips, and Falls Prevention Procedures; and
  - Hot Work Safety Procedures;
- Fall Protection Program; and
- Contractor Safety Program.

4.11.1.2 Safety Training Programs

To ensure that employees recognize and understand how to protect themselves from hazards that exist at the MLMDP, comprehensive training programs for construction and operations personnel would be

implemented. The following sections provide an overview of the training programs that would be required for workers at MLMDP.

Construction Safety Training Program

Workers participating in the construction phase of the Proposed Action would participate in applicable training programs designed to protect themselves and others from injuries while working at the site. All construction personnel would be required to attend a basic site safety orientation training course. Additional training would be provided to each individual based specifically on their job responsibilities or craft for those requirements where previous satisfactory training cannot be documented. All training courses would be documented and attendance records maintained at a centralized location.

Operation and Maintenance Safety Training Programs

Operations and maintenance employees assigned to the Proposed Action would be given instructions regarding their responsibility for the safe conduct of their work. These instructions would be given at the time the employee is first hired and as an ongoing training program of hazard recognition and avoidance. Employees would also be instructed in the safety procedures pertinent to their employment tasks. Safe working conditions, work practices, and protective equipment requirements would be communicated in the following manner:

- A new, promoted, or transferred employee would receive safety training orientation;
- Safety meetings would be held with employees;
- "Toolbox/tailgate" safety meetings would be conducted periodically for each crew. General safety topics and specific hazards that may be encountered would be discussed. Comments and suggestions from all employees would be encouraged;
- A periodic staff safety meeting would be held for supervisors;
- Hazard communication training, including California Proposition 65 warnings and discharge prohibitions, would be conducted as necessary when new hazardous materials are introduced to the workplace;
- Material safety data sheets would be available as required for all appropriate chemicals;
- A bulletin board with required postings and other information would be maintained at the plant site; and
- Warning signs (e.g., hazardous waste storage area, confined space area) would be posted in hazardous areas that comply with applicable regulations (i.e., bilingual, font size).

Safety training would be provided to each new employee as described below:

- A list of safe work rules for the MLMDP facility would be explained to each new employee;
- A copy of the applicable Safe Work Practices would be given to each new employee. The provisions would be incorporated into training for the qualifications programs so that employees may fully understand what the protective provisions mean;

- The Hazard Co mmunication Program and requirements for personal protection for the types of hazards that may be encountered at the MLMDP facility site would be explained and documented;

- Unusual hazards that are found onsite w ould be explained in detail to each new employee, including any specific requirements for personal protection; and

- Safety requirements for the new e mployee's specific job assignment would be explained by the foreman upon initial assignment and upon any reassignment.

An element of the Operations and Maintenance Sa fety Training Program includes addressing com pliance with contractor safety while on site. Contractors woul d be provi ded with a li st of potential job safet y hazards for their assigned activit y by a forem an, in cluding safety rules, che mical exposure hazards, physical hazards, and personal prot ection equipm ent. Contractors w ould also be invited to attend "tailgate" safety meetings.

4.11.1.3 Fire Protection

The fire sup pression and protection procedures a s th ey pertain to construction and operation of the Proposed Action are presented in Section 4.11.5.1. Section 4.11.5.2 presents a detailed descri ption of fire protection systems that would be installed at MLMDP.

Construction Fire Suppression and Prevention

Onsite Construction Fire Suppression and Prevention. The MLMDP Project would rely o n bo th onsite fire pr otection sy stems and loca l fire protect ion services. The contract or would develop a Fir e Protection and Prevention Plan to be followed thr oughout all phases of construction and w ould provide the specified fire-fighting equipment. The fire pr otection and prevention program would address each of the following requirements:

- General requirements;
- Responsibilities;
- Housekeeping;
- Employee alarm/communication system;
- Portable fire extinguishers;
- Fixed fire fighting equipment;
- Fire control;
- Perimeter fire buffer maintenance;
- Flammable and combustible liquid storage;
- Use and handling of flammable and combustible liquids;
- Dispensing and disposal of flammable and combustible liquids;
- Servicing and refueling areas; and
- Training.

Construction fire preventio n procedures would be de veloped i n a ccordance with applicable regulations (8 CCR, Section 1620 et s eq.) and would be followe d as necessar y to prevent construction-related fires. Special em phasis would be given to op erations invo lving open fl ames, such as welding, metal cutting, and brazing. Hot work per mits would be required for specific activities that pre sent the poten tial for fire and personne l involved in such operations woul d r eceive appropriate training by the contractor. In addition, a fire watch, utilizing the appropriate cla ss of extinguishers or oth er equip ment, would be

maintained during hot work operations. Site personnel would not be expected to fight fires past the incipient stage.

Materials brought on site by contractors must conform to contract requirements, insofar as flame resistance or fireproof characteristics are concerned. Specific materials in this category include fuels, paints, solvents, plastic materials, lumber, paper, boxes, and crating materials. Specific attention would be given to compressed gases and storage of fuels, solvents, and paint.

Elements of the onsite fire suppression system during construction would consist of portable fire extinguishers. Periodic fire prevention inspections would be conducted by the contractor's safety representative.

Fire extinguishers would be inspected monthly and replaced immediately if defective or in need of recharge. All fire-fighting equipment would be located to allow for unobstructed access to the equipment and would be conspicuously marked. Combustible materials would be controlled in covered roll-off dumpsters. Designated, approved flammable materials storage areas and flammable materials storage containers would be provided with adequate fire prevention systems.

Offsite Construction Fire Suppression Support. The MLMDP onsite fire suppression system would be supported by the North County Fire Protection District (NCFPD). The NCFPD would provide backup assistance and support to MLMDP in the event of a construction-related fire. The local fire response units would be provided information regarding the type and location of potential fire hazards at the site. This information would be included in emergency response planning.

Operations Fire Suppression and Prevention

Fire protection at the Proposed Action would include measures relating to safeguarding human life, preventing personnel injury, preserving property, and minimizing down time due to fire or explosion. It would principally involve physical arrangements, such as alarm systems, specific equipment for coal fire suppression and fire extinguishers. Fire protection measures would include measures to prevent the inception of fires. Of concern are adequate exits, fire-safe construction, reduction of ignition sources, and control of fuel sources.

The overall fire prevention and protection program for the facility would be designed and implemented to protect both personnel and property. The program would specifically address:

- Names and/or job titles responsible for maintaining equipment and accumulation of flammable or combustible material control;
- Procedures in the event of fire;
- Fire alarm and protection equipment;
- System and equipment maintenance;
- Perimeter fire buffer maintenance;
- Monthly inspections;
- Annual inspections;
- Fire-fighting demonstrations and training; and
- Housekeeping practices.

4.11.2 Alternative 2

Under this alternative, the project health and safety procedures and plans described above would be implemented. Through the implementation of the Injury and Illness Prevention Programs, Safety

Training, and Fire Protection Plans for both construction and operation, no substantial impacts to health and safety are expected.

4.11.3 No Action Alternative

If the No Action Alternative were implemented, no DOE or private funding would be obtained, and the existing facilitates, operations, and activities at the site would continue. As such, the existing health and safety programs currently being implemented by Calera would still continue, but the project elements would not need to be incorporated into such programs. Under this alternative, the slurry resulting from the Absorption Demonstration Plant that is currently stored in holding tanks on the MLCC site would not be converted to aggregates or cementitious products but would be disposed of in accordance with applicable permits and regulations.

4.11.4 Recommendations

The following recommendations are applicable to the Proposed Action and Alternative 2:

- Before beginning construction activities, Calera would develop a site-specific construction injury and illness prevention program. Once the construction is complete a site-specific injury and illness prevention program for operations and maintenance activities would be implemented.
- Periodic health and safety audits would be conducted by Calera to verify contractor and subcontractor compliance with contractual health and safety obligations.
- A Construction PPE program would be developed, and all Calera and contractor employees would use PPE during construction as specified in the construction PPE program.
- An exposure monitoring program would be developed to evaluate potential employee exposures to hazardous/toxic materials.
- An EAP would be developed specifically for the construction phase of the proposed project. The EAP would designate responsibilities and actions to be taken in the event of an emergency at the site.
- Additional written safety programs that would be established for the construction phase include, but are not limited to: Hazard communication program; Confined space program; Control of hazardous energy program (Lock Out/Tag Out); Hearing conservation program; Respiratory protection program; Blood-borne pathogens control program; Injury and accident reporting and investigation program; Ergonomics program; Emergency response program, including first aid and medical services; Elevated work procedures; Heavy equipment procedures; Hot work procedures; Crane and hoist procedures; Compressed gas and air handling procedures; Subcontractor safety programs; Equipment inspection programs; and Excavation and trenching program.
- On completion of construction and startup of the MLMDP and implementation of routine operations, the construction injury and illness prevention programs would transition into an operations-oriented program that reflect the hazards and controls necessary during routine operations and maintenance of MLMDP. The MLMDP program would reflect any unique hazards specifically associated with maintenance and operation of this facility, and would include: Injury and Illness Prevention Plan, Fire Protection and

Prevention Plan, Emergency Action Plan, Hazardous Material Management Program, and PPE Program.

- Additional written safety programs would be developed and implemented as necessary to address hazards that are identified with operation and maintenance of MLMDP

- To ensure that employees recognize and understand how to protect themselves from hazards that exist at the MLMDP, comprehensive training programs for construction and operations personnel would be implemented, including: Construction Safety Training Program and Operation and Maintenance Safety Training Programs.

- The contractor would develop a Fire Protection and Prevention Plan to be followed throughout all phases of construction and would provide the specified fire-fighting equipment.

4.12 CUMULATIVE IMPACTS

The Council on Environmental Quality defines a cumulative impact as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions…" (40 CFR Part 1508.7). Past, present, and reasonably foreseeable actions were identified based on information from numerous federal, state, and local resources, including the DOE and CEQAnet, a database of all CEQA documents submitted to the California State Clearinghouse, the State Transportation Improvement Program, Monterey County, and Calera.

4.12.1 Past, Present, and Reasonably Foreseeable Future Actions

Past actions in the area include the construction, use, operation, and maintenance of the MLCC site and Moss Landing Energy Facility (including all related utilities and infrastructure); Highway 1, Dolan Road, and other roads in the project vicinity; and nearby commercial, residential, industrial, agricultural, and quasi-public structures. Construction and operation of the Pilot Plant and the Absorption Demonstration Plant are also considered past actions. Ongoing and current projects are limited to use and maintenance of the developed facilities in the project vicinity (e.g., ongoing maintenance of roads, activities at the Absorption Demonstration Plant and those associated with other tenants at the MLCC site). These past and current actions are assumed to have created the existing affected environment, and therefore the impacts of such actions are detailed in Section 3.

Screening criteria were developed to determine which actions would be considered speculative versus "reasonably foreseeable." The criteria included specific projects for which CEQA or NEPA compliance is complete or under way (based on a published notices of intent, other published scoping documents, Findings of No Significant Impact, decision records, or listings in CEQAnet); projects listed in short-range adopted land use or management plans (e.g., roadway projects within the State Transportation Improvement Program); and projects listed in the county's Active Planning Projects and County Approved Projects lists. Also, it was assumed that at least some of the applicants' proposed projects for DOE's Funding Opportunities Announcement for beneficial use of carbon dioxide would be approved and funded, though it is unknown where or which applications would be approved. Identified reasonably foreseeable future projects are listed in Appendix N; they include:

- new residential units, additions, remodels, and other minor residential changes;
- new industrial, commercial, office, mixed use, and open space/parklands;
- new government (public) facilities;
- new alternative energy development;

- new wells;
- renovation of water supply facilities, and water system and sanitation district consolidation;
- modification of exiting commercial and agricultural facilities;
- roadway improvements;
- excavation of contaminated soils;
- habitat/wildlife research and management activities (e.g., new research facilities, monitoring, wetland and habitat restoration); and
- demolition and removal of existing residential and accessory structures.

4.12.2 Cumulative Impact Analysis

The potential cumulative impacts of each alternative to the resource are as are discussed below. If an alternative would have no or negligible direct or indirect impacts to a resource, that alternative is assumed to not contribute to any cumulative impact on that resource and the resource topic relative that alternative is not discussed further in this section. Therefore, the No Action Alternative, which would have no impacts to atmospheric conditions/air quality, water quality/quantity/hydrologic conditions, solid and hazardous waste, land use, noise, historic/cultural resources, visual resources, and socioeconomic conditions, would not contribute to any cumulative impact to these resources. Similarly, as none of the alternatives would result in impacts to floodplains, wetlands, geologic/soil conditions, or ecology, they would not contribute to any cumulative impact to these resources.

4.12.2.1 Atmospheric Conditions/Air Quality

For air quality purposes, the airshed (or region sharing a common flow of air that is often used to establish an air quality management area) is the appropriate boundary for a cumulative air quality assessment. Generally, the actions occurring within a range of about 3 miles of the Proposed Action sufficiently address effects that may cumulatively have an impact on air quality. Activities affecting air quality in the region include, but are not limited to, mobile sources and stationary sources, manufacturing operations and other industries. Construction projects in the vicinity, together with either the Proposed Action or Alternative 2, would result in ground disturbance that would contribute to fugitive dust emissions. The implementation of BMPs to control construction-related dust would minimize these types of short-term cumulative effects. Some of the actions in the project vicinity would bring more traffic to the area; however there are also transportation improvements that help to offset vehicular emissions. In addition, these projects were accounted for in the Regional Transportation Plan and the Air Quality Management Plan (AQMP).

As previously described, implementing both the Proposed Action and Alternative 2 would result in the emission of pollutants on both local and regional scales; however, no adverse air quality impacts were identified. These alternatives would conform to the state implementation plan and would not trigger a conformity determination under Section 176(c) of the Clean Air Act by virtue of being in a federal attainment area for all criteria pollutants. Furthermore, as of the preparation date of this section of the Environmental Information Volume, there is uncertainty as to which of the other projects named above would actually be developed and on what schedules. It is anticipated, however that both the Moss Landing Absorption Demonstration Plant and the Moss Landing Pilot Plant would operate coincidently with the Proposed Action. These two projects have already been permitted by the MBUAPCD. They are therefore accommodated in the AQMP.

Funding of the construction and operation of several beneficial use of carbon dioxide projects, by the DOE, may lead to full development of these resources and, as a result, cumulative long-term reduction in carbon dioxide emissions released into the atmosphere in the United States.

4.12.2.2 Water Quality/Quantity/Hydrologic Conditions

Under both the Proposed Action and Alternative 2, water supply for the project would be provided primarily by groundwater, and to a lesser extent by seawater. During operation, the peak daily water demand from groundwater is expected to be approximately 350 gpm, which is the same amount of groundwater that is currently used. The California Coastal Commission considers the North Monterey County to be in overdraft and that there should be no net increase in groundwater use. Since the groundwater demand would remain the same, neither the Proposed Action nor Alternative 2 would contribute to a cumulative impact to groundwater.

4.12.2.3 Solid and Hazardous Waste

Reasonably foreseeable projects include residential, utility, and industrial projects, including a temporary pilot desalination facility at the Moss Landing Commercial Park; the proposed modification of an existing commercial fishing facility west of the project site; remedial activities including contaminated soil excavation within portions of the Moss Landing Commercial Park site and on the Moss Landing Energy Facility site to the north; vehicle dismantling and sales east of the project site; research facilities for Monetary Bay Aquarium west of the site; and an agricultural cold storage facility north of the site. The Proposed Action or Alternative 2 would only generate larger volumes of nonhazardous solid waste during construction activities and only minor amounts of nonhazardous solid waste during operation. To the extent possible, nonhazardous solid wastes would be recycled and would have no impact on landfill capacities. As such, when analyzed with reasonably foreseeable future projects, these alternatives would only have a small incremental contribution to the overall impact of the generation and disposal of solid waste from reasonably foreseeable projects. The Proposed Action or Alternative 2 would only generate very small quantities of potential hazardous waste in the form of Universal Wastes. When analyzed with reasonably foreseeable future projects, these alternatives would have a negligible contribution to the overall impact of the generation and disposal of hazardous solid waste from reasonably foreseeable projects.

4.12.2.4 Land Use

Reasonably foreseeable projects include residential development projects such as new residential units, additions, remodels, and other minor changes. There are several applications for subdivisions in the surrounding communities, including in Royal Oaks. Reasonably foreseeable projects also include construction of wells and well replacements in addition to habitat restoration projects. Proposed or planned projects within the project vicinity that are generally of an industrial nature include: a temporary pilot desalination facility, the proposed modification of existing commercial fishing facility west of the project site, contaminated soil excavation and remediation on the site to the north, vehicle dismantling and sales east of the project site, research facilities for Monetary Bay Aquarium west of the site, and an agricultural cold storage facility north of the site. Neither the Proposed Action nor Alternative 2 would conflict with the Moss Landing Marine Laboratories Draft Development Plan—created by the laboratory for expansion and modification of its facilities, a few which are as close as approximately 0.5 mile from the MLCC site (Moss Landing Marine Laboratories, 2008). These facilities would not be affected by the incremental increase in additional industrial uses on the MLCC site that would result from either action alternative. Neither the Proposed Action nor Alternative 2 would substantially alter present or planned land uses of the site and surrounding areas. Furthermore, the proposed uses are consistent with adopted plans and would not alter future anticipated uses in the area. Therefore, the alternatives, when analyzed with reasonably foreseeable future projects, would not contribute to cumulative impact to land use.

4.12.2.5 Noise

Monterey County has approved projects, including multiple residential development permits, throughout the County that would include new residential units, additions, remodels and other minor changes. These projects are subject to the noise standards found in the Noise Element of the Monterey County General Plan as well as the standards found in the Monterey County Noise Ordinance. Since all projects in the County would need to comply with local regulations, no substantial cumulative noise impacts would be expected with implementation of the Proposed Action or Alternative 2.

4.12.2.6 Historic/Cultural Resources

Along with other past, present, and reasonably foreseeable future actions at the site, the Proposed Action and Alternative 2 could contribute to cumulative impacts to cultural resources. The ongoing modifications, use, and improvements to the project site would continue to alter historic and potentially significant cultural resources. However, the additional cultural resources studies that would be conducted as part of these alternatives would determine if the existing facilities constitute a significant cultural resources site and if so, would also document appropriate testing and/or mitigation. Disturbance associated with both of these alternatives is minimal and, therefore, it is anticipated that implementation of either action alternative would result in a minor contribution to cumulative impacts to cultural resources in the study area.

4.12.2.7 Visual Resources

The Proposed Action and Alternative 2 would both add a minor incremental contribution to the existing industrial character of the Moss Landing Community. The three silos may be intermittently visible from Highway 1 and Dolan Road, depending on specific site layout and placement. However, the silos and other components of the proposed project would be compatible with the existing buildings and accessory structures and facilities on the MLCC site. The additional lighting associated with the proposed project would have a minimal contribution to nighttime glare.

Proposed or planned projects within the project vicinity that are, or may also be, of an industrial nature include: temporary pilot desalination facility, the proposed modification of existing commercial fishing facility west of the project site, contaminated soil excavation and remediation on the site to the north, vehicle dismantling and sales east of the project site, research facilities for Monetary Bay Aquarium west of the site, and an agricultural cold storage facility north of the site. Additionally, according to the County, a proposed 70,000-square-foot industrial warehouse to replace demolished facilities is proposed in the immediate vicinity of the project site. All reasonably foreseeable future projects would comply with local ordinances regarding visual resources and, therefore, neither the Proposed Action nor Alternative 2, when considered along with other planned or anticipated projects in the Moss Landing area would contribute to a substantial cumulative impact to visual resource impacts.

4.12.2.8 Socioeconomic Conditions

Neither the Proposed Action nor Alternative 2 would result in substantial socioeconomic impacts; therefore, when considered along with other past, present and reasonably foreseeable actions in the project vicinity, these alternatives would not contribute to cumulative impacts. Additionally, both the Proposed Action and Alternative 2 would be primarily staffed by workers within commuting distance and would result in only an incremental increase of workers (temporary and permanent) to the area. Because of the availability of local labor, these alternatives would not result in adverse cumulative impacts to public services or housing.

4.12.2.9 Health and Safety Factors

Past, present, and reasonably foreseeable future industrial projects within Monterey County would be subject to Cal/OSHA regulations for construction and operation. Since these projects would need to comply with Cal/OSHA, no substantial cumulative health and safety impacts would be expected with implementation of any of the considered alternatives.

4.13 IMPACTS ON REGIONAL OR LOCAL PLANS

An analysis was undertaken to identify potential impacts to applicable regional or local plans associated with the implementation of the MLMDP, including the 1982 Monterey County General Plan, the North County Land Use Plan, the Monterey County Coastal Implementation Plan, and the Monterey County Zoning Ordinance. Consistency with these regional or local plans is discussed within the specific environmental resource sections of this chapter. In summary, the MLMDP is not expected to conflict with applicable provisions of regional and local plans with the implementation of appropriate best management practices and mitigation measures.

The use of resources is also discussed within applicable environmental resource sections of this chapter. The proposed project involves establishing a demonstration scale of Calera's back-end process that would create beneficial resources from carbon dioxide captured from a slip stream of power plant flue gas in Calera's front-end process. Calera is committed to the sustainable use of resources and maximizes opportunities to reuse and recycle resources, including water and waste. Resource consumption is minimized wherever possible, and Calera's goals include aiming to achieve zero liquid discharge.

5.0 POTENTIAL LIABILITY TO DOE OF EXISTING CONDITIONS AT THE SITE

This section reviews potential liabilities related to the project and lands proposed for use in the demonstration project. The conclusions in this section were based solely on a visual review, readily available records, interviews, and other secondary sources. No independent investigation of the accuracy of these secondary sources has been completed.

Calera leases the land on which the existing facility is located from the Moss Landing Commercial Park and has an option to lease all remaining areas proposed for new project components. Calera's lease is for a period of 15 years, ending in 2023. The terms of the lease purport to hold Calera harmless for environmental releases that may have occurred at the site during prior use of the land by Moss Landing Commercial Park and its predecessors. Based on information provided, there are no judgments or suits filed against Calera, and no known obligations would be transferred to the DOE as a result of its funding of the proposed project. Furthermore, Calera would agree to a hold harmless clause in agreements with DOE pertaining to the proposed project.

Although not directly applicable to the MLCC site, there are two other items relevant to the Moss Landing Commercial Park, specifically regarding land use permits and hazardous materials.

5.1 LAND USE PERMITS

In October 2009, Monterey County issued a Coastal Administrative Permit (CAP) for Calera's existing operations located within the northwest portion of the Moss Landing Commercial Park. The proposed project is expected to require modification of this permit, a new Coastal Development Permit, or General Development Plan (although the requirement for a General Development Plan was waived in the October 2009 CAP for Calera's existing operations). Prior to Calera's CAP application for its existing operations, the landowner of the project site (Moss Landing Commercial Park) applied for a separate General Development Plan to address future development of the entire overall Moss Landing Commercial Park, including areas outside the project site. Calera understands that the County's approval of this General Development Plan was appealed and that a decision on the overall Moss Landing Commercial Park project is still pending. However, this appeal process for the overall Moss Landing Commercial Park did not prevent the issuance of the 2009 CAP for Calera's existing operations. Monterey County's findings in the 2009 CAP indicated that Calera's use of the site would be consistent with the historic use of the property for a brick refractory. Calera anticipates that similar findings would be made for the Moss Landing Materials Demonstration Project**.**

5.2 HAZARDOUS MATERIALS

The Moss Landing Commercial Park was once the location of the Kaiser Aluminum & Chemical Corporation and National Refractories, where magnesium metal was produced. After World War II, the site was converted to produce magnesium oxide for refractory bricks and specialties. This production continued until 1991, although the plant continued to produce magnesia products until 1999. Historically, portions of the commercial park east of the MLCC site also contained stockpiles of chromite maintained by the United States for its strategic value. Based on the historic industrial nature of the site, there is potential for hazardous materials to be present. Although much information regarding hazardous materials is not part of the readily available public record, some information was obtained from agency databases, interviews with Calera staff, and preliminary site reconnaissance. Calera is also in the process of conducting searches for additional site related information.

Anecdotal information suggests that the northeast area of the site, proposed for potential aggregate lay down and processing may be a capped landfill from past site use. No information confirming this past

use, or providing details of potential contents was available. Calera proposes to further cap the area and install stormwater and drainage collection systems, to ensure that no water permeates into the area and subsequently leaches into the subsurface (e.g., soil and groundwater). The materials Calera would process at this site would essentially be inert, and would therefore not exacerbate an existing condition.

Based on information available from the California Regional Water Quality Control Board, the stockpiles of chromite have been removed from the site. However, residual material had mixed with soil at concentrations above site background levels. Therefore, the United Sates Government (i.e., Defense National Stockpile Center) has submitted a document outlining its proposal to remove residual chromite and restore the site. No information is available to confirm if this clean up has been completed. However, these stockpiles are understood to have been located on portions of the commercial park east of the MLCC site.

A check of the U.S. Environmental Protection Agency Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database revealed one listing for Moss Landing, California (U.S. EPA ID CAN000906003). This was for a study of a tank fire at the Duke Energy Power Plant across the highway from the Calera facility. The result of the study was that the tank fire does not warrant further consideration under the Comprehensive Environmental Response and Compensation Liability Act (CERCLA). The CERCLIS database was also searched for all sites within Monterey County. Seven sites were found in addition to the Duke Energy Tank Fire listing. None of the seven additional sites are near the existing or proposed Calera facilities. Therefore, based on the data provided to URS, as well as the readily available public record, there are no known outstanding obligations under CERCLA regarding the MLCC project site.

6.0 ABILITY TO MEET COMPLIANCE REQUIREMENTS AT THE SITE

Implementation of either the Proposed Action or Alternative 2 would require compliance with various local, state, and federal laws. However, the Proposed Action is the only alternative under which federal funds would be obtained. Therefore, additional laws and executive orders may apply to this alternative. Table 6-1 lists the compliance requirements for the action alternatives. Implementation of either the Proposed Action or Alternative 2 is anticipated to require compliance with the California Environmental Quality Act (CEQA). CEQA requires state and local agencies to disclose and consider the implications of their actions and, when feasible, to avoid or reduce the significant environmental impacts of their decisions. Because the No Action alternative would maintain the status quo, no additional regulatory requirements would be required. Therefore, this alternative is not presented in Table 6-1.

Table 6-1
Compliance Requirements

Law/Regulation	Proposed Action	Alternative 2
Advisory Council on Historic Preservation: Protection of Historic and Cultural Properties, Amendments to Existing Regulations, January 30, 1979; 36 C.F.R. 800 and C.F.R. 60	X	
Alquist-Priolo Earthquake Fault Zoning Act (CCR § 2621 et seq.)	X	X
American Indian Religious Freedom Joint Resolution of 1978	X	
American National Standards Institute/American Society for Mechanical Engineers Boiler and Pressure Vessel Code	X X	
Antiquities Act of 1906	X	
Archaeological and Historical Preservation Act of 1974	X	
Archaeological Resources Protection Act of 1979	X	
California Building Standards Code, CCR Title 24	X	X
California Clean Air Act	X	X
California Coastal Act § 30251, Scenic and Visual Qualities (2009)	X	X
California Code of Regulations, Title 22	X	X
California Endangered Species Act of 1984; California Fish & Game Code §§ 2050-2098	X	X
California Environmental Quality Act (CEQA); PRC § 21000 et seq.	X	X
California Fire Code	X X	
California Fish and Game Code, Fully Protected Species, Significant Natural Areas, Designated Ecological Reserves	X X	
California Fish and Game Code § 1600, Streambed Alteration Agreement	X	X
California Government Code § 65302(g)	X	X
California Hazardous Waste Control Law	X	X
California Integrated Waste Management Act	X	X
California Occupational Safety and Health Act 1973	X	X
California Species Preservation Act; California Fish and Game Code § 900-903	X	X
California Water Code § 461 and SWRCB Resolution 77-1	X	X
CDFG Policies and Guidelines, Wetlands Resources Policy	X	X
Clean Air Act	X	

Table 6-1
Compliance Requirements (Continued)

Law/Regulation	Proposed Action	Alternative 2
Clean Water Act of 1977 § 401 et seq.	X	X
Clean Water Act § 402	X	X
Clean Water Act § 404; 33 USC § 1251-1376; 30 CFR § 330.5(a)(26)	X	X
Cobey-Alquist Flood Plain Management Act	X	X
Endangered Species Act; 16 USC § 1531 et seq.; 50 CFR Parts 17 and 222	X	X
Executive Order 11593, Projection and Enhancement of the Cultural Environment (May 13, 1971)	X	
Executive Order 11988, Floodplain Management	X	
Executive Order 11990, Protection of Wetlands (May 24, 1977)	X	
Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations	X	
Federal National Flood Insurance Program	X	X
Fish and Wildlife Coordinating Act, Section 7; 16 USC 742 et seq.; 16 USC 1531 et seq.; and 50 CFR 17	X	
Flood Disaster Protection Act	X	X
Historic Sites Act of 1935	X	
Information on Levels of Environmental Noise Requisite to Protect Health and Welfare with an Adequate Margin of Safety	X X	
Migratory Bird Treaty Act, 16 USC § 703-711; 50 CFR Subchapter B	X	X
Monterey Bay Unified Air Pollution Control District Regulation II, Permits, Rule 200	X	X
Monterey Bay Unified Air Pollution Control District Regulation II, Permits, Rule 207	X	X
Monterey Bay Unified Air Pollution Control District Regulation IV, Prohibitions, Rules 400, 402, 403, 404, and 412, Visible Emissions, Nuisances, Particulate Matter, Sulfur Compounds and Nitrogen Oxides, and Sulfur Content of Fuels	X X	
Monterey County Coastal Implementation Plan Part I, Title 20 Zoning Ordinance, § 20.28.070, Site Development Standards (Monterey County 2000)	X	X
Monterey County Coastal Implementation Plan Part I, Title 20 Zoning Ordinance, § 20.28.080, Special Regulations (Monterey County 2000)	X	X
Monterey County Coastal Implementation Plan Part 2, Development Standards: § 20.144.030, Visual Resources Development Standards	X	X
Monterey County General Plan	X	X
Monterey County Health Department Ordinances	X	X
Monterey County Municipal Code, Chapter 16.08, Grading Ordinance	X X	
Monterey County Municipal Code, Chapter 16.12, Erosion Control	X	X
Monterey County Municipal Code, Chapter 16.16, Development of Floodplains	X	X
Monterey County Municipal Code, Chapter 16.60, Preservation of Oak Trees and Other Protected Trees	X	X
Monterey Peninsula Water Management District Ordinances	X	X
Moss Landing Community Development Standards § 20.144.160	X	X
Moss Landing Community Plan Policy 5.5.2.2, Master Plan Requirements	X	X

Table 6-1
Compliance Requirements (Continued)

Law/Regulation	Proposed Action	Alternative 2
National Environmental Policy Act of 1969	X	
National Historic Preservation Act of 1966	X	
National Register of Historic Places, Nominations by States and Federal Agencies, Rules and Regulations, January 9, 1976	X	
Native American Graves Protection and Repatriation Act of 1990	X	
Native Plant Protection Act of 1977; California Fish and Game Code § 1900 et seq.	X	X
Noise Control Act of 1972 (42 U.S.C. 4910)	X	
North County Coastal Implementation Plan § 20.144.140, Land Use and Development Standards	X X	
North County Land Use Plan (NCLUP) Local Coastal Program	X	X
Occupational Safely and Health Act	X	X
OSHA Occupational Noise Exposure: Hearing Conservation Amendment (FR 48 [46] 9738–9785 [1983]).	X X	
OSHA Safety and Health Regulations for Construction	X	X
Porter-Cologne Water Quality Control Act (California Water Code § 13000 et seq.)	X	X
Reservoir Salvage Act of 1960	X	
Resource Conservation and Recovery Act	X	X
Revisions to 36 C.F.R. 800 (Protection of Historic Properties, January 10, 1986)	X	
Rivers and Harbors Act § 10	X	X
Senate Bill 18 (Government Code § 65352.3)	X	X
Safe Drinking Water and Toxic Enforcement Act	X	X
Seismic Hazards Mapping Act (Public Resources Code §§ 2690–2699.6)	X	X
State Housing Element Law (Government Code Article 10.6, §§ 65580–65590)	X	X
Surface Mining and Reclamation Act of 1975 (SMARA)	X	X
SWRCB Water Quality Orders	X	X
Title VI of the Civil Rights Act of 1964	X	
Uniform Relocation Assistance and Real Property Acquisition Act of 1970	X	
49 C.F.R. Parts 172 and 173	X	X

Notes:
ATC = authority to construct
CCR = California Code of Regulations
CDFG = California Department of Fish and Game
CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act
C.F.R. = Code of Federal Regulations
DOE = Department of Energy
FR = Federal Register
MBUAPCD = Monterey Bay Unified Air Pollution Control District
OSHA = Occupational Safety and Health Administration
RCRA = Resource Conservation and Recovery Act of 1976
SWRCB = State Water Resources Control Board
U.S.C. = U.S. Code

7.0 AGENCIES AND PERSONS CONTACTED

The following agencies, organizations, and persons were contacted and/or consulted as part of the EIV analysis. In some instances, contact was limited to databases or files accessible over the internet, in other cases, correspondence with agency or organizational staff was competed:

- California Department of Fish and Game
- California Native American Heritage Commission
- Central Coast Regional Water Quality Control Board
- Department of Toxic Substances Control
- Monterey County Environmental Health Division Administration
- North County Fire Protection District
- Northwest Information Center of the California Historical Resources Information System
- U.S. Census Bureau

Additional agency coordination would be required if either the Proposed Action or Alternative 2 were implemented, as part of the NEPA, CEQA, and permitting processes. Involved agencies may include the following:

- California Department of Fish and Game
- California Occupational Safety and Health Commission
- Central Coast Regional Water Quality Control Board
- Monterey Bay Unified Air Pollution Control District
- Monterey County
- Monterey Peninsula Water Management District
- Native American Tribes
- California Environmental Protection Agency
- State Historic Preservation Officer
- U.S. Fish and Wildlife Service
- U.S. Army Corps of Engineers

8.0 EXPERIENCE AND APPROACH TO THE IDENTIFICATION AND RESOLUTION OF ENVIRONMENTAL ISSUES

Calera has prepared an Environmental Management Plan (EMP) in conjunction with this Environmental Information Volume; refer to the *Moss Landing Materials Demonstration Plant Environmental Management Plan*. The EMP documents Calera's environmental philosophy and previous experience with identifying, addressing, and resolving environmental issues. The EMP also lists current and proposed environmental policies, procedures, and plans—including best management practices, training, and permits—as well as specific permits, plans, and measures that would be required for project implementation. Calera has identified key personnel whose experience and training provide them with the qualifications required to implement the EMP. Refer to *Section 4.1 Key Personnel* of the EMP for a description of responsibilities of the key personnel and their education, training, and experience related to environmental permitting and implementation.

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APPENDIX A
DETAILED PROJECT DESCRIPTION

1.0 INTRODUCTION AND PROJECT OVERVIEW

The Calera Corporation (Calera) is proposing a research-and-development facility for beneficial carbon dioxide use to be called the Moss Landing Materials Demonstration Plant (MLMDP or project). The facility would test and optimize aggregates and cementitious products that are created through an innovative process of mineralizing carbon dioxide from power plant flue gas. The MLMDP would be operated by the Moss Landing Cement Company (MLCC), which is a special-purpose entity company wholly owned by Calera. The project location would be in Moss Landing in unincorporated Monterey County, California, as shown on Figure A-1.

The MLCC currently operates a pilot plant at Moss Landing (the Pilot Plant) that encompasses the complete process of the absorption of carbon dioxide and the creation of aggregates and cementitious products. The Pilot Plant is scaled at 1:1,000 to a commercial plant.

The MLCC also currently operates a demonstration plant at the site that is referred to as the Moss Landing Absorption Demonstration Plant (Absorption Demonstration Plant), which consists of the first (front-end) stage of Calera's process scaled at 1:100 to a commercial plant. The existing Absorption Demonstration Plant captures carbon dioxide from a slip stream of flue gas produced by the adjacent Moss Landing Energy Facility natural gas–fired combined-cycle power plant. The Absorption Demonstration Plant uses a source of base/high-alkalinity material plus calcium and/or other divalent cations to capture and convert the carbon dioxide into solid carbonates.

Calera has requested U.S. Department of Energy (DOE) Phase 2 funding under the Innovative Concepts for Beneficial Reuse of Carbon Dioxide program for detailed design, construction, and operation of the MLMDP. The MLMDP is the second (back-end) stage of Calera's two-part carbonate mineralization process. Product slurry produced in the Absorption Demonstration Plant would be received by the proposed MLMDP and would be converted into aggregates and cementitious products. These beneficialuse products would be tested and optimized to maximize their marketability and value. Calera would use the information it gathers during the MLMDP project to scale up the full carbonate mineralization technology to commercial scale at other locations. The aggregates and cementitious products that would be generated at the commercial scale through the use of Calera's process are expected to be sold for use in the construction industry. A commercial-scale plant is not part of this project. The Absorption Demonstration Plant and the MLMDP are collectively referred to as the Moss Landing Demonstration Plant.

This project description provides further details regarding the Moss Landing Demonstration Plant.

1.1 LOCATION

The project site is in an industrial area on the east side of Highway 1, 10.6 miles northwest of Salinas and 2.3 miles northwest of Castroville within the Bolsa Nueva Y Moro Cojo Spanish Land Grant, Township 13 South, Range 2 East, as depicted on the "Moss Landing Calif." U.S. Geological Survey topographic quadrangle map (see Figure A-2).

The area of the project site is approximately 42 acres and consists of a portion of Assessor's Parcel Number 133-172-013-000 (see Figure A-3). Adjacent land uses include Dolan Road and the Moss Landing Energy Facility to the north; undeveloped land to the east; Moro Cojo Slough and undeveloped land to the south; and Highway 1, a marina, and commercial uses to the west. The Moss Landing State Wildlife Area and the Elkhorn Slough National Estuarine Sanctuary are approximately 0.5 mile northeast of the project site.

U:\GIS\Calera\Projects\vicinitymap_A2.mxd - 5/12/2010 @ 8:38:29 AM

Source: Hillshade, USGS, 2001; State parks, Cal State Parks - Acquisition and Development Division, 2009; USFWS Lands, USFWS, Region 1, Division of Refuge Planning, 2004; USDA, 2009; Roads, communities and streams, ESRI, 2005.

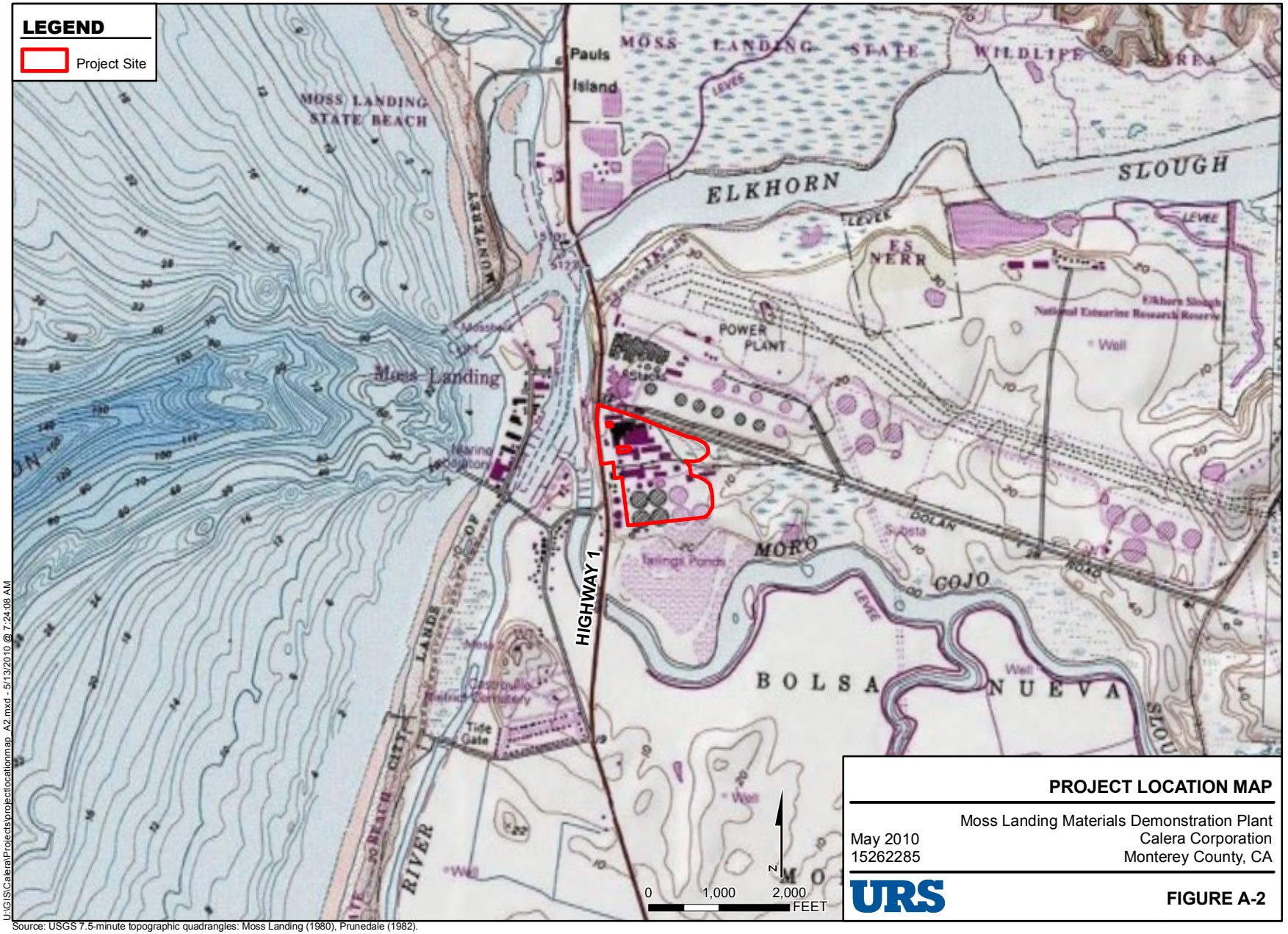
PROJECT VICINITY

Moss Landing Materials Demonstration Plant
Calera Corporation
Monterey County, CA

May 2010
15262285

URS

FIGURE A-1



PROJECT LOCATION MAP

Moss Landing Materials Demonstration Plant
May 2010 — Calera Corporation
15262285 — Monterey County, CA

URS

FIGURE A-2

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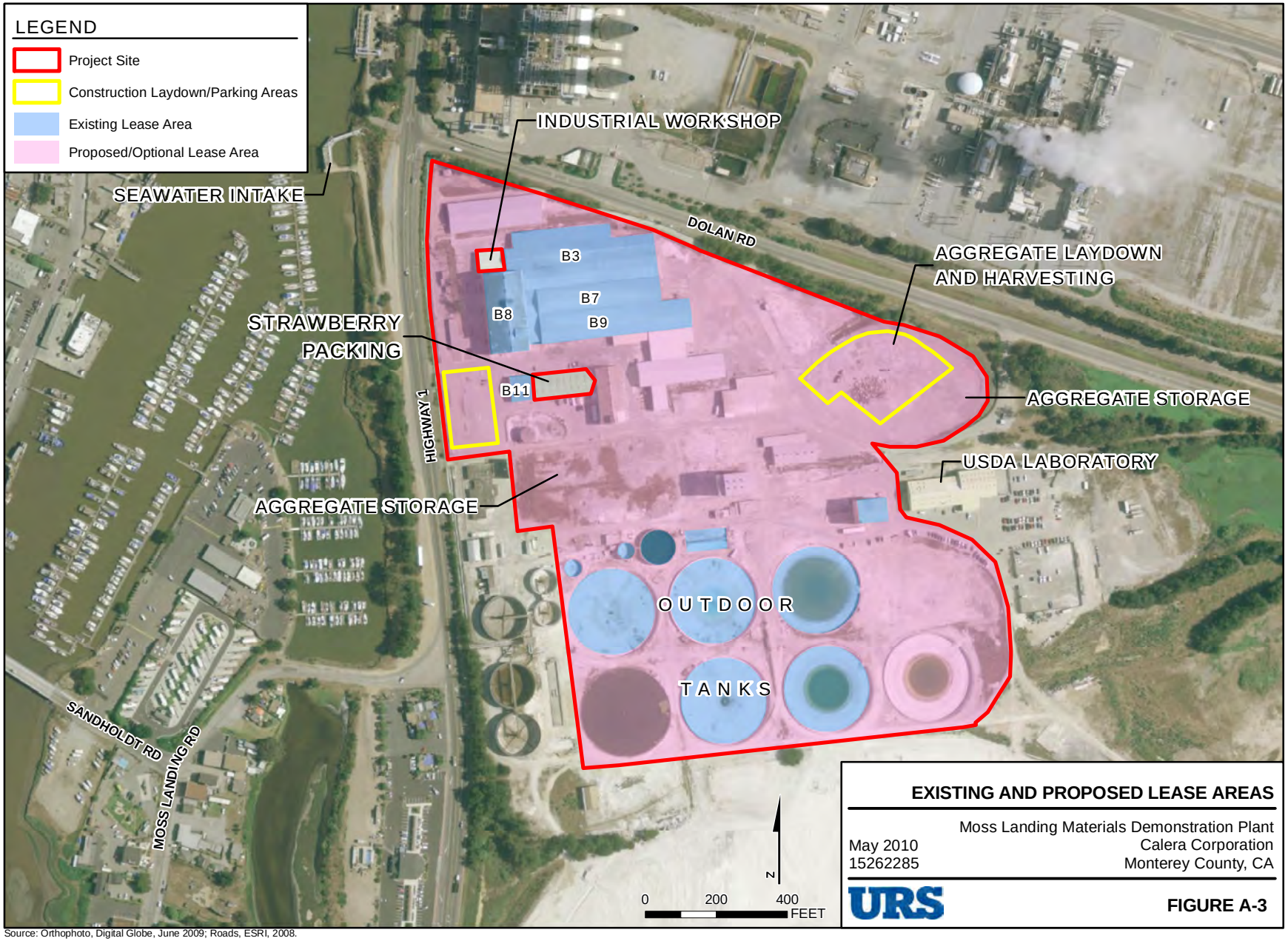
Source: USGS 7.5-minute topographic quadrangles: Moss Landing (1980), Prunedale (1982).



EXISTING AND PROPOSED LEASE AREAS

Moss Landing Materials Demonstration Plant
May 2010 — Calera Corporation
15262285 — Monterey County, CA

URS

FIGURE A-3

Source: Orthophoto, Digital Globe, June 2009; Roads, ESRI, 2008.

1.2 PROJECT OWNERSHIP

Calera proposes to own and operate the MLMDP facilities, which would be built on the 42-acre project site, as defined above. The site is leased from the site owner: Moss Landing Commercial Park. Moss Landing Commercial Park is not affiliated with Calera. Moss Landing Commercial Park owns an existing groundwater supply well that is approximately 2 miles east of the project site, an existing seawater intake and outfall, and the pipelines associated with the well and intake/outfall. MLCC owns an existing 2,718-foot pipeline that conveys flue gas from the adjacent Moss Landing Energy Facility to the MLCC site.

2.0 CALERA'S EXISTING SITE ACTIVITIES

Features and activities associated with the Pilot Plant and the Absorption Demonstration Plant are described below. Both of these facilities currently exist at the site and are operational. No modifications or alterations to these features and activities are proposed, and continued operations are not part of the proposed project. Calera also operates an Electrochemical Pilot Plant at the MLCC. However, these facilities are not part of the Proposed Action and information discussed here is intended to provide an overview of current activities and to allow a more comprehensive understanding of the proposed project.

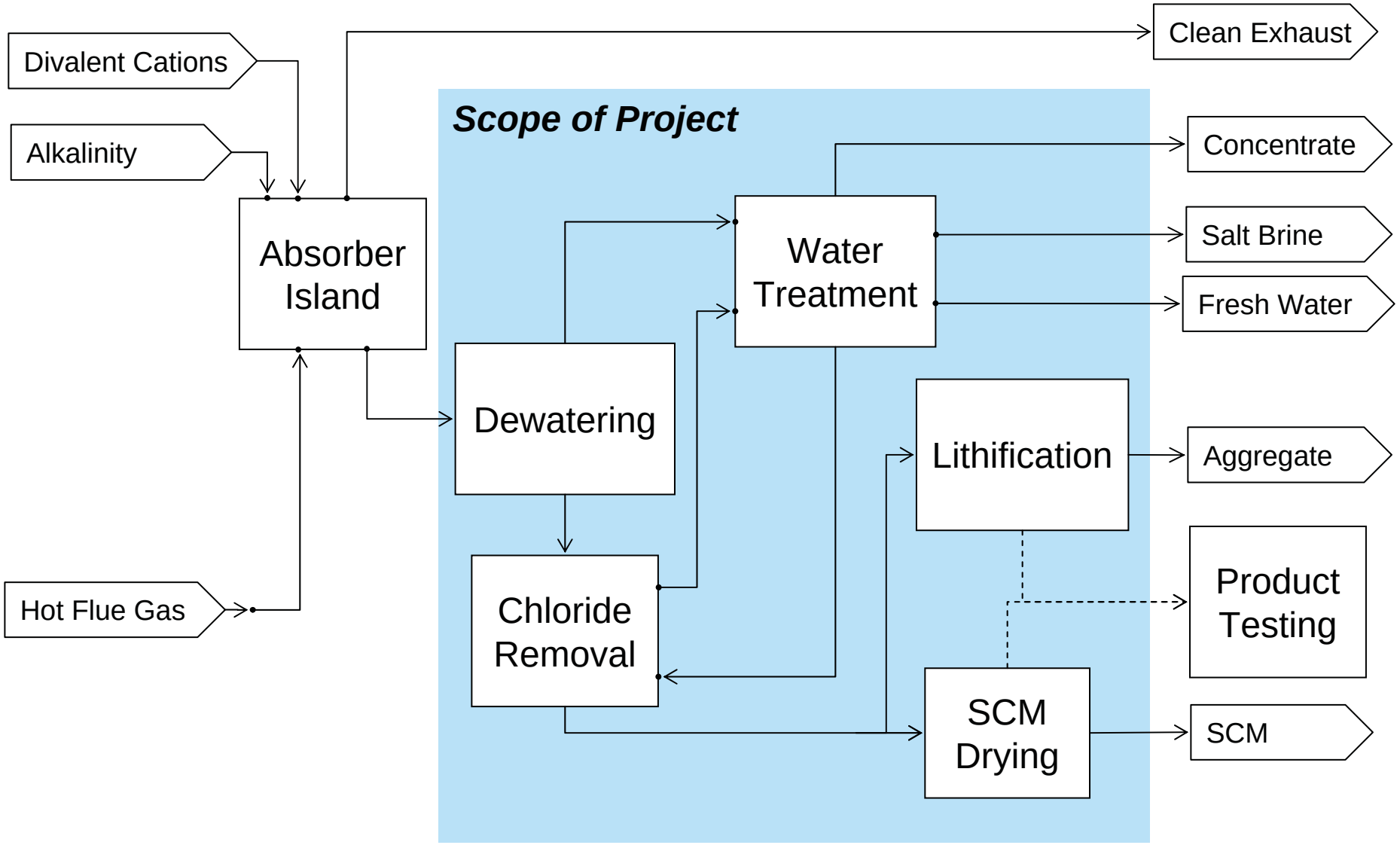
2.1 MOSS LANDING ABSORPTION DEMONSTRATION PLANT

2.1.1 Process Description

A simplified block flow diagram of the process is shown on Figure A-4.
Two flue stacks at the adjacent Moss Landing Energy Facility are tapped such that flue gas can be taken from either flue stack or simultaneously from both. Under an existing agreement with the owners of the Moss Landing Energy Facility, Calera can obtain up to 25,000 standard cubic feet per minute (scfm) of flue gas. Flue gas leaves the Moss Landing Energy Facility at approximately 175 to 200 degrees Fahrenheit (°F) through a 36-inch-diameter, 2,718-foot-long, uninsulated carbon steel pipe. The pipe passes under Dolan Road, which separates the Moss Landing Energy Facility from the MLCC site. A forced draft centrifugal fan is used to pull the flue gas from the Moss Landing Energy Facility through the pipe to the Absorption Demonstration Plant. The fan uses a variable frequency drive (VFD) and a vent to control the flow rate. Condensate is collected from the cooling of the flue gas in the pipe on both sides of the road.
Under the agreement, condensate collected on the north side of Dolan Road is transported to MLCC; condensate collected on the south side of Dolan Road is transported to MLCC's Pilot Plant drain tank.

The 20,000 scfm of gas entering the process has been calculated to contain 2.66 ton/hr of CO2. In addition, the flue gas entering the process contains 0.31 lb/hr of NOX, 0.008 lb/hr of CO, and 0.003 lb/hr of SOX.

There is approximately 300 feet of additional pipe between the centrifugal fan and the absorber column (Absorber), which is the major component of the Absorption Demonstration Plant process. Flue gas enters the Absorber at approximately 70 to 110°F, depending on ambient temperature and flue gas flow rate. The Absorber scrubs the flue gas to remove carbon dioxide by absorbing it into scrubbing liquid slurry. The scrubbing liquid contains one or more divalent cation metals (e.g., calcium) either dissolved or as a finely divided suspended solid. The scrubbing liquid also contains a base source of high pH (e.g., sodium hydroxide). Currently, calcium hydroxide and/or calcium chloride is being used as the divalent cation source and sodium hydroxide and/or calcium hydroxide as the base source; these are typically mixed with freshwater to form the scrubbing liquid, although seawater is periodically used in accordance with existing permits. These chemicals are used to model fly ash, cement kiln dust, and calcium hardness of brines that may be used for commercial operation of Calera's technology at other locations in the



BLOCK FLOW DIAGRAM

Moss Landing Materials Demonstration Plant
May 2010 — Calera Corporation
15262285 — Monterey County, CA

URS

FIGURE A-4

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future. The range of chemicals used in the Absorption Demonstration Plant process is anticipated to be expanded to include sodium carbonate and other compounds found in subsurface water reservoirs; chemicals representative of naturally occurring hard and alkaline brines that are to be used in commercial operations including calcium chloride, calcium hydroxide, sodium hydroxide, sodium chloride, sodium carbonate and sodium borate. Calera may also use power plant fly ash for part of the scrubbing reagent requirement.

Solid calcium hydroxide (93.5 percent purity with the balance being mainly calcium carbonate) is currently delivered by truck to the MLCC site. The calcium hydroxide is mixed with freshwater in the 120,000-gallon-capacity base mixing sump, which is in an outdoor open tank. Seawater is also periodically used in accordance with existing permits. The capability to add supernatant (the water phase from the Epuramat solids-water separator [Epuramat] that is described below) is to be installed at a later date as part of the Absorption Demonstration Plant.

The liquid in the base mixing sump is circulated through a turbolizer that combines the solid calcium hydroxide with slurry. Agitators and pumps keep the slurry well mixed. The slurry is then pumped to the base mixing tank—an existing outdoor 140,000-gallon open tank. Agitators are used to keep the contents of the tank well mixed. In the base mixing tank, liquid (currently filtered seawater, but also eventually supernatant) can be added to maintain the weight content of the calcium hydroxide slurry (i.e., approximately 6 wt% calcium hydroxide solids). Slurry is pumped from the base mixing tank to a 10,000-gallon-capacity base surge tank.

In another configuration, the alkalinity source is sodium hydroxide (NaOH) (50 percent by weight), which is diluted with recirculated process water to create synthetic alkaline brine; 7.0 tons per hour (ton/hr) (dry basis) of NaOH is used in the process. The calcium source is calcium chloride ($CaCl_2$), which is provided as either solid calcium chloride or a 35 wt% solution. This solution is diluted with recirculated process water to create synthetic hard brine; 7.6 ton/hr (dry basis) of $CaCl_2$ would be used in the process.

Diluted sodium hydroxide is fed to the base surge tank from one of the two caustic dilution tanks to provide a source of base for the absorption of carbon dioxide. The diluted sodium hydroxide solution is made by combining 50 wt% sodium hydroxide solution (which is stored in two 6,500-gallon-capacity tanks) with freshwater in a caustic dilution tank. The contents of the base surge tank are pumped through the absorber feed pump to the Absorber. Diluted sodium hydroxide can also be pumped directly to any of the pipe headers that feed slurry to the Absorber.

When needed, liquid calcium chloride solution is delivered by truck. The base preparation system is also used for this cation source processing. The calcium chloride solution is stored in the base mixing sump and is then diluted in the base mixing tank. Calcium chloride and water are simultaneously pumped into the base mixing tank. The diluted calcium chloride is then pumped to the base surge tank, then to the slurry feed pipe headers for the appropriate/selected levels of the Absorber.

Between operating runs the contents of the base mixing sump are piped to the base mixing tank, and the base mixing sump is flushed out with either freshwater or seawater. Materials flushed out of the sump are piped to an outdoor slurry storage tank, which is currently being used to store the net Absorber product slurry. Because the contents of the base mixing tank can pick up carbon dioxide from spray contact with air, the contents of the base mixing tank are also emptied between runs into the outdoor slurry storage tank, either directly or through the Absorber.

Flue gas enters the Absorber and flows upward through injected fresh and recirculated scrubbing liquid. The scrubbing liquid flows down the Absorber by gravity. After passing upward through the scrubbing stages, the flue gas then passes through a vapor-liquid separator that removes the entrained liquid by

impingement and out of the top of the Absorber to the atmosphere. The flue gas is not reheated throughout this process. At least 80 percent of the carbon dioxide from the flue gas is removed before it is exhausted to the environment through the Absorber outlet.

To avoid build-up of liquid in the Absorber, a purge stream with flow controlled by the liquid sump level is removed from the recirculating scrubber liquid and is sent to the absorber product surge tank. Currently, the contents of the Absorber product surge tank are sent to an outdoor storage tank, which has a 2,500,000-gallon capacity and is used to separate the slurry solids from the liquid by gravity. The supernatant liquid in the top of the slurry storage tank (from the settled Absorber slurry purge) is checked for pH. Although this water could be discharged to the ocean in accordance with existing permits, Calera's goal is to achieve zero liquid discharge, and is currently storing this water for future beneficial uses. If needed to adjust pH, carbon dioxide is added to make the liquid less basic (lower pH) and suitable for discharge. Recirculation of liquids in the Absorption Demonstration Plant process may reduce or possibly eliminate the need to discharge any liquid from the process. Some solids accumulated in the slurry storage tank are to be used to make and evaluate products. The balance is stored on site to be processed in the materials demonstration.

To shutdown the operation of the Absorber, the flow of flue gas from the Moss Landing Energy Facility is halted, fresh scrubbing solution flow is stopped, and scrubbing solution recycle is stopped. Freshwater from the spray water storage tank is then pumped into the top of the Absorber through nozzles that are below the mist eliminator. The spray water can also be directed into nozzles above the mist eliminator, as required, for cleaning. The water used for flushing is then sent to an outdoor tank for storage.

2.1.2 Plant Arrangement

Major equipment associated with the Absorption Demonstration Plant is included in Building 3 and Building 8 of the MLCC site, as shown on Figure A-1. The septic system is west of Building 8. Outdoor storage tanks are south of the building complex.

2.1.3 Water Supply and Treatment

Water supply for operation of the Absorption Demonstration Plant is primarily based on groundwater from a local well. The use of this well is part of MLCC's lease agreement with Moss Landing Commercial Park. The groundwater well is approximately 2 miles east of the MLCC site and has capacity to provide up to 1,200 gallons per minute (gpm) of water with a salinity of approximately 400 parts per million (ppm) total dissolved solids (TDS).

Seawater is also periodically used as an alternative water source. The existing seawater intake is in the harbor at Moss Landing, approximately 270 feet east of the Moss Landing Commercial Park. It has two pumps and the intake pumping capacity is limited by a National Pollutant Discharge Elimination System (NPDES) discharge permit. The California Regional Water Quality Board NPDES permit specifies seawater discharge capacity from 0.04 million gallons per day (mgd) or 28 gpm for Phase 1 and up to 60 mgd (49,000 gpm) for Phase 3.

The Absorption Demonstration Plant uses water for dissolution of process reagents including calcium, magnesium, carbon dioxide and alkalinity, and transportation of reaction products through the process equipment. Effluent from the Epuramat would contain residual hardness and alkalinity. This process water would be reused for adsorption or used for production of low salinity water for beneficial use (industrial applications or irrigation) after processing through a desalination unit. Recirculation of water from the dewatering step would result in increase of water salinity, which would require partial discharge

of a high salinity blow down stream and addition of lower salinity makeup water to the process. The flow and mass balance conditions required for continuous operation would be evaluated and tested during operation of the Absorption Demonstration Plant. It is expected that the required inflow of groundwater or seawater would be substantially lower that the rated flow rate of process equipment of 300 to 600 gpm. Table A-1 includes approximate water utilization rates for the Absorption Demonstration Plant and the MLMDP.

Table A-1
Projected Water Utilization Estimates: Moss Landing Demonstration Plant

	Peak		**Average (assumes 8 hours per day)**	
	gpm	**gpd**	**gpm**	**gpd**
Water for Ca-brine	110	158,400	110	52,800
Water for alkaline brine	243	349,920	243	116,640
Total water required	**353**	**508,320**	**535**	**169,440**
Water in reagent feeds	38	54,720	38	18,240
Water vapor (loss)	10	14,400	10	4,800
Salt brine	76	109,440	76	36,480
Net fresh water produced	305	439,200	305	146,400
Total water out	**391**	**563,040**	**391**	**187,680**
Total water required	**353**	**508,320**	**353**	**169,440**
Net fresh water	305	439,200	305	146,400
Net water requirement	**48**	**69,120**	**48**	**23,040**

During operation mode at the high flow rate (approximately 600 gpm), the effluent from the dewatering process would have salinity of about 45,000 to 50,000 ppm TDS. This effluent, after pretreatment, would be sent to a desalination unit. Approximately 50 percent of the available flow could be converted to low salinity permeate. The remaining flow (concentrate stream) would have salinity of up to 80,000 to 100,000 ppm TDS. During operation mode at low flow rate (approximately 300 gpm), the dewatering process effluent would have salinity of about 75,000 to 95,000 ppm TDS. This salinity would be too high for desalination using commercial reverse osmosis (RO) equipment. An integrated system may be used consisting of electrodialysis (ED) and seawater RO to convert part of this high salinity stream to low salinity permeate. This system would be evaluated in the Pilot Plant and implemented in the Absorption Demonstration Plant. The high salinity RO concentrate and high salinity blow down from recirculation loop would be treated on the MLCC site. The present approach includes evaluating and implementing high pressure seawater RO, high concentration ED, and low energy enhanced evaporation methods to achieve the goal of zero liquid discharge.

2.2 MOSS LANDING PILOT PLANT

2.2.1 Process Description

The MLCC also operates the Pilot Plant that includes the complete process of absorption of carbon dioxide and creation of aggregates and cementitious products scaled at 1:1,000 to a commercial sized plant. Processes and equipment are tested in the Pilot Plant before being implemented in the Moss Landing Demonstration Plant. In addition, smaller scale absorption studies are conducted on coal flue gas to evaluate recovery and conversion of higher concentrations of carbon dioxide and sulfur oxides that are present in coal-fired flue gas.

2.2.2 Plant Arrangement

Major equipment associated with the Pilot Plant is included in Building 3 and Building 8 of the MLCC site, as shown on Figure A-1. The Pilot Plant also involves the use of the same outdoor storage tanks south of the building complex that are used for the Absorption Demonstration Plant.

3.0 PROPOSED ACTION – MOSS LANDING MATERIALS DEMONSTRATION PLANT

3.1 PROCESS DESCRIPTION

A simplified block flow diagram of the process is shown on Figure A-4.

As discussed in Section 1.1, the project would involve detailed design, construction, and operation of the MLMDP, which is the back end of Calera's demonstration process. This process would begin with slurry from the existing absorber product surge tank within the Absorption Demonstration Plant. This slurry would be pumped to either the Epuramat vessel and/or the Lamella, which would be the primary slurry dewatering units.

The Epuramat has already been installed and is currently operating. Although Calera expended the capital cost of the Epuramat, the DOE grant, and the project, include operation of the vessel. The absorber product transfer pump would move the product slurry to the top of the Epuramat. The slurry then flows under gravity down the Epuramat and exits by way of an adjustable diffuser/separator. The Epuramat would dewater the slurry from approximately 1 to 7 weight percent solids to 20 to 40 weight percent solids, forming a liquid supernatant and thickened slurry. The Lamella would dewater the slurry from approximately 1 to 7 weight percent solids to 20 to 30 weight percent solids, forming a liquid supernatant and thickened slurry. The dewatered slurry from the Epuramat or the Lamella would be sent to the Lamella slurry holding tank, and the liquid supernatant would be sent to the supernatant surge tank, from which it would be pumped to the 2,500,000-gallon outdoor supernatant storage tank. The supernatant is to be recycled to the base mixing sump to reduce process water consumption and to use unreacted base and alkali.

Slurry from the Lamela slurry holding tank would be pumped to the Filter Press and/or Vacuum Filter, which are secondary slurry dewatering units. The Filter Press and Vacuum Filter would dewater the slurry, with a first stage target of 20 to 30 percent solids, and a second stage target of 50 to 80 percent solids. Dewatered slurry from the Filter Press and Vacuum Filter would be pumped to a lithification unit and/or drying units. Liquid supernatant would be sent to the supernatant surge tank, from which it would be pumped to the 2,500,000-gallon outdoor supernatant storage tank.

The lithification unit would dewater the slurry from the approximately 60 weight percent solids to 85 weight percent solids; water would be removed as vapor. A binder would be added to the slurry before being moved by dump truck for spreading at an aggregate drying and harvesting area. Aggregate drying and harvesting is further discussed in Section 1.5.2.3.

After secondary slurry dewatering, some of the slurry with approximately 60 weight percent solids is expected to also be briquetted, which involves adding a binder and pressing the slurry solids into formed briquettes. Various binders are expected to be trialed including fly ash. Briquettes would be sieved to sort various briquette sizes and trucked to outdoor storage bays.

Drying units are expected to include a spray dryer, swirl dryer and/or rotary drum. These drying units would be used to dewater the slurry from approximately 60 weight percent solids to greater than 99.9 weight percent solids to create supplementary cementitious materials (SCM). SCM would be conveyed to a SCM storage silo by pneumatic conveyor. SCM would periodically be blown thru hoses into trucks for hauling.

3.2 PLANT ARRANGEMENT

3.2.1 Dewatering Equipment

Dewatering equipment associated with the MLMDP would be included in Building 3 and Building 8 of the MLCC site, as shown on Figure A-1, which are also currently used for the Pilot Plant and the Absorption Demonstration Plant. Buildings 5, 7 and 9 are also currently leased by the MLCC and may by used for the MLMDP. The same outdoor storage tanks south of the building complex that are used for the Pilot Plant and the Absorption Demonstration Plant would be used for the MLMDP.

3.2.2 SCM Silos

Three silos would be constructed in the vicinity of the perimeter of existing buildings for the storage of SCM. The top of silos would be below the roof line of the existing buildings.

3.2.3 Aggregate Laydown and Harvesting

An aggregate laydown and harvesting area would be constructed east of the existing building complex, as shown on Figure A-1. The aggregate laydown and harvesting area would consist of six 60-foot by 60-foot outdoor areas in which raw aggregate would be laid and pressed using a front end loader. These areas would be lined with geotextile fabric, followed by gravel layer and then a reinforced concrete slab, and with a concrete berm/curb around the perimeter and separate leachate collection and water collection systems. Slurry would be spread in the pads to approximately 6 inches to allow for additional drying of material. Six of these pads are expected to be constructed side by side. Material would be placed on top of previously spread material in the pads until the height of the product reach up to about six feet in height.

Leachate would be decanted and sediment allowed to settle; this sediment (non-specification product) is expected to be collected and potential applications tested such as combining it with other nonspecification products into cement blocks or other building materials. The decanted water from the leachate would be discharged into an outdoor storage tank.

After a stacked pad of material has dried it would be harvested using a scraper or dozer. A mobile crushing unit that would include available dust and noise suppression equipment would be used

approximately once per month to crush the material into aggregate. The crushed material would be sifted into distinct classifications of base rock and P Gravel.

The aggregate would be stored in six 3-sided uncovered bays approximately 8 foot tall. Because of the site's proximity to Monterey Bay, the aggregate stored in the bays may be exposed to salts in the air. If the intended use of the aggregate is for concrete, it would be washed before use in a wash bay. There would be no need to wash the aggregate if it would be used for landscaping or base rock.

Water for dust control during harvesting would come from the RO. This water would also be used for aggregate washing. Water used for washing would be collected and transferred to an existing storage tank.

3.3 WATER SUPPLY AND TREATMENT

The MLMDP would primarily use groundwater that is piped from the existing well; the amount would be the same or less than what is currently used by the MLCC through enhanced water recycling methods. Seawater may also be periodically used in accordance with existing permits. Water is needed to balance the 960 gallons per hour of water evaporated through drying activities and freshwater used for desalination. Calera's overall goal for the Moss Landing Demonstration Plant is to achieve zero liquid discharge. Table A-1, above, includes approximate water utilization rates for the Absorption Demonstration Plant and the MLMDP together.

3.4 PROJECT CONSTRUCTION

The project would continue to use several of the existing buildings and tanks currently used for the Absorption Demonstration Plant. No additional offsite linears are needed for implementation of the MLMDP. The following features would be constructed as part of the project:

- Three silos to store SCM
- An aggregate laydown, drying, and harvesting area
- Three-sided uncovered bays for storage of aggregate and briquettes

Excavations would be needed for the installation of silos and within existing structures for installation of equipment. The depth of these excavations from existing foundations is expected to be approximately 3 feet. The total cut is not expected to exceed 90 cubic yards and cut material is expected to be placed around the existing facility to fill existing rough grades. No soils are expected to need to be imported to the site for construction of the project.

The total projected cost of constructing the MLMDP is $31,200,000 (labor: $5,950,000; material and equipment: $22,500,000 [$3,000,000 of which would be purchased from the local area]; specialty subcontractors: $250,000; engineering and procurement: $2,500,000).

3.4.1 Mobilization

Site mobilization is expected to commence after receipt of all building, development, and environmental permits for the MLMDP. Site preparation work would include site grading and stormwater control. Crushed rock would be used for temporary roads, laydown, and work areas that are not currently paved. Onsite construction and commissioning is expected to occur over 7 months, commencing in fall/winter 2010 and completed in spring/summer 2011. The schedule has been estimated based on a single-shift 10-hour workday and a 50-hour workweek. The majority of construction operations are expected to take place between 6:00 a.m. and 6:00 p.m. However, longer workdays or workweeks may be necessary to

make up for schedule delays or complete critical construction activities. During the start-up and testing phase of the project, some activities may continue 24 hours per day, 7 days per week. All construction activity, access, and staging is expected to occur within the MLCC site and all construction deliveries would occur within the construction hours stated above.

3.4.2 Construction Staffing

Projected construction staff is expected to include an average of 48 workers throughout the approximately 6-month-long construction period, with an estimated peak of approximately 77 workers for a period of 3 months. Approximately 18 workers are expected to be present for the 1-month-long commissioning period. The workforce would include construction craft, engineers, and operators. Approximately 63 of the 77 peak workforce would consist of construction craft, and the remaining would consist of the engineers and operators. Specific construction craft (trade) required for construction include laborers, carpenters, scaffold builders, pipefitters, instrumentation and controls crafts, electricians, millwrights, boiler makers, and ironworkers.

The onsite workforce is expected to reach its peak of approximately 77 individuals from approximately January to April 2011. It is expected that the majority of the construction workers would commute daily 60 minutes or less roundtrip to and from the project site within Monterey County. Given the size of the labor force within commuting distance of the site, less than 10 percent of the construction laborers are expected to relocate for the construction period. It is expected that there would be enough construction workers/laborers available within the study area to meet project demands during the construction period.

3.4.3 Construction Offices, Parking, and Laydown Areas

Two areas on the MLCC site would be used for construction offices, parking, and laydown as follows (see Figure A-3):

- Approximately 0.6 acre on the west portion of the MLCC site, adjacent to Building B11
- Approximately 1.3 acres on the east portion of the MLCC site, adjacent to Building B16

Mobile trailers or similar suitable facilities (e.g., modular offices) would be used as construction offices for contractor and subcontractor personnel. Site access would be controlled for personnel and vehicles. Access between the onsite laydown areas and the remaining areas of the MLCC site would be on internal roads. Deliveries to the onsite laydown areas would be by way of Dolan Road via Highway 1. The construction laydown and parking area would be graded (as necessary) and surfaced with 4 inches of crushed rock. The crushed rock surfacing would provide erosion protection.

At the end of construction, these areas would be cleaned up, but the crushed rock surfacing may remain in place. All miscellaneous construction materials would be removed from these areas and disposed off site in accordance with applicable disposal regulations. No additional restoration would be required at the end of construction.

3.4.4 Construction Materials and Equipment Deliveries

Construction access to the site would be through the MLCC main site entrance, accessed from Dolan Road. The primary route to the project site is Highway 101 to Dolan Road. Construction materials would be delivered to the MLCC site by truck, as shown on Table A-2. The primary delivery route is anticipated to be Highway 101 to State Route 156 (west) to State Route 183 (north) to Dolan Road (west). Oversized equipment delivery route would include Highway 101 to San Miguel Canyon Road (north) to

Castroville Boulevard (west) to Dolan Road (west). Alternative routes for oversized equipment would include Highway 156 (west) to Highway 1 (north) to Dolan Road (east). The specific route would be determined in consultation with the California Highway Patrol and Caltrans.

The estimated average and peak numbers of construction staff vehicle round trips per day, and the estimated number of average and peak truck deliveries per day are shown in Table A-2. Truck deliveries normally would be on weekdays between 7:00 a.m. and 5:00 p.m.

Table A-2
Estimated Construction Vehicle Round-Trips per Day and Truck Deliveries per Day

Type	Average	Peak
Construction Staff	48	77
Inspector/Officials	1	3
Tractor Trailer Deliveries	1	3
Panel Truck Deliveries	1	2
Cranes and Construction Equipment	2	3

3.4.5 Construction Equipment

Daily construction equipment usage is shown on Table A-3.

Table A-3
Estimated Construction Equipment Use per Day

Type	Average	Peak
Cranes and Construction Equipment	2	3
Compressors	1	3
Electric Welding Machines	3	6
Small Hand Tools	15	22

3.4.6 Construction Utilities and Site Services

During construction, temporary utilities would be provided for the construction offices, the laydown area, and the remaining areas of the project site. Temporary construction power would be furnished via temporary generators. Temporary area lighting would be provided as needed and strategically located for safety and security. Construction water is anticipated to be supplied by existing sources. Average daily use of construction water is estimated to be 250 gallons. The maximum water usage is estimated at 1,500 gallons per month over a three-month peak construction period. Services would be provided during construction, including: environmental health and safety training; site security; site first aid; sanitary facilities; trash collection and disposal; and disposal of hazardous materials and waste in accordance with local, state, and federal regulations.

3.4.7 Non-Hazardous and Hazardous Materials/Waste Storage

Hazardous materials used during construction would consist of typical construction materials, such as solvents and lubricants. Hazardous materials and commodities for use on site would be inventoried and appropriately stored indoors in approved, industry standard containers. Onsite personnel would maintain the records for these materials.

Waste generated during construction would include shipping containers (wood, energy-absorbent materials); steel used for temporary supports; copper wire; aluminum materials; and miscellaneous debris, such as rags or abrasive materials. Non-hazardous refuse and construction rubbish would be sorted and stored in containers until removed from the MLCC site by a licensed disposal subcontractor for recycling or disposal. Wastes such as aluminum, steel and cooper would be recycled through licensed vendors. Hazardous waste generated during the construction period would be placed in properly identified and approved storage bins until they are recycled or disposed of off site in accordance with applicable local, state, and federal regulations.

Fuel would not be stored in bulk on the MLCC site for construction activities. A local vendor would be contacted, and arrive on the site with approved equipment to fuel generators, trucks, and construction equipment, when necessary.

3.4.8 Construction Land Disturbance Control Measures

The Engineering, Procurement and Construction (EPC) contractor would implement the following fugitive dust control measures during construction at the project site to minimize the formation of fugitive dust: watering all active grading areas and storage piles, cessation of grading in high winds, limiting vehicle speeds on unpaved roads to 15 miles per hour, and preventing the track-out of dirt from unpaved areas to paved roadways. As discussed in Section 4.1, Air Quality, the fugitive dust mitigation measures listed above would comply with the local air district regulations and control fugitive dust that occurs during onsite construction.

3.4.9 Stormwater Pollution Prevention Plan

If applicable, a construction Storm Water Pollution Prevention Plan (SWPPP) would be prepared and implemented. This plan would include best management practices (BMPs) to be used to minimize erosion. Erosion control would be accomplished according to the SWPPP and may include the use of strategically placed berms, swales, and culverts to redirect runoff toward stormwater retention basins. Sand bags, filter bales, silt fences, or temporary dams may also be installed to minimize the volume of sediment carried by storm runoff and to prevent the erosion of slopes and temporary drainage facilities. Grades would be designed to prevent the effects of ruts and ponding.

3.4.10 Construction Health and Safety

A site-specific health and safety plan (HSP) would be developed by the EPC contractor for its scope of work. The HSP would incorporate information and procedures to be followed by onsite personnel for the completion of the work, including procedures established in the project Environmental Management Plan. The HSP would outline requirements and provide guidance for control of construction safety hazards in compliance with safety standards and protection of public health. Prior to start of construction, the EPC contractor would interact with the local emergency responders to outline the type of construction and identify contact points for emergencies, including notification of the hazardous materials unit. An emergency evaluation procedure would be communicated to all personnel.

3.5 PROJECT OPERATIONS

Operation of the MLMDP would require approximately 18 additional full-time permanent personnel, with approximately 6 additional staff being employed for each of the 3 shifts operated each day (day shift, swing shift, and night shift). MLMDP operations would primarily be consistent with operation of the Absorption Demonstration Plant, which is up to 24 hours each day. The plant would be staffed approximately seven days a week primarily from 7:00 a.m. and 6:00 p.m. When the plant is not operating, personnel would be present as necessary for preparation of the plant for start-up, shutdown, and maintenance. Existing operational security and safety procedures would be followed during operation of the MLMDP.

Operation of the MLMDP would include continued testing and refinement of processes and monitoring of components and end products. Once operation of MLMDP provides sufficient data to allow for commercial scale up, the facility is expected to continue to operate as a research and development facility for Calera.

3.5.1 Energy Requirements

Fuel in the form of propane of between 18 and 60 million British Thermal Units (MMBTUs) per hour is expected to be required for drying activities because of the distance of the MLMDP from the Pilot Plant stack. This heat is expected to be generated through the combustion of propane and is estimated to be 18 MMBTU/hr for Aggregate or SCM production in a rotary dryer would utilize approximately 18MMBTUs per hour of propane. If SCM is produced in a spray dryer, up to 60 MMBTUs of propane per hour would be required. Propane consumption would be an average of the 18, 18, and 60 MMBTUs per hour firing rates, weighted by the produced quantities of aggregate, rotary-dryed SCM, and spraydryed SCM, respectively. In addition, an upgrade may be needed to the existing utility connection at the site to provide electrical power of between 1 and 2 MW for operation of process equipment.

3.5.2 Process Residuals

Liquid output streams are expected to be reused within the Moss Landing Demonstration Plant or in related processes at the MLCC site (including electrochemical production of sodium hydroxide, which is not part of this project). Specific liquid output streams include a calcium-rich water stream of about 130 gpm; sodium chloride-rich water stream of approximately 130 gpm; and a fresh water stream of about 300 gpm. The calcium-rich water stream would be recirculated to dilute or dissolve the incoming calcium chloride. The sodium chloride-rich stream is expected to be used in Calera's electrochemical process. Freshwater would either be sold or reused within the process for dilution of reagents.

Solid products are expected to consist primarily of calcium carbonate; with small quantities of magnesium carbonate, calcium sulfate and other co-precipitating species that originate from impurities in feed stock or trace pollutants in flue gas. These materials are expected to be used in testing and/or sold for use in concrete mixtures.

3.5.3 Operations Equipment

Table A-4 lists the mechanical equipment operated as part of the proposed project. Low noise equipment would be selected, when available, and most equipment listed in Table A-4 would be limited to a noise level of 85 dBA at 3 feet from the source. If attenuation is needed, features such as insulation, blanketing, silencers, sound barriers, or enclosures would be used.

3.5.4 Stormwater Management

During operations, stormwater runoff from outdoor storage areas would be contained. During the layout and setting of raw aggregate in the aggregate storage areas and aggregate laydown and harvesting area, stormwater runoff would be diverted using berms and ditches to a collection point (or collection points). The location of the collection point would be based on topography and would consist of an excavated sump, lined with un-reinforced concrete. The containment would have a manual controlled discharge, whereby all contained water in the storage area would be captured and tested before releasing to the existing stormwater system presently in place for the Moss Landing Commercial Park. Floor drains and process water would be kept separate from rain water runoff.

3.5.5 Operational Land Disturbance Control Measures

Calera would implement the following fugitive dust control measures during operation at the project site to minimize the formation of fugitive dust: baghouses would be used to suppress dust from process equipment, water would be sprayed on the outdoor aggregate production when in use, and limiting vehicle speeds on unpaved roads to 10 miles per hour. As discussed in Section 4.1, Air Quality, the fugitive dust mitigation measures listed above would comply with the local air district regulations and control fugitive dust that occurs during onsite operation.

3.5.6 Maintenance

Maintenance activities associated with the MLMDP would be expected to be limited to equipment cleaning, testing, and maintenance as per product specifications, good housekeeping, and Calera process requirements. Preventative maintenance would be conducted to ensure safe operations. Other facilities maintenance is the responsibility of the Moss Landing Commercial Park, as owners of the site.

Table A-4
Mechanical Equipment List

Plant Qty.	Unit	Equipment ID			Description	Type and Size	Unit Capacity	Aux Load (kW)	Driver Horsepower (HP)	Make and Model
PRIMARY DEWATERING										
1	1	TW	ML	001	Primary Slurry Dewatering Unit (Epuramat) Including: – Epuramat Feed Pump – Epuramat Dewatered Slurry Pump	300 gpm Max Flow	1 x 100%			Epuramat, ExSep 7000
1	1	TW	MP	002	Lamella Feed Pump	Horizontal Centrifugal Slurry Pump, 300 gpm,175 ft TDH	1 x 100%	19	26	
1	1	TW	ML	002	Primary Slurry Dewatering Unit (Lamella) Including: – Inclined Tank with Supporting Structure – Settler Plates, Feed Baffles, Effluent Flumes, and Sludge Compartment – Flashmix Tank with Fixed Speed Flash Mixer – Flocculation Tank with Variable Speed Flocculator	300 gpm total flow rate, 21' 4" in length x 9' 4" width x 19' 6.5" in high, 0.5 HP propeller type mixer, 0.5 HP mixer, 0.5 HP chemical feed metering pump	1 x 100%	1	2	Graver Parkson
1	1	TW	MP	004	Primary Dewatered Slurry Pump	60 gpm @60' TDH 20 – 30% solids	2 x 100%	1	1	Monyo progressive cavity suitable for slurry
1	1	TW	MT	003	Lamella Overflow Tank	Vertical, Cylindrical, Atmospheric, Conical Bottom, 2,000-gallon HDPE tank, 90" dia x 125" H	1 x 100%	N/A	N/A	Snyder Industries possible supplier
1	1	TW	MP	003	Lamella Overflow Pump	400 gpm centrifugal pump @ 60' TDH	1 x 100%	7	9	
1	1	TW	MP	009	Epuramat Overflow Pump	300 gpm @ 60' TDH				

Table A-4
Mechanical Equipment List (Continued)

Plant Qty.	Unit	Equipment ID			Description	Type and Size	Unit Capacity	Aux Load (kW)	Driver Horsepower (HP)	Make and Model
1	1	TW	MT	004	Lamella Slurry Holding Tank	4,000 Gallons HDPE vertical, conical bottom, 90"dia x 255" SS	1 x 100%	N/A	N/A	Snyder Industries
1	1	TW	MT	010	Epuramat Slurry Holding Tank	4,000 Gallons HDPE vertical, conical bottom, 90"dia x 255" SS	1 x 100%	N/A	N/A	Snyder Industries
1	1	TW	MF	002	Lamella Slurry Holding Tank Mixer	Top Mounted Tank Mixer for 4,000-gallon tank with 30 wt. % solids, pH 13 slurry	1 x 100%	2	3	Lightnin or Mixing Equip Corp possible supplier
1	1	TW	MF	003	Epuramat Slurry Holding Tank Mixer	Top Mounted Tank Mixer for 4,000-gallon tank with 30 wt. % solids, pH 13 slurry	2 x 100%	2	3	Lightnin or Mixing Equip Corp possible supplier
1	1	TW	MP	008	Lamella Secondary Dewatering Slurry Feed Pump	60 gpm @ 35' TDH	1 x 100%			
1	1	TW	MP	008	Epuramat Secondary Dewatering Slurry Feed Pump	60 gpm @ 35' TDH	1 x 100%			
1	1	TW	MT	006	Combined Supernatant Surge Tank	40,000-gallon Vertical, Cylindrical, Flat Bottom, Atmospheric, lined carbon steel 21.5' dia x 16' H		N/A	N/A	Snyder Industries Item H53301000998
1	1	TW	MF	004	Combined Supernatant Surge Tank Mixer	Top Mounted Tank Mixer for 40,000-gallon tank with 5 wt. % solids, pH 13 slurry	1 x 100%	7	10	Existing Lightnin XLQ150F (too small)
2	1	TW	MP	010	Combined Supernatant Transfer Pump	400 gpm @ 300' TDH	1 x 100%			

Table A-4
Mechanical Equipment List (Continued)

Plant Qty.	Unit	Equipment ID			Description	Type and Size	Unit Capacity	Aux Load (kW)	Driver Horsepower (HP)	Make and Model
SECONDARY DEWATERING										
1	1	TW	ML	005	Secondary Slurry Dewatering Unit (Filter Press and Wash Water Station) Including: – Filter Press Cake Wash Pump – Filter Press Feed Pump	300 gpm total flow rate, 1% influent solids, 80% effluent solids (based on quotation). 20' 6"L x 7' 9"W x7' 5" H Unit, 15' L x 10' 10"W x 7' 10" H water station, 8' x 2' x 7' Electrical panel. Unit height included 2' 6" of pull space on the top of filter removal. Unit actual height would be less this amount.	1 x 100%			Filtra Systems Verti-Press Model VP-50-1
1	1	TW	MT	008	Belt Wash Hold Tank	300 Gallons HDPE vertical, conical bottom, 90"dia x 255" SS				
1	1	TW	MP	011	Belt Filter Wash Forwarding Pump	Horizontal Centrifugal 40 gpm@ 60' TDH				
1	1	TW	ML	004	Secondary Slurry Dewatering Unit (Vacuum Filter) Including: – Vacuum Filter Press Cake Wash Pump – Vacuum Filter Press Feed Pump	100 gpm total flow rate, 20% influent solids, 60 – 80% effluent solids, Skid dimensions 6' 8" x 4'2" x 5'	1 x 100%			
1	1	TW	MH	001	Filter Press Product Conveyor	88,000 lb/day, 83 wt. % solids Elevation change = 15 ft	3 x 100%			FMC Dearborn Midwest
1	1	TW	MH	002	Vacuum Filter Product Conveyor	41,000 lb/hr, 60 – 83 wt. % solids Elevation change = 15 ft	3 x 100%			FMC

Table A-4
Mechanical Equipment List (Continued)

Plant Qty.	Unit	Equipment ID			Description	Type and Size	Unit Capacity	Aux Load (kW)	Driver Horsepower (HP)	Make and Model
1	1	TW	MT	009	Filtrate Tank	Vertical, Cylindrical, Flat Bottom, Atmospheric 20,000-gallon carbon steel epoxy coated 18' 2" dia x14' 10 5/8" H	1 x 100%	N/A	N/A	Snyder Industries possible supplier
1	1	TW	MP	007	Filtrate Recycle Pump	320 gpm @ 60' TDH	1 x 100%	7	9.3	
1	1	TW	MF	005	Filtrate Tank Mixer	Top Mounted Tank Mixer for 20,000-gallon tank with 0-5 wt. % solids, pH 13 filtrate	1 x 100%	4	5	Lightnin possible supplier
SUPERNATANT TREATMENT										
2	1	WD	ML	001	Supernatant Treatment Trailer(s) Including: - Supernatant Filter, 325 gpm - Ultrafiltration Unit 325 gpm with product tank - Nanofiltration Unit including cartridge filter, feed pumps and product tank - RO Unit including RO feed pump - ERD Unit - CIP Skid with pump, tank, tank header, cartridge filter	Equipment sized for 500 gpm, 16’ x 70’ each trailer	2 x 50%			
CRYSTALLIZATION										
1	1	WY	MT	001	Divalent Concentrate Tank	32,807 gallons Vertical, Cylindrical, Flat Bottom, Atmospheric, carbon steel epoxy coated 20' 5/8" dia x14' 10 5/8" H		N/A	N/A	Snyder Industries possible supplier
1	1	WY	MP	001	Divalent Concentrate Forwarding Pump	250 gpm @ 100' head 1	1 x 100%	9	12	

Table A-4
Mechanical Equipment List (Continued)

Plant Qty.	Unit	Equipment ID			Description	Type and Size	Unit Capacity	Aux Load (kW)	Driver Horsepower (HP)	Make and Model
1	1	WY	MT	002	Brine Concentrate Tank	24,103 gallons Vertical, Cylindrical, Flat Bottom, Atmospheric, carbon steel epoxy lined, 17' 2 1/4" x 14' 10 5/8" H	1 x 100%	N/A	N/A	Snyder Industries possible supplier
1	1	WY	MP	002	Brine Concentrate Forwarding Pump	200 gpm @ 100' head	1 x 100%	1	2	
1	1	WY	ML	001	Concentrate Evaporator/Crystallizer Including: - Evaporator Feed Tank, Pump, Preheaters, and Deaerator - Falling Film Evaporator Heater - Evaporator Vapor Body, Turbo Fan, and Vapor Ducting - Evaporator Recirculation Pump and Ducting - Combined Distillate Tank and Pump - Chemical Addition System - Crystallizer Feed Tank (w/ Mixer) and Pump - Crystallizer Vapor Body, Compressor, and Vapor Piping - Crystallizer Heater - Crystallizer Recirculation Pump and Ducting - Solids / Liquids Separation Device and Feed Pump	550 gpm, 45,000 to 50,000 ppm TDS, Approximate Size 100' x 200'	1 x 100%	1,800	2414	Violia or Aquatech
1	1	WY	MT	003	Distillate Recycle Tank- ERD Unit - CIP Skid with pump, tank, tank header, cartridge filter	40,857-gallon Vertical, Cylindrical, Flat Bottom, Atmospheric, lined Carbon Steel 21' 6.6" dia x15' 11 7/8"	1 x 100%	N/A	N/A	
1	1	WY	MP	003	Recovered Distillate Pump	600 gpm @ 220' TDH centrifugal pump	2 x 100%	48	64.2	

Table A-4
Mechanical Equipment List (Continued)

Plant Qty.	Unit	Equipment ID			Description	Type and Size	Unit Capacity	Aux Load (kW)	Driver Horsepower (HP)	Make and Model
SCM DRYING										
OPTION 1 SPRAY DRYER										
1	1	HY	MT	001	Spray Dryer Slurry Mix Tank 1	3,900 Gallons Vertical, Cylindrical, Cone Bottom, Atmospheric, Polyethylene, 90" dia x 203" H		N/A	N/A	
1	1	HY	MT	002	Spray Dryer Slurry Mix Tank 2	3,900 Gallons Vertical, Cylindrical, Cone Bottom, Atmospheric, Polyethylene, 90" dia x 203" H		N/A	N/A	
1	1	HY	MF	001	Spray Dryer Slurry Mix Tank Mixer 1	Top Mounted Tank Mixer for 3,900-gallon tank with 20 – 30 wt. % solids, pH 13 slurry		1.2	2	
1	1	HY	MF	002	Spray Dryer Slurry Mix Tank Mixer 2	Top Mounted Tank Mixer for 3,900-gallon tank with 20 – 30 wt. % solids, pH 13 slurry		2.2	3	
2	1	HY	MP	001	Spray Dryer Slurry Feed Pumps	70 gpm				
1	1	HY	ML	001	Spray Dryer Including: – inlet air filter – fan – atomizer – air heater and air disperser – Drying Chamber – Cyclone Separator – Baghouse	60 gpm, 20 – 30 wt % solids, 30' x 20' all skid mounted equipment				

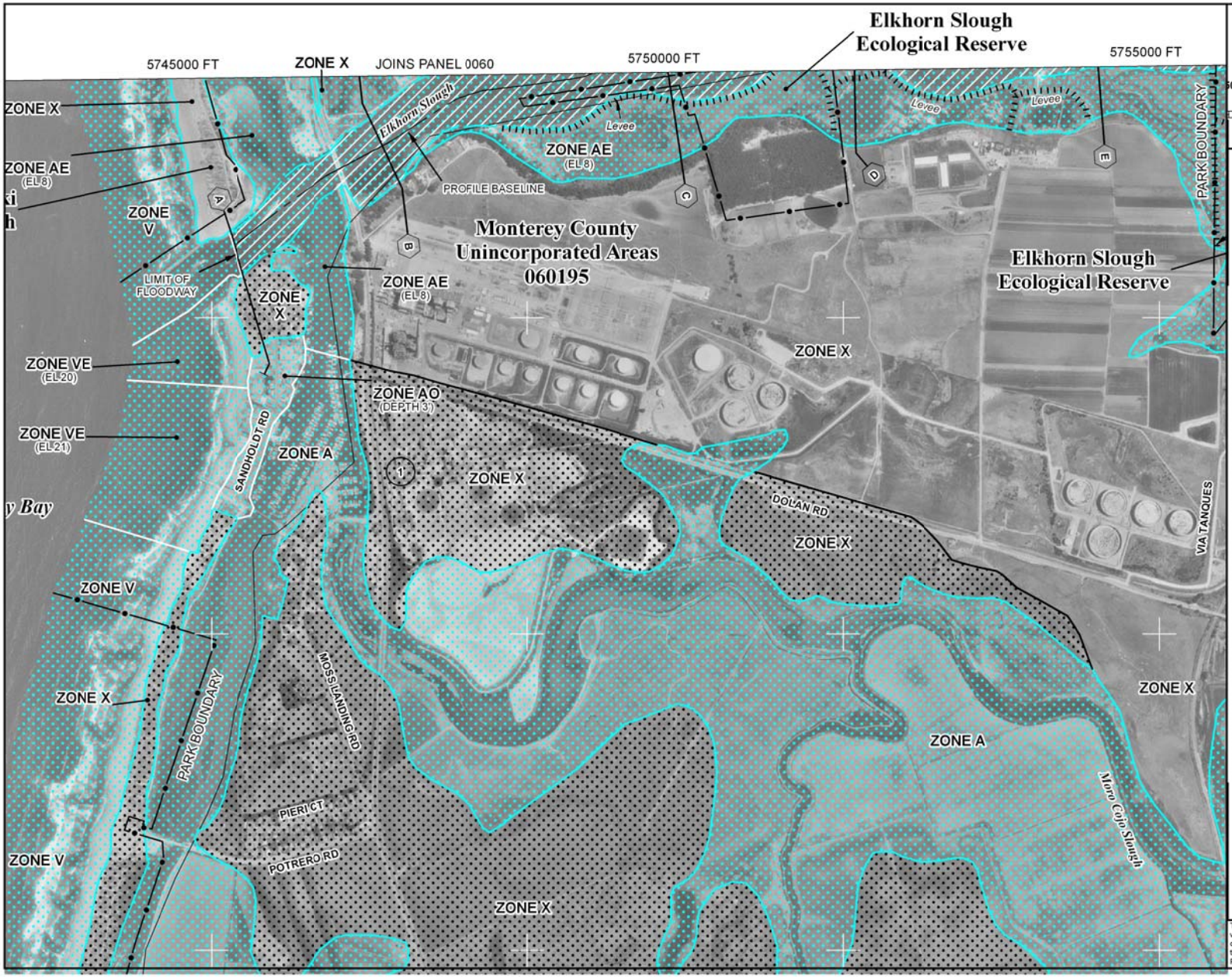
Table A-4
Mechanical Equipment List (Continued)

Plant Qty.	Unit	Equipment ID			Description	Type and Size	Unit Capacity	Aux Load (kW)	Driver Horsepower (HP)	Make and Model
OPTION 2 ROTARY DRYER										
1	1	HY	ML	002	Rotary Dryer Including: – Air Heater and Forced Draft Fan – Solids Feed Hopper – Separator and Baghouse(s) – Stack – Induced Draft Fan	24 gpm 60 wt% solids, 152'L x 37.4'W Rotary Heater		45	60	Metso Minerals Helo-Flite Dryer
AGGREGATE DRYING										
OPTION 1- BRIQUETTING										
1	1	HY	MH	003	Binder 1 Volumetric Feeder	75 liter hopper		N/A	N/A	
1	1	HY	MH	004	Binder 2 Volumetric Feeder	75 liter hopper				
1	1	HY	MH	002	Filter Cake Volumetric Feeder	75 liter hopper		Included	Included	
1	1	HY	MH	001	Turbulizer Continuous Mixer	10 ton/hr		Included	Included	
1	1	HY	MH	005	Briquetting/Lithification Feed Conveyor	10 ton/hr		Included	Included	
1	1	HY	MH	006	Briquetter	10 ton/hr, entire system including hopper, feeder, ribbon blender, feed conveyor is approximately 20' W x 30' L x 50' H		225	301	
1	1	HY	MH	007	Vibrating Screen			Included	Included	
1	1	HY	MH	009	Fines Transfer Screw					
1	1	HY	MH	008	Bucket Elevator					

Table A-4
Mechanical Equipment List (Continued)

Plant Qty.	Unit	Equipment ID			Description	Type and Size	Unit Capacity	Aux Load (kW)	Driver Horsepower (HP)	Make and Model
OPTION 2 – MANUAL LITHIFICATION										
1	1	HL	MH	010	Front End Loader	Area would include six, 60' x 60' pads which heavy equipment can move around and a 100' x 60' processing area		N/A	N/A	
1	1	HL	MH	011	Compactor	10 ton/hr		N/A	N/A	
1	1	-	-	-	Mobile Crusher and Sieve (rented; on site once per month)	10 ton/hr, entire system including hopper, feeder, ribbon blender, feed conveyor is approximately 20' W x 30' L x 50' H			75-125	CemCo Turbo 35 VSI Crusher
ADDITIONAL EQUIPTMENT										
1	1	HY	MH	001	Air Compressor					

APPENDIX B
FLOOD INSURANCE RATE MAP
COMMUNITY PANEL NUMBER 06053C0070G



MAP SCALE 1" = 1000'

500 0 1000 2000

FEET

METER

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0070G

FIRM

FLOOD INSURANCE RATE MAP

MONTEREY COUNTY, CALIFORNIA
AND INCORPORATED AREAS

PANEL 70 OF 2050

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MONTEREY COUNTY	060195	0070	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06053C0070G

EFFECTIVE DATE
APRIL 2, 2009

Federal Emergency Management Agency

APPENDIX C
ENVIRONMENTAL DATA RESOURCES REPORTS

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APPENDIX D
FUNDAMENTALS OF ACOUSTICS

Fundamentals of Acoustics

This section describes the physical characteristics of sound. An understanding of these characteristics is useful for evaluating environmental noise from the Proposed Action. The methods and metrics used to quantify noise exposure, human response, and relative judgment of loudness are also discussed and noise levels of common noise environments are presented. This section is intended to provide the reader with a basic understanding that is essential for assessing potential noise impacts.

Noise is generally defined as loud, unpleasant, unexpected, or undesired sound that is typically associated with human activity and interferes with or disrupts normal activities. The effects of noise on people can be grouped into four general categories:

- Subjective effects (dissatisfaction, annoyance)
- Interference effects (communication and sleep interference, learning)
- Physiological effects (startle response)
- Physical effects (hearing loss)

Although exposure to high noise levels has been demonstrated to cause physical and physiological effects, the principal human responses to typical environmental noise exposure are related to subjective effects and interference with activities. The subjective responses of individuals to similar noise events are diverse and influenced by many factors including the type of noise, the perceived importance of the noise, its appropriateness to the setting, duration of the noise, the time of day and the type of activity during which the noise occurs, and individual noise sensitivity.

Interference effects of environmental noise refer to those effects that interrupt daily activities and include interference with human communication activities such as normal conversation, watching television, telephone conversation, etc., and interference with sleep. Sleep interference effects can include both awakening from sleep and arousal to a lesser state of sleep.

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air, and are sensed by the human ear. Sound is generally characterized by several variables, including frequency and amplitude. Frequency describes the sound's pitch (tone) and is measured in cycles per second (hertz [Hz]), while amplitude describes the sound's pressure (loudness). Because the range of sound pressures that occur in the environment is extremely large, it is convenient to express these pressures on a logarithmic scale that compresses the wide range of pressures into a more useful range of numbers. The standard unit of sound measurement is the decibel (dB).

Hz is a measure of how many times each second the crest of a sound pressure wave passes a fixed point. For example, when a drummer beats a drum, the skin of the drum vibrates a given number of times per second. If the drum vibrates 100 times per second it generates a sound pressure wave that is oscillating at 100 Hz, and this pressure oscillation is perceived by the ear/brain as a tonal pitch of 100 Hz. Sound frequencies between 20 and 20,000 Hz are within the range of sensitivity of the healthy human ear.

Sound levels are expressed by reference to a specified national/international standard. The sound pressure level is used to describe sound pressure (loudness) and is specified at a given distance or specific receptor location. In expressing sound pressure level on a logarithmic scale, sound pressure (dB) is referenced to a value of 20 micropascals. The sound pressure level depends not only on the power of the source but also on the distance from the source to the receiver and the acoustical characteristics of the sound propagation path (e.g., absorption, reflection).

Outdoor sound levels decrease logarithmically as the distance from the source increases. This decrease is due to wave divergence, atmospheric absorption, and ground attenuation. Sound radiating from a source in a homogeneous and undisturbed manner travels in spherical waves. As the sound waves travel away from the source, the sound energy is dispersed over a greater area decreasing the sound pressure of the wave. Spherical spreading of the sound wave from a point source reduces the noise level at a rate of 6 dB per doubling of distance.

Atmospheric absorption also influences the sound levels received by an observer. The greater the distance traveled, the greater the influence of the atmosphere and the resultant fluctuations. Atmospheric absorption becomes important at distances greater than 1,000 feet. The degree of absorption varies depending on the frequency of the sound as well as the humidity and temperature of the air. For example, atmospheric absorption is lowest (i.e., sound carries further) at high humidity and high temperatures and lower frequencies are less readily absorbed (i.e., sound carries further) than higher frequencies. Over long distances, lower frequencies become dominant as the higher frequencies are more rapidly attenuated. Turbulence, gradients of wind and other atmospheric phenomena also play a significant role in determining the degree of attenuation. For example, certain conditions, such as temperature inversions can channel or focus the sound waves resulting in higher noise levels than would result from simple spherical spreading.

Sound from a tuning fork contains a single frequency (a pure tone), but most sounds one hears in the environment do not consist of a single frequency; but rather, a broad band of many frequencies differing in sound level. Because of the broad range of audible frequencies, methods have been developed to quantify these values into a single number representative of human hearing. The most common method used to quantify environmental sounds consists of evaluating all frequencies of a sound according to a weighting system that is reflective of human hearing characteristics. Human hearing is less sensitive at low frequencies and extremely high frequencies than at the mid-range frequencies. This process is termed "A weighting," and the resulting dB level is termed the A-weighted decibel (dBA).

Because "A weighting" is designed to emulate the frequency response characteristics of the human ear and reflect the way people perceive sounds, it widely used in local noise ordinances and state and federal guidelines including the State of California and Monterey County. Unless specifically noted, the use of A-weighting is always assumed with respect to environmental sound and community noise even if the notation does not include the "A."

In terms of human perception, a sound level of 0 dBA is approximately the threshold of human hearing and is barely audible by a healthy ear under extremely quiet listening conditions. This threshold is the reference level against which the amplitude of other sounds is compared. Normal speech has a sound level of approximately 60 dBA. Sound levels above about 120 dBA begin to be felt inside the human ear as discomfort progressing to pain at still higher levels. Humans are much better at discerning relative sound levels than absolute sound levels. The minimum change in the sound level of individual events that an average human ear can detect is about 1 to 3 dBA. A 3 to 5 dBA change is readily perceived. An increase (or decrease) in sound level of about 10 dBA is usually perceived by the average person as a doubling (or halving) of the sound's loudness.

Because of the logarithmic nature of the decibel, sound levels cannot be added or subtracted directly and are somewhat cumbersome to handle mathematically. However, some simple rules are useful in dealing with sound levels. First, if a sound's acoustical energy is doubled, the sound level increases by 3 dB, regardless of the initial sound level. Thus, for example: 60 dB + 60 dB = 63 dB, and 80 dB + 80 dB = 83 dB. Remember however, that an increase of approximately 10 dBA is required to double the perceived loudness of a sound and it is interesting to note that a doubling or halving of the acoustical energy (a 3 dB difference) is at the lower limit of readily perceived change.

Although dBA may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously. Most ambient environmental noise includes a mixture of noise from nearby and distant sources that creates an ebb and flow of sound including some identifiable sources plus a relatively steady background noise in which no particular source is identifiable. A single descriptor termed the equivalent sound level (L_{eq}) is used to describe sound that is constant or changing in level. L_{eq} is the energy-mean dBA during a measured time interval. It is the "equivalent" sound level produced by a given constant source equal to the acoustic energy contained in the fluctuating sound level measured during the interval. In addition to the energy-average level, it is often desirable to know the acoustic range of the noise source being measured. This is accomplished through the maximum L_{eq} (L_{max}) and minimum L_{eq} (L_{min}) indicators that represent the root-mean-square maximum and minimum noise levels measured during the monitoring interval. The L_{min} value obtained for a particular monitoring location is often called the acoustic floor for that location.

To describe the time-varying character of environmental noise, the statistical or percentile noise descriptors L_{10}, L_{50}, and L_{90} may be used. These are the noise levels equaled or exceeded during 10 percent, 50 percent, and 90 percent of the measured time interval. Sound levels associated with L_{10} typically describe transient or short-term events, L_{50} represents the median sound level during the measurement interval, while L_{90} levels are typically used to describe background noise conditions.

The Day-Night Average Sound Level (L_{dn} or DNL) represents the average sound level for a 24-hour day and is calculated by adding a 10 dBA penalty to sound levels during the night period (10:00 p.m. to 7:00 a.m.). The L_{dn} is the descriptor of choice used by nearly all federal, state, and local agencies throughout the United States to define acceptable land use compatibility with respect to noise. Within the State of California, the Community Noise Equivalent Level (CNEL) is sometimes used. CNEL is very similar to L_{dn}, except that an additional 5 dB penalty is applied to the evening hours (7:00 p.m. to 10:00 p.m.) Because of the time-of-day penalties associated with the L_{dn} and CNEL descriptors, the L_{dn} or CNEL dBA value for a continuously operating sound source during a 24-hour period will be numerically greater than the dBA value of the 24-hour L_{eq}. Thus, for a continuously operating noise source producing a constant noise level operating for periods of 24 hours or more, the L_{dn} will be 6 dB higher than the 24-hour L_{eq} value. For convenience, a summary of common noise metrics is provided in Table D-1, "Common Noise Metrics." To provide a frame of reference, common sound levels are presented in Table D-2, "Sound Levels of Typical Noise Sources and Noise Environments."

Table D-1
Common Noise Metrics

Unit of Measure		Description
CNEL	Community Noise Equivalent Level	The CNEL value represents noise as measured by an A-weighted sound level. The metric includes a 4.8-decibel penalty during relaxation hours (7 p.m. to 10 p.m.) and a 10-decibel penalty for sleeping hours (10 p.m. to 7 a.m.). CNEL is similar to L_{dn} (which does not include the evening penalty).
dB Decibel		Units for measuring the volume of sound, decibels are measured on a logarithmic scale, representing points on a sharply rising curve. For example, 10 decibels are 10 times more intense than one decibel and 20 decibels are 100 times more intense. A 10-decibel increase in sound level is perceived by the human ear as a doubling of the loudness of the sound.
dBA	A-Weighted Decibel	A sound pressure level that has been weighted to quantitatively reduce the effect of the high and low frequency noise. It was designed to approximate the response of the human ear to sound.
L_{dn}	Day-Night Average Noise	The 24 hour average sound level, expressed in a single decibel rating, for the period from midnight to midnight obtained after the addition of a 10.0-decibel penalty to sound levels for the periods between 10 p.m. and 7 a.m.
L_{eq}	Equivalent Noise Level	Equivalent Noise Level Total sound energy of time-varying noise over a sample period.
L_{max}	Maximum Noise Level	L_{max} is the highest exponential time-averaged sound level that occurs during a stated time period. It reflects peak operating conditions and addresses the annoying aspects of intermittent noise.
L_{min}	Minimum Noise Level	L_{min} is the minimum exponential time-averaged sound level that occurs during a stated time period. It reflects baseline operating conditions and is commonly referenced as the noise floor.
L_1, L_{10}, L_{50}, L_{90}	Percentile Noise Exceedance Levels	The fast A-weighted noise levels that are equaled or exceeded by a fluctuating sound level 1 percent, 10 percent, 50 percent, and 90 percent of a stated time period.
Source: URS Corporation, 2010		

Table D-2
Sound Levels of Typical Noise Sources and Noise Environments
(A-Weighted Sound Levels)

Noise Source (at Given Distance)	Scale of A-Weighted Sound Level in Decibels	Noise Environment	Human Judgment of Noise Loudness (Relative to a Reference Loudness of 70 Decibels*)
Military Jet Take-off with After-burner (50 ft)	140	Carrier Flight Deck	–
Civil Defense Siren (100 ft)	130	–	–
Commercial Jet Take-off (200 ft)	120 –		**Threshold of Pain** *32 times as loud
Standard Heavy Construction Pile Driver (50 ft)	110	Rock Music Concert	*16 times as loud
Ambulance Siren (100 ft) Newspaper Press (5 ft) Power Lawn Mower (3 ft)	100		**Very Loud** *8 times as loud
Propeller Plane Flyover (1,000 ft) Diesel Truck, 40 mph (50 ft) Motorcycle (25 ft)	90	Boiler Room Printing Press Plant	*4 times as loud
Garbage Disposal (3 ft)	80	High Urban Ambient Sound	*2 times as loud
Passenger Car, 65 mph (25 ft) Living Room Stereo (15 ft) Vacuum Cleaner (3 ft)	70 –		**Moderately Loud** *70 decibels (Reference Loudness)
Air Conditioning Unit (100 ft) Normal Conversation (5 ft)	60	Data Processing Center Department Store	*1/2 as loud
Light Traffic (100 ft)	50	Private Business Office	*1/4 as loud
Bird Calls (distant)	40	Lower Limit of Urban Ambient Sound	**Quiet** *1/8 as loud
Soft Whisper (5 ft)	30	Quiet Bedroom	**Very Quiet**
20		Recording Studio	
10		–	**Extremely Quiet**
0		–	**Threshold of Hearing**

Source: Compiled by URS Corporation from various published sources and widely-used references such as The Handbook of Acoustical Measurements and Noise Control, Third Edition, edited by C.M. Harris, 1991; and Noise and Vibration Control, Second Edition, edited by L.L. Beranek, 1988 Institute of Noise Control Engineering.

APPENDIX E
CALIFORNIA NATIVE AMERICAN HERITAGE COMMISSION CORRESPONDENCE

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APPENDIX F
PREVIOUSLY COMPLETED CULTURAL STUDIES WITHIN THE STUDY AREA

(LIMITED RIGHTS. MAILED SEPARATELY TO NETL AAD DOCUMENT CONTROL)

APPENDIX G
DEPARTMENT OF PARKS AND RECREATION SITE FORM FOR CA-MTN-235

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APPENDIX H
PREVIOUSLY RECORDED CULTURAL RESOURCES WITHIN ONE-MILE OF THE STUDY AREA

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APPENDIX I
PHOTOGRAPHIC RECORD

Photo Point 1: MLCC site from Highway 1, south of site; view northeast.
MLCC site obscured by trees; Moss Landing Energy Facility features visible.

Photo Point 2: MLCC site from Highway 1, north of site; view southeast.
MLCC site obscured by trees and Moss Landing Energy Facility features.

Photo Point 3: Highway 1 and select MLCC features, from MLCC site; view north. Highway 1 is left of pipe and fencing, in left portion of photo.

Photo Point 4: MLCC site from Dolan Road, north of site; view east. MLCC site partially obscured by trees.

Photo Point 5: MLCC site from Dolan Road, northeast of site; view west.
MLCC site obscured by trees; Moss Landing Energy Facility features visible to right.

Photo Point 6: Dolan Road from MLCC site, north end of site; view northeast.
Dolan Road, rail line, utility line, Moss Landing Energy Facility, and MLCC site landscaping visible.

Photo Point 7: Northeastern portion of MLCC site from proposed aggregate lay-down area; view west.

Photo Point 8: Southern portion of MLCC site from south of T-tanks; view southwest.

Photo Point 9: MLCC site from Highway 1 south of site; view northeast.

Photo Point 10: MLCC site from Highway 1 south of site; view northeast.

Photo Point 11: MLCC site from Highway 1 south of site; view northeast.

Photo Point 12: MLCC site from Highway 1 south of site; view north.

Photo Point 13: MLCC site from Highway 1 north of site; view southeast.
MLCC site obscured by vegetation and Moss Landing Energy Facility.

Photo Point 14: Coastal Brackish Marsh just east of MLCC site from eastern boundary of site; view east.

Photo Point 15: Moro Cojo Slough from southeastern eastern boundary of site; view south.

Photo Point 16: Coastal Brackish Marsh just east of MLCC site from eastern boundary of site; view east.

Photo Point 17: MLCC site from commercial area west of site and west of Highway 1; view northeast. MLCC site obscured by vegetation; Moss Landing Energy Facility features visible.

Point 18: MLCC site from commercial area west of site and west of Highway 1; view northeast. MLCC site partially obscured by vegetation; Moss Landing Energy Facility features visible.

Point 19: Proposed aggregate laydown area from MLCC site; view northeast.

Point 20: Proposed aggregate laydown area from Dolan Road; view southeast.

APPENDIX J
RESULTS OF CALIFORNIA NATURAL DIVERSITY DATABASE RECORDS SEARCH FOR PLANT SPECIES WITHIN ONE AND FIVE MILES OF THE PROJECT SITE

Results of CNDDB records search for plant species within 1 and 5 miles of the Project Site.

Common Name	Scientific Name	Federal Status	State Status	CNPS Rank*	Within 5 miles?	Within 1 mile?
Hooker's manzanita	*Arctostaphylos hookeri* ssp. *hookeri*	None	No ne	1B.2	Yes	–
Pajaro manzanita	*Arctostaphylos pajaroensis*	None	No ne	1B.1	Yes	–
Congdon's tarplant	*Centromadia parryi* ssp. *congdonii*	None	No ne	1B.2	Yes	–
Monterey spineflower	*Chorizanthe pungens* var. *pungens*	Threatened	N one	1B.2	Yes	Yes
robust spineflower	*Chorizanthe robusta* var. *robusta*	Endangered	No ne	1B.1	Yes	–
seaside bird's-beak	*Cordylanthus rigidus* ssp. *littoralis*	None	En dangered	1B.1	Yes	–
Eastwood's goldenbush	*Ericameria fasciculata*	None	No ne	1B.1	Yes	–
sand-loving wallflower	*Erysimum ammophilum*	None	No ne	1B.2	Yes	–
Yadon's wallflower	*Erysimum menziesii* ssp. *yadonii*	Endangered	En dangered	1B.1	Yes	–
sand gilia	*Gilia tenuiflora* ssp. *arenaria*	Endangered	T hreatened	1B.2	Yes	Yes
Yadon's rein orchid	*Piperia yadonii*	Endangered	No ne	1B.1	Yes	–
pine rose	*Rosa pinetorum*	None	No ne	1B.2	Yes	–
saline clover	*Trifolium depauperatum* var. *hydrophilum*	None	No ne	1B.2	Yes	Yes

* CNPS = California Native Plant Society

APPENDIX K
RESULTS OF CALIFORNIA NATURAL DIVERSITY DATABASE RECORDS SEARCH FOR WILDLIFE SPECIES WITHIN ONE AND FIVE MILES OF THE PROJECT SITE

Results of CNDDB records search for wildlife species within 1 and 5 miles of the Project Site.

Common Name	Scientific Name	Federal Status	State Status	Within 5 miles?	Within 1 mile?
Invertebrate					
globose dune beetle	*Coelus globosus*	None No	ne	Yes	Yes
Smith's blue butterfly	*Euphilotes enoptes smithi*	Endangered No	ne	Yes	
monarch butterfly	*Danaus plexippus*	None No	ne	Yes	Yes
mimic tryonia	*Tryonia imitator*	None No	ne	Yes	Yes
Fish					
tidewater goby	*Eucyclogobius newberryi*	Endangered SSC		Yes	Yes
Amphibian					
Santa Cruz long-toed salamander	*Ambystoma macrodactylum croceum*	Endangered Endangere	d, FP	Yes	–
California tiger salamander	*Ambystoma californiense*	Threatened C	andidate Endangered, SSC	Yes	Yes
California red-legged frog	*Rana draytonii*	Threatened S	SC	Yes	Yes
Reptile					
western pond turtle	*Actinemys marmorata*	None SSC		Yes	–
black legless lizard	*Anniella pulchra nigra*	None SSC		Yes	Yes
silvery legless lizard	*Anniella pulchra pulchra*	None SSC		Yes	Yes
Birds					
white-tailed kite	*Elanus leucurus*	None FP		Yes	–
California clapper rail	*Rallus longirostris obsoletus*	Endangered Endangere	d, FP	Yes	Yes
western snowy plover	*Charadrius alexandrinus nivosus*	Threatened, SSC	SSC	Yes	Yes
burrowing owl	*Athene cunicularia*	SSC SSC		Yes	Yes
short-eared owl	*Asio flammeus*	None SSC		Yes	Yes
bank swallow	*Riparia riparia*	None T	hreatened	Yes	Yes
Mammal					
Salinas harvest mouse	*Reithrodontomys megalotis distichlis*	None No	ne	Yes	Yes
sea otter	*Enhydra lutris nereis*	Threatened F	P	–	Yes*

* Not recorded in CNDDB but seen during April 15, 2010, site visit within 1 mile of the project site.
FP = CDFG Fully Protected
SSC = Species of Special Concern

APPENDIX L
ASSUMPTIONS/DATA USED IN ESTIMATING CONSTRUCTION EMISSIONS

Calera MLBMDP Project - Construction Emission Summary Tables

Table L1
Estimated Daily Maximum Construction Emissions of Criteria Pollutants (Month 2) (lbs/day)

Activity	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_x
On-Site Construction Emissions						
On-Site Combustion Emissions						
Construction Equipment	2.84	2.61	22.28	7.72	69.44	0.07
Delivery Trucks and Inspector & official vehicles	0.01	0.01	0.10	0.04	0.15	0.00
Worker Vehicles	0.01	0.00	0.47	0.04	0.04	0.00
Subtotal of On-site Combustion Emissions	**2.86**	**2.63**	**22.84**	**7.80**	**69.63**	**0.07**
On-Site Fugitive Emissions						
Construction Equipment	2.21	0.37				
Wind Erosion of Storage Piles	0.72	0.16				
Delivery Trucks and Inspector & official vehicles	0.59	0.11				
Worker Vehicles	1.35	0.23				
Subtotal of On-Site Fugitive Emissions	**4.87**	**0.87**	**0.00**	**0.00**	**0.00**	**0.00**
Subtotal of On-Site Emissions	**7.73**	**3.50**	**22.84**	**7.80**	**69.63**	**0.07**
Off-Site On-Road Emissions						
Off-Site Combustion Emissions						
Delivery Trucks and Inspector & official vehicles	0.22	0.19	1.63	0.28	5.22	0.01
Worker Vehicles	0.08	0.04	7.18	0.25	0.83	0.01
Subtotal of Off-Site Combustion Emissions	**0.29**	**0.23**	**8.81**	**0.54**	**6.05**	**0.01**
Off-Site Paved Road Fugitive Emissions						
Delivery Trucks and Inspector & official vehicles	12.57	1.82				
Worker Vehicles	2.41	0.04				
Subtotal of Off-Site Fugitive Emissions	**14.98**	**1.86**				
Subtotal of Off-Site Emissions	**15.27**	**2.08**	**8.81**	**0.54**	**6.05**	**0.01**
Total Maximum Emissions	**23.00**	**5.58**	**31.65**	**8.33**	**75.68**	**0.09**

Table L2
Estimated Annual Maximum Construction Emissions of Criteria Pollutants (Month 1-7) (tons/year)

Activity	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_x
On-Site Construction Emissions						
On-Site Combustion Emissions						
Construction Equipment	0.13	0.12	1.01	0.36	2.94	0.00
Delivery Trucks and Inspector & official vehicles	0.00	0.00	0.01	0.00	0.01	0.00
Worker Vehicles	0.00	0.00	0.04	0.00	0.00	0.00
Subtotal of On-site Combustion Emissions	**0.13**	**0.12**	**1.05**	**0.37**	**2.95**	**0.00**
On-Site Fugitive Emissions						
Construction Equipment	0.13	0.02				
Wind Erosion of Storage Piles	1.44	0.32				
Delivery Trucks and Inspector & official vehicles	0.03	0.01				
Worker Vehicles	0.10	0.02				
Subtotal of On-Site Fugitive Emissions	**1.71**	**0.36**	**0.00**	**0.00**	**0.00**	**0.00**
Subtotal of On-Site Emissions	**1.84**	**0.48**	**1.05**	**0.37**	**2.95**	**0.00**
Off-Site On-Road Emissions						
Off-Site Combustion Emissions						
Delivery Trucks and Inspector & official vehicles	0.01	0.01	0.09	0.01	0.24	0.00
Worker Vehicles	0.01	0.00	0.55	0.02	0.06	0.00
Subtotal of Off-Site Combustion Emissions	**0.02**	**0.01**	**0.65**	**0.03**	**0.30**	**0.00**
Off-Site Paved Road Fugitive Emissions						
Delivery Trucks and Inspector & official vehicles	0.58	0.08				
Worker Vehicles	0.18	0.00				
Subtotal of Off-Site Fugitive Emissions	**0.76**	**0.09**				
Subtotal of Off-Site Emissions	**0.78**	**0.10**	**0.65**	**0.03**	**0.30**	**0.00**
Total Maximum Emissions	**2.62**	**0.57**	**1.69**	**0.40**	**3.26**	**0.00**

Table L3
Estimated Annual Maximum Construction Emissions of Greenhouse Gases (Month 1-7) (metric tons/year)

Activity	CO_2	CH_4	N_2O	CO_2e
On-Site Construction Emissions				
On-Site Combustion Emissions				
Construction Equipment	255.85	0.03	-	256.48
official vehicles	0.97	0.00	0.00	0.98
Worker Vehicles	4.26	0.00	0.00	4.39
Subtotal of On-Site Emissions	**261.09**	**0.03**	**0.00**	**261.85**
Off-Site On-Road Emissions				
Off-Site Combustion Emissions				
Delivery Trucks and Inspector & official vehicles	29.20	0.00	0.00	29.73
Worker Vehicles	51.98	0.01	0.01	55.79
Subtotal of Off-Site Emissions	**81.18**	**0.01**	**0.01**	**85.52**
Total Maximum Emissions	**342.27**	**0.04**	**0.01**	**347.37**

Calera MLBMDP Project - Detailed Emission Inventory During Project Construction

Table 3A. Detailed Daily Emissions In Every Month

Equipment/Vehicle Type	unit (# per day)	Daily Emissions (unit: lbs/day)													
		Fugitive Dust PM_{10}	Exhaust PM_{10}	Total PM_{10}	Fugitive Dust $PM_{2.5}$	Exhaust $PM_{2.5}$	Total $PM_{2.5}$	CO	ROG	NO_x	SO_x	CO_2	CH_4	N_2O	Total GHG - CO_2e
Month 1															
Total Daily Emissions In This Month		18.26	2.75	21.01	2.59	2.49	5.07	26.11	7.41	68.50	0.08	7,152.20	0.78	0.15	7,214.45
Month 2															
Total Daily Emissions In This Month		19.85	3.15	23.00	2.73	2.85	5.58	31.65	8.33	75.68	0.09	7,980.73	0.90	0.19	8,058.61
Month 3															
Total Daily Emissions In This Month		15.27	1.84	17.10	1.86	1.65	3.50	22.48	5.00	38.58	0.05	4,582.70	0.62	0.20	4,658.06
Month 4															
Total Daily Emissions In This Month		10.69	1.38	12.07	1.17	1.23	2.40	19.09	4.07	29.81	0.04	3,794.95	0.55	0.21	3,870.61
Month 5															
Total Daily Emissions In This Month		11.39	1.53	12.92	1.22	1.36	2.58	21.86	4.67	31.11	0.04	4,053.17	0.63	0.24	4,140.47
Month 6															
Total Daily Emissions In This Month		11.39	1.40	12.79	1.22	1.24	2.46	20.52	4.12	29.97	0.04	3,946.37	0.58	0.24	4,032.62
Month 7															
Total Daily Emissions In This Month		8.24	0.94	9.18	0.97	0.83	1.81	12.31	2.74	22.35	0.03	2,788.38	0.35	0.13	2,834.70

Table 3B. Detailed Annual Emissions (rolling year)

Equipment/Vehicle Type	unit (# per day [7 months added-up])	Annual Emissions (unit: tons/year)													
		Fugitive Dust PM_{10}	Exhaust PM_{10}	Total PM_{10}	Fugitive Dust $PM_{2.5}$	Exhaust $PM_{2.5}$	Total $PM_{2.5}$	CO	ROG	NO_x	SO_x	CO_2	CH_4	N_2O	Total GHG - CO_2e
Month 1 to 7															
On-site															
Off-road Equipment															
CRANE	4	0.02	0.01	0.02	0.00	0.01	0.01	0.07	0.02	0.23	0.00	21.20	0.00	-	21.25
EXCAVATOR	2	0.00	0.01	0.01	0.00	0.01	0.01	0.04	0.02	0.17	0.00	17.79	0.00	-	17.82
FORKLIFT	4	0.01	0.00	0.02	0.00	0.00	0.01	0.03	0.01	0.05	0.00	4.12	0.00	-	4.13
COMPRESSOR	12	-	0.02	0.02	-	0.02	0.02	0.18	0.07	0.15	0.00	14.10	0.01	-	14.24
LIGHT TOWER	1	-	0.00	0.00	-	0.00	0.00	0.00	0.00	0.01	0.00	0.69	0.00	-	0.69
WATER TRUCK	7	0.05	0.03	0.08	0.01	0.03	0.03	0.21	0.08	0.77	0.00	79.44	0.01	-	79.59
ROLLER	2	0.01	0.01	0.02	0.00	0.01	0.01	0.08	0.02	0.15	0.00	13.79	0.00	-	13.82
LOADER	7	0.02	0.02	0.04	0.00	0.02	0.02	0.18	0.06	0.64	0.00	61.89	0.01	-	62.01
DOZER	2	0.01	0.02	0.02	0.00	0.01	0.02	0.11	0.04	0.35	0.00	26.22	0.00	-	26.29
DUMP TRUCK	2	0.00	0.01	0.01	0.00	0.01	0.01	0.05	0.02	0.20	0.00	20.87	0.00	-	20.90
GRADER	2	0.01	0.01	0.02	0.00	0.01	0.01	0.06	0.02	0.23	0.00	21.94	0.00	-	21.98
WELDING MACHINE	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-
On-road Vehicles															
Panel trucks	8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.21
Inspector and official vehicle	9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.13
Crushed rock delivery trucks	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.06
Tractor trailer delivery	11	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.68	0.00	0.00	0.68
Worker passenger vehicles	335	0.10	0.00	0.10	0.02	0.00	0.02	0.04	0.00	0.00	0.00	4.70	0.00	0.00	4.84
Other Sources															
(Cover Storage Pile)	2	1.44	-	1.44	0.32	-	0.32								
On-site Emissions Subtotal		**1.71**	**0.13**	**1.84**	**0.36**	**0.12**	**0.48**	**1.05**	**0.37**	**2.95**	**0.00**	**287.80**	**0.03**	**0.00**	**288.63**
Off-site															
On-road Vehicles															
Panel trucks	8	0.04	0.00	0.04	0.01	0.00	0.01	0.01	0.00	0.02	0.00	4.67	0.00	0.00	5.00
Inspector and official vehicle	9	0.01	0.00	0.01	0.00	0.00	0.00	0.03	0.00	0.00	0.00	3.21	0.00	0.00	3.44
Crushed rock delivery trucks	1	0.04	0.00	0.04	0.01	0.00	0.01	0.00	0.00	0.02	0.00	2.03	0.00	0.00	2.03
Tractor trailer delivery	11	0.48	0.01	0.49	0.07	0.01	0.08	0.05	0.01	0.20	0.00	22.28	0.00	0.00	22.30
Worker passenger vehicles	335	0.18	0.01	0.19	0.00	0.00	0.01	0.55	0.02	0.06	0.00	57.30	0.01	0.01	61.50
Off-site Emissions Subtotal		**0.76**	**0.02**	**0.78**	**0.09**	**0.01**	**0.10**	**0.65**	**0.03**	**0.30**	**0.00**	**89.48**	**0.02**	**0.01**	**94.27**
Total Emissions In This Year		**2.47**	**0.14**	**2.62**	**0.45**	**0.13**	**0.57**	**1.69**	**0.40**	**3.26**	**0.00**	**377.28**	**0.05**	**0.01**	**382.90**

Calera MLBMDP Project - EMISSION FACTORS FOR PROJECT CONSTRUCTION

Table 2A. Emission Factors For On-site Vehicle and Equipment Combustion Exhaust Emissions

			Emission Factors (unit: both lb/hr for off-road equipment and on-road vehicle)									
Equipment/Vehicle Type	**Load Factors**	**Actual Operating Hours / Day**	**Exhausted PM_{10}**	**Exhausted $PM_{2.5}$**	**CO**	**ROG**	**NO_x**	**SO_x**	**CO_2**	**CH_4**	**N_2O**	**Total GHG - CO_2e**
Off-road Equipment												
CRANE	0.43	4.3	0.047	0.043	0.346	0.124	1.236	0.001	112.058	0.011	0.000	112.29
EXCAVATOR	0.51	5.1	0.052	0.048	0.393	0.145	1.491	0.002	158.540	0.013	0.000	158.81
FORKLIFT	0.30	3.0	0.034	0.031	0.223	0.059	0.346	0.000	31.197	0.005	0.000	31.31
COMPRESSOR	0.48	4.8	0.026	0.024	0.278	0.114	0.237	0.000	22.251	0.010	0.000	22.47
LIGHT TOWER	0.62	6.2	0.003	0.003	0.062	0.012	0.074	0.000	10.098	0.001	0.000	10.12
WATER TRUCK	0.62	6.2	0.057	0.053	0.430	0.164	1.612	0.002	166.396	0.015	0.000	166.71
ROLLER	0.58	5.8	0.066	0.060	0.626	0.147	1.201	0.001	108.049	0.013	0.000	108.33
LOADER	0.54	5.4	0.056	0.052	0.421	0.149	1.533	0.002	148.843	0.013	0.000	149.13
DOZER	0.65	6.5	0.107	0.099	0.777	0.278	2.446	0.002	183.322	0.025	0.000	183.85
DUMP TRUCK	0.57	5.7	0.057	0.053	0.430	0.164	1.612	0.002	166.396	0.015	0.000	166.71
GRADER	0.58	5.8	0.066	0.061	0.493	0.176	1.787	0.002	171.959	0.016	0.000	172.29
WELDING MACHINE	0.62	6.2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
On-road Vehicle												
Panel trucks		0.08	0.002	0.001	0.085	0.009	0.041	0.000	29.456	0.002	0.002	30.20
Inspector and official vehicle		0.08	0.001	0.001	0.122	0.009	0.011	0.000	15.933	0.002	0.001	16.41
Crushed rock delivery trucks		0.08	0.044	0.040	0.334	0.158	0.617	0.001	69.786	0.000	0.000	69.82
Tractor trailer delivery		0.08	0.044	0.040	0.334	0.158	0.617	0.001	69.786	0.000	0.000	69.82
Worker passenger vehicles		0.08	0.001	0.001	0.122	0.009	0.011	0.000	15.933	0.002	0.001	16.41

Note:

1. Equipment description in OFFROAD2007 model
   - COMPRESSOR is air compressor.
   - LIGHT TOWER is other construction equipment.
   - WATER TRUCK is off-highway truck.
2. Vehicle description in EMFAC2007 model (For on-site activity, it is assumed that the mean vehicle speed = 10 mph. The temperature is 60F and Relative Humidity is 65%).
   - Panel trucks are light-heavy-duty trucks (LHD1-ALL).
   - Crushed rock delivery trucks and tractor trailer deliveries are heavy-heavy-duty truck (HHD-DSL).
   - Worker passenger vehicles and inspector and official vehicles are passenger cars (LDA-ALL).
3. $PM_{2.5}$ emission factors determined using guidance from SCAQMD Final - Methodology to Calculate $PM_{2.5}$ and $PM_{2.5}$ Significance Thresholds 10/1/2006, Appendix A - Updated CEIDARS Table with $PM_{2.5}$ Fractions
   - $PM_{2.5}$ Fraction of PM_{10}, Brake wear = 0.429
   - $PM_{2.5}$ Fraction of PM_{10}, Diesel = 0.920
   - $PM_{2.5}$ Fraction of PM_{10}, Gasoline-catalyst = 0.928
   - $PM_{2.5}$ Fraction of PM_{10}, Tire wear = 0.250
   - $PM_{2.5}$ Fraction of PM_{10}, Diesel off-road equipment = 0.920
4. CH_4 and N_2O emission factors for the vehicles are from Reference source 1: Table C.4, California Climate Action Registry General Reporting Protocol Version 3.1, January 2009.
5. Utilization Load Factors from Table A9-8-D SCAQMD CEQA Handbook (1993). On-road vehicles do not apply any load factor.
6. Greenhouse Gas Global Warming Potential (GWP) - Intergovernmental Panel on Climate Change, Second Assessment Report (1996)
   - CO_2 GWP (SAR, 1996) = 1
   - CH_4 GWP (SAR, 1996) = 21
   - N_2O GWP (SAR, 1996) = 310

Table 2B. Emission Factors For Offsite Vehicle Combustion Exhaust Emissions

Equipment Description	Load Factors	Actual Operating Hours / Day	Emission Factors (unit: lb/hr for off-road equipment and g/mile for on-road vehicle)									
			PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_x	CO_2	CH_4	N_2O	Total GHG - CO_2e
Off-road Equipment												
CRANE	On-site Use Only											
EXCAVATOR												
FORKLIFT												
COMPRESSOR												
LIGHT TOWER												
WATER TRUCK												
ROLLER												
LOADER												
DOZER												
DUMP TRUCK												
GRADER												
WELDING MACHINE												
On-road Vehicle												
Panel trucks		1.00	0.004	0.002	0.117	0.008	0.179	0.001	53.081	0.009	0.011	56.81
Inspector and official vehicle		1.00	0.003	0.002	0.312	0.011	0.036	0.000	32.394	0.008	0.007	34.77
Crushed rock delivery trucks		1.00	0.070	0.060	0.400	0.088	1.668	0.002	184.161	0.001	0.001	184.34
Tractor trailer delivery		1.00	0.070	0.060	0.400	0.088	1.668	0.002	184.161	0.001	0.001	184.34
Worker passenger vehicles		0.48	0.003	0.002	0.312	0.011	0.036	0.000	32.394	0.008	0.007	34.77

Note:

1. Vehicle description in EMFAC2007 model (For off-site activity, it is assumed that the mean vehicle speed = 50 mph. The temperature is 60F and Relative Humidity is 65%).
   - Panel trucks are light-heavy-duty trucks (LHD1-ALL).
   - Crushed rock delivery trucks and tractor trailer deliveries are heavy-heavy-duty truck (HHD-DSL).
   - Worker passenger vehicles and inspector and official vehicles are passenger cars (LDA-ALL).
2. $PM_{2.5}$ emission factors determined using guidance from SCAQMD Final - Methodology to Calculate $PM_{2.5}$ and $PM_{2.5}$ Significance Thresholds 10/1/2006, Appendix A - Updated CEIDARS Table with $PM_{2.5}$ Fractions
   - $PM_{2.5}$ Fraction of PM_{10}, Brake wear : 0.429
   - $PM_{2.5}$ Fraction of PM_{10}, Diesel 0.920
   - $PM_{2.5}$ Fraction of PM_{10}, Gasoline-catalyst : 0.928
   - $PM_{2.5}$ Fraction of PM_{10}, Tire wear 0.250
3. CH_4 and N_2O emission factors for the vehicles are from Reference source 1: Table C.4, California Climate Action Registry General Reporting Protocol Version 3.1, January 2009.
4. Greenhouse Gas Global Warming Potential (GWP) - Intergovernmental Panel on Climate Change, Second Assessment Report (1996)
   - CO_2 GWP (SAR, 1996) = 1
   - CH_4 GWP (SAR, 1996) = 21
   - N_2O GWP (SAR, 1996) = 310

Table 2C. On-site Fugitive Dust Emissions

Emission Factor Equation:

(1) Travel on unpaved surfaces (construction unpaved site)

$E = k * (s/12)^a * (W/3)^b * [(365 - P)/365]$

Source: EPA AP-42 Section 13.2.2 Unpaved Roads Equations 1a and 2
E = size-specific emission factor (lb/VMT)
k, a, b = empirical constants
8.5 s = surface material silt content (%) Construction sites - Scraper routes
W = mean vehicle weight (tons)

constants

	$PM_{2.5}$	PM_{10}	Industrial Roads
k	0.15	1.5	
a	0.9	0.9	
b	0.45	0.45	

58 P = Mean number of days per year with at least 0.01 inches of precipitation (from WRCC for WATSONVILLE WATERWORKS 1908-2009 data)

Travel on unpaved surfaces (gravel road)

$F = 2.1 * G/12 * H/30 * (J/3)^{0.7} * (I/4)^{0.5} * (365-K)/365$

Source: SCAQMD Table A9-9-D
F = Emission factor for vehicle travel on unpaved roads (lb/VMT)
4 G = Surface silt loading (%) (value for gravel road)
10 H = Mean vehicle speed (mph)
I = Mean number of wheels on vehicle
J = Mean vehicle weight (ton)
58 K = Mean number of days per year with at least 0.01 inches of precipitation (from WRCC for WATSONVILLE WATERWORKS 1908-2009 data)
It is assumed that all the construction equipment will have 90% of time to be used on construction unpaved site and 10% of time to be used on gravel road.
It is assumed that all the on-road vehicles will have 10% of time to be used on construction unpaved site and 90% of time to be used on gravel road.
PM2.5 emission factors from updated CEIDARS List with PM2.5 fractions of PM10 for unpaved road (0.212).

(2) Bulldozing & grading

Source: EPA AP-42 Section 11.9

$E = p * 1 * s^{1.5} / M^{1.4}$

PM10 Emissions from bulldozing (lb/hr); Table 11.9-1 EMISSION FACTOR EQUATIONS FOR UNCONTROLLED OPEN DUST SOURCES AT WESTERN SURFACE COAL MINES (Overburden)
0.75 p = particle size multiplier for PM10
6.9 s = Silt content (%) (from Table 11.9-3 for bulldozers overburden)
7.9 M = Moisture content of surface material (%) (from Table 11.9-3 for bulldozers overburden)
0.75 lb/hr of PM10

$E = p * 5.7 * s^{1.2} / M^{1.3}$

PM2.5 Emissions from bulldozing (lb/hr); Table 11.9-1 EMISSION FACTOR EQUATIONS FOR UNCONTROLLED OPEN DUST SOURCES AT WESTERN SURFACE COAL MINES (Overburden)
0.105 p = particle size multiplier for PM2.5
6.9 s = Silt content (%) (from Table 11.9-3 for bulldozers overburden)
7.9 M = Moisture content of surface material (%) (from Table 11.9-3 for bulldozers overburden)
0.41 lb/hr of PM2.5

$E = p * 0.051 * S^{2.0}$

PM10 Emissions from grading (lb/VMT); Table 11.9-1 EMISSION FACTOR EQUATIONS FOR UNCONTROLLED OPEN DUST SOURCES AT WESTERN SURFACE COAL MINES (Overburden)
0.6 p = particle size multiplier for PM10
7.1 S = mean vehicle speed (mph) (from Table 11.9-3 for grader)
1.54 lb/VMT of PM10

$E = p * 0.040 * S^{2.5}$

PM2.5 Emissions from grading (lb/VMT); Table 11.9-1 EMISSION FACTOR EQUATIONS FOR UNCONTROLLED OPEN DUST SOURCES AT WESTERN SURFACE COAL MINES (Overburden)
0.031 p = particle size multiplier for PM2.5
7.1 S = mean vehicle speed (mph) (from Table 11.9-3 for grader)
0.17 lb/VMT of PM2.5
2 months of earth work
10 total construction hours per work day
22 construction days per month

(3) Dirt Piling or Material Handling

Source: PM10 Emissions from Material Handling (lb/ton) from EPA AP-42 Chapter 13.2.4 Eq. 1

$E = k * 0.0032 * (U/5)^{1.3} / (M/2)^{1.4}$

E = Emission factor (lb/ton material handled)
10 U = Mean Wind speed (mph) (assumption)
12 M = Moisture content of surface material (%) (from Table 13.2.4-1 for cover at municipal landfill)

constants

	$PM_{2.5}$	PM_{10}
k	0.053	0.35

0.00003 lb/ton of PM2.5
0.00022 lb/ton of PM10
Assume 100% soil movement from loaders

Total amount of material handling calculation

46 yd3/day 144 ton/day
2,033 yd3/project 6,338 tons/project 6236 density of soil (lb/yd3)
(The range of surficial soil density (total unit weight) is from about sigma low 115 to sigma high 135 lb/cf. Use the highest as the most conservative value.)

total project

0.42 acres = 2,033 cubic yds, assume depth of soils moved is 1 depth of disturbance (yards)
42 total acres as described in Project Description and only 10% of this soil is picked up and moved via the equipment above

(4) Cover Storage Pile

E = 1.7 * G/1.5 * (365-H)/235 * I/15 * J

Source: SCAQMD Table A9-9-E
PM10 Emission factor from wind erosion of storage piles per day per acre
15 G = Silt content (%) (from CEQA Handbook Table A9-9-E-1 for blended ore and dirt)
58 H = Number of days with >= 0.01 inches of precipitation per year (from WRCC for WATSONVILLE WATERWORKS 1908-2009 data)
5 I = Percentage of time that the unobstructed wind speed exceeds 12 mph at mean pile height (assumption)
0.5 J = Fraction of TSP that is PM10 = 0.5
3.701 lb/acre/day
1 piles (assumptions)
0.5 Size of Pile (acre) (assumptions)
2 months (month 1-2) total for piles present due to earth moving.

	(1) Travel on unpaved surfaces			(2) Bulldozing & grading			(3) Dirt Piling or Material Handling			(4) Cover Storage Pile		
Equipment/Vehicle Type	**$PM_{2.5}$ EF (lbs/VMT)**	**PM_{10} EF (lbs/VMT)**	**Mitigation Efficiency**	**$PM_{2.5}$ EF (lbs/VMT)**	**PM_{10} EF (lbs/VMT)**	**Mitigation Efficiency**	**$PM_{2.5}$ EF (lbs/day)**	**PM_{10} EF (lbs/day)**	**Mitigation Efficiency**	**$PM_{2.5}$ EF (lbs/day)**	**PM_{10} EF (lbs/day)**	**Mitigation Efficiency**
Off-road Equipment												
CRANE	0.220	2.072	83%									
EXCAVATOR	0.207	2.007	83%				0.002	0.016	61%			
FORKLIFT	0.185	1.778	83%									
COMPRESSOR	0.051	0.508	83%									
LIGHT TOWER	0.051	0.508	83%									
WATER TRUCK	0.215	2.046	83%									
ROLLER	0.169	1.649	83%	0.17	1.54	61%						
LOADER	0.235	2.248	83%				0.002	0.016	61%			
DOZER	0.211	2.029	83%	0.41	0.75	61%						
DUMP TRUCK	0.215	2.046	83%				0.005	0.032	61%			
GRADER	0.202	1.911	83%	0.17	1.54	61%						
WELDING MACHINE	0.018	0.180	83%									
On-road Vehicle												
Panel trucks	0.065	0.369	83%									
Inspector and official vehicle	0.036	0.210	83%									
Crushed rock delivery trucks	0.245	1.271	83%									
Tractor trailer delivery	0.245	1.271	83%									
Worker passenger vehicles	0.036	0.210	83%									
(Cover Storage Pile)										0.411	1.851	61%

Note:

1. "Watering Control Efficiency" and "Limit Maximum Speed Control Efficiency" for unpaved road from SCAQMD CEQA Handbook 2007 - Mitigation Measures and Control Efficiencies (http://www.aqmd.gov/CEQA/handbook/mitigation/fugitive/MM_fugitive.html) - 61% from watering every 3 hours, 57% from limiting speeds to 15 mph, and 83% [=1-(1-0.61)*(1-0.57)] from doing these two mitigation together.
2. (2)(3)(4) earth moving related activities only occur in month 1-2.

Table 2D. Off-site Fugitive Dust Emissions

(1) Travel on paved road

$E = [k * (sL/2)^{0.65} * (W/3)^{1.5} - C] (1 - P/4N)$

Source: EPA AP-42 Section 13.2.1 Paved Roads Equation 2
E = particulate emission factor (lb/VMT),
k = particle size multiplier for particle size range and units of interest

0.32 sL = road surface silt loading (grams per square meter) (g/m^2), From CARB - Emission Inventory Database - Section 7.9 Entrained Paved Road Dust - Local Streets (emission inventory code: 640-641-5400-0000

W = average weight (tons) of the vehicles traveling the road, and
C = emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear.

constants

	$PM_{2.5}$	PM_{10}
k	0.0024	0.016
C	0.00036	0.00047

58 P = Mean number of days per year with at least 0.01 inches of precipitation (from WRCC for WATSONVILLE WATERWORKS 1908-2009 data)
365 N = number of days in the year (averaging period)

Equipment/Vehicle Type	(1) Travel on paved road		
	$PM_{2.5}$ EF (lbs/VMT)	**PM_{10} EF (lbs/VMT)**	**Mitigation Efficiency**
Emission Factor Equation:			
CRANE			
EXCAVATOR			
FORKLIFT			
COMPRESSOR			
LIGHT TOWER			
WATER TRUCK			
ROLLER			
LOADER			
DOZER			
DUMP TRUCK			
GRADER			
WELDING MACHINE			
On-road Vehicle			
Panel trucks	0.001	0.010	0%
Inspector and official vehicle	0.000	0.002	0%
Crushed rock delivery trucks	0.012	0.080	0%
Tractor trailer delivery	0.012	0.080	0%
Worker passenger vehicles	0.000	0.002	0%

APPENDIX M
ASSUMPTIONS/DATA USED IN ESTIMATING OPERATIONAL EMISSIONS

Calera MLBMDP Project - Operational Emission Summary Tables

Table M1
Estimated Daily Maximum Operational Emissions of Criteria Pollutants (lbs/day)

Activity	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_x
On-Site Emissions						
On-Site Combustion Emissions						
Stationary Sources	0.16	0.05	12.92	1.25	4.08	0.00
Offroad Equipment	1.19	0.62	5.62	1.65	12.21	0.01
Worker Vehicles	2.59	0.48	0.39	0.03	0.03	0.00
Subtotal of On-site Combustion Emissions	**3.94**	**1.15**	**18.93**	**2.93**	**16.33**	**0.01**
On-Site Fugitive Emissions						
Stationary Sources	0.00	0.00				
Aggregate Handling and Wind Erosion	0.70	0.19				
Offroad Equipment	0.58	0.07				
Worker Vehicles	2.59	0.47				
Subtotal of On-Site Fugitive Emissions	**3.87**	**0.73**	**0.00**	**0.00**	**0.00**	**0.00**
Subtotal of On-Site Emissions	**7.81**	**1.88**	**18.93**	**2.93**	**16.33**	**0.01**
Off-Site On-Road Emissions						
Off-Site Combustion Emissions						
Worker Vehicles	0.07	0.04	5.96	0.20	0.69	0.01
Subtotal of Off-Site Combustion Emissions	**0.07**	**0.04**	**5.96**	**0.20**	**0.69**	**0.01**
Off-Site Paved Road Fugitive Emissions						
Worker Vehicles	2.11	0.04				
Subtotal of Off-Site Fugitive Emissions	**2.11**	**0.04**				
Subtotal of Off-Site Emissions	**2.18**	**0.07**	**5.96**	**0.20**	**0.69**	**0.01**
Total Maximum Emissions	**9.98**	**1.95**	**24.90**	**3.13**	**17.02**	**0.02**

Table M2
Estimated Annual Maximum Operational Emissions of Criteria Pollutants (tons/year)

Activity	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_x
On-Site Emissions						
On-Site Combustion Emissions						
Stationary Sources	0.01	0.00	0.44	0.04	0.14	0.00
Offroad Equipment	0.00	0.00	0.01	0.00	0.01	0.00
Worker Vehicles	0.01	0.01	0.98	0.07	0.09	0.00
Subtotal of On-site Combustion Emissions	**0.02**	**0.01**	**1.43**	**0.12**	**0.24**	**0.00**
On-Site Fugitive Emissions						
Stationary Sources	0.00	0.00				
Aggregate Handling and Wind Erosion	0.06	0.02				
Offroad Equipment	0.00	0.00				
Worker Vehicles	6.52	1.19				
Subtotal of On-Site Fugitive Emissions	**6.58**	**1.21**	**0.00**	**0.00**	**0.00**	**0.00**
Subtotal of On-Site Emissions	**6.60**	**1.22**	**1.43**	**0.12**	**0.24**	**0.00**
Off-Site On-Road Emissions						
Off-Site Combustion Emissions						
Worker Vehicles	0.17	0.09	15.03	0.50	1.74	0.02
Subtotal of Off-Site Combustion Emissions	**0.17**	**0.09**	**15.03**	**0.50**	**1.74**	**0.02**
Off-Site Paved Road Fugitive Emissions						
Worker Vehicles	5.31	0.09				
Subtotal of Off-Site Fugitive Emissions	**5.31**	**0.09**				
Subtotal of Off-Site Emissions	**5.48**	**0.18**	**15.03**	**0.50**	**1.74**	**0.02**
Total Maximum Emissions	**12.08**	**1.41**	**16.46**	**0.62**	**1.98**	**0.02**

Table M3
Estimated Annual Maximum Operational Emissions of Greenhouse Gases
(metric tons/year)

Activity	CO_2	CH_4	N_2O	CO_2e
On-Site Emissions				
On-Site Combustion Emissions				
Stationary Sources	6,228.78	0.32	0.11	6,269.04
Offroad Equipment	1.27	0.00	-	1.27
Worker Vehicles	122.56	0.01	0.01	126.21
Subtotal of On-Site Emissions	**6,352.61**	**0.34**	**0.12**	**6,396.52**
Off-Site On-Road Emissions				
Off-Site Combustion Emissions				
Worker Vehicles	1,494.88	0.36	0.33	1,604.29
Subtotal of Off-Site Emissions	**1,494.88**	**0.36**	**0.33**	**1,604.29**
Total Maximum Emissions	**7,847.49**	**0.69**	**0.45**	**8,000.81**

Calera MLBMDP Project - Detailed Emission Inventory During Project Operational

Table 3A. Detailed Daily Emissions

Equipment/Vehicle Type	unit (# per day)	Daily Emissions (unit: lbs/day)													
		Fugitive Dust PM_{10}	Exhaust PM_{10}	Total PM_{10}	Fugitive Dust $PM_{2.5}$	Exhaust $PM_{2.5}$	Total $PM_{2.5}$	CO	ROG	NO_x	SO_x	CO_2	CH_4	N_2O	Total GHG - CO_2e
Daily															
On-site															
Stationary Sources															
Spray Dryer	1		0.16	0.16		0.05	0.05	12.92	1.25	4.08		200,259.86	10.41	3.47	201,554.24
Off-road Equipment															
AIR COMPRESSOR	1	-	0.09	0.09	-	0.09	0.09	1.03	0.41	0.89	0.00	84.55	0.04	-	85.33
COMPACTOR	1	0.43	0.29	0.72	0.04	0.27	0.31	2.87	0.64	5.22	0.01	497.03	0.06	-	498.24
FRONT END LOADER	1	0.15	0.22	0.37	0.02	0.20	0.23	1.72	0.60	6.10	0.01	640.02	0.05	-	641.17
On-road Vehicles															
Worker passenger vehicles	14	2.59	0.00	2.59	0.47	0.00	0.48	0.39	0.03	0.03	0.00	53.61	0.01	0.00	55.21
Other Sources															
Primary Crushing	1			-			-								
Secondary Crushing	1			-			-								
Tertiary Crushing	1	0.10		0.10	0.03		0.03								
Screening	1	0.36		0.36	0.11		0.11								
Conveyor Transfer Point	6	0.05		0.05	0.01		0.01								
Truck Unloading - Conveyor, crushed stone	3	0.00		0.00	0.00		0.00								
(Cover Storage Pile)	6	0.18		0.18	0.04		0.04								
On-site Emissions Subtotal		**3.87**	**0.77**	**4.64**	**0.73**	**0.61**	**1.34**	**18.93**	**2.93**	**16.33**	**0.01**	**201,535.08**	**10.56**	**3.47**	**202,834.18**
Off-site															
On-road Vehicles															
Worker passenger vehicles	14	2.11	0.07	2.18	0.04	0.04	0.07	5.96	0.20	0.69	0.01	653.90	0.16	0.14	701.76
Off-site Emissions Subtotal		**2.11**	**0.07**	**2.18**	**0.04**	**0.04**	**0.07**	**5.96**	**0.20**	**0.69**	**0.01**	**653.90**	**0.16**	**0.14**	**701.76**
Total Daily Emissions In This Month		**5.97**	**0.84**	**6.81**	**0.77**	**0.64**	**1.41**	**24.90**	**3.13**	**17.02**	**0.02**	**202,188.98**	**10.72**	**3.62**	**203,535.94**

Table 3B. Detailed Annual Emissions

Equipment/Vehicle Type	unit (# per day in 12 month total)	Annual Emissions (unit: tons/year)													
		Fugitive Dust PM_{10}	Exhaust PM_{10}	Total PM_{10}	Fugitive Dust $PM_{2.5}$	Exhaust $PM_{2.5}$	Total $PM_{2.5}$	CO	ROG	NO_x	SO_x	CO_2	CH_4	N_2O	Total GHG - CO_2e
Annual															
On-site															
Stationary Sources															
Spray Dryer	12	-	0.01	0.01	-	0.00	0.00	0.44	0.04	0.14	-	6,866.05	0.36	0.12	6,910.43
Off-road Equipment															
AIR COMPRESSOR	12	-	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	-	0.10
COMPACTOR	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.57	0.00	-	0.57
FRONT END LOADER	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.73	0.00	-	0.73
On-road Vehicles															
Worker passenger vehicles	168	6.52	0.01	6.53	1.19	0.01	1.20	0.98	0.07	0.09	0.00	135.10	0.01	0.01	139.12
Other Sources															
Primary Crushing	12	-	-	-	-	-	-								
Secondary Crushing	12	-	-	-	-	-	-								
Tertiary Crushing	12	0.00	-	0.00	0.00	-	0.00								
Screening	12	0.01	-	0.01	0.00	-	0.00								
Conveyor Transfer Point	72	0.01	-	0.01	0.00	-	0.00								
Truck Unloading - Conveyor, crushed stone	36	0.00	-	0.00	0.00	-	0.00								
(Cover Storage Pile)	72	0.04	-	0.04	0.01	-	0.01								
On-site Emissions Subtotal		**6.58**	**0.02**	**6.60**	**1.21**	**0.01**	**1.22**	**1.43**	**0.12**	**0.24**	**0.00**	**7,002.55**	**0.37**	**0.13**	**7,050.95**
Off-site															
On-road Vehicles															
Worker passenger vehicles	168	5.31	0.17	5.48	0.09	0.09	0.18	15.03	0.50	1.74	0.02	1,647.83	0.39	0.36	1,768.43
Off-site Emissions Subtotal		**5.31**	**0.17**	**5.48**	**0.09**	**0.09**	**0.18**	**15.03**	**0.50**	**1.74**	**0.02**	**1,647.83**	**0.39**	**0.36**	**1,768.43**
Total Emissions In This Year		**11.89**	**0.19**	**12.08**	**1.30**	**0.11**	**1.41**	**16.46**	**0.62**	**1.98**	**0.02**	**8,650.38**	**0.76**	**0.49**	**8,819.38**

Note:

1. Maximum operating schedule is 32 hours per week which applies to all the emission sources except for worker vehicles.

Calera MLBMDP Project - EMISSION FACTORS FOR PROJECT OPERATION

I. Stational Source:

Equipment	Power Rating (hp)	Heat Input (MMbtu/hr)	Emission Factor (lb/hr)									
			PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_x	CO_2	CH_4	N_2O	Total GHG - CO_2e
Spray Dryer	-	60	0.0067	0.0020	0.5383	0.0521	0.1702	NE	8,344.16	0.4338	0.1446	8398.09

Note:

1. NE: negligible
2. Emission factor for dryers are from EPA AP-42 Ch11.3 Bricks Dryers. Assume the baghouse control efficiency is 90%.
3. For the dryers: PM emission factor ratio from CEIDARS List for MINERAL PROCESS LOSS - BRICK, CEMENT, FIBERGLASS, GLASS MFG. (PM10/PM=0.5, PM2.5/PM=0.146).
4. For dryers, GHG emission factors from Appendix Table C7 in California Climate Action Registry General Reporting Protocol Version 3.1, January 2009. 91500 Btu/gal for propane from EPA AP-42 Ch 1.5.

II. Mobile Source

Table 2A. Emission Factors For On-site Vehicle and Equipment Combustion Exhaust Emissions

Equipment/Vehicle Type	Load Factors	Actual Operating Hours / Day	Emission Factors (unit: lb/hr for both off-road equipment and on-road vehicle)									
			Exhausted PM_{10}	Exhausted $PM_{2.5}$	CO	ROG	NO_x	SO_x	CO_2	CH_4	N_2O	Total GHG - CO_2e
Off-road Equipment												
AIR COMPRESSOR	0.48	3.8	0.025	0.023	0.271	0.107	0.234	0.000	22.251	0.010	0.000	22.45
COMPACTOR	0.58	4.6	0.063	0.058	0.624	0.139	1.135	0.001	108.049	0.013	0.000	108.31
FRONT END LOADER	0.54	4.3	0.051	0.047	0.401	0.141	1.418	0.002	148.843	0.013	0.000	149.11
On-road Vehicle												
Worker passenger vehicles		0.24	0.001	0.001	0.116	0.009	0.010	0.000	15.956	0.002	0.001	16.43

Note:

1. Equipment description in OFFROAD2007 model
   - COMPRESSOR is air compressor.
   - COMPACTOR is roller.
2. Vehicle description in EMFAC2007 model (For on-site activity, it is assumed that the mean vehicle speed = 10 mph. The temperature is 60F and Relative Humidity is 65%).
   - Worker passenger vehicles and inspector and official vehicles are passenger cars (LDA-ALL).
3. $PM_{2.5}$ emission factors determined using guidance from SCAQMD Final - Methodology to Calculate $PM_{2.5}$ and $PM_{2.5}$ Significance Thresholds 10/1/2006, Appendix A - Updated CEIDARS Table with $PM_{2.5}$ Fractions
   - $PM_{2.5}$ Fraction of PM_{10}, Brake wear = 0.429
   - $PM_{2.5}$ Fraction of PM_{10}, Diesel = 0.920
   - $PM_{2.5}$ Fraction of PM_{10}, Gasoline-catalyst = 0.928
   - $PM_{2.5}$ Fraction of PM_{10}, Tire wear = 0.250
   - $PM_{2.5}$ Fraction of PM_{10}, Diesel off-road equipment = 0.920
4. CH_4 and N_2O emission factors for the vehicles are from Reference source 1: Table C.4, California Climate Action Registry General Reporting Protocol Version 3.1, January 2009.
5. Utilization Load Factors from Table A9-8-D SCAQMD CEQA Handbook (1993). On-road vehicles do not apply any load factor.
6. Greenhouse Gas Global Warming Potential (GWP) - Intergovernmental Panel on Climate Change, Second Assessment Report (1996)
   - CO_2 GWP (SAR, 1996) = 1
   - CH_4 GWP (SAR, 1996) = 21
   - N_2O GWP (SAR, 1996) = 310

Table 2B. Emission Factors For Offsite Vehicle Combustion Exhaust Emissions

Equipment Description	Load Factors	Actual Operating Hours / Day	Emission Factors (unit: lb/hr for both off-road equipment and on-road vehicle)									
			PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_x	CO_2	CH_4	N_2O	Total GHG - CO_2e
Off-road Equipment												
AIR COMPRESSOR												
COMPACTOR												
FRONT END LOADER												
On-road Vehicle												
Worker passenger vehicles		1.44	0.003	0.002	0.296	0.010	0.034	0.000	32.436	0.008	0.007	34.81

Note:

1. Vehicle description in EMFAC2007 model (For off-site activity, it is assumed that the mean vehicle speed = 50 mph. The temperature is 60F and Relative Humidity is 65%).
   - Worker passenger vehicles and inspector and official vehicles are passenger cars (LDA-ALL).
2. $PM_{2.5}$ emission factors determined using guidance from SCAQMD Final - Methodology to Calculate $PM_{2.5}$ and $PM_{2.5}$ Significance Thresholds 10/1/2006, Appendix A - Updated CEIDARS Table with $PM_{2.5}$ Fractions
   - $PM_{2.5}$ Fraction of PM_{10}, Brake wear = 0.429
   - $PM_{2.5}$ Fraction of PM_{10}, Diesel = 0.920
   - $PM_{2.5}$ Fraction of PM_{10}, Gasoline-catalyst = 0.928
   - $PM_{2.5}$ Fraction of PM_{10}, Tire wear = 0.250
3. CH_4 and N_2O emission factors for the vehicles are from Reference source 1: Table C.4, California Climate Action Registry General Reporting Protocol Version 3.1, January 2009.
4. Greenhouse Gas Global Warming Potential (GWP) - Intergovernmental Panel on Climate Change, Second Assessment Report (1996)
   - CO_2 GWP (SAR, 1996) = 1
   - CH_4 GWP (SAR, 1996) = 21
   - N_2O GWP (SAR, 1996) = 310

Table 2C. On-site Fugitive Dust Emissions

Emission Factor Equation:

(1) Travel on unpaved surfaces (unpaved site)

$E = k * (s/12)^a * (W/3)^b * [(365 - P)/365]$

Source: EPA AP-42 Section 13.2.2 Unpaved Roads Equations 1a and 2

E = size-specific emission factor (lb/VMT)

k, a, b = empirical constants

4.8 s = surface material silt content (%) Sand and gravel processing - Plant Road

W = mean vehicle weight (tons)

constants

	$PM_{2.5}$	PM_{10}	Industrial Roads
k	0.15	1.5	
a	0.9	0.9	
b	0.45	0.45	

58 P = Mean number of days per year with at least 0.01 inches of precipitation (from WRCC for WATSONVILLE WATERWORKS 1908-2009 data)

Travel on unpaved surfaces (gravel road)

$F = 2.1 * G/12 * H/30 * (J/3)^{0.7} * (I/4)^{0.5} * (365-K)/365$ Source: SCAQMD Table A9-9-D

F = Emission factor for vehicle travel on unpaved roads (lb/VMT)

4 G = Surface silt loading (%) (value for gravel road)

10 H = Mean vehicle speed (mph)

I = Mean number of wheels on vehicle

J = Mean vehicle weight (ton)

58 K = Mean number of days per year with at least 0.01 inches of precipitation (from WRCC for WATSONVILLE WATERWORKS 1908-2009 data)

It is assumed that all the offroad equipment will have 90% of time to be used on unpaved site and 10% of time to be used on gravel road.

It is assumed that all the on-road vehicles will have 10% of time to be used on unpaved site and 90% of time to be used on gravel road.

PM2.5 emission factors from updated CEIDARS List with PM2.5 fractions of PM10 for unpaved road (0.212).

(2) Dirt Piling or Material Handling

$E = k * 0.0032 * (U/5)^{1.3} / (M/2)^{1.4}$

Source: PM10 Emissions from Material Handling (lb/ton) from EPA AP-42 Chapter 13.2.4 Eq. 1

E = Emission factor (lb/ton material handled)

10 U = Mean Wind speed (mph) (assumption)

1 M = Moisture content of surface material (%) (assumptions for aggregate)

constants

	$PM_{2.5}$	PM_{10}
k	0.053	0.35

0.00110 lb/ton of PM2.5

0.00728 lb/ton of PM10

Assume 100% soil movement from loaders

Total amount of material handling calculation (assumption)

29 yd3/day 42 ton/day

2894 density of slurry (lb/yd3)

(3) Cover Storage Pile (aggregate)

$E = 1.7 * G/1.5 * (365-H)/235 * I/15 * J$

Source: SCAQMD Table A9-9-E

PM10 Emission factor from wind erosion of storage piles per day per acre

1.5 G = Silt content (%) (from CEQA Handbook Table A9-9-E-1 for crushed limestones)

58 H = Number of days with >= 0.01 inches of precipitation per year (from WRCC for WATSONVILLE WATERWORKS 1908-2009 data)

5 I = Percentage of time that the unobstructed wind speed exceeds 12 mph at mean pile height (assumption)

0.5 J = Fraction of TSP that is PM10 = 0.5

0.370 lb/acre/day

6 piles of aggregate (assumptions)

0.083 Size of Pile (acre) (assumptions)

	(1) Travel on unpaved surfaces			(2) Dirt Piling or Material Handling			(3) Cover Storage Pile		
Equipment/Vehicle Type	**$PM_{2.5}$ EF (lbs/VMT)**	**PM_{10} EF (lbs/VMT)**	**Mitigation Efficiency**	**$PM_{2.5}$ EF (lbs/day)**	**PM_{10} EF (lbs/day)**	**Mitigation Efficiency**	**$PM_{2.5}$ EF (lbs/day)**	**PM_{10} EF (lbs/day)**	**Mitigation Efficiency**
Off-road Equipment									
AIR COMPRESSOR	0.030	0.304	57%						
COMPACTOR	0.105	1.002	57%						
FRONT END LOADER	0.148	1.379	57%	0.02296	0.15165	0%			
On-road Vehicle									
Worker passenger vehicles	0.033	0.179	57%						
(Cover Storage Pile)							0.041	0.184	0%

Note:

1. "Limit Maximum Speed Control Efficiency" for unpaved road from SCAQMD CEQA Handbook 2007 - Mitigation Measures and Control Efficiencies (http://www.aqmd.gov/CEQA/handbook/mitigation/fugitive/MM_fugitive.html)

Table 2D. Off-site Fugitive Dust Emissions

(1) Travel on paved road

$E = [k * (sL/2)^{0.65} * (W/3)^{1.5} - C] (1 - P/4N)$

Source: EPA AP-42 Section 13.2.1 Paved Roads Equation 2
E = particulate emission factor (lb/VMT),
k = particle size multiplier for particle size range and units of interest

0.32 sL = road surface silt loading (grams per square meter) (g/m^2), From CARB - Emission Inventory Database - Section 7.9 Entrained Paved Road Dust - Local Streets (emission inventory code: 640-641-5400-0000),
W = average weight (tons) of the vehicles traveling the road, and
C = emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear.

constants

	$PM_{2.5}$	PM_{10}
k	0.0024	0.016
C	0.00036	0.00047

58 P = Mean number of days per year with at least 0.01 inches of precipitation (from WRCC for WATSONVILLE WATERWORKS 1908-2009 data)
365 N = number of days in the year (averaging period)

Equipment/Vehicle Type	(1) Travel on paved road		
	$PM_{2.5}$ EF (lbs/VMT)	**PM_{10} EF (lbs/VMT)**	**Mitigation Efficiency**
Off-road Equipment			
AIR COMPRESSOR			
COMPACTOR			
FRONT END LOADER			
On-road Vehicle			
Worker passenger vehicles	0.00004	0.00209	0%

III. Other Sources: (slurry crushing and processing)

Activities/Emission Sources	$PM_{2.5}$ EF (lbs/ton)	PM_{10} EF (lbs/ton)	Control Efficiency
Primary Crushing	ND	ND	0%
Secondary Crushing	ND	ND	0%
Tertiary Crushing	0.00070	0.00240	0%
Screening	0.00254	0.00870	0%
Conveyor Transfer Point	0.00032	0.00110	0%
Truck Unloading - Conveyor, crushed stone	0.00003	0.00010	0%

Note:

1. Source: EPA AP-42 Ch 11.19.2 Crushed Stone Processing and Pulverized Mineral Processing.
2. ND = No data.
3. PM2.5 emission factors from CEIDARS List with PM2.5 fractions of PM10 for MINERAL PROCESS LOSS - GRINDING, CRUSHING, SURFACE BLASTING LOADING AND UNLOADING BULK MATERIALS (0.292).

Calera MLBMDP Project - Operational Emission Summary Tables

I. Stational Source:

Equipment	Model	Quantities	Fuel	Power Rating (hp)	Heat Input (MMbtu/hr)
Rotary Dryer	TBD	1	Propane	TBD	18
Spray Dryer	TBD	1	Propane	TBD	60

Note:

1. Two dryers may not be used at the same time.

II. Mobile Source

Equipment/Vehicles	Gasoline/Diesel/Electric	Horse-power (HP)	Weight (ton)	Origin	Round Trip/ Day/Unit	Traveling distance off-site (mile/trip/day/unit)	Total off-site traveling distance (mile/day/unit)	Traveling distance on-site (mile/trip/day/unit)	Total on-site traveling distance (mile/day/unit)	Numbers of wheels	Op. Hrs/ Day Per Unit	Quantities (unit: # per day)
Off-road Equipment												
AIR COMPRESSOR	D	50	1						0	0	8	1
COMPACTOR	D	175	13						1	2	8	1
FRONT END LOADER	D	250	25						2	4	8	1
On-road Vehicles												
Worker passenger vehicles	G/D	100	2	local area	3	12	72	0.4	2.4	4	8	14

Note:

1. Operational worker trip and shift are provided by the applicant.
   - Month per year 12 month
   - Days per week 7 days
   - Days per month 30 days (assumption)
   - Hours per day 24 hours for dryers
   - Hours per day 8 hours for off-road equipment and workers.
   - Worker shift 3 shifts per day
   - the operational schedule is only 1 day per month for compressor and compactor.
2. TBD = to be decided.
3. It is conservatively assumed daily peak 18 additional operation staff (1.25 carpool ratio).

III. Other Sources: (slurry/SCM crushing and processing, assumptions)

Activities/Emission Sources	Quantities
Primary Crushing	1
Secondary Crushing	1
Tertiary Crushing	1
Sieving (Screening)	1
Conveyor Transfer Point	6
Truck Loading/Unloading - Conveyor, crushed stone	3

CY	Season	AvgDays	Equipment	Fuel	MaxHP	Class	County	Activity	PM Exhaust/ Activity (lbs/hr)	CO Exhaust/ Activity (lbs/hr)	ROG Exhaust/ Activity (lbs/hr)	NOX Exhaust/ Activity (lbs/hr)	SO2 Exhaust/ Activity (lbs/hr)	CO2 Exhaust/ Activity (lbs/hr)	CH4 Exhaust/ Activity (lbs/hr)	N2O Exhaust/ Activity (lbs/hr)
2011	Annual	Mon-Fri	Pavers	D	25	Construction and Mining Equipment	Monterey	2.98E-01	8.61E-03	8.26E-02	2.65E-02	1.56E-01	2.37E-04	1.86E+01	2.39E-03	0.00E+00
2011	Annual	Mon-Fri	Pavers	D	50	Construction and Mining Equipment	Monterey	1.76E+01	3.41E-02	3.76E-01	1.53E-01	3.07E-01	3.62E-04	2.80E+01	1.39E-02	0.00E+00
2011	Annual	Mon-Fri	Pavers	D	120	Construction and Mining Equipment	Monterey	2.07E+01	8.17E-02	5.16E-01	1.55E-01	9.23E-01	8.11E-04	6.91E+01	1.40E-02	0.00E+00
2011	Annual	Mon-Fri	Pavers	D	175	Construction and Mining Equipment	Monterey	1.29E+01	8.67E-02	7.89E-01	1.95E-01	1.52E+00	1.44E-03	1.28E+02	1.76E-02	0.00E+00
2011	Annual	Mon-Fri	Pavers	D	250	Construction and Mining Equipment	Monterey	1.55E+00	8.84E-02	6.68E-01	2.30E-01	2.20E+00	2.19E-03	1.94E+02	2.07E-02	0.00E+00
2011	Annual	Mon-Fri	Pavers	D	500	Construction and Mining Equipment	Monterey	1.59E+00	9.52E-02	1.08E+00	2.50E-01	2.38E+00	2.29E-03	2.33E+02	2.25E-02	0.00E+00
2011	Annual	Mon-Fri	Plate Compactors	D	15	Construction and Mining Equipment	Monterey	4.67E+00	1.31E-03	2.63E-02	5.02E-03	3.15E-02	6.71E-05	4.31E+00	4.53E-04	0.00E+00
2011	Annual	Mon-Fri	Rollers	D	15	Construction and Mining Equipment	Monterey	1.02E+01	1.80E-03	3.86E-02	7.35E-03	4.60E-02	9.83E-05	6.31E+00	6.63E-04	0.00E+00
2011	Annual	Mon-Fri	Rollers	D	25	Construction and Mining Equipment	Monterey	4.25E+00	4.91E-03	5.49E-02	1.62E-02	1.04E-01	1.69E-04	1.33E+01	1.46E-03	0.00E+00
2011	Annual	Mon-Fri	Rollers	D	50	Construction and Mining Equipment	Monterey	1.33E+01	2.77E-02	3.08E-01	1.18E-01	2.71E-01	3.36E-04	2.60E+01	1.07E-02	0.00E+00
2011	Annual	Mon-Fri	Rollers	D	120	Construction and Mining Equipment	Monterey	7.17E+01	6.11E-02	4.13E-01	1.12E-01	7.00E-01	6.91E-04	5.89E+01	1.01E-02	0.00E+00
2011	Annual	Mon-Fri	Rollers	D	175	Construction and Mining Equipment	Monterey	2.88E+01	6.31E-02	6.24E-01	1.39E-01	1.14E+00	1.22E-03	1.08E+02	1.26E-02	0.00E+00
2011	Annual	Mon-Fri	Rollers	D	250	Construction and Mining Equipment	Monterey	4.09E+00	5.49E-02	4.30E-01	1.44E-01	1.51E+00	1.72E-03	1.53E+02	1.30E-02	0.00E+00
2011	Annual	Mon-Fri	Rollers	D	500	Construction and Mining Equipment	Monterey	2.87E+00	7.16E-02	7.24E-01	1.87E-01	1.94E+00	2.15E-03	2.19E+02	1.68E-02	0.00E+00
2011	Annual	Mon-Fri	Scrapers	D	120	Construction and Mining Equipment	Monterey	1.05E+00	1.12E-01	7.08E-01	2.11E-01	1.24E+00	1.10E-03	9.38E+01	1.90E-02	0.00E+00
2011	Annual	Mon-Fri	Scrapers	D	175	Construction and Mining Equipment	Monterey	9.62E+00	1.01E-01	9.21E-01	2.27E-01	1.73E+00	1.66E-03	1.48E+02	2.05E-02	0.00E+00
2011	Annual	Mon-Fri	Scrapers	D	250	Construction and Mining Equipment	Monterey	9.37E+00	9.31E-02	7.02E-01	2.49E-01	2.33E+00	2.35E-03	2.09E+02	2.25E-02	0.00E+00
2011	Annual	Mon-Fri	Scrapers	D	500	Construction and Mining Equipment	Monterey	2.58E+01	1.29E-01	1.40E+00	3.49E-01	3.21E+00	3.15E-03	3.21E+02	3.15E-02	0.00E+00
2011	Annual	Mon-Fri	Scrapers	D	750	Construction and Mining Equipment	Monterey	1.29E+00	2.24E-01	2.42E+00	6.05E-01	5.66E+00	5.58E-03	5.55E+02	5.46E-02	0.00E+00
2011	Annual	Mon-Fri	Paving Equipment	D	25	Construction and Mining Equipment	Monterey	5.21E-01	4.64E-03	5.19E-02	1.54E-02	9.80E-02	1.60E-04	1.26E+01	1.39E-03	0.00E+00
2011	Annual	Mon-Fri	Paving Equipment	D	50	Construction and Mining Equipment	Monterey	4.45E-01	2.91E-02	3.20E-01	1.31E-01	2.62E-01	3.09E-04	2.39E+01	1.18E-02	0.00E+00
2011	Annual	Mon-Fri	Paving Equipment	D	120	Construction and Mining Equipment	Monterey	6.41E+00	6.41E-02	4.03E-01	1.21E-01	7.24E-01	6.39E-04	5.45E+01	1.09E-02	0.00E+00
2011	Annual	Mon-Fri	Paving Equipment	D	175	Construction and Mining Equipment	Monterey	3.01E+00	6.76E-02	6.15E-01	1.52E-01	1.20E+00	1.14E-03	1.01E+02	1.37E-02	0.00E+00
2011	Annual	Mon-Fri	Paving Equipment	D	250	Construction and Mining Equipment	Monterey	8.49E-01	5.48E-02	4.15E-01	1.42E-01	1.38E+00	1.37E-03	1.22E+02	1.29E-02	0.00E+00
2011	Annual	Mon-Fri	Surfacing Equipment	D	50	Construction and Mining Equipment	Monterey	2.19E-01	1.35E-02	1.48E-01	5.50E-02	1.43E-01	1.82E-04	1.41E+01	4.96E-03	0.00E+00
2011	Annual	Mon-Fri	Surfacing Equipment	D	120	Construction and Mining Equipment	Monterey	4.38E-02	5.94E-02	4.29E-01	1.11E-01	7.28E-01	7.47E-04	6.37E+01	1.00E-02	0.00E+00
2011	Annual	Mon-Fri	Surfacing Equipment	D	175	Construction and Mining Equipment	Monterey	3.28E-02	4.52E-02	4.76E-01	1.01E-01	8.66E-01	9.64E-04	8.57E+01	9.08E-03	0.00E+00
2011	Annual	Mon-Fri	Surfacing Equipment	D	250	Construction and Mining Equipment	Monterey	6.57E-02	4.52E-02	3.70E-01	1.17E-01	1.28E+00	1.52E-03	1.35E+02	1.06E-02	0.00E+00
2011	Annual	Mon-Fri	Surfacing Equipment	D	500	Construction and Mining Equipment	Monterey	5.47E-01	6.80E-02	7.27E-01	1.74E-01	1.91E+00	2.17E-03	2.21E+02	1.57E-02	0.00E+00
2011	Annual	Mon-Fri	Surfacing Equipment	D	750	Construction and Mining Equipment	Monterey	1.00E-01	1.08E-01	1.14E+00	2.77E-01	3.06E+00	3.49E-03	3.47E+02	2.50E-02	0.00E+00
2011	Annual	Mon-Fri	Signal Boards	D	15	Construction and Mining Equipment	Monterey	5.10E+01	1.70E-03	3.76E-02	7.18E-03	4.49E-02	9.59E-05	6.16E+00	6.47E-04	0.00E+00
2011	Annual	Mon-Fri	Signal Boards	D	50	Construction and Mining Equipment	Monterey	1.81E-01	3.44E-02	3.71E-01	1.39E-01	3.63E-01	4.67E-04	3.62E+01	1.25E-02	0.00E+00
2011	Annual	Mon-Fri	Signal Boards	D	120	Construction and Mining Equipment	Monterey	2.96E+00	7.54E-02	5.32E-01	1.39E-01	8.92E-01	9.40E-04	8.01E+01	1.25E-02	0.00E+00
2011	Annual	Mon-Fri	Signal Boards	D	175	Construction and Mining Equipment	Monterey	1.84E+00	8.10E-02	8.40E-01	1.79E-01	1.52E+00	1.74E-03	1.54E+02	1.61E-02	0.00E+00
2011	Annual	Mon-Fri	Signal Boards	D	250	Construction and Mining Equipment	Monterey	3.88E-01	7.06E-02	5.76E-01	1.88E-01	2.33E+00	2.87E-03	2.55E+02	1.70E-02	0.00E+00
2011	Annual	Mon-Fri	Trenchers	D	15	Construction and Mining Equipment	Monterey	1.12E+00	2.33E-03	5.16E-02	9.84E-03	6.16E-02	1.32E-04	8.46E+00	8.88E-04	0.00E+00
2011	Annual	Mon-Fri	Trenchers	D	25	Construction and Mining Equipment	Monterey	1.18E+00	1.12E-02	1.35E-01	3.98E-02	2.53E-01	4.17E-04	3.29E+01	3.60E-03	0.00E+00
2011	Annual	Mon-Fri	Trenchers	D	50	Construction and Mining Equipment	Monterey	4.59E+01	3.89E-02	4.27E-01	1.74E-01	3.57E-01	4.25E-04	3.29E+01	1.57E-02	0.00E+00
2011	Annual	Mon-Fri	Trenchers	D	120	Construction and Mining Equipment	Monterey	6.23E+01	7.45E-02	4.78E-01	1.43E-01	8.66E-01	7.61E-04	6.48E+01	1.29E-02	0.00E+00
2011	Annual	Mon-Fri	Trenchers	D	175	Construction and Mining Equipment	Monterey	6.81E+00	9.52E-02	8.76E-01	2.15E-01	1.71E+00	1.62E-03	1.44E+02	1.94E-02	0.00E+00
2011	Annual	Mon-Fri	Trenchers	D	250	Construction and Mining Equipment	Monterey	6.11E-01	1.03E-01	7.78E-01	2.62E-01	2.53E+00	2.51E-03	2.23E+02	2.37E-02	0.00E+00
2011	Annual	Mon-Fri	Trenchers	D	500	Construction and Mining Equipment	Monterey	7.79E-01	1.28E-01	1.51E+00	3.30E-01	3.21E+00	3.05E-03	3.11E+02	2.97E-02	0.00E+00
2011	Annual	Mon-Fri	Trenchers	D	750	Construction and Mining Equipment	Monterey	2.80E-02	2.43E-01	2.85E+00	6.26E-01	6.14E+00	5.90E-03	5.86E+02	5.65E-02	0.00E+00
2011	Annual	Mon-Fri	Bore/Drill Rigs	D	15	Construction and Mining Equipment	Monterey	1.96E-01	2.95E-03	6.31E-02	1.20E-02	7.53E-02	1.61E-04	1.03E+01	1.09E-03	0.00E+00
2011	Annual	Mon-Fri	Bore/Drill Rigs	D	25	Construction and Mining Equipment	Monterey	5.88E-01	5.88E-03	6.58E-02	1.94E-02	1.24E-01	2.03E-04	1.60E+01	1.75E-03	0.00E+00
2011	Annual	Mon-Fri	Bore/Drill Rigs	D	50	Construction and Mining Equipment	Monterey	2.67E+00	1.69E-02	2.41E-01	4.36E-02	2.79E-01	4.01E-04	3.10E+01	3.93E-03	0.00E+00
2011	Annual	Mon-Fri	Bore/Drill Rigs	D	120	Construction and Mining Equipment	Monterey	8.18E+00	4.00E-02	4.76E-01	6.06E-02	5.58E-01	9.04E-04	7.71E+01	5.47E-03	0.00E+00
2011	Annual	Mon-Fri	Bore/Drill Rigs	D	175	Construction and Mining Equipment	Monterey	1.89E+00	4.46E-02	7.53E-01	8.29E-02	8.25E-01	1.59E-03	1.41E+02	7.48E-03	0.00E+00

CY	Season	AvgDays	Equipment	Fuel	MaxHP	Class	County	Activity	PM Exhaust/ Activity (lbs/hr)	CO Exhaust/ Activity (lbs/hr)	ROG Exhaust/ Activity (lbs/hr)	NOX Exhaust/ Activity (lbs/hr)	SO2 Exhaust/ Activity (lbs/hr)	CO2 Exhaust/ Activity (lbs/hr)	CH4 Exhaust/ Activity (lbs/hr)	N2O Exhaust/ Activity (lbs/hr)
2011	Annual	Mon-Fri	Bore/Drill Rigs	D	250	Construction and Mining Equipment	Monterey	1.63E+00	3.23E-02	3.44E-01	8.92E-02	1.01E+00	2.11E-03	1.88E+02	8.05E-03	0.00E+00
2011	Annual	Mon-Fri	Bore/Drill Rigs	D	500	Construction and Mining Equipment	Monterey	3.62E+00	5.21E-02	5.54E-01	1.42E-01	1.49E+00	3.05E-03	3.11E+02	1.28E-02	0.00E+00
2011	Annual	Mon-Fri	Bore/Drill Rigs	D	750	Construction and Mining Equipment	Monterey	5.77E-01	1.04E-01	1.09E+00	2.83E-01	3.01E+00	6.18E-03	6.15E+02	2.55E-02	0.00E+00
2011	Annual	Mon-Fri	Excavators	D	25	Construction and Mining Equipment	Monterey	1.25E+00	4.97E-03	6.76E-02	1.98E-02	1.25E-01	2.08E-04	1.64E+01	1.79E-03	0.00E+00
2011	Annual	Mon-Fri	Excavators	D	50	Construction and Mining Equipment	Monterey	4.80E+01	2.55E-02	3.03E-01	1.01E-01	2.60E-01	3.23E-04	2.50E+01	9.15E-03	0.00E+00
2011	Annual	Mon-Fri	Excavators	D	120	Construction and Mining Equipment	Monterey	1.30E+02	7.23E-02	5.26E-01	1.28E-01	7.84E-01	8.63E-04	7.36E+01	1.16E-02	0.00E+00
2011	Annual	Mon-Fri	Excavators	D	175	Construction and Mining Equipment	Monterey	2.51E+02	6.25E-02	6.68E-01	1.37E-01	1.03E+00	1.26E-03	1.12E+02	1.24E-02	0.00E+00
2011	Annual	Mon-Fri	Excavators	D	250	Construction and Mining Equipment	Monterey	1.02E+02	4.64E-02	3.76E-01	1.37E-01	1.36E+00	1.78E-03	1.59E+02	1.24E-02	0.00E+00
2011	Annual	Mon-Fri	Excavators	D	500	Construction and Mining Equipment	Monterey	7.37E+01	6.39E-02	5.79E-01	1.89E-01	1.76E+00	2.29E-03	2.34E+02	1.70E-02	0.00E+00
2011	Annual	Mon-Fri	Excavators	D	750	Construction and Mining Equipment	Monterey	4.94E-01	1.08E-01	9.60E-01	3.15E-01	3.00E+00	3.89E-03	3.87E+02	2.84E-02	0.00E+00
2011	Annual	Mon-Fri	Concrete/Industrial Saws	D	25	Construction and Mining Equipment	Monterey	5.72E-02	5.60E-03	6.78E-02	1.99E-02	1.27E-01	2.09E-04	1.65E+01	1.80E-03	0.00E+00
2011	Annual	Mon-Fri	Concrete/Industrial Saws	D	50	Construction and Mining Equipment	Monterey	4.91E-01	2.84E-02	3.11E-01	1.14E-01	3.02E-01	3.90E-04	3.02E+01	1.03E-02	0.00E+00
2011	Annual	Mon-Fri	Concrete/Industrial Saws	D	120	Construction and Mining Equipment	Monterey	8.55E-01	6.83E-02	4.92E-01	1.24E-01	8.11E-01	8.69E-04	7.41E+01	1.12E-02	0.00E+00
2011	Annual	Mon-Fri	Concrete/Industrial Saws	D	175	Construction and Mining Equipment	Monterey	2.80E-02	8.25E-02	8.74E-01	1.80E-01	1.55E+00	1.80E-03	1.60E+02	1.62E-02	0.00E+00
2011	Annual	Mon-Fri	Cement and Mortar Mixers	D	15	Construction and Mining Equipment	Monterey	3.71E+00	2.57E-03	3.87E-02	7.62E-03	4.84E-02	9.83E-05	6.31E+00	6.87E-04	0.00E+00
2011	Annual	Mon-Fri	Cement and Mortar Mixers	D	25	Construction and Mining Equipment	Monterey	3.34E-01	9.85E-03	8.95E-02	3.19E-02	1.59E-01	2.23E-04	1.75E+01	2.87E-03	0.00E+00
2011	Annual	Mon-Fri	Cranes	D	50	Construction and Mining Equipment	Monterey	1.05E+00	2.73E-02	3.07E-01	1.19E-01	2.51E-01	2.99E-04	2.32E+01	1.07E-02	0.00E+00
2011	Annual	Mon-Fri	Cranes	D	120	Construction and Mining Equipment	Monterey	1.16E+01	5.70E-02	3.68E-01	1.05E-01	6.19E-01	5.88E-04	5.01E+01	9.44E-03	0.00E+00
2011	Annual	Mon-Fri	Cranes	D	175	Construction and Mining Equipment	Monterey	1.16E+01	5.13E-02	4.85E-01	1.15E-01	8.76E-01	9.03E-04	8.03E+01	1.03E-02	0.00E+00
2011	Annual	Mon-Fri	Cranes	D	250	Construction and Mining Equipment	Monterey	2.24E+01	4.28E-02	3.28E-01	1.17E-01	1.15E+00	1.26E-03	1.12E+02	1.06E-02	0.00E+00
2011	Annual	Mon-Fri	Cranes	D	500	Construction and Mining Equipment	Monterey	8.21E+00	6.27E-02	6.14E-01	1.72E-01	1.65E+00	1.77E-03	1.80E+02	1.56E-02	0.00E+00
2011	Annual	Mon-Fri	Cranes	D	750	Construction and Mining Equipment	Monterey	1.84E+00	1.07E-01	1.03E+00	2.92E-01	2.84E+00	3.04E-03	3.03E+02	2.63E-02	0.00E+00
2011	Annual	Mon-Fri	Graders	D	50	Construction and Mining Equipment	Monterey	3.22E-01	3.04E-02	3.47E-01	1.29E-01	2.92E-01	3.56E-04	2.75E+01	1.16E-02	0.00E+00
2011	Annual	Mon-Fri	Graders	D	120	Construction and Mining Equipment	Monterey	2.15E+01	7.98E-02	5.40E-01	1.44E-01	8.74E-01	8.79E-04	7.49E+01	1.30E-02	0.00E+00
2011	Annual	Mon-Fri	Graders	D	175	Construction and Mining Equipment	Monterey	7.34E+01	7.43E-02	7.38E-01	1.64E-01	1.27E+00	1.39E-03	1.24E+02	1.48E-02	0.00E+00
2011	Annual	Mon-Fri	Graders	D	250	Construction and Mining Equipment	Monterey	4.55E+01	6.02E-02	4.71E-01	1.66E-01	1.66E+00	1.93E-03	1.72E+02	1.50E-02	0.00E+00
2011	Annual	Mon-Fri	Graders	D	500	Construction and Mining Equipment	Monterey	1.29E+00	7.37E-02	7.05E-01	2.04E-01	1.96E+00	2.25E-03	2.29E+02	1.84E-02	0.00E+00
2011	Annual	Mon-Fri	Graders	D	750	Construction and Mining Equipment	Monterey	2.11E-02	1.58E-01	1.49E+00	4.35E-01	4.26E+00	4.88E-03	4.85E+02	3.93E-02	0.00E+00
2011	Annual	Mon-Fri	Off-Highway Trucks	D	175	Construction and Mining Equipment	Monterey	3.13E+00	7.28E-02	7.60E-01	1.63E-01	1.19E+00	1.41E-03	1.25E+02	1.47E-02	0.00E+00
2011	Annual	Mon-Fri	Off-Highway Trucks	D	250	Construction and Mining Equipment	Monterey	2.31E+01	5.14E-02	4.10E-01	1.55E-01	1.47E+00	1.87E-03	1.66E+02	1.40E-02	0.00E+00
2011	Annual	Mon-Fri	Off-Highway Trucks	D	500	Construction and Mining Equipment	Monterey	3.25E+01	7.85E-02	7.06E-01	2.37E-01	2.12E+00	2.67E-03	2.72E+02	2.14E-02	0.00E+00
2011	Annual	Mon-Fri	Off-Highway Trucks	D	750	Construction and Mining Equipment	Monterey	9.24E+00	1.29E-01	1.14E+00	3.87E-01	3.54E+00	4.44E-03	4.41E+02	3.49E-02	0.00E+00
2011	Annual	Mon-Fri	Crushing/Proc. Equipment	D	50	Construction and Mining Equipment	Monterey	3.69E+00	4.92E-02	5.41E-01	2.10E-01	4.62E-01	5.69E-04	4.40E+01	1.90E-02	0.00E+00
2011	Annual	Mon-Fri	Crushing/Proc. Equipment	D	120	Construction and Mining Equipment	Monterey	1.04E+01	9.13E-02	5.89E-01	1.64E-01	9.80E-01	9.74E-04	8.31E+01	1.48E-02	0.00E+00
2011	Annual	Mon-Fri	Crushing/Proc. Equipment	D	175	Construction and Mining Equipment	Monterey	4.41E+00	1.02E-01	9.69E-01	2.23E-01	1.75E+00	1.88E-03	1.67E+02	2.01E-02	0.00E+00
2011	Annual	Mon-Fri	Crushing/Proc. Equipment	D	250	Construction and Mining Equipment	Monterey	4.39E-01	7.53E-02	5.83E-01	2.08E-01	2.36E+00	2.75E-03	2.44E+02	1.88E-02	0.00E+00
2011	Annual	Mon-Fri	Crushing/Proc. Equipment	D	500	Construction and Mining Equipment	Monterey	2.47E+00	1.07E-01	9.62E-01	2.88E-01	3.19E+00	3.66E-03	3.73E+02	2.60E-02	0.00E+00
2011	Annual	Mon-Fri	Crushing/Proc. Equipment	D	750	Construction and Mining Equipment	Monterey	3.52E-02	1.72E-01	1.49E+00	4.62E-01	5.23E+00	5.92E-03	5.88E+02	4.16E-02	0.00E+00
2011	Annual	Mon-Fri	Rough Terrain Forklifts	D	50	Construction and Mining Equipment	Monterey	3.04E+00	3.53E-02	4.04E-01	1.45E-01	3.50E-01	4.37E-04	3.38E+01	1.31E-02	0.00E+00
2011	Annual	Mon-Fri	Rough Terrain Forklifts	D	120	Construction and Mining Equipment	Monterey	1.46E+02	6.34E-02	4.40E-01	1.12E-01	6.87E-01	7.32E-04	6.24E+01	1.01E-02	0.00E+00
2011	Annual	Mon-Fri	Rough Terrain Forklifts	D	175	Construction and Mining Equipment	Monterey	1.87E+01	7.09E-02	7.28E-01	1.54E-01	1.20E+00	1.40E-03	1.25E+02	1.39E-02	0.00E+00
2011	Annual	Mon-Fri	Rough Terrain Forklifts	D	250	Construction and Mining Equipment	Monterey	1.04E+00	5.06E-02	4.03E-01	1.42E-01	1.53E+00	1.92E-03	1.71E+02	1.28E-02	0.00E+00
2011	Annual	Mon-Fri	Rough Terrain Forklifts	D	500	Construction and Mining Equipment	Monterey	6.85E-01	7.07E-02	6.34E-01	1.98E-01	2.02E+00	2.52E-03	2.56E+02	1.78E-02	0.00E+00
2011	Annual	Mon-Fri	Rubber Tired Loaders	D	25	Construction and Mining Equipment	Monterey	3.24E-01	5.76E-03	6.96E-02	2.05E-02	1.30E-01	2.15E-04	1.69E+01	1.85E-03	0.00E+00
2011	Annual	Mon-Fri	Rubber Tired Loaders	D	50	Construction and Mining Equipment	Monterey	6.41E+00	3.39E-02	3.87E-01	1.43E-01	3.28E-01	4.02E-04	3.11E+01	1.29E-02	0.00E+00
2011	Annual	Mon-Fri	Rubber Tired Loaders	D	120	Construction and Mining Equipment	Monterey	1.74E+02	6.21E-02	4.22E-01	1.12E-01	6.81E-01	6.90E-04	5.89E+01	1.01E-02	0.00E+00
2011	Annual	Mon-Fri	Rubber Tired Loaders	D	175	Construction and Mining Equipment	Monterey	9.82E+01	6.31E-02	6.30E-01	1.39E-01	1.08E+00	1.20E-03	1.06E+02	1.25E-02	0.00E+00
2011	Annual	Mon-Fri	Rubber Tired Loaders	D	250	Construction and Mining Equipment	Monterey	9.77E+01	5.11E-02	4.01E-01	1.41E-01	1.42E+00	1.67E-03	1.49E+02	1.27E-02	0.00E+00

CY	Season	AvgDays	Equipment	Fuel	MaxHP	Class	County	Activity	PM Exhaust/ Activity (lbs/hr)	CO Exhaust/ Activity (lbs/hr)	ROG Exhaust/ Activity (lbs/hr)	NOX Exhaust/ Activity (lbs/hr)	SO2 Exhaust/ Activity (lbs/hr)	CO2 Exhaust/ Activity (lbs/hr)	CH4 Exhaust/ Activity (lbs/hr)	N2O Exhaust/ Activity (lbs/hr)
2011	Annual	Mon-Fri	Rubber Tired Loaders	D	500	Construction and Mining Equipment	Monterey	4.07E+01	7.46E-02	7.17E-01	2.06E-01	2.00E+00	2.32E-03	2.37E+02	1.86E-02	0.00E+00
2011	Annual	Mon-Fri	Rubber Tired Loaders	D	750	Construction and Mining Equipment	Monterey	8.70E-01	1.55E-01	1.47E+00	4.25E-01	4.21E+00	4.88E-03	4.85E+02	3.83E-02	0.00E+00
2011	Annual	Mon-Fri	Rubber Tired Dozers	D	175	Construction and Mining Equipment	Monterey	3.94E-01	9.96E-02	8.60E-01	2.30E-01	1.71E+00	1.46E-03	1.29E+02	2.07E-02	0.00E+00
2011	Annual	Mon-Fri	Rubber Tired Dozers	D	250	Construction and Mining Equipment	Monterey	9.66E+00	1.01E-01	7.44E-01	2.66E-01	2.32E+00	2.06E-03	1.83E+02	2.40E-02	0.00E+00
2011	Annual	Mon-Fri	Rubber Tired Dozers	D	500	Construction and Mining Equipment	Monterey	1.49E+01	1.29E-01	1.63E+00	3.48E-01	3.04E+00	2.60E-03	2.65E+02	3.14E-02	0.00E+00
2011	Annual	Mon-Fri	Rubber Tired Dozers	D	750	Construction and Mining Equipment	Monterey	1.60E+00	1.96E-01	2.46E+00	5.26E-01	4.64E+00	4.01E-03	3.98E+02	4.75E-02	0.00E+00
2011	Annual	Mon-Fri	Tractors/Loaders/Backhoes	D	25	Construction and Mining Equipment	Monterey	6.42E+00	6.63E-03	6.69E-02	2.05E-02	1.28E-01	2.01E-04	1.58E+01	1.85E-03	0.00E+00
2011	Annual	Mon-Fri	Tractors/Loaders/Backhoes	D	50	Construction and Mining Equipment	Monterey	3.94E+01	2.88E-02	3.42E-01	1.12E-01	3.07E-01	3.92E-04	3.03E+01	1.01E-02	0.00E+00
2011	Annual	Mon-Fri	Tractors/Loaders/Backhoes	D	120	Construction and Mining Equipment	Monterey	5.27E+02	4.77E-02	3.58E-01	8.30E-02	5.28E-01	6.06E-04	5.17E+01	7.49E-03	0.00E+00
2011	Annual	Mon-Fri	Tractors/Loaders/Backhoes	D	175	Construction and Mining Equipment	Monterey	3.94E+01	5.29E-02	5.87E-01	1.13E-01	8.93E-01	1.14E-03	1.01E+02	1.02E-02	0.00E+00
2011	Annual	Mon-Fri	Tractors/Loaders/Backhoes	D	250	Construction and Mining Equipment	Monterey	1.27E+01	4.66E-02	3.88E-01	1.33E-01	1.41E+00	1.93E-03	1.72E+02	1.20E-02	0.00E+00
2011	Annual	Mon-Fri	Tractors/Loaders/Backhoes	D	500	Construction and Mining Equipment	Monterey	2.05E+01	8.77E-02	8.06E-01	2.50E-01	2.48E+00	3.88E-03	3.45E+02	2.25E-02	0.00E+00
2011	Annual	Mon-Fri	Tractors/Loaders/Backhoes	D	750	Construction and Mining Equipment	Monterey	4.32E+00	1.34E-01	1.21E+00	3.77E-01	3.83E+00	5.82E-03	5.17E+02	3.41E-02	0.00E+00
2011	Annual	Mon-Fri	Crawler Tractors	D	50	Construction and Mining Equipment	Monterey	3.55E-01	3.04E-02	3.42E-01	1.35E-01	2.74E-01	3.21E-04	2.49E+01	1.22E-02	0.00E+00
2011	Annual	Mon-Fri	Crawler Tractors	D	120	Construction and Mining Equipment	Monterey	2.02E+02	7.76E-02	4.95E-01	1.46E-01	8.57E-01	7.71E-04	6.58E+01	1.31E-02	0.00E+00
2011	Annual	Mon-Fri	Crawler Tractors	D	175	Construction and Mining Equipment	Monterey	6.82E+01	8.16E-02	7.53E-01	1.84E-01	1.40E+00	1.36E-03	1.21E+02	1.66E-02	0.00E+00
2011	Annual	Mon-Fri	Crawler Tractors	D	250	Construction and Mining Equipment	Monterey	5.86E+01	7.24E-02	5.47E-01	1.95E-01	1.82E+00	1.87E-03	1.66E+02	1.76E-02	0.00E+00
2011	Annual	Mon-Fri	Crawler Tractors	D	500	Construction and Mining Equipment	Monterey	4.02E+01	1.02E-01	1.10E+00	2.78E-01	2.55E+00	2.54E-03	2.59E+02	2.51E-02	0.00E+00
2011	Annual	Mon-Fri	Crawler Tractors	D	750	Construction and Mining Equipment	Monterey	6.19E-01	1.85E-01	1.98E+00	5.01E-01	4.66E+00	4.67E-03	4.64E+02	4.52E-02	0.00E+00
2011	Annual	Mon-Fri	Skid Steer Loaders	D	25	Construction and Mining Equipment	Monterey	3.87E+01	7.27E-03	6.66E-02	2.29E-02	1.22E-01	1.75E-04	1.38E+01	2.07E-03	0.00E+00
2011	Annual	Mon-Fri	Skid Steer Loaders	D	50	Construction and Mining Equipment	Monterey	3.59E+02	1.97E-02	2.41E-01	6.82E-02	2.42E-01	3.30E-04	2.55E+01	6.15E-03	0.00E+00
2011	Annual	Mon-Fri	Skid Steer Loaders	D	120	Construction and Mining Equipment	Monterey	1.88E+02	3.24E-02	2.79E-01	5.40E-02	3.83E-01	5.01E-04	4.27E+01	4.88E-03	0.00E+00
2011	Annual	Mon-Fri	Off-Highway Tractors	D	120	Construction and Mining Equipment	Monterey	2.70E-02	1.20E-01	7.34E-01	2.33E-01	1.36E+00	1.10E-03	9.37E+01	2.11E-02	0.00E+00
2011	Annual	Mon-Fri	Off-Highway Tractors	D	175	Construction and Mining Equipment	Monterey	3.31E+01	9.73E-02	8.47E-01	2.23E-01	1.68E+00	1.47E-03	1.30E+02	2.01E-02	0.00E+00
2011	Annual	Mon-Fri	Off-Highway Tractors	D	250	Construction and Mining Equipment	Monterey	3.12E+01	6.89E-02	5.12E-01	1.80E-01	1.61E+00	1.47E-03	1.30E+02	1.62E-02	0.00E+00
2011	Annual	Mon-Fri	Off-Highway Tractors	D	750	Construction and Mining Equipment	Monterey	4.14E+00	2.69E-01	3.33E+00	7.11E-01	6.48E+00	5.71E-03	5.68E+02	6.42E-02	0.00E+00
2011	Annual	Mon-Fri	Dumpers/Tenders	D	25	Construction and Mining Equipment	Monterey	3.84E-01	3.37E-03	3.29E-02	1.03E-02	6.28E-02	9.67E-05	7.62E+00	9.33E-04	0.00E+00
2011	Annual	Mon-Fri	Other Construction Equipment	D	15	Construction and Mining Equipment	Monterey	5.52E+00	2.88E-03	6.17E-02	1.18E-02	7.36E-02	1.57E-04	1.01E+01	1.06E-03	0.00E+00
2011	Annual	Mon-Fri	Other Construction Equipment	D	25	Construction and Mining Equipment	Monterey	9.34E-01	4.86E-03	5.44E-02	1.61E-02	1.03E-01	1.68E-04	1.32E+01	1.45E-03	0.00E+00
2011	Annual	Mon-Fri	Other Construction Equipment	D	50	Construction and Mining Equipment	Monterey	1.46E+00	2.45E-02	2.83E-01	9.33E-02	2.74E-01	3.62E-04	2.80E+01	8.42E-03	0.00E+00
2011	Annual	Mon-Fri	Other Construction Equipment	D	120	Construction and Mining Equipment	Monterey	2.42E+00	6.92E-02	5.36E-01	1.21E-01	8.08E-01	9.48E-04	8.08E+01	1.09E-02	0.00E+00
2011	Annual	Mon-Fri	Other Construction Equipment	D	175	Construction and Mining Equipment	Monterey	3.33E+00	5.14E-02	5.88E-01	1.08E-01	9.23E-01	1.20E-03	1.06E+02	9.77E-03	0.00E+00
2011	Annual	Mon-Fri	Other Construction Equipment	D	500	Construction and Mining Equipment	Monterey	7.74E+00	6.05E-02	5.68E-01	1.59E-01	1.81E+00	2.49E-03	2.54E+02	1.44E-02	0.00E+00
2011	Annual	Mon-Fri	Aerial Lifts	D	15	Industrial Equipment	Monterey	2.58E+00	3.29E-03	5.28E-02	1.02E-02	6.49E-02	1.35E-04	8.64E+00	9.24E-04	0.00E+00
2011	Annual	Mon-Fri	Aerial Lifts	D	25	Industrial Equipment	Monterey	4.21E+00	5.93E-03	5.43E-02	1.90E-02	9.80E-02	1.39E-04	1.10E+01	1.71E-03	0.00E+00
2011	Annual	Mon-Fri	Aerial Lifts	D	50	Industrial Equipment	Monterey	1.48E+01	1.77E-02	1.86E-01	6.90E-02	1.94E-01	2.53E-04	1.96E+01	6.23E-03	0.00E+00
2011	Annual	Mon-Fri	Aerial Lifts	D	120	Industrial Equipment	Monterey	1.31E+01	3.40E-02	2.47E-01	6.43E-02	4.22E-01	4.46E-04	3.80E+01	5.80E-03	0.00E+00
2011	Annual	Mon-Fri	Aerial Lifts	D	500	Industrial Equipment	Monterey	1.68E+00	5.34E-02	5.25E-01	1.36E-01	1.76E+00	2.09E-03	2.13E+02	1.22E-02	0.00E+00
2011	Annual	Mon-Fri	Aerial Lifts	D	750	Industrial Equipment	Monterey	1.35E-01	9.80E-02	9.49E-01	2.53E-01	3.27E+00	3.87E-03	3.84E+02	2.28E-02	0.00E+00
2011	Annual	Mon-Fri	Forklifts	D	50	Industrial Equipment	Monterey	2.10E+01	1.47E-02	1.73E-01	5.76E-02	1.50E-01	1.90E-04	1.47E+01	5.20E-03	0.00E+00
2011	Annual	Mon-Fri	Forklifts	D	120	Industrial Equipment	Monterey	3.30E+01	3.07E-02	2.21E-01	5.35E-02	3.23E-01	3.66E-04	3.12E+01	4.83E-03	0.00E+00
2011	Annual	Mon-Fri	Forklifts	D	175	Industrial Equipment	Monterey	3.32E+01	3.09E-02	3.30E-01	6.71E-02	5.04E-01	6.30E-04	5.60E+01	6.06E-03	0.00E+00
2011	Annual	Mon-Fri	Forklifts	D	250	Industrial Equipment	Monterey	3.29E+01	2.05E-02	1.66E-01	6.16E-02	6.43E-01	8.67E-04	7.71E+01	5.56E-03	0.00E+00
2011	Annual	Mon-Fri	Forklifts	D	500	Industrial Equipment	Monterey	1.41E+01	2.77E-02	2.27E-01	8.29E-02	7.97E-01	1.09E-03	1.11E+02	7.48E-03	0.00E+00
2011	Annual	Mon-Fri	Sweepers/Scrubbers	D	15	Industrial Equipment	Monterey	5.58E-01	3.29E-03	7.28E-02	1.24E-02	8.69E-02	1.86E-04	1.19E+01	1.12E-03	0.00E+00
2011	Annual	Mon-Fri	Sweepers/Scrubbers	D	25	Industrial Equipment	Monterey	5.58E-01	6.70E-03	8.07E-02	2.37E-02	1.51E-01	2.49E-04	1.96E+01	2.14E-03	0.00E+00
2011	Annual	Mon-Fri	Sweepers/Scrubbers	D	50	Industrial Equipment	Monterey	2.04E+01	3.23E-02	3.67E-01	1.32E-01	3.21E-01	4.08E-04	3.15E+01	1.19E-02	0.00E+00
2011	Annual	Mon-Fri	Sweepers/Scrubbers	D	120	Industrial Equipment	Monterey	3.37E+01	7.69E-02	5.24E-01	1.34E-01	8.01E-01	8.79E-04	7.50E+01	1.21E-02	0.00E+00

CY	Season	AvgDays	Equipment	Fuel	MaxHP	Class	County	Activity	PM Exhaust/ Activity (lbs/hr)	CO Exhaust/ Activity (lbs/hr)	ROG Exhaust/ Activity (lbs/hr)	NOX Exhaust/ Activity (lbs/hr)	SO2 Exhaust/ Activity (lbs/hr)	CO2 Exhaust/ Activity (lbs/hr)	CH4 Exhaust/ Activity (lbs/hr)	N2O Exhaust/ Activity (lbs/hr)
2011	Annual	Mon-Fri	Sweepers/Scrubbers	D	175	Industrial Equipment	Monterey	1.55E+01	7.86E-02	8.00E-01	1.69E-01	1.31E+00	1.56E-03	1.39E+02	1.52E-02	0.00E+00
2011	Annual	Mon-Fri	Sweepers/Scrubbers	D	250	Industrial Equipment	Monterey	2.49E+00	4.40E-02	3.52E-01	1.26E-01	1.41E+00	1.82E-03	1.62E+02	1.13E-02	0.00E+00
2011	Annual	Mon-Fri	Other General Industrial Equipmen	D	15	Industrial Equipment	Monterey	3.21E+00	1.76E-03	3.90E-02	6.63E-03	4.66E-02	9.94E-05	6.39E+00	5.98E-04	0.00E+00
2011	Annual	Mon-Fri	Other General Industrial Equipmen	D	25	Industrial Equipment	Monterey	4.30E+00	4.65E-03	6.31E-02	1.85E-02	1.17E-01	1.95E-04	1.53E+01	1.67E-03	0.00E+00
2011	Annual	Mon-Fri	Other General Industrial Equipmen	D	50	Industrial Equipment	Monterey	5.33E+00	2.66E-02	2.94E-01	1.16E-01	2.36E-01	2.81E-04	2.17E+01	1.05E-02	0.00E+00
2011	Annual	Mon-Fri	Other General Industrial Equipmen	D	120	Industrial Equipment	Monterey	2.13E+01	7.42E-02	4.57E-01	1.34E-01	7.67E-01	7.27E-04	6.20E+01	1.21E-02	0.00E+00
2011	Annual	Mon-Fri	Other General Industrial Equipmen	D	175	Industrial Equipment	Monterey	2.14E+01	6.36E-02	5.77E-01	1.41E-01	1.06E+00	1.08E-03	9.58E+01	1.27E-02	0.00E+00
2011	Annual	Mon-Fri	Other General Industrial Equipmen	D	250	Industrial Equipment	Monterey	2.13E+01	4.53E-02	3.41E-01	1.29E-01	1.38E+00	1.52E-03	1.35E+02	1.16E-02	0.00E+00
2011	Annual	Mon-Fri	Other General Industrial Equipmen	D	500	Industrial Equipment	Monterey	2.12E+01	8.22E-02	7.23E-01	2.32E-01	2.38E+00	2.60E-03	2.65E+02	2.09E-02	0.00E+00
2011	Annual	Mon-Fri	Other General Industrial Equipmen	D	750	Industrial Equipment	Monterey	5.31E+00	1.38E-01	1.19E+00	3.85E-01	4.04E+00	4.39E-03	4.37E+02	3.48E-02	0.00E+00
2011	Annual	Mon-Fri	Other Material Handling Equipment	D	50	Industrial Equipment	Monterey	1.41E-01	3.68E-02	4.06E-01	1.61E-01	3.28E-01	3.92E-04	3.03E+01	1.45E-02	0.00E+00
2011	Annual	Mon-Fri	Other Material Handling Equipment	D	120	Industrial Equipment	Monterey	8.48E-01	7.22E-02	4.45E-01	1.31E-01	7.49E-01	7.11E-04	6.06E+01	1.18E-02	0.00E+00
2011	Annual	Mon-Fri	Other Material Handling Equipment	D	175	Industrial Equipment	Monterey	9.09E-01	8.05E-02	7.30E-01	1.78E-01	1.34E+00	1.37E-03	1.22E+02	1.61E-02	0.00E+00
2011	Annual	Mon-Fri	Other Material Handling Equipment	D	250	Industrial Equipment	Monterey	2.16E+00	4.81E-02	3.63E-01	1.36E-01	1.47E+00	1.63E-03	1.45E+02	1.23E-02	0.00E+00
2011	Annual	Mon-Fri	Other Material Handling Equipment	D	500	Industrial Equipment	Monterey	4.04E-01	5.90E-02	5.20E-01	1.65E-01	1.72E+00	1.88E-03	1.91E+02	1.49E-02	0.00E+00
2011	Annual	Mon-Fri	Generator Sets	D	15	Light Commercial Equipment	Monterey	4.96E+01	6.44E-03	7.10E-02	1.63E-02	1.10E-01	1.59E-04	1.02E+01	1.47E-03	0.00E+00
2011	Annual	Mon-Fri	Generator Sets	D	25	Light Commercial Equipment	Monterey	3.63E+01	1.01E-02	9.89E-02	2.86E-02	1.66E-01	2.24E-04	1.76E+01	2.58E-03	0.00E+00
2011	Annual	Mon-Fri	Generator Sets	D	50	Light Commercial Equipment	Monterey	4.43E+01	2.67E-02	2.80E-01	1.02E-01	3.01E-01	3.96E-04	3.06E+01	9.24E-03	0.00E+00
2011	Annual	Mon-Fri	Generator Sets	D	120	Light Commercial Equipment	Monterey	6.73E+01	6.75E-02	4.99E-01	1.28E-01	8.53E-01	9.14E-04	7.79E+01	1.16E-02	0.00E+00
2011	Annual	Mon-Fri	Generator Sets	D	175	Light Commercial Equipment	Monterey	3.98E+00	6.86E-02	7.43E-01	1.55E-01	1.38E+00	1.60E-03	1.42E+02	1.40E-02	0.00E+00
2011	Annual	Mon-Fri	Generator Sets	D	250	Light Commercial Equipment	Monterey	2.22E+00	5.53E-02	4.68E-01	1.46E-01	1.92E+00	2.39E-03	2.12E+02	1.32E-02	0.00E+00
2011	Annual	Mon-Fri	Generator Sets	D	500	Light Commercial Equipment	Monterey	4.94E+00	8.24E-02	8.09E-01	2.09E-01	2.76E+00	3.30E-03	3.37E+02	1.88E-02	0.00E+00
2011	Annual	Mon-Fri	Generator Sets	D	750	Light Commercial Equipment	Monterey	3.07E+00	1.35E-01	1.31E+00	3.48E-01	4.58E+00	5.46E-03	5.43E+02	3.14E-02	0.00E+00
2011	Annual	Mon-Fri	Pumps	D	15	Light Commercial Equipment	Monterey	4.44E+01	5.78E-03	5.17E-02	1.40E-02	8.21E-02	1.15E-04	7.42E+00	1.26E-03	0.00E+00
2011	Annual	Mon-Fri	Pumps	D	25	Light Commercial Equipment	Monterey	1.33E+01	1.24E-02	1.09E-01	4.10E-02	1.84E-01	2.47E-04	1.95E+01	3.70E-03	0.00E+00
2011	Annual	Mon-Fri	Pumps	D	50	Light Commercial Equipment	Monterey	2.31E+01	3.13E-02	3.31E-01	1.23E-01	3.41E-01	4.43E-04	3.43E+01	1.11E-02	0.00E+00
2011	Annual	Mon-Fri	Pumps	D	120	Light Commercial Equipment	Monterey	4.53E+01	7.04E-02	5.07E-01	1.33E-01	8.66E-01	9.14E-04	7.79E+01	1.20E-02	0.00E+00
2011	Annual	Mon-Fri	Pumps	D	175	Light Commercial Equipment	Monterey	4.91E+00	7.06E-02	7.44E-01	1.58E-01	1.39E+00	1.58E-03	1.40E+02	1.43E-02	0.00E+00
2011	Annual	Mon-Fri	Pumps	D	250	Light Commercial Equipment	Monterey	3.53E+00	5.45E-02	4.52E-01	1.45E-01	1.84E+00	2.26E-03	2.01E+02	1.30E-02	0.00E+00
2011	Annual	Mon-Fri	Pumps	D	500	Light Commercial Equipment	Monterey	6.98E-02	8.74E-02	8.56E-01	2.23E-01	2.86E+00	3.39E-03	3.45E+02	2.01E-02	0.00E+00
2011	Annual	Mon-Fri	Pumps	D	750	Light Commercial Equipment	Monterey	1.16E-02	1.47E-01	1.42E+00	3.79E-01	4.86E+00	5.73E-03	5.70E+02	3.42E-02	0.00E+00
2011	Annual	Mon-Fri	Air Compressors	D	15	Light Commercial Equipment	Monterey	1.22E+00	5.62E-03	5.03E-02	1.36E-02	7.99E-02	1.12E-04	7.22E+00	1.23E-03	0.00E+00
2011	Annual	Mon-Fri	Air Compressors	D	25	Light Commercial Equipment	Monterey	2.42E+00	9.20E-03	8.10E-02	3.04E-02	1.36E-01	1.83E-04	1.44E+01	2.74E-03	0.00E+00
2011	Annual	Mon-Fri	Air Compressors	D	50	Light Commercial Equipment	Monterey	2.20E+01	2.49E-02	2.71E-01	1.07E-01	2.34E-01	2.88E-04	2.23E+01	9.69E-03	0.00E+00
2011	Annual	Mon-Fri	Air Compressors	D	120	Light Commercial Equipment	Monterey	1.47E+02	5.16E-02	3.31E-01	9.40E-02	5.62E-01	5.50E-04	4.69E+01	8.48E-03	0.00E+00
2011	Annual	Mon-Fri	Air Compressors	D	175	Light Commercial Equipment	Monterey	5.55E+00	5.41E-02	5.08E-01	1.19E-01	9.43E-01	9.95E-04	8.84E+01	1.07E-02	0.00E+00
2011	Annual	Mon-Fri	Air Compressors	D	250	Light Commercial Equipment	Monterey	7.81E+00	4.12E-02	3.17E-01	1.12E-01	1.29E+00	1.48E-03	1.31E+02	1.01E-02	0.00E+00
2011	Annual	Mon-Fri	Air Compressors	D	500	Light Commercial Equipment	Monterey	1.02E+01	6.76E-02	6.13E-01	1.79E-01	2.03E+00	2.27E-03	2.32E+02	1.62E-02	0.00E+00
2011	Annual	Mon-Fri	Air Compressors	D	750	Light Commercial Equipment	Monterey	3.81E+00	1.06E-01	9.47E-01	2.81E-01	3.23E+00	3.60E-03	3.58E+02	2.54E-02	0.00E+00
2011	Annual	Mon-Fri	Welders	D	15	Light Commercial Equipment	Monterey	3.20E+01	4.83E-03	4.32E-02	1.17E-02	6.87E-02	9.65E-05	6.20E+00	1.05E-03	0.00E+00
2011	Annual	Mon-Fri	Welders	D	25	Light Commercial Equipment	Monterey	2.82E+01	7.19E-03	6.33E-02	2.38E-02	1.06E-01	1.43E-04	1.13E+01	2.14E-03	0.00E+00
2011	Annual	Mon-Fri	Welders	D	50	Light Commercial Equipment	Monterey	8.68E+01	2.71E-02	2.92E-01	1.14E-01	2.67E-01	3.35E-04	2.59E+01	1.03E-02	0.00E+00
2011	Annual	Mon-Fri	Welders	D	120	Light Commercial Equipment	Monterey	6.74E+01	4.06E-02	2.70E-01	7.47E-02	4.61E-01	4.63E-04	3.95E+01	6.74E-03	0.00E+00
2011	Annual	Mon-Fri	Welders	D	175	Light Commercial Equipment	Monterey	3.34E-01	5.62E-02	5.48E-01	1.24E-01	1.02E+00	1.10E-03	9.81E+01	1.12E-02	0.00E+00
2011	Annual	Mon-Fri	Welders	D	250	Light Commercial Equipment	Monterey	7.42E-02	3.58E-02	2.81E-01	9.61E-02	1.14E+00	1.34E-03	1.19E+02	8.67E-03	0.00E+00
2011	Annual	Mon-Fri	Welders	D	500	Light Commercial Equipment	Monterey	1.86E-01	4.68E-02	4.36E-01	1.22E-01	1.44E+00	1.64E-03	1.67E+02	1.10E-02	0.00E+00
2011	Annual	Mon-Fri	Pressure Washers	D	15	Light Commercial Equipment	Monterey	9.87E-01	3.09E-03	3.40E-02	7.83E-03	5.28E-02	7.60E-05	4.89E+00	7.06E-04	0.00E+00
2011	Annual	Mon-Fri	Pressure Washers	D	25	Light Commercial Equipment	Monterey	2.30E-01	4.09E-03	4.01E-02	1.16E-02	6.74E-02	9.06E-05	7.14E+00	1.05E-03	0.00E+00

CY	Season	AvgDays	Equipment	Fuel	MaxHP	Class	County	Activity	PM Exhaust/ Activity (lbs/hr)	CO Exhaust/ Activity (lbs/hr)	ROG Exhaust/ Activity (lbs/hr)	NOX Exhaust/ Activity (lbs/hr)	SO2 Exhaust/ Activity (lbs/hr)	CO2 Exhaust/ Activity (lbs/hr)	CH4 Exhaust/ Activity (lbs/hr)	N2O Exhaust/ Activity (lbs/hr)
2011	Annual	Mon-Fri	Pressure Washers	D	50	Light Commercial Equipment	Monterey	4.56E-01	1.08E-02	1.10E-01	3.76E-02	1.36E-01	1.85E-04	1.43E+01	3.39E-03	0.00E+00
2011	Annual	Mon-Fri	Pressure Washers	D	120	Light Commercial Equipment	Monterey	1.88E-01	1.82E-02	1.47E-01	3.55E-02	2.51E-01	2.82E-04	2.41E+01	3.20E-03	0.00E+00

Title : Calera MLBMDP project
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2010/04/27 09:58:07
Scen Year: 2011 -- All model years in the range 1967 to 2011 selected
Season : Annual
Area : Monterey
****

Year: 2011 -- Model Years 1967 to 2011 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

County Average Monterey County Average

Table 1: Running Exhaust Emissions (grams/mile)

Pollutant Name: Reactive Org Gases Temperature: 60F Relative Humidity: 65%

Speed	LDA	LDA	LDA	LDA	LDT1	LDT1	LDT1	LDT2	LDT2	LDT2	LDT2	MDV	MDV	MDV	MDV	LHD1	LHD1	LHD1	LHD1	LHD2	LHD2	LHD2	LHD2	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	OBUS	OBUS	OBUS	OBUS	UBUS	UBUS	UBUS	UBUS	MCY	MCY	MCY	MCY	SBUS	SBUS	SBUS	SBUS	MH	MH	MH	MH	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
10	14.964	0.3	0.363	0.387	15.52	0.537	0.177	0.707	15.467	0.403	0.319	0.483	18.216	0.361	0.148	0.396	13.172	0.329	0.36	0.363	13.172	1.109	0.495	0.86	19.808	2.762	0.644	1.063	83.616	20.249	6.643	7.513	19.808	3.968	1.078	2.189	0	5.647	0.925	2.97	4.832	2.878	0	4.016	19.808	5.612	0.926	1.814	19.808	1.583	0.237	1.981	10.131	0.441	2.548	0.706
50	5.009	0.06	0.116	0.09	5.198	0.117	0.056	0.177	5.18	0.083	0.102	0.11	6.112	0.068	0.047	0.08	1.914	0.047	0.115	0.069	1.914	0.155	0.158	0.162	2.917	0.387	0.205	0.246	12.573	2.987	0.743	0.886	2.917	0.543	0.343	0.426	0	0.827	0.25	0.5	3.728	1.685	0	2.875	2.917	0.796	0.295	0.397	2.917	0.216	0.075	0.281	4.367	0.092	0.359	0.164

Pollutant Name: Carbon Monoxide Temperature: 60F Relative Humidity: 65%

Speed	LDA	LDA	LDA	LDA	LDT1	LDT1	LDT1	LDT2	LDT2	LDT2	LDT2	MDV	MDV	MDV	MDV	LHD1	LHD1	LHD1	LHD1	LHD2	LHD2	LHD2	LHD2	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	OBUS	OBUS	OBUS	OBUS	UBUS	UBUS	UBUS	UBUS	MCY	MCY	MCY	MCY	SBUS	SBUS	SBUS	SBUS	MH	MH	MH	MH	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
10	129.762	4.523	2	5.255	131.891	9.08	1.56	10.268	131.918	6.397	1.881	7.052	219.69	5.198	1.443	5.614	249.088	3.201	2.288	3.429	249.088	10.666	2.572	7.639	373.632	29.852	7.09	12.384	2246.646	174.614	14	25.205	373.632	47.328	11.485	25.845	0	59.883	7.485	30.171	37.859	13.885	0	27.851	373.632	58.931	10.227	21.294	373.632	31.07	2.669	38.213	92.877	6.368	8.12	7.582
50	66.592	2.309	0.526	2.683	67.684	4.527	0.41	5.127	67.698	3.239	0.494	3.574	112.741	2.672	0.379	2.884	69.256	0.89	0.601	0.944	69.256	2.966	0.676	2.106	103.884	8.3	1.864	3.353	624.652	48.549	3.419	6.563	103.884	13.159	3.019	7.075	0	16.65	1.598	8.115	49.933	11.964	0	34.083	103.884	16.385	2.689	5.79	103.884	8.639	0.702	10.62	60.556	3.09	2.044	3.747

Pollutant Name: Oxides of Nitrogen Temperature: 60F Relative Humidity: 65%

Speed	LDA	LDA	LDA	LDA	LDT1	LDT1	LDT1	LDT2	LDT2	LDT2	LDT2	MDV	MDV	MDV	MDV	LHD1	LHD1	LHD1	LHD1	LHD2	LHD2	LHD2	LHD2	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	OBUS	OBUS	OBUS	OBUS	UBUS	UBUS	UBUS	UBUS	MCY	MCY	MCY	MCY	SBUS	SBUS	SBUS	SBUS	MH	MH	MH	MH	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
10	3.573	0.443	1.692	0.465	3.489	0.9	1.718	0.969	3.505	0.935	1.709	0.951	5.188	0.877	1.745	0.889	1.798	0.315	5.133	1.671	1.798	0.774	6.064	3.25	2.697	2.402	9.875	8.69	23.337	14.746	25.712	25.053	2.697	4.492	15.642	11.617	0	6.684	18.466	13.365	1.081	1.164	0	1.116	2.697	2.831	16.272	14.173	2.697	1.423	10.798	2.502	2.302	0.722	13.772	1.625
50	5.086	0.279	1.363	0.311	4.966	0.574	1.384	0.666	4.989	0.581	1.377	0.607	7.385	0.542	1.406	0.559	2.492	0.436	4.136	1.48	2.492	1.073	4.886	2.86	3.737	3.329	7.957	7.224	32.344	20.437	13.73	14.145	3.737	6.226	12.603	10.294	0	9.263	13.091	11.434	1.501	1.122	0	1.343	3.737	3.924	13.111	11.675	3.737	1.972	8.7	2.772	3.255	0.498	8.774	1.093

Pollutant Name: Carbon Dioxide Temperature: 60F Relative Humidity: 65%

Speed	LDA	LDA	LDA	LDA	LDT1	LDT1	LDT1	LDT2	LDT2	LDT2	LDT2	MDV	MDV	MDV	MDV	LHD1	LHD1	LHD1	LHD1	LHD2	LHD2	LHD2	LHD2	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	OBUS	OBUS	OBUS	OBUS	UBUS	UBUS	UBUS	UBUS	MCY	MCY	MCY	MCY	SBUS	SBUS	SBUS	SBUS	MH	MH	MH	MH	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
10	992.919	723.234	359.489	723.749	995.482	895.31	347.247	871.467	995.72	896.771	355.968	895.596	1178.44	1226.295	346.708	1222.651	1672.267	1672.267	521.379	1348.949	1672.267	1672.267	532.145	1139.398	1672.267	1672.267	1505	1531.564	1672.267	1672.267	3165.447	3074.865	1672.267	1672.267	1505	1565.264	0	1672.267	2594.034	2194.956	194.342	225.478	0	207.34	1672.267	1672.267	1505	1531.1	1672.267	1672.267	1505	1653.698	605.187	872.568	1760.19	929.242
50	402.816	293.408	359.489	294.25	403.856	363.217	347.247	362.993	403.953	363.81	355.968	363.999	478.08	497.495	346.708	496.847	464.953	464.953	521.379	480.805	464.953	464.953	532.145	496.357	464.953	464.953	1505	1339.828	464.953	464.953	1670.679	1597.535	464.953	464.953	1505	1130.285	0	464.953	2594.034	1672.252	97.283	165.723	0	125.853	464.953	464.953	1505	1342.713	464.953	464.953	1505	580.411	249.342	347.768	1268.02	408.789

Pollutant Name: Sulfur Dioxide Temperature: 60F Relative Humidity: 65%

Speed	LDA	LDA	LDA	LDA	LDT1	LDT1	LDT1	LDT2	LDT2	LDT2	LDT2	MDV	MDV	MDV	MDV	LHD1	LHD1	LHD1	LHD1	LHD2	LHD2	LHD2	LHD2	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	OBUS	OBUS	OBUS	OBUS	UBUS	UBUS	UBUS	UBUS	MCY	MCY	MCY	MCY	SBUS	SBUS	SBUS	SBUS	MH	MH	MH	MH	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
10	0.012	0.007	0.003	0.007	0.012	0.009	0.003	0.009	0.012	0.009	0.003	0.009	0.015	0.012	0.003	0.012	0.02	0.016	0.005	0.013	0.02	0.016	0.005	0.011	0.022	0.017	0.014	0.015	0.052	0.019	0.03	0.03	0.022	0.017	0.014	0.015	0	0.017	0.025	0.021	0.003	0.002	0	0.003	0.022	0.017	0.014	0.015	0.022	0.017	0.014	0.016	0.008	0.008	0.017	0.009
50	0.005	0.003	0.003	0.003	0.005	0.004	0.003	0.004	0.005	0.004	0.003	0.004	0.006	0.005	0.003	0.005	0.006	0.004	0.005	0.005	0.006	0.005	0.005	0.005	0.006	0.005	0.014	0.013	0.014	0.005	0.016	0.015	0.006	0.005	0.014	0.011	0	0.005	0.025	0.016	0.002	0.002	0	0.002	0.006	0.005	0.014	0.013	0.006	0.005	0.014	0.006	0.003	0.003	0.012	0.004

Pollutant Name: PM10 Temperature: 60F Relative Humidity: 65%

Speed	LDA	LDA	LDA	LDA	LDT1	LDT1	LDT1	LDT2	LDT2	LDT2	LDT2	MDV	MDV	MDV	MDV	LHD1	LHD1	LHD1	LHD1	LHD2	LHD2	LHD2	LHD2	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	OBUS	OBUS	OBUS	OBUS	UBUS	UBUS	UBUS	UBUS	MCY	MCY	MCY	MCY	SBUS	SBUS	SBUS	SBUS	MH	MH	MH	MH	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
10	0.074	0.044	0.273	0.044	0.072	0.056	0.117	0.059	0.075	0.104	0.233	0.104	0.076	0.099	0.096	0.099	0.066	0.024	0.091	0.043	0.066	0.035	0.115	0.073	0.066	0.045	0.713	0.607	0.066	0.07	1.717	1.617	0.066	0.064	1.197	0.789	0	0.063	0.35	0.225	0.063	0.004	0	0.039	0.066	0.058	1.19	1.013	0.066	0.015	0.393	0.059	0.068	0.065	0.897	0.121
50	0.025	0.009	0.087	0.01	0.024	0.012	0.037	0.014	0.025	0.022	0.074	0.023	0.026	0.021	0.031	0.021	0.01	0.004	0.029	0.011	0.01	0.005	0.037	0.02	0.01	0.007	0.227	0.192	0.01	0.011	0.526	0.494	0.01	0.01	0.381	0.247	0	0.009	0.095	0.058	0.049	0.002	0	0.03	0.01	0.009	0.379	0.321	0.01	0.002	0.125	0.016	0.037	0.014	0.278	0.032

Pollutant Name: PM10 - Tire Wear Temperature: 60F Relative Humidity: 65%

Speed	LDA	LDA	LDA	LDA	LDT1	LDT1	LDT1	LDT2	LDT2	LDT2	LDT2	MDV	MDV	MDV	MDV	LHD1	LHD1	LHD1	LHD1	LHD2	LHD2	LHD2	LHD2	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	OBUS	OBUS	OBUS	OBUS	UBUS	UBUS	UBUS	UBUS	MCY	MCY	MCY	MCY	SBUS	SBUS	SBUS	SBUS	MH	MH	MH	MH	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
10	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.036	0.035	0.012	0.012	0.012	0.012	0	0.012	0.008	0.01	0.004	0.004	0	0.004	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.006	0.008	0.019	0.009
50	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.036	0.035	0.012	0.012	0.012	0.012	0	0.012	0.008	0.01	0.004	0.004	0	0.004	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.006	0.008	0.019	0.009

Pollutant Name: PM10 - Break Wear Temperature: 60F Relative Humidity: 65%

Speed	LDA	LDA	LDA	LDA	LDT1	LDT1	LDT1	LDT2	LDT2	LDT2	LDT2	MDV	MDV	MDV	MDV	LHD1	LHD1	LHD1	LHD1	LHD2	LHD2	LHD2	LHD2	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	OBUS	OBUS	OBUS	OBUS	UBUS	UBUS	UBUS	UBUS	MCY	MCY	MCY	MCY	SBUS	SBUS	SBUS	SBUS	MH	MH	MH	MH	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
10	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.028	0.028	0.028	0.028	0.013	0.013	0.013	0.013	0	0.013	0.013	0.013	0.006	0.006	0	0.006	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.009	0.013	0.018	0.013
50	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.028	0.028	0.028	0.028	0.013	0.013	0.013	0.013	0	0.013	0.013	0.013	0.006	0.006	0	0.006	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.009	0.013	0.018	0.013

Pollutant Name: Gasoline - mi/gal Temperature: 60F Relative Humidity: 65%

Speed	LDA	LDA	LDA	LDA	LDT1	LDT1	LDT1	LDT2	LDT2	LDT2	LDT2	MDV	MDV	MDV	MDV	LHD1	LHD1	LHD1	LHD1	LHD2	LHD2	LHD2	LHD2	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	OBUS	OBUS	OBUS	OBUS	UBUS	UBUS	UBUS	UBUS	MCY	MCY	MCY	MCY	SBUS	SBUS	SBUS	SBUS	MH	MH	MH	MH	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
10	7.121	12.115	0	12.086	7.078	9.722	0	9.688	7.077	9.756	0	9.742	5.603	7.171	0	7.167	4.209	5.28	0	5.277	4.209	5.235	0	5.229	3.816	5.128	0	5.088	1.621	4.407	0	4.374	3.816	5.037	0	5.022	0	4.966	0	4.966	32.896	34.523	0	33.575	3.816	4.97	0	4.889	3.816	5.133	0	5.089	20.208	10.55	0	10.681
50	16.925	29.808	0	29.731	16.817	23.899	0	23.806	16.815	23.999	0	23.961	13.131	17.652	0	17.643	15.275	18.994	0	18.984	15.275	18.847	0	18.826	13.896	18.487	0	18.345	5.961	16.084	0	15.966	13.896	18.175	0	18.122	0	17.944	0	17.944	47.182	46.606	0	46.942	13.896	17.959	0	17.672	13.896	18.488	0	18.332	32.262	25.941	0	26.027

Pollutant Name: Diesel - mi/gal Temperature: 60F Relative Humidity: 65%

Speed	LDA	LDA	LDA	LDA	LDT1	LDT1	LDT1	LDT2	LDT2	LDT2	LDT2	MDV	MDV	MDV	MDV	LHD1	LHD1	LHD1	LHD1	LHD2	LHD2	LHD2	LHD2	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	OBUS	OBUS	OBUS	OBUS	UBUS	UBUS	UBUS	UBUS	MCY	MCY	MCY	MCY	SBUS	SBUS	SBUS	SBUS	MH	MH	MH	MH	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
10	0	0	28.039	28.039	0	0	29.028	29.028	0	0	28.317	28.317	0	0	29.073	29.073	0	0	19.333	19.333	0	0	18.942	18.942	0	0	6.698	6.698	0	0	3.184	3.184	0	0	6.698	6.698	0	0	3.886	3.886	0	0	0	0	0	0	6.698	6.698	0	0	6.698	6.698	0	0	10.437	10.437
50	0	0	28.039	28.039	0	0	29.028	29.028	0	0	28.317	28.317	0	0	29.073	29.073	0	0	19.333	19.333	0	0	18.942	18.942	0	0	6.698	6.698	0	0	6.033	6.033	0	0	6.698	6.698	0	0	3.886	3.886	0	0	0	0	0	0	6.698	6.698	0	0	6.698	6.698	0	0	11.375	11.375

For on-site activity (mean vehicle speed = 10 mph, Temperature: 60F, Relative Humidity: 65%

	Emission Factors (g/mile)						
	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_x	CO_2
LDA-ALL	0.0650	0.0482	5.2550	0.3870	0.4650	0.0070	723.7490
LHD1-ALL	0.0680	0.0483	3.4290	0.3630	1.6710	0.0130	1348.9490
HHD-DSL	1.7810	1.6075	14.0000	6.6430	25.7120	0.0300	3165.4470

For off-site activity (mean vehicle speed = 50 mph, Temperature: 60F, Relative Humidity: 65%

	Emission Factors (g/mile)						
	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_x	CO_2
LDA-ALL	0.0310	0.0168	2.6830	0.0900	0.3110	0.0030	294.2500
LHD1-ALL	0.0360	0.0187	0.9440	0.0690	1.4800	0.0050	480.8050
HHD-DSL	0.5900	0.5070	3.4190	0.7430	13.7300	0.0160	1670.6790

Note:

1. $PM_{2.5}$ emission factors determined using guidance from SCAQMD, Final - Methodology to Calculate PM2.5 and PM2.5 Significance Thresholds, 10/1/2006, Appendix A - Updated CEIDARS Table with PM2.5 Fractions
   On-road vehicles
   - $PM_{2.5}$ Fraction of PM_{10}, Brake wear = 0.429
   - $PM_{2.5}$ Fraction of PM_{10}, Diesel = 0.920
   - $PM_{2.5}$ Fraction of PM_{10}, Gasoline-catalyst = 0.928
   - $PM_{2.5}$ Fraction of PM_{10}, Tire wear = 0.250
2. The temperature, RH, and mean vehicle speeds are from assumptions.

Reference source 1: Table C.4, California Climate Action Registry General Reporting Protocol Version 3.1, January 2009

Table C.4 Methane and Nitrous Oxide Emission Factors for Highway Vehicles by Model Year

Vehicle Types/Model Years	N_2O (g/mile)	CH_4 (g/mile)
Gasoline Passenger Cars		
Model Years 1984-1993	0.0647	0.0704
Model Year 1994	0.0560	0.0531
Model Year 1995	0.0473	0.0358
Model Year 1996	0.0426	0.0272
Model Year 1997	0.0422	0.0268
Model Year 1998	0.0393	0.0249
Model Year 1999	0.0337	0.0216
Model Year 2000	0.0273	0.0178
Model Year 2001	0.0158	0.0110
Model Year 2002	0.0153	0.0107
Model Year 2003	0.0135	0.0114
Model Year 2004	0.0083	0.0145
Model Year 2005 - Present	0.0079	0.0147
Gasoline Light Trucks (Vans, Pickup Trucks, SUVs)		
Model Years 1987-1993	0.1035	0.0813
Model Year 1994	0.0982	0.0646
Model Year 1995	0.0908	0.0517
Model Year 1996	0.0871	0.0452
Model Year 1997	0.0871	0.0452
Model Year 1998	0.0728	0.0391
Model Year 1999	0.0564	0.0321
Model Year 2000	0.0621	0.0346
Model Year 2001	0.0164	0.0151
Model Year 2002	0.0228	0.0178
Model Year 2003	0.0114	0.0155
Model Year 2004	0.0132	0.0152
Model Year 2005 - Present	0.0101	0.0157

Table C.4 Methane and Nitrous Oxide Emission Factors for Highway Vehicles by Model Year (continued)

Vehicle Types/Model Years	N_2O (g/mile)	CH_4 (g/mile)
Gasoline Heavy-Duty Vehicles		
Model Years 1985-1986	0.0515	0.4090
Model Year 1987	0.0849	0.3675
Model Years 1988-1989	0.0933	0.3492
Model Years 1990-1995	0.1142	0.3246
Model Year 1996	0.1680	0.1278
Model Year 1997	0.1726	0.0924
Model Year 1998	0.1693	0.0641
Model Year 1999	0.1435	0.0578
Model Year 2000	0.1092	0.0493
Model Year 2001	0.1235	0.0528
Model Year 2002	0.1307	0.0546
Model Year 2003	0.1240	0.0533
Model Year 2004	0.0285	0.0341
Model Year 2005 - Present	0.0177	0.0326
Diesel Passenger Cars		
Model Years 1960-1982	0.0012	0.0006
Model Years 1983 - Present	0.0010	0.0005
Diesel Light Trucks		
Model Years 1960-1982	0.0017	0.0011
Model Years 1983-1995	0.0014	0.0009
Model Years 1996 - Present	0.0015	0.0010
Diesel Heavy-Duty Vehicles		
All Model Years	0.0048	0.0051

Source: Gasoline vehicle factors from EPA Climate Leaders, Mobile Combustion Guidance, (2008) based on U.S. EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005 (2007). Diesel vehicle factors based on U.S. EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005 (2007), Annex 3.2, Table A-98.

Reference source 2: Table C.6, California Climate Action Registry General Reporting Protocol Version 3.1, January 2009

Table C.6 Methane and Nitrous Oxide Emission Factors for Non-Highway Vehicles

Vehicle Type/Fuel Type	N_2O (g/gallon)	CH_4 (g/gallon)
Ships & Boats		
Residual Fuel Oil	0.30	0.86
Diesel Fuel	0.26	0.74
Gasoline	0.22	0.64
Locomotives		
Diesel Fuel	0.26	0.80
Agricultural Equipment		
Gasoline	0.22	1.26
Diesel Fuel	0.26	1.44
Construction		
Gasoline	0.22	0.50
Diesel Fuel	0.26	0.58
Other Non-Highway		
Snowmobiles (Gasoline)	0.22	0.50
Other Recreational (Gasoline)	0.22	0.50
Other Small Utility (Gasoline)	0.22	0.50
Other Large Utility (Gasoline)	0.22	0.50
Other Large Utility (Diesel)	0.26	0.58
Aircraft		
Jet Fuel	0.31	0.27
Aviation Gasoline	0.11	7.04
All Non-Highway/Construction Vehicles		
Butane*	0.41	0.09
Propane*	0.41	0.09

Source: U.S. EPA, Climate Leaders, Mobile Combustion Guidance (2008) based on U.S. EPA Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005 (2007), Annex 3.2, Table A-101, except butane and propane.
* Butane and propane emission factors based on stationary combustion emission factors for these fuels from U.S. EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2000 (2002).

APPENDIX N
REASONABLY FORESEEABLE FUTURE ACTIONS

Description	Location	Source
Project Name: General Permits Multiple development permits primarily for residential projects in surrounding areas that include new residential units, additions, remodels, and other minor residential changes. Several applications for minor and standard subdivisions in surrounding areas including in Royal Oaks. Other permits include construction of wells, lot line adjustments, and legalization of existing structures.	Throughout Monterey County	Monterey Co. Active Planning Projects & Approved Projects 2009
Project Name: Existing commercial fishing facility Modification of commercial fishing facility to allow storage yard, parking, pedestrian trail, grading. Yard consists of twenty-nine 10x10 foot pads for storage of fishing equipment (hooks, nets) for operation of commercial fishing. Install 40 parking stalls, elevated observation platform, 5-wide pedestrian coastal trail. Would require approximately 5,000 cyds of grading. In the coastal zone.	Across from 7881 Sandholt Rd., Moss Landing. Parcel No. 133-212-009-000, southeast corner of Sandholt Bridge.	Monterey Co. Active Planning Projects
Project Name: Not provided Coastal administrative permit for excavation of approx 5,800 cy of soil contaminated with chromite ore, and re-grading of area. In the coastal zone.	7697 Hwy 1, Moss Landing. Parcel No. 133-172-004-000, North County Area	Monterey Co. Approved Projects 2009
Project Name: Not provided Private owners approved for coastal administrative permit to install a new well to replace an existing well that has seawater intrusion. TRS PLN090201. In the coastal zone.	172 Bluff Rd., Moss Landing Parcel No. 117-042-005-000. In North County Land Use Plan	Monterey Co. Approved Projects 2009
Project Name: Not provided PG&E PLN090236 7. Coastal Development permit for excavation of approx. 2,109 cyds of potentially contaminated soil within the eastern half of an approx. 41,200 sf area called "rock blotter area" of the Moss Landing Power Plant. If necessary, remaining concrete foundations associated with previously removed transformers and associated steel rails and rebar will also be removed. In North County Coastal Zone.	7301 Hwy 1, Moss Landing. Parcel No. 133-181-010-000	Monterey Co. Approved Projects 2009

Description	Location	Source
Project Name: Moss Landing Wildlife Area Phase 2 Project Site modifications and repairs to maintain and improve the functionality of the project site as a managed wildlife habitat area. Following project completion, the project site would be fundamentally, unchanged in appearance or use; however, it would provide better habitat for the wildlife populations, and would give site managers greater ability to maintain this habitat.	Lat/Long: 34° 49' 6" / 121° 46' 38" Parcel No: 413-023-008, 009	CEQAnet 2010
Project Name: Elkhorn Slough National Estuarine Research Reserve Administration and management of the Elkhorn Slough National Estuarine Research Reserve. Maintenance of the property, implementation of best management practices, monitoring, research, and possibly small habitat restoration projects.	CEQAnet	2008
Project Name: Marina Downtown Specific Plan Specific Plan for future development within City of Marina downtown core. The Plan aims to revitalize the Downtown economy and sense of place through: A clearly stated vision for the future; Clearly articulated land uses and development standards; Appropriate design guidelines and regulations; Strategies to encourage desired redevelopment and business; and An implementation program identifying action steps, organizations and resources.	15 miles north of Monterey	CEQAnet 2009
Project Name: Marina High School/Middle School and Joint Use Community Recreation Facilities The existing Marina High School will be converted into a Middle School for 650 students. A new High School will be developed on an adjacent property of approximately 22 acres for 1,380 students. The joint use facilities would remain unchanged and provide for future uses as a Middle School, which would include a Regional Occupational Program, and Adult Education.	Lat/Long: 36° 40' 33" / 121° 48' 16"	CEQAnet 2010
Project Name: Marina Station Specific Plan Mixed-use development project including ~1,360 residential units, 651,624 sf of industrial uses, 143,808 sf of office space, and 60,000 sf of commercial uses, in addition to open space and park lands.	Cross Sts: Del Monte Blvd /Marina Greens Dr.; Parcel No: 203-011-023, 024; 175-011-044, 046	CEQAnet 2008

Description	Location	Source
Project Name: Interim Measures Workplan for AOC Power Block 1-5, Rock Blotter Area, Moss Landing Power Plant, PG&E Department of Toxic Substances Control (DTSC) is proposing to approve Interim Measure (IM) Workplan for the Rock Blotter Area in Area of Concern (AOC) Power Block 1-5, at Moss Landing Power Plant (MLPP) formerly owned by PG&E in Moss Landing, (EPA ID No. CAT080011653). The IM Workplan includes procedures to be used in excavation of impacted soil beneath a former row of transformers in the eastern part of the Rock Blotter Area in Power Block 1-5 at the MLPP.	Cross Streets: Dolan Road Lat/Long: 36° 48' 22" / 121° 46' 55"; Parcel No: 133-181-011-000	CEQAnet 2009
Project Name: Dissolution of the Pajaro Sanitation District & Reorganization to Become Part of the Pajaro Sunny Mesa Community Service District One of the three related projects proposed by the PSMCSD: 1. Renovation of water supply facilities formerly owned and operated by the Vega Road Mutual Water Company. 2. Consolidation of 12 small individual water systems into the PSMCSD; and 3. The subject project, annexation of the services of the Pajaro Sanitation District into the PSMCSD. Initial Studies have been prepared individually for each project. The project would carry out PSMCSD plans to annex the system, dissolve it, and incorporate it into the PSMCSD. Formally, this action is dissolution of the Sanitation District and reorganization of its services into that of the PSMCSD.	Nearest Community: Pajaro	CEQAnet 2008
Project Name: San Miguel Canyon Rd/Castroville Blvd Intersection Improvements Roadway widening and striping improvements to an ~0.75 mile long segment of San Miguel Canyon Rd between Prunedale North Rd and just north of Catroville Blvd, widening and restriping of an ~.14 mile long segment of Castroville Blvd near its intersection with San Miguel Canyon Rd, and signalization of the San Miguel Canyon Rd/Castroville Blvd intersections. Designed to improve safety conditions. Grading in several locations is needed. Approximately 94 oak, pine, and non-native trees may be removed.	San Miguel Canyon Rd./Castroville Blvd., San Miguel Canyon Rd./US Hwy 101; Lat/Long: 36° 49' 33" / 121° 40' 36"	CEQAnet 2009
Project Name: Solar Power Array at the Watsonville Landfill Installation of an 8-acre solar power array, with approx. 6,600 solar panels, on a portion of the City landfill at 730 San Andreas Rd. The project will generate ~4700 kilo watts of electricity.	Cross Streets: San Andreas; Parcel No: 046-201-22	CEQAnet 2009

Description	Location	Source
Project Name: Monterey-Salinas Transit - Whispering Oaks Business Park Phased, standard subdivision to create 20 parcels including a 24.37-acre parcel for the Monterey-Salinas Transit (MST) Administrative and Maintenance Facility, 15 additional lots for the Whispering Oaks Business Park (24.44 acres total), two open space parcels (57.62 acres total), one parcel for a detention basin (1.71 acres), and one parcel for private streets (7.39 acres). General Development Plan to guide development of the Whispering Oaks Business Park (57.91 acres). General Development Plan and Use Permit to develop the MST Administrative and Maintenance Facility (24.37 acres). Based on conceptual site plans, buildings would total 153,938 square feet.	City of Marina, Cross Sts: North of Inter-Garrison Rd and east of 7th Ave; Parcel No: 031-101-056 and 031-031-101	CEQAnet 2009
Project Name: Not provided Coastal Administration Permit for installation and operation of skid-mounted 4,000 sf temporary pilot desalination facility, 10-20 feet high. Will operate for up to 3 years. In North County Area, Coastal Zone.	7697 Hwy 1, Moss Landing. Parcel No. 133-172-013-000	Monterey Co. Active Planning Projects
Project Name: Not provided Combined development permit consisting of 1) General Development Plan for Industrial property totaling 189 acres (Former National Refractories Site) to establish historical uses to be allowed as part of business park (including warehouse, industrial shops, bio-diesel research and development, etc.) and a coastal development permit and design approval for construction of a 70,000 sf industrial warehouse to replace demolished facilities (PLN040363). In Moss Landing Community Plan Area, Coastal Zone.	7697 Hwy 1, Moss Landing. Parcel No. 133-172-013-000 Southeast corner of Dolan Rd.	Monterey Co. Active Planning Projects
Project Name: Loan Exchange Group Development permit to clear (CE020302) consisting of: coastal development permit for vehicle dismantling and sales within Dolan Industrial Park (parcel D/ Dolan Development Partners LTD); General Development Plan including 6 vehicle dismantling yards, agricultural operations on two portions (14 ac and 24 ac) of parcel, the 2 existing "Dolan" residences; installation of 5 new septic systems, connection to existing water system and tank, installation of new fire hydrants, berming, fencing, tree planting for visual screening. Previous permit (PC94196) expired June 14, 2000 . In North County Area, Coastal Zone.	516 Dolan Rd Moss Landing; Parcel No. 131-054-004-000; on Via Tanques Rd, north of Dolan Rd.	Monterey Co. Active Planning Projects

Description	Location	Source
Project Name: Monterey Bay Aquarium Research Institute Combined development permit for: coastal development permit for development within 100 feet of environmentally sensitive habitat; a coastal development permit for marine related research facilities, and a coastal development permit for a general development plan to be constructed in three phases: Phase 1: remove finger pier on Parcel No. 133-231-001-000 for better maneuvering of exiting research vessel, phases 1A&1B for construction of 58,655 sf research facility for laboratory space for several research center offices on parcels 133-242-001-000 and 133-242-008-000. Phase II for construction of 34,000 sf replacement of existing building on Parcel 133-232-001-000 --current site of Phil's Fish Market and MBARI facilities. Building will support research centers and integration and testing of equipment prior to deployment of research vessels. Allow 30 ft dock extension for marine operations staff and vessel replacement. Phase III: construction of 66,500 sf building on Parcel 133-252-001-000 to support science and engineering ocean dependent research and allow 7,500 sf dock house on Parcel 133-231-001-000. In North County Area, Coastal Zone.	7600 7532 & 7500 Sandholdt Rd Moss Landing; Parcel Nos. 133-242-001-000, 133-242-008-000; 133-231-001-000; 133-232-001-000; 133-252-001-000	Monterey Co. Active Planning Projects
Project Name: Agriculture & Land-Based Training Association Combined development permit for voluntary wetland restoration on 40 ac of a 195 ac parcel. Consists of restoring, improving, maintaining native plant and endangered habitat while reconnecting Carneros Creek to historic floodplain. Grading 4,130 cy of cut, 130 cy of fill, balanced on site. In North County Area, Coastal Zone.	East of Sill Rd. and south of Hall Rd. in Elkhorn Slough Watershed; Parcel Nos. 181-251-001-000 & 181-251-003-000	Monterey Co. Active Planning Projects
Project Name: Pajaro Community Park Use permit for community park on a 4.9 acre site. New facilities include: a youth sized baseball and soccer field, decomposed granite running track, full size basketball court, two playgrounds, small stage area, picnic tables and benches, three shade pavilions with barbecue facilities, restroom building, and 53 car parking lot with a drop-off area and turning circle. In North County Area Plan.	Intersection of W. San Juan Rd and W. Porter Rd Dr, Pajaro; Parcel Nos 117-341-002-000, 117-341-003-000 and 117-331-025-000	Monterey Co. Active Planning Projects

Description	Location	Source
Project Name: Not provided Combined development permit for: coastal development permit and standard subdivision for division of two parcels (16.96 and 16.62 ac) into 76 lots: 68 single family residential (lot sized 4,200–18,000 sf); 4 duplex lots; one 1.76ac mixed use; and 9.7 ac of common area including a 2.5 ac recreation area with small parking lot and 2 0.5 ac mini-parks. Coastal development permit for removal of up to 25 coastal oak trees and onsite relocation of 0.1ac of willow trees. General development plan and coastal development permit for commercial or quasi-public development of the commercial parcel and construction of 4-unit apartment over the commercial space. Coastal development permit for demolition of 2 single family dwellings, 2 barns, garage, and removal of 2 mobile homes. Coastal development permit for development on slopes greater than 25 percent. In North County Area, Coastal Zone.	100 Sill Rd, Royal Oaks; Parcel Nos. 412-073-015 & 412-073-002-000	Monterey Co. Active Planning Projects
Project Name: Not provided Combined development permit for: coastal development permit to add 80,000 sf of additional cold storage capacity, 30,000 sf of loading dock; 9,000 sf of mechanical space, and 4,000 sf of office space to an existing 72,000 sf agricultural distribution center; and variance to exceed allowed site coverage. In North County Area, Coastal Zone.	2250 Salinas Rd. Moss Landing; fronting on and west of Hwy 1 Parcel No. 413-011-023-000	Monterey Co. Active Planning Projects
Project Name: Not provided Continued from 02/08/2005. Combined development permit for: coastal development permit for standard sub-division to divide 13.3 ac parcel into 26 LOTS (6,649–10,765 sf), remainder of parcel (6.61 ac), infrastructure improvements, and grading. Coastal development permit to demolish single family dwelling, barn, and other accessory buildings. In North County Area, Coastal Zone.	66 Fruitland Ave, Royal Oaks; south of Salinas Rd. Parcel No. 117-131-032-000)	Monterey Co. Active Planning Projects


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Environmental Management Plan

Moss Landing Materials Demonstration Plant

CALERA

May 13, 2010

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Environmental Management Plan

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Prepared by:

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TABLE OF CONTENTS

Page

LIST OF TABLES

LIST OF APPENDICES

LIST OF ACRONYMS AND ABBREVIATIONS

AAQS	ambient air quality standard
ATC Authorit	y To Construct
BAAQMD	Bay Area Air Quality Management District
BACT	Best Available Control Technology
bhp-hr/gal	brake horsepower hour per gallon
BMP	Best Management Practices
CA SHPO	California State Historic Preservation Office
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
Cal EPA	California Environmental Protection Agency
Cal/OSHA	California Occupational Safety and Health Administration
CARB	California Air Resources Board
CCR	California Code of Regulations
CCTA	Contra Costa Transportation Authority
CCRWQCB	Central Coast Regional Water Quality Control Board
CDFG	California Department of Fish and Game
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CMAP Carbonate	Mineralization by Aqueous Precipitation
CNEL	Community Noise Equivalent Level
CO carbon	monoxide
CO_2	carbon dioxide
CZ coastal	zone
db decibels	
dBA A-weighted	decibels
DDSD	Delta Diablo Sanitation District
DNL	Day-Night Average Sound Level
DOE	Department of Energy
DPM diesel	particulate matter
DTSC	Department of Toxic Substances Control
DWI	Detailed Work Instruction
ED electrodialy	sis
EIR	Environmental Impact Report
EMP	Environmental Management Plan
EMS	Environmental Management System
EO Executive	Order
FERC	Federal Energy Regulatory Commission
FWS	U.S. Fish and Wildlife Service
g/day	grams per day
g/hr	grams per hour
g/kW-hr	gallons per kilowatt hour
g/mi gram	s per minute
g/s	grams per second
g/year	grams per year
gpm gallon-per-m	inute
HC h	ydrocarbons
HRA	health risk assessment
HSP	health and safety plan
I&C	instrumentation and control

K Kelvin
kW kilowatts
L_{dn} Day-Night Average Sound Level
L_{eq} equivalent sound level
L_{90} sound level exceeded 90 percent of the time
LO/TO lockout/tag out
LOS level of service
m m eters
m/s meters per second
MBUAPCD Monterey Bay Unified Air Pollution Control District
mgd million gallons per day
MLCC Moss Landing Cement Company
MLCP Moss Landing Commercial Park
MLGS Marsh Landing Generating Station
MLMDP Moss Landing Materials Demonstration Plant
MW Megawatt
n/a not applicable
NAAQS National Ambient Air Quality Standards
NCLUP North County Land Use Plan
NCCAB North Central Coast Air Basin
NEPA National Environmental Policy Act
NO_X nitrogen oxides
NO_2 nitrogen dioxide
NPDES National Pollutant Discharge Elimination System
OSHA Occupational Safety and Health Administration
PM particulate matter
PM_{10} particulate matter of 10 microns or less
$PM_{2.5}$ particulate matter less than or equal to 2.5 microns in diameter
ppm parts per million
PTO Permit To Operate
RCRA Resource Conservation and Recovery Act
RO Reverse osmosis
SCM Supplem entary cementitious material
SILs Significant Impact Levels
SO_2 sulfur dioxide
SOP Standard Operating Procedure
SPL sound pressure level
SQG small quantity generator
SR State Route
SWPPP Stormwater Pollution Prevention Plan
TAC toxic air contaminant
TBD to be determined
USDOENNSA U.S. Department of Energy National Nuclear Security Commission
U.S. EPA U.S. Environmental Protection Agency
UTM Universal Transverse Mercator
VOC volatile organic compound
WPGS Willow Pass Generating Station
WTP Wastewater Treatment Plant

1.0 INTRODUCTION

The Calera Corporation's (Calera) currently proposed materials demonstration plant at the Moss Landing Cement Company (MLCC) site in Moss Landing, California, is Calera's signature project for demonstrating maximum carbon sequestration achieved through minimal energy consumption and minimal impact to the human and natural environments.

> ***Calera Corporation fully supports and approves this Environmental Management Plan (EMP). This includes a commitment to provide management assistance, manpower, training, equipment, and materials as necessary to implement the EMP and modify it as needed.***

Calera has developed this Environmental Management Plan (EMP) as a "management tool" for use by the Moss Landing Materials Demonstration Plant (MLMDP) management team, designers, constructors, and operators during project operation. The EMP presents Calera's organizational and management capabilities to successfully implement the project, achieve the project objectives, and oversee and minimize environmental concerns. This EMP presents Calera's capabilities and describes the process Calera will follow to maximize its environmental compliance and minimize impacts to the environment.

Specifically, the EMP:

- Discusses Calera's philosophy regarding environmental stewardship;
- Lists the Calera team members who oversee environmental and safety considerations at the MLMDP;
- Summarizes prior Calera team experience related to identification and minimization of potential environmental impacts, obtaining agency approval/permits, and meeting environmental regulatory requirements related to Calera operations;
- Describes/lists existing and proposed Environmental Policies, Procedures, and Plans;
- Discusses Calera's organizational and management capabilities for successfully implementing this EMP;
- Addresses environmental commitments relevant to construction and operation of the MLMDP; and
- Discusses how Calera will ensure compliance by its employees and subcontractors with all relevant project-related environmental requirements, best management practices designed for minimization of both regulated and unregulated pollutants, and mitigation measures; and Calera's approach regarding management and minimization of unexpected environmental consequences.

The EMP is a "living" document that will be revised and updated with additional information as applicable and appropriate. Calera will distribute the EMP to site personnel and notify them of substantive changes to the document or guidance, and provide appropriate training on EMP

implementation and environmental awareness. Implementation of the EMP will be promoted to ensure that the mitigation of adverse impacts and enhancement of beneficial impacts is carried out effectively during the project life cycle. Calera management will promote its use in the spirit of continual improvement, and to assist in achieving best practices in environmental management in an efficient and cost-effective manner.

In accordance with the principles of the EMP and Calera's philosophy regarding environmental stewardship, the EMP will be reviewed at regular intervals to assess the <u>overall</u> effectiveness of the management system and improvements relative to the environmental initiatives and to achieving the overall objectives of the project. Full implementation of, and continual improvements to, the EMP are key foci.

2.0 CALERA CORPORATION

2.1 ENVIRONMENTAL PHILOSOPHY

Green Cement for a Blue Planet - Calera seeks a new future that combines the world's most traded commodities (water, concrete, and electricity) into a synergistic infrastructure that converts man-made greenhouse gas emissions into sustainable products for use in the built environment.

Calera's Business System Plan is based on a "Do No Harm" philosophy. For Calera, the environment comes first in our operations. Calera has consistently demonstrated this commitment to the environment by recognizing that good environmental practices lead to good engineering and vice versa. Minimizing waste, recycling, and re-circulating byproducts is good business. Reducing the volume of raw materials put into our process and reusing byproducts saves money and is good environmental stewardship. Calera views this as a win-win. Calera aims for a zero discharge operation. Calera further strives to "do no harm" by constantly looking for opportunities to integrate our systems with other industries and by collaborating with these industries to reduce our impacts.

"ENVIRONMENT COMES FIRST / DO NO HARM"

Calera has the potential to significantly reduce the amount of carbon dioxide (CO_2) emissions from the emitter. Net emissions are calculated as the net capture of flue gas from the power plant (at least 70%), minus the emissions generated from the Calera process and the mining and transport of raw materials, plus the CO_2 avoided by the process:

1. Every ton of supplementary cementitious material (SCM) or cement replacement produced by Calera avoids the release of approximately a ton of CO_2 that would otherwise be emitted by the traditional manufacturing of Portland Cement (calcination).

2. The energy consumption needed to produce fresh water is reduced by the Calera process. By removing cations (calcium and magnesium), the energy use required for desalination is reduced by about 30%.

2.2 BACKGROUND

The primary objective of the MLMDP is to design, construct, and conduct Calera's innovative process for mineralization of CO_2 from flue gas directly to carbonates while maximizing the value and versatility of its beneficial use products. The MLMDP will be operated in conjunction with an existing 10 megawatt (MW) CO_2 Absorption Demonstration Plant. The beneficial use products will be tested and optimized to maximize their marketability and value. A second objective is to optimize the Carbonate Mineralization by Aqueous Precipitation (CMAP) process to achieve key metrics that will demonstrate the technology's commercial viability.

We anticipate that operating the MLMDP in conjunction with our Absorption Demonstration Plant will have a synergistic effect and increase the key performance metrics of the technology. The information

supplied by this study will be directly utilized for scale-up of the full carbonate mineralization technology to commercial scale in the future, presumably at other locations throughout the country.

The proposed MLMDP site is located adjacent to the Calera Absorption Demonstration Plant in Moss Landing, California. The Building Materials Demonstration Plant will receive product slurry produced in the CO_2 Absorption Demonstration Plant and convert it to aggregates and cementitious substitutes for use in the construction industry. In the Demonstration Plant, a variety of unit operations will be tested to find optimal combinations that maximize the value of carbonate mineralization beneficial use products. Producing marketable building materials from carbonate minerals by this technology can greatly reduce the net operating costs per amount of CO_2 sequestered.

2.3 PROJECT DESCRIPTION

The Proposed Action addressed in this EMP is the granting of Phase 2 federal financial assistance through the Department of Energy's (DOE's) Innovative Concepts for Beneficial Reuse of Carbon Dioxide program to Calera for the construction, operation, and maintenance of the MLMDP. The MLMDP would convert output from the Absorption Demonstration Plant into aggregates and cementitious products, which would be tested and optimized to maximize marketability and value. The Absorption Demonstration Plant and MLMDP are collectively referred to as the Moss Landing Demonstration Plant. An overview of the Proposed Action is provided below.

Calera is proposing a research-and-development facility for beneficial carbon dioxide use to be called the MLMDP. The facility will test and optimize aggregates and cementitious products that are created through an innovative process of mineralizing carbon dioxide from power plant flue gas. The MLMDP will be operated by the MLCC, which is a special-purpose entity company wholly owned by Calera. The project location is in Moss Landing in unincorporated Monterey County, California.

The MLCC currently operates a pilot plant at Moss Landing (the Pilot Plant) that encompasses the complete process of the absorption of carbon dioxide and the creation of aggregates and cementitious products. The Pilot Plant is 1:1,000 the scale of a commercial scale plant.

The MLCC also currently operates a demonstration plant at the site that is referred to as the Moss Landing Absorption Demonstration Plant (Absorption Demonstration Plant), which consists of the first (front-end) stage of Calera's process at 1:100 the scale of a commercial plant. The existing Absorption Demonstration Plant captures CO_2 from a slip stream of flue gas produced by the adjacent Dynegy Moss Landing natural gas–fired combined-cycle power plant (Dynegy Plant). The Absorption Demonstration Plant uses a source of base/high-alkalinity material plus calcium and/or other divalent cations to capture and convert the CO_2 into solid carbonates.

Project Construction

Calera will commence site mobilization subsequent to the receipt of all building, development, and environmental permits for the MLMDP. Site preparation work will include site grading and stormwater control. The project will continue to use several of the existing buildings and tanks currently used for the Absorption Demonstration Plant. No offsite linears will need to be constructed for implementation of the MLMDP. The following features will be constructed as part of the project:

- Three silos to store SCM
- An aggregate lay-down, drying, and harvesting area
- Three-sided uncovered bays for storage of aggregate and briquettes

Excavations will be needed for the installation of silos and within existing structures for installation of equipment. The depth of these excavations from existing foundations is expected to be approximately

3 feet. The total cut is not expected to exceed 90 cubic yards and cut material is expected to be placed around the existing facility to fill existing rough grades. No soils are expected to need to be imported to the site for construction of the project.

Portions of the site will be used for construction laydown, offices, and parking. Mobile trailers or similar suitable facilities (e.g., modular offices) will be used as construction offices for contractor and subcontractor personnel. Site access will be controlled for personnel and vehicles. The construction laydown and parking areas will be graded (as necessary) and surfaced with crushed rock—which will provide erosion protection. As necessary, temporary security fences will be installed for access control. A construction Storm water Pollution Prevention Plan (SWPPP) will be prepared and implemented if applicable. The plan will include best management practices (BMPs) to minimize erosion, such as use of strategically placed berms, swales, and culverts to redirect runoff toward storm water retention basins. After construction, disturbed areas will be cleaned up, but the crushed rock surfacing and fencing may remain in place.

A site-specific health and safety plan (HSP), incorporating information and procedures to be followed by onsite personnel for the completion of the work, will be developed and implemented. The HSP will outline requirements and provide guidance for control of construction safety hazards in compliance with safety standards and protection of public health.

Project Operations and Maintenance

MLMDP operations will primarily be consistent with operation of the Absorption Demonstration Plant, which is up to 24 hours each day. When the plant is not operating, personnel will be present as necessary for preparation of the plant for start-up, shutdown, and maintenance. Operation of the MLMDP will include continued testing and refinement of processes and monitoring of components and end products. Once operation provides sufficient data to allow for commercial scale up, the facility is expected to continue to operate as a research and development facility for Calera. Operation of process equipment is expected to require approximately 1 and 2 MW, which is anticipated to be provided by propane.

Liquid output streams are expected to be reused within the Moss Landing Demonstration Plant or in related processes at the MLCC site (including electrochemical production of sodium hydroxide, which is not part of this project). Specific liquid output streams include a calcium-rich water stream of about 130 gallongs per minute (gpm); sodium chloride-rich water stream of approximately 130 gpm; and a fresh water stream of about 300 gpm. The calcium-rich water stream will be recirculated to dilute or dissolve the incoming calcium chloride. The sodium chloride-rich stream is expected to be used in Calera's electrochemical process. Freshwater will either be sold or reused within the process for dilution of reagents.

Maintenance activities will be expected to be limited to equipment cleaning, testing, and maintenance as per product specifications within MLCC. Other facilities maintenance is the responsibility of the MLCP, as the owner of the site.

2.4 DEMONSTRATION OF CALERA ENVIRONMENTAL COMMITMENT

Calera's environmental commitment is best illustrated by our existing absorption demonstration plant (the "Absorption Demonstration Plant") in Moss Landing, California, which is being used to determine the commercial-scale processing and energy requirements to remove CO_2 from power plant flue gas. This Plant removes CO_2 from a slip stream of flue gas produced by the adjacent Dynegy Moss Landing natural gas-fired combined-cycle power plant (the "Dynegy Plant"). The Absorption Demonstration Plant instruments and controls allow Calera to obtain the data needed to quantify the amount of CO_2 removal obtained and internal power consumption required for the absorber configuration and operating condition being tested in pursuit of Calera's goals for CO_2 removal and power consumption.

During the Absorption Demonstration Plant planning and permitting process, Calera applied for and obtained an encroachment permit from the Monterey County Department of Public Works for extension of a flue gas conduit from the adjacent power plant to the Calera project site. The permit was required due to the need to trench across Dolan Road. Although not required to obtain the permit, Calera hired an independent consultant to perform a Biological Survey. Calera recognized the potentially sensitive nature of the proposed flue gas conduit's preferred path and sought independent assurance that sensitive habitat and species would not be directly or indirectly affected by the construction activities. Calera further demonstrated our proactive approach to good environmental stewardship by applying for and receiving air permits for individual pieces of equipment that would potentially, but not necessarily, be used by the absorption demonstration plant. Calera made an extensive effort during project planning and permitting to anticipate permit requirements and respond to those early and thoroughly. By permitting equipment that might be needed, Calera sought to ensure compliance with permitting requirements and demonstrate our desire to "do no harm".

Calera's commitment to "do no harm" cannot completely prevent the occasional instrument malfunction or unavoidable system breakdown. Calera has expressed our commitment, and demonstrated our ability, to respond to issues quickly and in compliance with incident reporting procedures. On January 7, 2010, due to a leak at a pipefitting, approximately 100 gallons of supernatant was released. The flow through the pipe was immediately discontinued. The spill was contained within an area that was approximately 150 feet long by 1 to 2 feet wide; 3 feet at the widest point on the side of the road (Highway 1). Procedures for clean up and incident reporting were immediately implemented. The spill was below reporting limits. However, courtesy calls were placed, as a precaution, to the appropriate parties including the California Highway Patrol, the Monterey County Health Department, and the North Monterey County Fire Department. The supernatant was absorbed and the remaining solid materials were properly disposed of onsite. Water used in the process and stored on site in T-tanks was released in a separate incident after instrument failure caused the tank to be overfilled. Calera was able to vacuum the water up and return it to the system. Calera's response to these minor incidents illustrates our commitment to the environment and our ability to respond to environmental issues that could arise.

Calera has developed guidelines to enhance the safety of staff, vendors, and visitors on our site. Anyone accessing the site is provided a safety briefing and written procedural guidelines to read and sign. The required form is included in Appendix B.

3.0 APPROACH FOR SUCCESSFULLY IMPLEMENTING THE ENVIRONMENTAL MANAGEMENT PLAN

Calera's Business System is a comprehensive set of procedures that are used to train employees on procedures relevant to their job responsibilities. The Calera Business System is a living plan that will grow with the company and be updated on an as-needed basis. We plan to amend the policy document for the Calera Business System to incorporate an environmental management systems (EMS) approach to environmental management, as well as incorporate this EMP. This formalized approach will demonstrate how we are fulfilling our obligations to the public, regulatory agencies, teaming partners, employees, and the environment.

The program elements of an effective EMS approach, and Calera's initial implementation of an EMS, include:

Establish Phase	Identify program goals and objectives to achieve maximum environmental compliance and minimal adverse environmental impacts; *this EMP was developed in support of the Establish Phase*
Deploy Phase	Deploy strategies; perform preliminary impact analysis and identify appropriate best management practices, mitigation, and permitting requirements – *Calera prepared an Environmental Information Volume for submittal to DOE, to assess impacts and identify our environmental commitments*
Implement Phase	Conduct field projects and implement strategies by using in-house resources and outside environmental specialists as needed – *Agency consultations and permitting discussions will be held, detailed resource studies will be performed (if required), permits will be obtained and conditions implemented, additional training will be developed/provided, and additional management plans will be developed and implemented as necessary*
Review	Evaluate the effectiveness of the EMP through audits and other evaluation factors; modify the program accordingly to further meet the objectives – *Calera will perform periodic audits; we will also modify the EMP as necessary based on DOE and other regulatory agency comments, and regulatory and permit requirements*

3.1 IMPLEMENTATION OF THE EMP

Implementation of the EMP will incorporate EMS components to achieve the project objectives while promoting continuous improvement. The eight primary components include:

Plans, Training, and Environmental Awareness. Based on Calera's philosophy of "Environment Comes First / Do No Harm," our approach is to first engineer to avoid adverse impacts to the environment, and second, control and minimize adverse impacts through administrative controls and procedures. For example, although Calera has a Resource Conservation and Recovery Act (RCRA,

hazardous waste) generator permit as a small-quantity generator, we have not required use of the permit based on our responsible use of hazardous products. Similarly, although the site has a National Pollutant Discharge Elimination System (NPDES) permit, we plan on reusing and recirculating excess waste water, with no discharge to surface waters, and, therefore, no (or limited) use of the NPDES permit. If any additional plans or actions are required or deemed necessary to protect the environment from Calera operations, Calera will prepare and implement the plans, and obtain agency approval as necessary.

Calera places utmost importance on proper training to facilitate awareness of environmental considerations and comply with environmental commitments.

Greater awareness of Calera's environmental policy, EMP, and related regulatory requirements supports the Calera philosophy identified in our Business System.

Calera is fully dedicated to maintaining a well-trained and well-prepared staff on the MLMDP site. To be effective, Calera's training program will include an induction and refresher training for staff and contractors as appropriate. It will cover general environmental issues and the purpose of environmental impact prevention goals, and provide details on specific controls relevant to individual job areas/responsibilities. An electronic training database has been implemented to maintain all training records for Calera staff.

Existing and proposed health and safety-related procedures and training courses that meet California Occupational Safety and Health Administration (Cal/OSHA) regulations, which take precedence over the federal OSHA regulations at this site, are listed in Table 3-1. This training is required for employees based on their project role and potential exposures to hazardous conditions. Calera will continue to update and determine site-specific health and safety-related procedures during project and site development.

Table 3-1
Safety Procedures and Training

Course Title	Category[1]	Document Number	Issue Date
Machine Shop Safety and Usage Guidelines	DWI	1230	Done
Asbestos Management	DWI	1178	Done
Injury and Illness Reporting	DWI	1174	05/31/10
Permit to Work Procedure	DWI	1058	05/31/10
Emergency Response and Evacuation	SOP.SS	1175	05/31/10
Lock Out Tag Out Procedure	DWI	1057	05/31/10
Job hazard Questionnaire	FRM	1173	05/31/10
Electrical Safety	DWI	1181	05/31/10
Industrial and Environmental Hygiene	SOP.SS	1144	05/31/10
Injury and Illness Prevention Plan	SOP.SS	1056	05/31/10

[1] DWI = Detailed work instructions, SOP = Standard Operating Procedures

Table 3-1 (cont.)
Safety Procedures and Training

Course Title	Category	Document Number	Issue Date
Confined Space Procedure	DWI	1063	05/31/10
Noise Hygiene Procedure	DWI	1180	05/31/10
Respiratory Program	DWI	1186	05/31/10
Personal Protective Equipment (PPE)	DWI	1187	05/31/10
First Aid, CPR, and AED	DWI	1188	05/31/10
Fire Prevention Plan	DWI	1176	06/30/10
Chemical Hygiene Plan	SOP.SS	1177	06/30/10
Ergonomics Procedure	DWI	1179	06/30/10
Elevated Work Procedure	DWI	1182	06/30/10
Construction Safety	SOP.SS	1183	06/30/10
Tool Safety	DWI	1184	06/30/10
Excavation Procedure	DWI	1185	06/30/10
Vehicle Safety	DWI	1189	06/30/10

Documentation and Recordkeeping. Good recordkeeping demonstrates that Calera is following the EMP and that it is working as intended. Appropriate records will be kept of inspections and audits, monitoring programs, training programs, incident forms and responses, internal and external communications regarding the EMP, and results of internal and external assessments and compliance visits. The type of records to be maintained will include completed forms, checklists and maintenance logs; memoranda documenting identified problems and corrective actions undertaken; and monitoring data/results. Records will include photographs of the site that are taken prior to, during and immediately after construction. The Manager of Environmental Services will be responsible for maintenance of these records consistent with Calera's document management and retention policies.

Reporting Procedures. The Manager of Environmental Services will establish specific reporting procedures associated with this EMP that are to be followed in response to agency/public inquiries, to meet permit requirements, and to inform Calera management of environmental accomplishments, improvements, and remedial actions. Incident reports and documentation of mitigation of adverse environmental impacts will be used to enhance and improve the program.

Progress Monitoring. Progress against Calera's project implementation schedule will be monitored and corrective actions identified as necessary. Of particular importance is progress made toward applying for and obtaining permits prior to required equipment installation and operation. Monitoring will be ongoing throughout the project life cycle to ensure that environmental impacts are within the predicted levels and that specified environmental performance targets are being achieved. For any sampling/monitoring undertaken, monitoring equipment will be accurately calibrated, quality controls implemented, accredited laboratories used, certified methods of testing employed and where specifications or guidance criteria exist for testing and sampling methods these are taken into account.

Auditing. Auditing of internal policies and procedures, and adherence to environmental and health and safety regulatory requirements will be performed on a 6-month basis. Action/corrective action plans will be developed and corrective actions undertaken and documented. Audits will ensure that the EMP is being appropriately updated and will confirm that identified corrective actions have been undertaken and will assess the effectiveness of such actions. The Manager of Environmental Services will be responsible

for scheduling and ensuring execution of the audit, as well as for the verification of the implementation of corrective action.

Flowdown of EMP Requirements to Calera Contractors, Subcontractors, and Other Parties. Environmental controls associated with the project that are directly relevant to a Contractor's or subcontractor's activities will be contained within environmental specifications or established within a set of management action method statements provided to or required from Contractors before performing any activity. These method statements, developed for managing impacts and achieving EMP objectives, will include management actions for pre-operations during construction, approval and permits; site clearing and landscaping; site management; water use management; soils management; materials handing/storage; fire control and emergency procedures; leaks and spill management; solid water; wastewater and stormwater management; and noise and dust control management.

Management Review and Revision of EMP. The Calera management team approves and fully supports implementation of this EMP. The EMP will be reviewed and updated regularly to ensure it reflects the current situation on the site. Updates will be made to document changes in staff roles and responsibilities, significant changes to the site's activities, facilities or pollution controls, key changes to the company, changes in industry best management practices, changes in legal requirements, and responses to inspection, incidents, and corrective actions. A document control system will be implemented to ensure that out-of-date versions of the latest EMP document are not used.

Life cycle of the project includes design, pre-construction planning and permitting, construction, commissioning, and operation. Implementation of this EMP will begin during the design stage and continue throughout the life of the project. Calera will consider revisions and additions to this EMP at each stage of the project as well as when auditing and any resulting action/corrective action plans should be documented. An EMP revision log will be maintained in Appendix D.

Financial Resources for Plan Implementation. All project activities will be reviewed to ensure that contractors have committed to meeting the environmental performance targets and have budgeted accordingly; and have retained sufficient flexibility to meet unforeseen but reasonable costs. Project budgets will be reviewed to ensure funds are available for the implementation of remedial actions when mitigation measures are not sufficiently effective or when unanticipated impacts occur. Costs for recurring expenses for implementing the EMP, including administrative, design and consultancy, operational and maintenance, training, monitoring, and auditing are included in the overall project costs.

4.0 ORGANIZATIONAL AND MANAGEMENT CAPABILITIES FOR SUCCESSFULLY IMPLEMENTING THE ENVIRONMENTAL MANAGEMENT PLAN

Calera is committed to hiring dedicated and experienced professionals for our team. The Calera Team is always growing, and is currently managed by Mr. Will Day, Ms. Nikki Blane, and Dr. Betty Pun for environmental management.

This Calera Management Team uses a proactive management approach to enhance overall environmental performance while simultaneously achieving the objectives of the MLMDP. The core team that has overall environmental management responsibility includes:

William Day, Vice President Development Engineer and Construction, has over 25 years of experience in construction oversight and management in the power industry prior to joining Calera. Mr. Day is responsible for the direction of all construction activities, ensuring all facilities are engineered to meet the specifications of Calera's designed process, and all equipment and material are procured and constructed within budget and schedule. As he did in numerous power plant projects, he has oversight responsibility on all regulatory compliance during construction and operation of Calera facilities.

Nikki Blane, Vice President of Operations, has over 20 years of experience in industrial operations in three continents, North America, South America, and Europe. As Vice President of Operations at CEMEX, she oversaw environmental operations at both the plant and corporate levels. Nikki's experience managing the environmental impacts of both construction and operation of major industrial facilities ensures strong environmental leadership for Calera's projects in the U.S. and around the world.

The **Manager of Environmental Services** is responsible for implementing environmental programs and plans to achieve Calera objectives, metrics, and timelines. The Manager ensures environmental policies and procedures are integrated with operations based on environmental risk factors, while measuring and evaluating environmental performance metrics. This Manager is responsible for reviewing environmental regulations and ensuring Calera is proactive in addressing issues that would have a negative impact on the company or the environment. The Manager of Environmental Services also develops processes to manage permitting requirements for locating projects. This Manager is also responsible for implementation and updating of this EMP. **Dr. Betty Pun** is currently serving in this role as the Manager of Environmental Services for the MLMDP, along with her role in operations.

Betty Pun, Ph.D., has over 10 years of related environmental experience. Dr. Pun is in charge of overall environmental strategy and regulatory compliance at the MLMDP site. Dr. Pun has performed computer modeling of criteria air pollutants, air toxics, and other environmental hazards at regional, urban, and local scales; performed statistical analysis to gain insights into underlying processes; reviewed environmental issues including human exposure and climate change; and recommended for measurement priorities in expensive field measurement campaigns. She has lead research teams to apply state-of-the-science air quality models to a variety of locations, including S.E. Tennessee, Big Bend National Park, and California Central Valley. She steered the research approach and was responsible for budget, delegation of tasks, schedule, and deliverables. She participated in multi-stakeholder studies involving industry, academic groups, and environmental groups to evaluate different modeling approaches and conduct multimedia modeling.

Michael Lach, General Manager at MLCC, has over 7 years of experience in industrial operations and construction. As a Regional Manager, Plant Manager, and Project Manager in construction and aggregate industries, he oversaw environmental and safety operations at the plant levels of employees numbering in

the hundreds. Michael's hands on development of programs and strategic implementation will help in creating a safe and environmentally friendly culture at the MLCC site.

Jeff Spear, EHS Manager at MLCC, has over 5 years of experience in environmentally and safety sensitive fields related to oil, gas, and aggregates. As an EHS manager with Columbia Inspections, he managed staff in document control, day-to-day operations and long term strategic planning. He is certified to teach multiple classes including OSHA inspections, respirator training, EAS, CPR, First Aid, HAZMAT, Material Management.

5.0 ENVIRONMENTAL COMMITMENTS

Calera has prepared an Environmental Information Volume (EIV) to preliminarily evaluate potential environmental impacts of the project, identify relevant regulatory agencies with whom we (or DOE) may need to consult, identify applicable federal, state, and local regulations that likely apply to this project, and identify and assess appropriate best management practices and mitigation measures necessary for minimizing adverse impacts to the human and natural environment. This EMP currently includes measures that are relevant to operation but also to detailed design and construction. Following completion of the design and construction phases the EMP will be amended to focus primarily on operation.

This section of the EMP is a reference for each Environmental Resource Topic, summarizing the applicable regulatory framework, relevant regulatory agencies, environmental permits, and environmental commitments. An important revision phase to this section will be tied to DOE's assessment and findings under the National Environmental Policy Act (NEPA). The Environmental Commitments section will also be updated as needed, including when new permits are obtained; and additional or revised environmental mitigation, monitoring or reporting are identified. Additional guidance material is provided in Appendix A.

5.1 ATMOSPHERIC CONDITIONS/AIR QUALITY

The federal Clean Air Act (CAA), California Clean Air Act, and other Acts govern air pollution and its control. Applicable regulatory agencies involved in air pollution regulation include:

U.S. EPA, Region 9 (Pacific Southwest)
75 Hawthorne Street
San Francisco, CA 94105
Regional Receptionist: (415) 947-8021
http://www.epa.gov/region9/

Monterey Bay Unified Air Pollution Control District (MBUAPCD)
24580 Silver Cloud Court
Monterey, CA 93940
Main Office: (831) 647-9411
http://www.mbuapcd.org/

California Air Resources Board (CARB)
1001 "I" Street
P.O. Box 2815
Sacramento, CA 95812
Public Information: (916) 322-2990
http://www.arb.ca.gov/homepage.htm

A summary of applicable air-related laws and regulations is presented in Table A-1 in Appendix A.

Commitments and Requirements

Potential air quality impacts associated with the MLMDP are related to emissions from both construction and operations, with the latter occurring primarily due to the facility's process equipment and other sources such as employee vehicles and aggregate laydown areas.

Calera will coordinate with MBUAPCD, the regional agency principally responsible for comprehensive air pollution control in the North Central Coast Air Basin (NCCAB), which includes the MLMDP site.

- In accordance with permit requirements, Calera will conduct or assist in public notice prior to issuance of the permits (if required), and conduct continuous monitoring during operations.

- Calera understands that any emissions during construction and operation that could cause a public nuisance, particulate matter emissions, sulfur compounds, and NOx from combustion equipment, and sulfur content of fuels must conform to permit requirements.

- During construction, dust-control measures such as watering all active grading areas and storage piles, cessation of grading in high winds, limiting vehicle speeds on unpaved roads to 15 mph, and preventing the track-out of dirt from unpaved areas to paved roadways will be implemented, if appropriate.

Table 5-1

Atmospheric Conditions/Air Quality Commitments and Requirements

Permit / Governing Body	Reason / Commitments	Comments
Existing		
(list any additional environmental permits applied for an/or obtained for equipment to be used for the project)		
Future		
Authority To Construct (ATC) MBUAPCD / Air Pollution Control Officer (APCO)	Required for each permit unit during construction. Commitments: TBD	Remains in effect until Permit to Operate is issued.
Permit To Operate (PTO)	Required for each air pollution-emitting equipment that will operate as part of the project. Commitments: Calera will conduct monitoring and reporting as required by the issued permit.	After project construction and upon completion of initial compliance testing, Calera understands that the MBUAPCD will grant or deny a PTO.

5.2 WATER RESOURCES

5.2.1 Water Quality/Quantity

The federal Clean Water Act, Rivers and Harbors Act, and the Porter-Cologne Water Quality Act are the primary laws governing surface water quality. The applicable regulatory agencies involved in water quality/quantity regulation are:

California State Water Resources Control Board
Physical Address
State Water Resources Control Board
1001 I Street
Sacramento, CA 95814

Mailing Address
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812
Tel: (916) 341-5272
Fax: (916) 341-5896
http://www.swrcb.ca.gov/

Central Coast Regional Water Quality Control Board (CCRWQCB)
895 Aerovista Place, Suite 101
San Luis Obispo, CA. 93401-7906
Tel: (805) 549-3147
Fax: (805) 543-0397
http://www.swrcb.ca.gov/centralcoast/

US Army Corps of Engineers
Los Angeles District
Physical Address
915 Wilshire Blvd., Suite 1101
Los Angeles, CA 90017

Mailing address
P.O. Box 532711
Los Angeles, CA 90053-2325
Tel: (213) 452-3333
Fax: (213) 452-4209
http://www.spl.usace.army.mil/cms/index.php?option=com_frontpage&Itemid=1

The regulations applicable to water quality/quantity are summarized in Table A-2 in Appendix A.

Commitments and Requirements

Calera currently complies with the NPDES General Industrial Permit and has prepared a SWPPP that describes the BMPs implemented at the site. To date, with the exception of the seven T-tanks, operations have been contained within existing buildings. The CCRWQCB issued Order No. R3-2009-0002, NPDES No. CA0007005, Waste Discharge Requirements for the Moss Landing Commercial Park and Moss Landing Cement Company, Moss Landing Cement Company Facility. This permit allows the facility to discharge calcium and magnesium depleted seawater to Monterey Bay by way of the existing discharge outfall structure at a maximum daily discharge rate of up to 60 million gallons per day (mgd). To date, however, the facility has contained the process effluent on site in the T-tanks instead of discharging to the bay.

The project will continue to comply with the General Industrial Storm water Permit by amending the current NOI filed for the Absorber Demonstration Plant and the associated SWPPP if the disturbance exceeds one acre. During operations, stormwater collected from the curbed laydown and storage area of the plant will be routed through a small settling basin. The water will be discharged with the process wastewater to one of the tanks. The remaining solids will either be reused or disposed of at an

appropriate facility. The proposed approach will be to evaluate and implement high-pressure seawater reverse osmosis (RO), high concentration electrodialysis (ED), and low energy enhanced evaporation methods to achieve zero liquid discharge conditions at the MLCP site.

Table 5-2

Water Resources Commitments and Requirements

Permit / Governing Body	Reason for Permit / Commitments	Comments
Current		
NPDES No. CA0007005, Waste Discharge Requirements for the Moss Landing Commercial Park and Moss Landing Cement Company, Moss Landing Cement Company Facility. The Central Coast RWQCB.	This permit allows the facility to discharge calcium and magnesium depleted seawater to Monterey Bay by way of the existing discharge outfall structure at a maximum daily discharge rate up to 60 million gallons per day (mgd). Commitments: Refer to permit in Appendix C for conditions and commitments.	To date, the facility has contained the process effluent on site in the T-tanks instead of discharging to the bay.
General Industrial Stormwater Permit NOI filed	SWPPP kept on site (SWPPP will be updated)	
Future		
General Industrial Stormwater Permit	Existing SWPPP to be revised. During operations, stormwater collected from the curbed laydown and storage area of the plant will be routed through a small settling basin. The water will be discharged with the process wastewater to one of the tanks. The remaining solids will either be reused or disposed of at an appropriate facility. Calera will conduct monitoring and reporting for requirements outlined in the permitting document.	
SWPPP The Central Coast RWQCB	The SWPPP describes BMPs to be used to minimize erosion and limit the rate and amount of stormwater runoff. Following each significant precipitation event, a site review of the effectiveness of the erosion control plan will take place. Commitment: TBD	
Construction Wastewater	Wastewater generated during construction will be disposed of in accordance with permit and regulatory requirements.	

5.2.2 Floodplains/Wetlands

Executive Order (EO) 11988—Floodplain Management, Flood Disaster Protection Act, Federal National Flood Insurance Program, Clean Water Act Section 404, EO 11990—Protection of Wetlands, and the Cobey-Alquist Flood Plain Management Act, California Department of Fish and Game (CDFG) Policies and Guidelines, Wetlands Resources Policy are the primary laws governing floodplains and wetlands. The applicable regulatory agencies involved in floodplain and wetland regulation are:

California State Water Resources Control Board
Physical Address
State Water Resources Control Board
1001 I Street
Sacramento, CA 95814

Mailing Address
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812

Compliance with environmental laws pertaining to water quality protection:
Tel: (916) 341-5272
Fax: (916) 341-5896
http://www.swrcb.ca.gov/

The regulations applicable to floodplains/wetlands are summarized in Table A-3 in Appendix A.

No floodplains or wetlands have been identified on the MLMDP site. At this time, no permits are required.

Commitments and Requirements

In accordance with the regulations contained in Title 10 Code of Federal Regulations (CFR) Part 1022, Compliance with Floodplain and Wetlands Environmental Review Requirements, the U.S. Department of Energy National Nuclear Security Administration (USDOENNSA) has established policy and procedures to consider impacts on floodplains and wetlands as part of its decision-making process. This policy was developed in response to EO 11990 Protection of Wetlands (May 24, 1977), and EO 11 988 Floodplain Management (May 24, 1977). These executive orders require federal agencies to evaluate and, to the extent possible, minimize the impacts of their projects on floodplains and wetlands. Under DOE policy, a floodplain and wetlands assessment is required for any activities involving floodplains or wetlands (10 CFR 1022).

The project area is within a 500-year flood plain according to the Federal Emergency Management Agency (FEMA) flood map for the project area (Panel 06053c0070g). The MLMDP is in a shaded area of the map labeled Zone X. FEMA defines that area as "Area of moderate flood hazard, usually the area between the limits of the 100-year and 500-year floods." Because no project activities would occur within the 100-year floodplain, there would be no impact to this resource.

Based on a field review of the project site and adjacent areas, likely wetland areas are present immediately east and south of the MLMDP associated with a coastal brackish marsh and the Mojo Oro Slough, respectively. However, these wetland areas are outside the MLMDP limits. No activities would occur within potential wetland areas; additionally all potential site runoff during construction and operation would be addressed through BMPs and permits. Therefore, there would be no direct or indirect impacts to wetlands.

Table 5-3
Floodplains / Wetlands Commitments and Requirements

Permit / Governing Body	Reason / Commitments	Comments
Current		
None required at this time. n/a		
Future		
Floodplain and Wetlands Assessment	DOE regulation 10 CFR Part 1022 requires a floodplain and wetlands assessment to be prepared.	

5.3 GEOLOGIC/SOIL CONDITIONS

The National Environmental Policy Act, Clean Water Act, Surface Mining and Reclamation Act, California Environmental Quality Act (CEQA), Alquist-Priolo Earthquake Fault Zoning Act, Seismic Hazards Mapping Act, California Building Standards Code, Porter-Cologne Water Quality Act are the primary laws governing geologic/soil conditions. The relevant regulatory agency will be dependent on specific soil conditions and issues to be addressed. For example, the applicable regulatory agency involved in seismic issues would be the County of Monterey Resource Management Agency to address Building Standard Codes. If contaminated soils are encountered or need to be addressed, and RCRA is the governing regulatory program, then Cal EPA DTSC would be the regulatory agency involved.

The regulations applicable to geologic/soil conditions are summarized in Table A-4 in Appendix A.

Commitments and Requirements

- No project-related features are anticipated to increase the hazard of erosion. Further, during construction, a construction SWPPP will be prepared and implemented.
- Following each significant precipitation event, a site review of the effectiveness of the erosion control plan will take place.
- Storm water will be retained on site for impoundment in storm water retention basins.
- Since no new paved areas are included in the Proposed Action, this alternative will have no adverse impact to the behavior of site conditions relative to soil permeability and filtration.
- No components of the Proposed Acton will alter groundwater resources, and therefore, there will be no impacts to land subsidence.
- Contaminated soils are not anticipated to be encountered during implementation of the Proposed Action. If contaminated soils are encountered, and in the event of leaks or spills occurring during construction, resulting contaminated soils will be addressed to mitigate impacts to surface and subsurface soils as addressed in Section 5.4.

Table 5-4 Geology and Soils Commitments and Requirements		
Action Required / Governing Body	**Reason / Commitments**	**Comments**
Current		
None required at this time. n/a		
Future		
SWPPP The Central Coast RWQCB	The SWPPP describes BMPs to be used to minimize erosion. Commitments: TBD	

5.4 SOLID AND HAZARDOUS WASTE

The Resource Conservation and Recovery Act (RCRA), 49 CFR Parts 172 and 173, and the California Hazardous Waste Control Law are the primary laws governing solid and hazardous waste. The applicable regulatory agency involved in solid waste regulation is:

The Monterey County Health Department, Environmental Health Division
1270 Natividad Road
Salinas, CA 93906
Phone: (831) 755-4505
Fax: (831) 755-4880

Monterey Branch Office
1200 Aguajito Road
Monterey, CA 93940
Phone: (831) 647-7654
Fax: (831) 647-7925

The applicable regulatory agency involved in hazardous waste regulation is:

California Environmental Protection Agency
Department of Toxic Substances Control (DTSC)
DTSC Headquarters (Joe Serna Jr. Cal/EPA Headquarters Building)
Physical Address
1001 I Street
Sacramento, CA 95814-2828

Mailing Address:
P.O. Box 806
Sacramento, CA 95812-0806
Tel: (800) 72TOXIC
http://www.dtsc.ca.gov/ContactDTSC/locations.cfm

A summary of applicable solid and hazardous waste related laws and regulations is presented in Table A-5 in Appendix A.

Commitments and Requirements

Calera will conduct baseline environmental sampling in areas where site operations would have the potential to affect subsurface conditions at the project site. Baseline sampling would include the collection and analysis of surface and near surface samples in order to establish conditions prior to project construction.

Table 5-5
Solid and Hazardous Waste Commitments and Requirements

Action Required / Governing Body	Reason / Commitments	Comments
Current		
RCRA Hazardous Waste Generator (Small Quantity Generator [SQG]) Cal EPA DTSC	This Generator status allows the facility to generate and manage small quantities of hazardous waste. Commitments: Generation of hazardous waste will be minimized to the extent possible. Refer to permit in Appendix C for copy of permanent record.	Change in status from SQG is not anticipated.
Future		
Confirmation that Facility Remains an SQG (Maximum Quantities are not exceeded) Cal EPA	Commitments: Hazardous wastes will be segregated for compatibility and stored in designated accumulation areas with appropriate secondary containment; Additional hazardous wastes will be picked up for transport only by licensed hazardous waste haulers. All hazardous wastes will be properly manifested to a permitted disposal facility; Additional hazardous waste documentation, including the biennial hazardous waste generator reports that will be submitted to the DTSC, will be kept on site and accessible for inspection for a period of not less than 3 years; Employees training trained in hazardous waste management, spill prevention and response, and waste minimization will be updated; and Procedures will be developed to reduce the quantity of hazardous waste generated. Nonhazardous materials will be substituted for hazardous materials, and wastes will be recycled where possible. Additional commitments determined during permitting.	
Title 22 California Code of Regulations (CCR)	Commitments: Hazardous wastes will be stored on site for less than 90 days	

The construction contractor is considered the generator of hazardous waste associated with MLMDP construction activities and is responsible for proper handling of all hazardous wastes in accordance with all federal, state, and local regulations. This includes all licensing requirements, training of employees where required, accumulation limits and duration, and recordkeeping and reporting requirements. Wastes that are deemed hazardous are to be collected in hazardous waste accumulation containers placed near the area of generation. After the end of each workday, the accumulation containers will be moved to the contractor's licensed hazardous waste accumulation area where hazardous wastes can be stored up to 90 days after the date of generation. The construction contractor will manifest these wastes for disposal at a

permitted Class I facility or recycling facility in accordance with all federal, state, and local regulations. All hazardous wastes will be removed from the site by a licensed hazardous waste management contractor.

During construction and operation of the proposed MLMDP, the primary waste generated will be solid nonhazardous waste. It is anticipated that some hazardous solid waste(s) will also be generated during plant construction; however, the amount that will be generated is anticipated to be small. Where practical, nonhazardous solid wastes will be recycled. All remaining wastes will be removed by a licensed contractor and disposed of properly. The types of waste(s), estimated quantities, and the waste management methods are described below and summarized in Table 5-6.

Table 5-6
Summary of Anticipated Solid Waste Streams and Management Methods

Waste Stream	Waste Characteristics	Estimated Quantity	Estimated Frequency of Generation	Waste Management Method	
				On-site	Off-site Treatment
Construction Phase					
Scrap wood, steel, copper, aluminum, rags, abrasive materials, glass, plastic, paper, insulation, cardboard and corrugated packaging.	Nonhazardous solids	1 ton	Twice Weekly	Containerize, housekeeping	Recycle and/or Class III/II landfill disposal
Empty hazardous material containers	Hazardous solids	Less than 1 cubic yard	Monthly	Containerize and store for less than 90 days	Recycle and/or Class I/II landfill disposal
Spent welding materials	Hazardous solid	Less than 1 cubic yard	Monthly	Containerize and store for less than 90 days	Recycle and/or Class I landfill disposal
Concrete and soil	Nonhazardous	Up to 100 cubic yards	One time	Stockpile and cover	Reuse, recycle, or Disposal at a Class II/III landfill
Operation Phase					
Solids from slurry storage tank	Nonhazardous	Up to 1,000 tons	One time	Stored or containerized for potential reuse in site operations	N/A
Quality Control Laboratory waste; Paper, cardboard, plastic, glass	Nonhazardous 1	ton	Yearly	Containerize for recycling or disposal	Recycle or disposal at Class III landfill
Universal waste; fluorescent bulbs and ballasts	Hazardous solids	Up to 10 pounds	Yearly	Containerize for recycling or disposal	Disposal to a licensed Treatment, Storage, and Disposal Facility
Salts from zero liquid discharge crystallizer	Nonhazardous	Up to 240 tons	Weekly	Containerized for potential reuse in site operations	Disposal to a Class II/III landfill if not reused in site operations
Spent reverse osmosis membrane cartridges	Nonhazardous	1	Quarterly	Containerize for recycling or disposal	Reuse and disposal at a Class II/III landfill

5.5 LAND USE

The North County Land Use Plan (NCLUP) Local Coastal Program, the Monterey Bay Sanctuary Scenic Trail Master Plan, and the Moss Landing Community Plan are the primary laws governing land use. The applicable regulatory agencies involved in land use regulation are:

California Coastal Commission (CCC)
Central Coast District Office
725 Front Street, Suite 300
Santa Cruz, CA 95060-4508
(831) 427-4863
FAX (831) 427-4877
http://www.coastal.ca.gov/

County of Monterey
Resource Management Agency
Planning Department
Physical Address:
168 W. Alisal Street @ Capitol
2nd Floor
Salinas, CA 93901
Tel: (831) 755-5025
Fax: (831) 757-9516

Mailing Address:
168 W. Alisal Street,
2nd Floor
Salinas, CA 93901

Commitments and Requirements

The MLMDP is consistent with the Heavy Industrial (HI) CZ District. The MLMDP is similar to previous permitted industrial uses on-site, including the existing Absorption Demonstration Plant and Pilot Plant. In October 2009, Monterey County issued a Coastal Administrative Permit for Calera's existing operations.

The MLMDP is expected to require modification of Coastal Administrative Permit, a new Coastal Development Permit, or General Development Plan. The appropriate permit process would be determined in consultation with the Monterey County Planning Department. A component of these approvals would include a use permit for the height of proposed silos if the CZ District height limit of 35 feet is exceeded. However, these silos would be adjacent to existing buildings and would not exceed the height of the tallest of these buildings. Compliance with zoning requirements for landscaping, building site coverage, and parking for the overall MLCC would need to be maintained.

Table 5-7 Land Use Commitments and Requirements		
Permit / Governing Body	**Reason / Commitment**	**Comments**
Current		
(None currently applicable to the MLMDP)		
Future		
Coastal Administrative Permit Monterey County and CCC	The MLMDP is expected to require modification of the existing Coastal Administrative Permit, a new Coastal Development Permit, or General Development Plan.	

5.6 NOISE

The Noise Control Act of 1972; Federal Energy Regulatory Commission (FERC) Guidelines On Noise Emissions From Compressor Stations, Substations, And Transmission Lines; OSHA Occupational Noise Exposure; California Government Code Section 65302(f) and Section 46050.1 of the Health and Safety Code; Cal-OSHA; CEQA; and The Safety Element of the Monterey County General Plan are the primary laws governing noise. The applicable regulatory agency involved in noise regulation is:

Monterey County Health Department
Division of Environmental Health
Resource Protection Branch
1270 Natividad Road, Suite 109
Salinas, CA 93906-3198
Phone: (831) 755-4507
Fax: (831) 755-8929
http://www.co.monterey.ca.us/health/EnvironmentalHealth/

The regulations applicable to noise are summarized in Table A-6 in Appendix A.

Commitments and Requirements

Construction

Construction of SCM Silo and Aggregate Lay Down, Drying and Harvesting Area - It is very likely that pieces of equipment used during the construction of the SCM Silos and aggregate lay down, drying and harvesting area could be louder than 85 dBA at a distance of 50 feet. In order to meet the noise standards found in the Monterey County Noise Ordinance, mitigation will be implemented or a variance from the County of Monterey will be requested if this threshold is exceeded.

Operation

Table 5-8 summarizes noise impact criteria as it applies to the MLMDP Operations. Calera will consult with Monterey County Health Department regarding any noise levels above these limits.

Table 5-8
Noise Commitments and Requirements

Permit / Governing Body	Reason / Commitment	Comments
Current		
None required at this time. n/a		
Future		
Noise mitigation Monterey County Health Department Division of Environmental Health Resource Protection Branch	Noise generated at the MLCP site will be mitigated in order to meet Monterey County noise standards if the noise was from sources that are: (1) 85 dBA or above at a distance of 50 feet, and (2) within 2,500 feet of residences. Commitments: All construction and operational equipment will be fitted with applicable muffler technology to minimize noise levels	
Noise Variance Monterey County Health Department Division of Environmental Health Resource Protection Branch	In order to meet the noise standards found in the Monterey County Noise Ordinance, variance from the County of Monterey would be needed if noise thresholds are exceeded. Commitments: To be determined in consultation with Monterey County Health Department	

The significant noise impact criteria thresholds are listed in Table 5-9. The Day-Night Average Sound Level (L_{dn} or DNL) represents the average sound level for a 24-hour day and is calculated by adding a 10 dBA penalty to sound levels during the night period (10:00 p.m. to 7:00 a.m.). The L_{dn} is the descriptor of choice used by nearly all federal, state, and local agencies throughout the United States to define acceptable land use compatibility with respect to noise. Within the State of California, the Community Noise Equivalent Level (CNEL) is sometimes used. CNEL is very similar to L_{dn}, except that an additional 5 dB penalty is applied to the evening hours (7:00 p.m. to 10:00 p.m.).

Table 5-9
Significant Noise Impact Criteria-Project Operation

Jurisdiction	Criteria	Noise Metric	Noise Level	Notes
State of California	CEQA	CNEL	3 dBA increase in "normally unacceptable" or "clearly unacceptable" noise/land use compatibility categories	
State of California	CEQA	CNEL	5 dBA increase	
Monterey County	Noise Element	L_{dn}	60 dBA Exterior	Single-Family Residential

5.7 HISTORIC/CULTURAL RESOURCES

The regulations applicable to historic/cultural resources include numerous laws, regulations, and statutes on both the federal and State levels seek to protect and target the management of cultural resources.

These include the: Antiquities Act of 1906; Historic Sites Act of 1935; Reservoir Salvage Act of 1960; National Historic Preservation Act of 1966; National Environmental Policy Act of 1969; Executive Order 11593 (Projection and Enhancement of the Cultural Environment, 5/13/1971); 36 CFR 800 and CFR 60 (Advisory Council on Historic Preservation: Protection of Historic and Cultural Properties, Amendments to Existing Regulations, 1/30/1979, National Register of Historic Places, Nominations by States and Federal Agencies, Rules and Regulations, 1/9/1976); Revisions to 36 CFR 800 (Protection of Historic Properties, 1/10/1986); Archaeological and Historical Preservation Act of 1974; American Indian Religious Freedom Joint Resolution of 1978; Archaeological Resources Protection Act of 1979; Native American Graves Protection and Repatriation Act of 1990; and the California Environmental Quality Act. Collectively these regulations and guidelines establish a comprehensive program for the identification, evaluation, and treatment of cultural resources.

There are a number of federal, state, and local regulatory criteria regarding the documentation and treatment of cultural resources. Cultural resources are defined as buildings, sites, structures, or objects, each of which may have historical, architectural, archaeological, cultural, and/or scientific importance.

The applicable regulatory agencies involved in historic/cultural resource regulation are:

Office of Historic Preservation
California Department of Parks and Recreation
Physical address
1416 9th Street, Room 1442-7
Sacramento, CA 95814
Mailing address
P.O. Box 942896
Sacramento, CA 94296-0001
Tel: (916) 653-6624
Fax: (916) 653-9824
http://ohp.parks.ca.gov/

Office of the Sheriff, County of Monterey
Coroner Division
1414 Natividad Road
Salinas, California 93906
Tel: (831) 755-3792
http://www.co.monterey.ca.us/sheriff/links.htm

Commitments and Requirements

Based on the record search and archival document review, there is the potential for significant cultural resources within the MLMDP site.

Table 5-10

Historic/Cultural Resources Commitments and Requirements

Permit / Governing Body	Reason / Commitments	Comments
Current		
None required at this time.		
Future		
Phase I Cultural Resource Inventory (CRI) CA SHPO	A Phase I CRI will be required and will include the documentation of any potentially significant resources associated with the MLMDP and will provide appropriate mitigation measures and recommendations. If potentially significant resources are documented during the Phase I study, additional cultural resources study may be required such as Extended Phase I Survey, Phase II Testing, and Phase III Mitigation. Commitments: Survey will be conducted and SHPO concurrence received prior to ground disturbing activities,	
Coroner Notification Monterey County Coroner CA SHPO	Unanticipated discovery of human remains will require coroner notification. Commitments: In the event of the accidental discovery or recognition of any human remains in any location other than a dedicated cemetery during construction or operation of the MLMDP, there will be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains. The coroner of the County must be contacted to determine that no investigation of the cause of death is required.	

5.8 VISUAL RESOURCES

The National Environmental Policy Act (NEPA), Monterey County Coastal Implementation Plan, Parts 1 and 2, and The Scenic and Visual Qualities of the California Coastal Act are the primary laws governing visual resources. The applicable regulatory agencies involved in visual resource regulation are:

County of Monterey
Resource Management Agency
Planning Department
Physical Address:
168 W. Alisal Street at Capitol
2nd Floor
Salinas, CA 93901
Tel: (831) 755-5025
Fax: (831) 757-9516

Mailing Address:
168 W. Alisal Street,
2nd Floor
Salinas, CA 93901

The regulations applicable to visual resources are summarized in Table A-7 in Appendix A.

Commitments and Requirements

Compliance with Monterey County Coastal Implementation Plan, Parts 1 and 2 including standards for siting of structures, landscaping, and lighting, would limit potential visual impacts from the proposed project. The proposed project is consistent with the industrial character of the site and surrounding industrial uses and does not substantially degrade the visual character or quality of the area.

Section 30251 of the Scenic and Visual Qualities of the California Coastal Act (2009) states that scenic and visual qualities of coastal areas shall be considered and protected as a resource. The *North County Land Use Plan* Local Coastal Program serves as the guiding land use document for the coastal zone within unincorporated Monterey County. The project site is zoned Heavy Industrial Zoning District, (HI) Coastal Zone (CZ). The Monterey County Coastal Implementation Plan Part I, Title 20 Zoning Ordinance (Monterey County 2000) contains development standards that address the visual quality within the HI (CZ) Districts. The Monterey County Coastal Implementation Plan, Part 2 contains several development standards that apply to the project (Monterey County 1988). Section 20.144.030, Visual Resources Development Standards contains a requirement for onsite inspection by a planner for industrial uses, to determine conformance with policies of the land use and development standards of the Implementation Plan.

Table 5-11
Visual Resources Commitments and Requirements

Permit / Governing Body	Reason / Commitments	Comments
Current		
None required at this time		
Future		
Visual Mitigation n/a	Equipment and process design will incorporate visual mitigation measures where needed. Calera will manage dust through standard dust-control practices. All additional lighting, including during the construction period, will conform to any lighting plan required by the County.	
Onsite inspection Monterey County Planning Department	Compliance with Visual Resources Development Standards will be required. Commitments: An onsite inspection by a planner for industrial uses will be scheduled to determine conformance with policies of the land use and development standards of the Implementation Plan.	

5.9 ECOLOGY

The Endangered Species Act, Section 7 of Fish and Wildlife Coordinating Act, the Clean Water Act, Migratory Bird Treaty Act, California Endangered Species Act, Fish and Game Code, Native Plant Protection Act, CDFG Policies and Guidelines, Wetlands Resources Policy, Title 20 CCR §§1702 (q) and (v), Title 14 CCR Section 15000 et seq, and the Municipal Code, County of Monterey, California; Chapter 16.60 are the primary regulations governing ecological resources. The applicable regulatory agencies involved in ecology regulation are:

U.S. Fish and Wildlife Service
Sacramento Fish and Wildlife Office

2800 Cottage Way
Room W-2605
Sacramento, CA 95825
Tel: (916) 414-6600
http://www.fws.gov/sacramento/contact_us.htm

US Army Corps of Engineers
Los Angeles District
Physical Address
915 Wilshire Blvd., Suite 1101
Los Angeles, CA 90017

Mailing address
P.O. Box 532711
Los Angeles, CA 90053-2325
Tel: (213) 452-3333
Fax: (213) 452-4209
http://www.spl.usace.army.mil/cms/index.php?option=com_frontpage&Itemid=1
Central Coast Regional Water Quality Control Board (CCRWQCB)
895 Aerovista Place, Suite 101
San Luis Obispo, CA 93401-7906
Phone - 805 549 3147
Fax - 805 543 0397
http://www.swrcb.ca.gov/centralcoast/

California Department of Fish and Game (CDFG)
Headquarters
1416 9th Street
12th Floor
Sacramento, CA 95814
Tel: (916) 445-0411
http://www.dfg.ca.gov/

The regulations applicable to ecology are summarized in Table A-8 in Appendix A.

Commitments and Requirements

Due to the heavily developed and disturbed nature of the MLMDP, the need for ecological permitting and/or coordination is not anticipated.

Table 5-12
Ecological Resources Commitments and Requirements

Permit / Governing Body	Reason / Commitment	Comments
Current		
None required at this time. n/a		
Future		
None required at this time. n/a		

5.10 SOCIOECONOMIC CONDITIONS

The Uniform Relocation Assistance and Real Property Acquisition Act of 1970, Title VI of the Civil Rights Act of 1964, Executive Order 12898 Federal Actions to Address Environmental Justice in Minority and Low-Income Populations, and State Housing Element Law are the primary laws governing socioeconomic factors. The applicable regulatory agencies involved in socioeconomic regulation are:

The regulations applicable to socioeconomic conditions are summarized in Table A-9 in Appendix A.

Commitments and Requirements

Due to the developed nature of the area and the relatively small number of employees required, socioeconomic impacts and permitting are not anticipated. Should BMPs, mitigation, or other environmental permitting be required in the future, MLMDP will comply and update this section as necessary

Table 5-13

Socioeconomics Commitments and Requirements

Permit / Governing Body	Reason / Commitment	Comments
Current		
None required at this time. n/a		
Future		
None identified at this time.	As applicable, Spanish language materials and other accommodations (e.g., translators) will be considered for future public involvement efforts. The communication efforts will be recorded in the project files.	

5.11 HEALTH AND SAFETY FACTORS

California operates its own Occupational Safety and Health Administration (Cal/OSHA). As such, Cal/OSHA regulations will take precedence over the federal OSHA regulations at this site. The applicable regulatory agencies involved in socioeconomic regulation are:

Cal/OSHA

For issues involving federal agencies or private companies working for federal agencies, contact:

Region IX
90 7th Street, Suite 18100
San Francisco, California 94103
(415) 625-2547 (Main Public - 8:00 AM - 4:30 PM Pacific)
(800) 475-4019 (For Technical Assistance)
(800) 475-4020 (For Complaints - Accidents/Fatalities)
Note: The 800 number for Complaints - Accidents/Fatalities is Regional only.
(800) 475-4022 (For Publication Requests)
(415) 625-2534 FAX

http://www.osha.gov/oshdir/r09.html

For issues involving private or state government employers in California, contact:

California Department of Industrial Relations
455 Golden Gate Avenue, 10th Floor
San Francisco, California 94102
John Duncan, Director (415) 703-5050 Fax: (415) 703-5059
Len Welsh, Chief, Cal/OSHA (510) 286-7000 Fax: (510) 286-7037
Chris Lee, Deputy Chief, Cal/OSHA (510) 286-7000 Fax (510) 286-7037
http://www.osha.gov/dcsp/osp/stateprogs/california.html

Commitments and Requirements

Construction, operation, and maintenance activities associated with the MLMDP may expose workers to physical and chemical hazards. Potential worker hazards would be minimized through adherence to appropriate engineering design criteria and implementation of appropriate programs, plans, and procedures. Anticipated programs and program components are listed in Table 5-14. Additional detail regarding the individual program components can be found in Appendix E. The plans, as developed, will be compiled in the Safety Manual maintained onsite.

Table 5-14
Health and Safety Programs and Program Components

Program	Program Components
Construction Injury and Illness Prevention Programs	Construction Safety Program Construction Personal Protective Equipment Program Construction Exposure Monitoring Program Construction Emergency Plan Construction Written Safety Programs
Operations and Maintenance Injury and Illness Prevention Programs	Injury and Illness Prevention Plan Emergency Action Plan Hazardous Materials Management Program Personal Protective Equipment Program Operations and Maintenance Written Safety Program
Safety Training Programs	Construction Safety Training Program Operation and Maintenance Safety Training Programs
Fire Protection	Onsite and Offsite Construction Fire Suppression and Prevention Operations Fire Suppression and Prevention

The Potential hazards that workers may be exposed to while working on MLMDP are presented in Table 5-15. Potential worker exposure to hazards is minimized through adherence to appropriate engineering design criteria, implementation of appropriate administrative procedures, use of personal protective equipment, and compliance with applicable health and safety regulations. Formal health and safety procedures and programs will be established and implemented for construction and operations to control the various hazards and provide for a safe workplace. The regulations applicable to worker safety and health are summarized in Table A-10 in Appendix A.

Table 5-15

MLMDP Construction, Operation, and Maintenance Hazard Analysis

Activity	Exposure Potential	Potential Hazard	Control Strategies
Heavy Equipment Operation	C, O, M	Employee injury and property damage from collisions with workers and/or facility equipment.	Implement heavy equipment safety program, ensure that equipment is routinely inspected and operators are properly trained.
Trenching and Excavation	C, M	Employee injury and property damage from collapse of trenches and excavations or contact with underground utilities.	Trenching and excavation will be performed by subcontractor's using their own excavation and trenching safety program. All employees will receive training specific to excavation safety. Require digging permits prior to initiating excavation or trenching.
Vehicle Operation	C, O, M	Employee injury from vehicle accident or pedestrian/vehicle accident.	Incorporate vehicle safety information in general safety training.
Work at Elevation	C, O, M	Employee injury due to falls from the same level and elevated work areas.	Implement a fall protection program that requires fall protection systems whenever unprotected work is performed at greater than 6 feet.
General Project Work	C, O, M	Employee injury resulting from a slip, trip, or fall.	Maintain good housekeeping, adequate lighting, compliant stairways, and railings.
Crane and Derrick Operation	C, M	Employee injuries and property damage due to falling loads.	Implement hoisting and rigging safety program, inspect equipment routinely, and ensure that operators are properly trained.
Hot Work	C, O, M	Employee injuries and property damage due to fire or explosion.	Implement fire protection and prevention program, require Hot Work permits, ensure that welders, pipe fitters, etc., are properly trained.
Working with Combustible Liquids	C, O, M	Employee injuries and property damage due to fire or explosion.	Implement fire protection and prevention program that includes proper procedures for the proper storage and use of flammable or combustible liquids.
Electrical Work	C, O, M	Employee injuries due to contact with energized parts.	Implement energy control program, including LO/TO of energized sources.
Materials Handling	C, O, M	Employee injuries due to improper lifting.	Implement an ergonomics program, and train employees in proper lifting techniques.

Table 5-15 (cont.)
MLMDP Construction, Operation, and Maintenance Hazard Analysis

Activity	Exposure Potential	Potential Hazard	Control Strategies
Confined Space Entries	C, M	Employee injuries due to suffocation, exposure to toxic materials, engulfment, etc.	Implement a confined space program, including permit procedures and air monitoring requirements.
Compressed Gas Storage	C, O, M	Employee injuries and equipment damage due to explosive release of pressure.	Implement a compressed gas safety program, including procedures for proper use and storage.
Power Tool Use	C, O, M	Employee injuries due to improper use, or use of damaged power tools.	Implement procedures for inspecting power tools before operation and train employees on the proper use and care of power tools.
Working with or near hazardous or toxic materials	C, O, M	Employee injuries due to exposure to hazardous and/or toxic materials.	Implement hazard communication program and exposure control procedures including: engineering controls, administrative controls, and PPE for activities that may expose employees to hazardous/toxic materials.
Working with or near noisy equipment	C, O, M	Employee overexposure to noise.	Implement a hearing conservation program to include: identifying high noise activities and sources, sound level monitoring, and PPE.
Working with or near exposed machinery	C, O, M	Employee injuries from entanglement in rotating or moving equipment.	Develop and implement machine-guarding equipment LO/TO procedures.
Work outdoors	C, O, M	Employee injury or illness from biological hazards such as ticks, snakes, spiders, and wildlife.	Develop and implement procedures for outdoor work that warn employees of the potential for exposure and provide guidelines for avoidance of contact with biological hazards.
Work in weather extremes	C, O, M	Employee injury or illness due to heat or cold stress.	Develop and implement procedures for work in hot and cold environments that provide for employee monitoring, appropriate clothing and other guidance.

C = Construction Phase
O = Facility Operations
M = Facilities Maintenance
LO/TO = Lockout/tagout

Appendix A

Listing of Applicable Environmental Regulations and Acts

Table A-1 Air Related Laws and Regulations	
Law/Regulation	**Notes**
The federal Clean Air Act (CAA) of 1970, 42 United States Code 7401 *et seq*., as amended in 1977 and 1990	The basic federal statute governing air pollution and its control. The provisions of the CAA that are potentially relevant to the MLMDP include the National Ambient Air Quality Standards (NAAQS), Prevention of Significant Deterioration (PSD) Requirements, and General Conformity rule.
Proposed Endangerment and Cause or Contribute Findings for Green House Gases under the Clean Air Act	Signed on April 17, 2009, the final rule requires mandatory reporting of GHG emissions from large sources in the U.S.; however, Since CO_2 sequestration is at the heart of the MLBMDP, it is anticipated that its operational combustion CO_2 emissions will be low enough not to trigger this requirement.
California Clean Air Act (CCAA). The CCAA, as amended in 1992	Requires all air districts in the state to endeavor to achieve and maintain the California Ambient Air Quality Standards (CAAQS). The California Air Resources Board (CARB) administers the CCAA statewide.
California Global Warming Solutions Act of 2006	The CARB approved a regulation for the mandatory reporting and verifying of GHG emissions from major sources on December 6, 2007, pursuant to the California Global Warming Solutions Act of 2006. Since CO_2 sequestration is at the heart of this Project, it is anticipated that its operational combustion CO_2 emissions will be low enough not to trigger this requirement.

Table A-2 Water Quality/Quantity Related Laws and Regulations	
Law/Regulation	**Notes**
Clean Water Act Section 404 Permit for Fill Material in Waters and Wetlands	Section 404 of the act regulates the discharge of dredged or fill material into waters of the United States, including rivers, streams and wetlands.
Section 402 NPDES Program	Point source discharges to surface water are regulated by Section 402 of the CWA through requirements set forth in specific or general National Pollutant Discharge Elimination System (NPDES) permits. NPDES requirements apply to discharges of pollutants into navigable waters from a point source, discharges of dredged or fill material into navigable waters, and the disposal of sewage sludge that could result in pollutants entering navigable waters. Stormwater discharges during construction and operation of a facility and incidental non-stormwater discharges associated with construction also fall under this act and are addressed through a general NPDES permit. In California, requirements of the CWA regarding regulation of point source discharges and stormwater discharges are delegated to the SWRCB and administered by the nine RWQCBs. The Central Coast RWQCB implements the statewide policy in the study area. Under California's NPDES program, any waste discharger subject to the NPDES program must obtain an NPDES permit from the local RWQCB. The permits typically include criteria and water quality objectives and require periodic effluent sampling.
Section 401 Clean Water Quality Certification	Under Section 401 of the CWA, water quality certification is required from the state for any activity that requires a federal permit or license that may result in discharge into navigable waters. The certification must indicate that the activity will comply with the applicable state water quality standards. With respect to the project, the authority to grant water quality certification has been delegated to the SWRCB, and for the project study area, applications for certification under CWA Section 401 are processed by the Central Coast RWQCB. A Section 401 Certification would be necessary to obtain a Section 404 permit for discharge into waters subject to the Corps jurisdiction.
Section 303(d) Water Quality Impairments	Under Section 303(d) of the CWA, each state is required to develop effluent limitations for waters within its boundaries where water quality standards are not met. The state must establish priority rankings for these waters and develop Total Maximum Daily Loads (TMDLs) to improve water quality. In California, the SWRCB and RWQCBs prepare the Clean Water Act Section 303(d) List of Water Quality Limited Segments Requiring TMDLs. The United States Environmental Protection Agency (USEPA) approved California's 2006 303(d) List on June 28, 2007 (SWRCB, 2009).

Rivers and Harbors Act (33 USC 401 et seq.) Section 10	Section 10 of the Rivers and Harbors Act of 1899 requires approval from the Corps for the construction of any structure over or in navigable waters of the United States. The Corps also regulates the excavation, dredging or deposition of material in a navigable water and any obstruction or alteration in a navigable water. Work adjacent to navigable waters require permits under Section 10 of this act if structures or work alters the course, location, condition, or capacity of the water body.
Porter-Cologne Water Quality Act (Water Code § 13000 et seq.)	Established the SWRCB and nine RWQCBs as the primary state agencies with regulatory authority over water quality and surface water rights allocation. Requirements of the Porter-Cologne Act are implemented by the SWRCB at the state level and the RWQCBs at the regional level. The SWRCB, as authorized by the Porter-Cologne Act, promulgated regulations in the CCR Subchapter 15, Title 23 designed to protect water quality from the effects of waste discharges to land. Under Subchapter 15, wastes that cannot be discharged directly or indirectly to waters of the state (and therefore must be discharged to land for treatment, storage, or disposal) are classified to determine specifically where such wastes may be discharged. This classification requirement would apply to dredged material or fill that would be disposed in an upland environment.
State Water Resources Control Board	Applicable water quality protection regulations include SWRCB Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Water in California," which generally restricts dischargers from reducing the water quality of surface water and groundwater. SWRCB Resolution No. 88-63, "Sources of Drinking Water Policy," specifies that all groundwater occurrences in California are to be protected as existing or potential sources of municipal and domestic supply.
Regional Water Quality Control Boards	***Basin Plans and Water Quality Objectives*** Under the provisions of the Porter-Cologne Act and the CWA, the Central Coast RWQCB regulates water quality in the project area. The Water Quality Control Plan for the Central Coast Basin ("Basin Plan") (CCRWQCB, 1994) designates beneficial uses for specific surface water and groundwater resources, establishes water quality objectives to protect those uses, and sets forth policies to guide the implementation of programs to attain the objectives. Pursuant to the Porter-Cologne Act, the Central Coast RWQCB is authorized to issue individual permits to allow for discharge of specified quantities and qualities of waste to land or surface waters. The limitations placed on the discharge are designed to ensure compliance with water quality objectives in the Basin Plan. To obtain a permit, the discharger must submit a Report of Waste Discharge and the requirements of CEQA must be met. All dischargers must submit monitoring reports. The RWQCB can use this approach to regulate any discharge to surface waters. The discharger would be responsible for providing enough information regarding the chemicals and volumes to be discharged and receiving waters to allow preparation of a permit. The SWRCB also regulates activities that could result in adverse impacts to groundwater quality. Policies and regulations by the SWRCB, either under CWA authority or other state-derived authority, are implemented and enforced by the RWQCB. Groundwater-related activities governed by NPDES permits

	or waste discharge requirements issued by the RWQCB include aquifer re-injection, reclaimed water irrigation, and design of waste management facilities, including wastewater treatment plants. The RWQCB also oversees local implementation of underground storage tank management programs and other programs related to the prevention and control of groundwater impacts. In general, SWRCB policy prohibits degradation of groundwater quality, and in cases where impacts occur, the CCRWQCB typically requires restoration of impacted aquifers such that residual concentrations do not exceed the USEPA's Maximum Contaminant Levels (MCLs) for drinking water. In cases where the aquifer is hydraulically connected to a surface water body, water quality criteria for fresh water aquatic habitats may be imposed as standards for cleanup and restoration efforts.
	Construction Activities – NPDES General Construction Permit Surface water quality is regulated by the NPDES, developed by the U.S. EPA in accordance with Section 303 of the CWA. In California, the NPDES program is administered by the SWRCB, with implementation and enforcement by the RWQCBs. The NPDES program, designed to protect surface water quality, is applicable to all discharges to waters of the United States, including storm water discharges associated with municipal drainage systems, construction activities, industrial operations and point sources. In general, the NPDES permit program is designed to control, minimize or reduce surface water impacts. For any construction project that will result in the disturbance of one acre or more, a project must comply with the NPDES Construction Activities Storm Water General Permit (2009-0009-DWQ Permit). Construction activities subject to the permit include clearing, grubbing, grading, stockpiling, and excavation activities. The project applicant must submit must electronically submit Permit Registration Documents (PRDs) prior to commencement of construction activities in the Stormwater Multi- Application Report Tracking System (SMARTS). PRDs consist of the Notice of Intent, Risk Assessment, Post-Construction Calculations, a Site Map, a Stormwater Pollution Prevention Plan (SWPPP), a signed certification statement by the Licensed Responsible Person, and the first annual fee. The General Permit requires the preparation and implementation of a SWPPP for construction activities. The plan must describe best management practices to prevent erosion and stormwater pollution during construction activities. Best management practices include erosion controls, sediment controls, and other controls to prevent stormwater from contracting pollutants. The SWPPP must also include a stormwater monitoring program.

	Industrial Activities – NPDES General Industrial Permit SWRCB Order 97-03-DWQ, General Storm Water Permit for Industrial Activities, regulates industrial storm water discharges under the NPDES Program and in accordance with the CWA. The regulations require that storm water associated with industrial activity (stormwater) that discharges either directly to surface waters or indirectly through municipal separate storm sewers must be regulated by an NPDES permit. All permit holders are required to prepare a SWPPP that describes the BMPs to be implemented to prevent the discharge of polluted storm water off site. In addition, permit holders are required to sample and analyze their storm water runoff during a minimum of two storm events each rainy season. A no-exposure exemption can be authorized for those light industry facilities where all industrial activities are conducted inside buildings and where all materials stored and handled are not exposed to storm water.
Monterey Peninsula Water Management District	The Monterey Peninsula Water Management District (MPWMD) is responsible for the MPWMD law with the integrated management of groundwater and surface water resources in the Monterey Peninsula area (ESA, 2009). MPWMD is authorized to establish a written permit system for regulation of water distribution systems (ESA, 2009).
Monterey County Health Department	In order to protect groundwater quality, the well program is responsible for the permitting of the construction, destruction, and repairs/modification of a domestic, irrigation, agricultural, cathodic protection, observation, test, or monitoring well (ESA, 2009). The well program works closely with the cities and the MCWRA and MPWMD (Monterey County Health Department, 2008; from ESA, 2009).

Table A-3 Floodplains/Wetlands Related Laws and Regulations	
Law/Regulation	**Notes**
Executive Order (EO) 11988—Floodplain Management (U.S. DOT Order 5650.2; 23 CFR 650, Subpart A)	The U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) is delegated to map the designated floodplains along major streams and rivers and administer the National Flood Insurance Program (NFIP) for communities that have enacted local ordinances restricting development within the 100-year floodplain. Executive Order 11988 requires projects with federal funding or involvement to evaluate alternatives to floodplain encroachment and avoid adverse impacts to floodplain functions.
Flood Disaster Protection Act (42 USC 4001–4128; DOT Order 5650.2, 23 CFR 650 Subpart A; and 23 CFR 771)	The Flood Disaster Protection Act of 1973 establishes the National Flood Insurance Program to enable interested parties to purchase insurance against loss resulting from physical damage to or loss of real property or personal property as a result of flooding. This act substantially increases the coverage area authorized under the NFIP and provides for prompt identification and communication of information concerning flood-prone areas. Under this act, State or local communities are required to participate in the NFIP and establish flood ordinances that reduce or avoid flood losses, and property owners within special flood hazard areas are require to purchase flood insurance if they are being assisted by federally supported (funded, supervised, regulated, or insured) programs or agencies.
Department of Energy 10 CFR PART 1022—Compliance with Floodplain and Wetland Environmental Review Requirements	This part establishes policy and procedures for discharging the Department of Energy's (DOE's) responsibilities under EO 11988 and EO 11990, including: (1) DOE policy regarding the consideration of floodplain and wetland factors in DOE planning and decisionmaking; and (2) DOE procedures for identifying proposed actions located in a floodplain or wetland, providing opportunity for early public review of such proposed actions, preparing floodplain or wetland assessments, and issuing statements of findings for actions in a floodplain. To the extent possible, DOE shall accommodate the requirements of E.O 11988 and EO 11990 through applicable DOE NEPA procedures or, when appropriate, the environmental review process under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 U.S.C. 9601 et seq.).
Federal National Flood Insurance Program	FEMA is responsible for determining flood elevations and developing the Flood Insurance Rate Maps, which are used in the NFIP. Participation in the NFIP provides an opportunity for property owners in the community to purchase flood insurance, provided that the community complies with FEMA requirements for maintaining flood protection and managing development in the floodplain. Within designated floodplains, the community must not permit any development,

	new construction or encroachment, which would cause an increase in the 100-year (base) flood elevation. FEMA defines a significant increase to mean a maximum one-foot rise in the base flood elevation.
EO 11990, Protection of Wetlands,	Requires Federal agencies to take action to minimize the destruction or modification of wetlands by considering both direct and indirect impacts to wetlands. Furthermore, EO 11990 requires that Federal agencies proposing to fund a project that could adversely affect wetlands must consider alternatives to avoid such effects. Work involving wetlands is subject to Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the CWA
Cobey-Alquist Flood Plain Management Act (Water Code § 8400 et seq.)	Establishes mandatory floodplain management objectives, prohibiting inappropriate development that may endanger life or significantly restrict the carrying capacity of designated floodways. The Act states the primary responsibility for planning, adoption, and enforcement of land use regulations to accomplish floodplain management rests with local levels of government. It is the policy of the State to encourage government to accomplish and provide the State assistance and guidance for floodplain management.
CDFG Policies and Guidelines, Wetlands Resources Policy	Provides for the protection, preservation, restoration, enhancement, and expansion of wetland habitats in California, including vernal pools. The administering agencies for the above authority are the CDFG, California Environmental Protection Agency (Cal/EPA), and the Central Coast RWQCB.

Table A-4

Geologic/Soil Conditions Related Laws and Regulations

Law/Regulation	Notes
National Environmental Policy Act (NEPA) [42 U.S.C. Section 4321 et seq.]	Requires the consideration of potential environmental effects, including potential effects to geology, soils, and geologic resources, in the evaluation of any proposed Federal agency action. NEPA also obligates federal agencies to consider the environmental consequences and costs in their projects and programs as part of the planning process. General NEPA procedures are set forth in the Council on Environmental Quality (CEQ) regulations 23 CFR 771.
Clean Water Act Section 404 Permit for Fill Material in Waters and Wetlands	Section 404 of the act regulates the discharge of dredged or fill material into waters of the United States, including rivers, streams and wetlands.

Section 402 NPDES Program	Point source discharges to surface water are regulated by Section 402 of the CWA through requirements set forth in specific or general National Pollutant Discharge Elimination System (NPDES) permits. NPDES requirements apply to discharges of pollutants into navigable waters from a point source, discharges of dredged or fill material into navigable waters, and the disposal of sewage sludge that could result in pollutants entering navigable waters. Stormwater discharges during construction and operation of a facility and incidental non-stormwater discharges associated with construction also fall under this act and are addressed through a general NPDES permit. In California, requirements of the CWA regarding regulation of point source discharges and stormwater discharges are delegated to the SWRCB and administered by the nine RWQCBs. The Central Coast RWQCB implements the statewide policy in the study area. Under California's NPDES program, any waste discharger subject to the NPDES program must obtain an NPDES permit from the local RWQCB. The permits typically include criteria and water quality objectives and require periodic effluent sampling.
Section 401 Clean Water Quality Certification	Under Section 401 of the CWA, water quality certification is required from the state for any activity that requires a federal permit or license that may result in discharge into navigable waters. The certification must indicate that the activity will comply with the applicable state water quality standards. With respect to the project, the authority to grant water quality certification has been delegated to the SWRCB, and for the project study area, applications for certification under CWA Section 401 are processed by the Central Coast RWQCB. A Section 401 Certification would be necessary to obtain a Section 404 permit for discharge into waters subject to the Corps jurisdiction.
Section 303(d) Water Quality Impairments	Under Section 303(d) of the CWA, each state is required to develop effluent limitations for waters within its boundaries where water quality standards are not met. The state must establish priority rankings for these waters and develop Total Maximum Daily Loads (TMDLs) to improve water quality. In California, the SWRCB and RWQCBs prepare the Clean Water Act Section 303(d) List of Water Quality Limited Segments Requiring TMDLs. The United States Environmental Protection Agency (USEPA) approved California's 2006 303(d) List on June 28, 2007 (SWRCB, 2009).
Surface Mining and Reclamation Act [Public Resources Code, Division 2, Chapter 9, Section 2710 et seq.]	Enacted to address the need for a continuing supply of mineral resources, and to prevent or minimize the adverse impacts of surface mining to public health, property and the environment.
California Environmental Quality Act (CEQA) [Section 21000 et seq.] and CEQA Guidelines [Section 15000 et seq.]	Requires state and local agencies to identify the significant environmental impacts of their actions, including potential significant impacts to geology, soils, and geologic resources, and to avoid or mitigate those impacts, when feasible.

Alquist-Priolo Earthquake Fault Zoning Act [California Code of Regulations Section 2621 et seq.]	Provides policies and criteria to assist cities, counties, and state agencies in the exercise of their responsibility to prohibit the location of developments and structures for human occupancy across the trace of active faults.
Seismic Hazards Mapping Act [Public Resources Code Sections 2690 to 2699.6]	Requires that site-specific geotechnical investigations be performed prior to permitting development within the seismic hazard zones.
California Building Standards Code [California Code of Regulations Title 24]	Governs the design and construction of buildings, associated facilities and equipment and applies to buildings in California.
Porter-Cologne Water Quality Act [California Water Code Section 13000 et seq.]	Requires projects that are discharging or proposing to discharge wastes that could affect the quality of the state's water, to file a Report of Waste Discharge with the appropriate RWQCB.
California Government Code Section 65302(g)	Requires general plans to include a safety element for the protection of the community from any unreasonable risks associated with the effects of seismically induced surface rupture, ground shaking, ground failure, tsunami, seiche, and dam failure; slope instability leading to mudslides and landslides; subsidence and other geologic hazards known to the legislative body. Monterey County has a Health and Safety Element in its General Plan, and corresponding ordinances to enforce General Plan policies related to protection of public health and welfare from geologic hazards. In general, these policies and ordinances require soils engineering and geologic-seismic analysis of developments, including public infrastructure, in areas prone to geologic or seismic hazards, and enforce the California Building Standards Codes.
Surface Mining and Reclamation Act (SMARA) of 1975	Addresses the need for a continuing supply of mineral resources, and to prevent of minimize the negative effects of surface mining to public health, property, and the environment. The State has delegated the approval of reclamation plans to local agencies. The agency responsible for reclamation plans in the project study area is the Monterey County Resource Management Agency.

Table A-5 Solid and Hazardous Waste Related Laws and Regulations	
Law/Regulation	**Notes**
Resource Conservation and Recovery Act (RCRA), 42 United States Code (USC), § 6901 to § 6992k	Provides the basic framework for federal regulation of non-hazardous and hazardous waste. RCRA's Subtitle D establishes state responsibility for regulating non-hazardous wastes, while Subtitle C controls the generation, transfer, storage, and disposal of hazardous waste through a comprehensive "cradle to grave" system of hazardous waste management techniques and requirements. The U.S. Environmental Protection Agency (USEPA) is responsible for implementing the law, and the implementing regulations are set forth in 40 Code of Federal Regulations (CFR) 260 et seq. The law allows USEPA to delegate the administration of the RCRA programs to the various states provided that the state programs meet or are more stringent than the federal requirements. California's program was authorized by USEPA on August 1, 1992, and the California Environmental Protection Agency (Cal EPA) Department of Toxic Substances Control (DTSC) is responsible for administering the program.
49 CFR Parts 172 and 173	Provides for the controls for hazardous waste shipments that will be shipped offsite over the state highways and roads. Part 172 lists and classifies those materials that the Department of Transportation has designated as hazardous materials for purposes of transportation and prescribes the requirements for shipping papers, package marking, labeling, and transport vehicle placarding applicable to the shipment and transportation of those hazardous materials. Part 173 Includes definitions of hazardous materials for transportation purposes; requirements to be observed in preparing hazardous materials for shipment by air, highway, rail, or water, or any combination thereof; and inspection, testing, and retesting responsibilities for persons who retest, recondition, maintain, repair and rebuild containers used or intended for use in the transportation of hazardous materials. The US Department of Transportation and the California Highway Patrol are responsible for its administration and enforcement.
California Integrated Waste Management Act (CIWMA) of 1989 (PRC Sections 40000 et seq.).	Nonhazardous solid waste is regulated under the California Integrated Waste Management Act (CIWMA) of 1989 (PRC Sections 40000 et seq.). State and local efforts in source reduction, recycling, and land disposal safety are coordinated through CIWMA. CIWMA requires each county to submit an integrated waste management plan to the state. Monterey County, solid waste haulers, and disposal sites will all comply with CIWMA requirements. CIMWA affects facility operations to the extent that hazardous wastes are not to be disposed of with nonhazardous wastes. RCRA allows states to develop their own programs to regulate hazardous waste. California has developed its own program by passage of the California Hazardous Waste Control Law (HWCL), California

	Health and Safety Code, § 25100 et seq. It should be noted that California's HWCL includes non-RCRA (California) hazardous wastes. The law specifies two hazardous waste criteria (Soluble Threshold Limit Concentration and Total Threshold Limit Concentration) that are not required under RCRA but are used by California in the waste determination process to assess whether a waste is a California Hazardous Waste if RCRA does not apply. Primary authority for the statewide administration and enforcement of California's HWCL rests with the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC). However, local government often provides most regulatory functions covering those who generate hazardous waste.
The Monterey Count y Health Department, Environ mental Health Division	Designated by the California Integrated Waste Man agement Board, as the Local Enforcem ent Agency (LEA) . The LEA is responsible for administering and enforcing laws an d regulation s relating to the collection, handling , storage, and di sposal of solid waste materials in Monterey County.

Table A-6 Noise Related Laws and Regulations	
Law/Regulation	**Notes**
Noise Control Act of 1972 (42 U.S.C 4910)	This Act establishes a national policy to promote an environment for all Americans free from noise that jeopardizes their health and welfare. To accomplish this, the Act establishes a means for the coordination of Federal research and activities in noise control, authorizes the establishment of Federal noise emissions standards for products distributed in commerce, and provides information to the public respecting the noise emission and noise reduction characteristics of such products.
"Information on Levels of Environmental Noise Requisite to Protect Health and Welfare with an Adequate Margin of Safety", NTIS 550\9 -74-004, USEPA, Washington, D.C., March 1974.	In response to a federal mandate, the U.S. EPA provided guidance in this document, commonly referenced as the, "Levels Document," that establishes an L_{dn} of 55 dBA as the requisite level, with an adequate margin of safety, for areas of outdoor uses including residences and recreation areas. This document does not constitute U.S. EPA regulations or standards, but identifies safe levels of environmental noise exposure without consideration of costs for achieving these levels or other potentially relevant considerations. It is intended to "provide State and Local governments as well as the Federal Government and the private sector with an informational point of departure for the purpose of decision making." The agency is careful to stress that the recommendations contain a factor of safety and do not consider technical or economic feasibility issues, and therefore should not be construed as standards or regulations.
Federal Energy Regulatory Commission (FERC) Guidelines On Noise Emissions From Compressor Stations, Substations, And Transmission Lines (18 C.F.R 157.206(d)5)	These guidelines require that: "the noise attributable to any new compressor stations, compression added to an existing station, or any modification, upgrade or update of an existing station, must not exceed a day-night level (L_{dn}) of 55 dBA at any pre-existing noise sensitive area (such as schools, hospitals, or residences)." This policy was adopted based on the U.S. EPA-identified level of significance of 55 L_{dn} dBA.
Federal Highway Administration (FHWA) Noise Abatement Procedures (23 C.F.R. Part 772)	The purpose of 23 CFR Part 772 is to provide procedures for noise studies and noise abatement measures to help protect the public health and welfare, to supply noise abatement criteria, and to establish requirements for information to be given to local officials for use in the planning and design of highways. It establishes five categories of noise sensitive receptors and prescribes the use of the Hourly L_{eq} as the criterion metric for evaluating traffic noise impacts.
Department of Housing and Urban Development (HUD) Environmental Standards (24 C.F.R Part 51)	HUD Regulations set forth the following exterior noise standards for new home construction assisted or supported by the Department: 65 L_{dn} or less – Acceptable > 65 L_{dn} and < 75 L_{dn} – Normally unacceptable, appropriate sound attenuation measures must be provided > 75 L_{dn} – Unacceptable HUD's regulations do not contain standards for interior noise levels. Rather, a

	goal of 45 decibels is set forth and attenuation requirements are geared to achieve that goal.
Occupational Safety and Health Administration (OSHA) Occupational Noise Exposure; Hearing Conservation Amendment (FR 48 (46), 9738 – 9785 (1983).	The standard stipulates that protection against the effects of noise exposure shall be provided for employees when sound levels exceed 90 dBA over an 8-hour exposure period. Protection shall consist of feasible administrative or engineering controls. If such controls fail to reduce sound levels to within acceptable levels, personal protective equipment shall be provided and used to reduce exposure of the employee. Additionally, a Hearing Conservation Program must be instituted by the employers whenever employee noise exposure equals or exceeds the Action Level of an 8-hour time-weighted average (TWA) sound level of 85 dBA. The Hearing Conservation Program requirements consist of periodic area and personal noise monitoring, performance and evaluation of audiograms, provision of hearing protection, annual employee training, and record keeping.
California Government Code Section 65302(f) and Section 46050.1 of the Health and Safety Code	The State of California requires that all municipalities prepare and adopt a comprehensive long-range General Plan. General Plans must contain a Noise Element. The requirements for the Noise Element of the General Plan include describing the noise environment quantitatively using a cumulative noise metric such as CNEL or DNL, establishing noise/land use compatibility criteria, and establishing programs for achieving and/or maintaining land use compatibility.
Cal-OSHA in Title 8, Group 15, Article 105, Sections 5095-5100	Occupational exposure to noise is regulated by this standard. The standard stipulates that protection against the effects of noise exposure shall be provided when sound levels exceed 90 dBA over an 8-hour exposure period. Protection shall consist of feasible administrative or engineering controls. If such controls fail to reduce sound levels to within acceptable levels, personal protective equipment shall be provided and used to reduce exposure of the employee. Additionally, a Hearing Conservation Program must be instituted by the employers whenever employee noise exposure equals or exceeds the Action Level of an 8-hour time-weighted average (TWA) sound level of 85 dBA.
The California Environmental Quality Act (CEQA) (California Public Resources Code section 21000 et seq.). Section XI of Appendix G of CEQA Guidelines (Cal. Code Regs., Title 14, App. G).	Requires identification of "significant" environm ental im pacts an d their feasible mitigation. CEQA does not define a threshold of "significant increase" regarding noise exposure; however, based on human response and comm only applie d industry standard, the foll owing thresholds of signi ficance will be applied. A significant impact related to operational noise would result if: -The project causes the ambient noise level measured at the property line of affected uses to increase by 3 dBA in CNEL to or within the "normally unacceptable" or "clearly unacceptable" noise/land use compatibility category; or -The project causes any 5 dBA or greater noise increase.
The Safety Element of the Monterey County General Plan contains the Monterey County Noise Element	Designed to limit the exposure of the community to excessive noise levels by specifying noise guidelines at noise-sensitive receptors. No piece of machinery can be operated within 2,500 feet of a noise-sensitive receiver if the piece of the equipment has a sound level of 85 dBA at a reference distance of 50 feet.

Table A-7 Visual Resource Related Laws and Regulations	
Law/Regulation	**Notes**
The Scenic and Visual Qualities of the California Coastal Act (2009) Section 30251	States that scenic and visual qualities of coastal areas shall be considered and protected as a resource.
The Monterey County Coastal Implementation Plan Part I, Title 20 Zoning Ordinance (Monterey County 2000): 20.28.070 Site Development Standards and 20.28.080 Special Regulations.	Contains development standards that address the visual quality within the HI (CZ) Districts.
Monterey County Coastal Implementation Plan, Part 2 Development Standards: Section 20.144.030, Visual Resources Development Standards	Contains a requirement for onsite inspection by a planner for industrial uses, to determine conformance with policies of the land use and development standards of the Implementation Plan.

Table A-8 Ecology Related Laws and Regulations	
Law/Regulation	**Notes**
Endangered Species Act of 1973 and implementing regulations, Title 16 U.S. Code (USC) §1531 et seq. (16 USC 1531 et seq.), Title 50 Code of Federal Regulations (CFR) §17.1 et seq. (50 CFR 17.1 et seq.)	The Endangered Species Act (ESA) includes provisions for the protection and management of federally listed threatened or endangered plants and animals and their designated critical habitats. Section 10(1)(A) of the ESA requires a permit to take threatened or endangered species during lawful project activities. The administering agency for the above authority is the USFWS for terrestrial, avian, and most aquatic species, and the National Marine Fisheries Service (NMFS) for anadromous species.
Section 7 of Fish and Wildlife Coordinating Act, 16 USC 742 et seq., and Endangered Species Act, 16 USC 1531 et seq., and 50 CFR 17:	Section 7 requires consultation if any project facilities could jeopardize the continued existence of an endangered or threatened species, and issuance of a Biological Opinion that also authorizes incidental take of a threatened or endangered species. The applicability of this act depends on federal jurisdiction over some aspect of the project. The administering agencies for the above authority are the USFWS and the National Oceanic and Atmospheric Administration (NOAA).
Section 404 of the Clean Water Act of 1977 (33 USC 1251 et seq., 33 CFR §§320 and 323):	This section of the Clean Water Act gives the USACE authority to regulate discharges of dredge or fill material into waters of the United States, including wetlands. The administering agency for the above authority is the USACE.
Section 401 of the Clean Water Act of 1977:	Section 401 of the Clean Water Act requires the Applicant to conduct water quality impact analysis for the project when using Section 404 permits and for discharges to waterways.
Migratory Bird Treaty Act 16 USC §§703-711:	This Act includes provisions for protection of migratory birds, including the non-permitted take of migratory birds. The administering agencies for the above authority are the USFWS and CDFG.
California Endangered Species Act of 1984, Fish and Game Code, §2050 through §2098	The California Endangered Species Act (CESA) includes provisions for the protection and management of plant and animal species listed as endangered or threatened, or designated as candidates for such listing. CESA includes a consultation requirement "to ensure that any action authorized by a state lead agency is not likely to jeopardize the continued existences of any endangered or threatened species…or result in the destruction or adverse modification of habitat essential to the continued existence of the species" (§2090). Plants of California declared to be endangered, threatened, or rare are listed at 14 CCR §670.2. Animals of California declared to be endangered or threatened are listed at 14 CCR §670.5. 14 CCR §15000 et seq. describes the types and extent of information required to evaluate the effects of a proposed project on biological resources of a project site. Section 2081 also requires a permit to authorize incidental take of species listed as threatened or endangered. The

	administering agency for the above authority is CDFG.
Fish and Game Code, Fully Protected Species: §3511:	Fully Protected Birds; §4700: Fully Protected Mammals; §5050: Fully Protected Reptiles and Amphibians; §5515: Fully Protected Fishes. The Fish and Game Code prohibits the taking of listed plants and animals that are Fully Protected in California. The administering agency for the above authority is CDFG.
Fish and Game Code §1930, Significant Natural Areas:	Section 1930 of the Fish and Game Code designates certain areas such as refuges, natural sloughs, riparian areas, and vernal pools as significant wildlife habitats. These Significant Natural Areas are listed in the CNDDB. The administering agency for the above authority is CDFG.
Fish and Game Code §1580, Designated Ecological Reserves:	In Section 1580 of the Fish and Game Code, the CDFG Commission designates land and water areas as significant wildlife habitats to be preserved in natural condition for the general public to observe and study. The administering agency for the above authority is CDFG.
Fish and Game Code §1600, Streambed Alteration Agreement:	Section 1600 of the Fish and Game Code requires authorization for activities that impact waterways, including impacts to vegetation and wildlife from sediment, diversions, and other disturbances. The administering agency for the above authority is the CDFG.
Native Plant Protection Act of 1977, Fish and Game Code, §1900 et seq.:	The Native Plant Protection Act designates state rare and endangered plants and provides specific protection measures for identified populations. The administering agency for the above authority is the CDFG.
CDFG Policies and Guidelines, Wetlands Resources Policy	The Wetlands Resource policy provides for the protection, preservation, restoration, enhancement, and expansion of wetland habitats in California, including vernal pools. The administering agencies for the above authority are the CDFG, California Environmental Protection Agency (Cal/EPA), and the Regional Water Quality Control Board.
Public Resource Code §§25500 and 25527	Sections 25500 and 25527 of the Public Resource Code prohibits constructing facilities in certain areas of critical concern for biological resources, such as ecological preserves, wildlife refuges, estuaries, and unique or irreplaceable wildlife habitats of scientific or educational value. If there is no alternative, strict criteria are applied. The administering agencies for the above authority are the USFWS and CDFG.
Title 20 CCR §§1702 (q) and (v):	Title 20 CCR 1702 (q) and (v) protects "areas of critical concern" and "species of special concern" identified by local, state, or federal resource agencies within the project area, including the California Native Plant Society. The administering agencies for the above authority are the USFWS and CDFG.
Title 14 CCR Section 15000 et seq.:	The 14 CCR Section 15000 et seq. describe the types and extent of information required to evaluate the effects of a proposed project on biological resources of a project site. The administering agencies for the above authority are the USFWS and CDFG.
Municipal Code, County of	Chapter 16.60 describes the size and types of trees that are protected

Monterey, California; Chapter 16.60 - Preservation of Oak trees and other protected trees	from removal without a permit from the county of Monterey. The administering agencies for the above authority is Monterey County Planning and Building.

Table A-9 Socioeconomic Related Laws and Regulations	
Law/Regulation	**Notes**
The Uniform Relocation Assistance and Real Property Acquisition Act of 1970	The Uniform Relocation Assistance and Real Property Acquisition Act of 1970 **(**Uniform Act) addresses the need for consistent and equitable treatment of persons displaced from their homes, farms, or businesses by federally assisted programs. It specifies the due process to be followed in real property acquisitions and relocation of displaced individuals, families, businesses, farms, and nonprofit organizations. It provides for payment of moving expenses, housing rental or purchase supplements, down payment assistance, etc. The Uniform Act is in 49 Code of Federal Regulations Part 24.
Title VI of the Civil Rights Act of 1964	Title VI of the Civil Rights Act of 1964 directs federal agencies to ensure that no person is excluded from participation in, denied benefits of, or subject to discrimination under any program or activity receiving federal financial assistance on the basis of race, color, religion, national origin, sex, age, or handicap. Title VI is supplemented by EO 12898.
Executive Order 12898 Federal Actions to Address Environmental Justice in Minority and Low-Income Populations	EO 12898 was designed to supplement Title VI of the Civil Rights Act of 1964; this EO requires Federal agencies, such as the DOE, to consider EJ issues in their policies, activities, and procedures. The EO requires Federal agencies to identify and address as appropriate, as part of project planning and decision-making, the occurrence of disproportionately high and adverse effects on minority and low-income populations. A Presidential Memorandum accompanying EO 12898 directed to the heads of all departments and agencies states, "each Federal agency shall analyze the environmental effects, including human health, economic, and social effects, of Federal actions, including effects on minority communities and low-income communities, when such analysis is required by NEPA." The memorandum particularly emphasizes the importance of NEPA's public participation process, directing that "each Federal agency shall provide opportunities for community input in the NEPA process." Agencies are further directed to "identify potential effects and mitigation measures in consultation with affected communities, and improve the accessibility of meetings, crucial documents, and notices."
State Housing Element Law	There are no specific state guidelines that address population, socioeconomics, or EJ. However, state law recognizes the vital role local governments play in the supply and affordability of housing. Each county and city in California is required to adopt a comprehensive, long-term general plan to guide its physical development. The State Housing Element Law (Government Code Article 10.6, Sections 65580 through 65590), enacted in 1969, mandates that local governments adequately plan to meet the existing and projected housing needs of all economic segments of the community. The law acknowledges that, for the private market to adequately address housing needs and demand, local governments must adopt land use plans and regulatory systems that provide opportunities for, and do not unduly constrain, housing development. As a result, housing policy in the state rests largely upon the effective implementation of local general plans and, in particular, local housing elements.

Table A-10 Applicable Worker Safety and Health Laws, Ordinances, Regulations, and Standards		
Administering Agency	**Applicable LORS**	**Requirement/Compliance**
California Division of Occupational Safety and Health California Occupational Safety and Health Act 1973	Title 8, CCR	The Act establishes the Cal/OSHA and establishes minimum safety and health standards for work operations occurring in the state.
	8 CCR, Section 339	Requires listing of hazardous chemicals relating to the Hazardous Substance Information and Training Act.
	8 CCR, Section 450 et seq. – 560 et seq.	Establishes safety orders for pressurized vessels including: air tanks, anhydrous ammonia, and general safe work practices.
	8 CCR, Section 750 et seq.	Establishes safety orders of work with high-pressure steam.
	8 CCR, Construction Safety Orders (Sections 1500 et seq. – 1938 et seq.)	Establishes safety orders for construction work.
	8 CCR, Sections 1508 et. seq. – 1527 et seq.	Requirements for IIPP, PPE, and general site safety.
	8 CCR, Sections 1528 et seq. – 1537 et seq.	Requirements for controlling exposures to hazardous air contaminants.
	8 CCR, Sections 1539 et seq. – 1547 et seq.	Requirements for excavations and trenching.
	8 CCR, Sections 1590 et seq. – 1596 et seq.	Requirements for earth moving and haulage.
	8 CCR, Sections 1597 et seq. – 1599 et seq.	Requirements for vehicles, traffic control, flaggers, barricades, and warning signs.
	8 CCR, Sections 1604 et seq. – 1605 et seq.	Requirements for construction hoists.
	8 CCR, Sections 1620 et seq. – 1635 et seq.	Requirements for railings, ramps, stairs, access and egress, openings in floors, roofs and walls, and temporary floors.

Administering Agency	Applicable LORS	Requirement/Compliance
	8 CCR, Sections 1635 et seq. – 1667 et seq.	Requirements for scaffolding.
	8 CCR, Sections 1669 et seq. – 1678 et seq.	Requirements for safety belts, nets, and ladders.
	8 CCR, Sections 1680 et seq. – 1708 et seq.	Requirements for saws, powder-actuated tools, miscellaneous tools and equipment.
	8 CCR, Sections 1709 et seq. – 1722 et seq.	Requirements for steel reinforcing, concrete pouring, and structural steel erection operations.
	8 CCR, Sections 1760 et seq.	Electrical requirements for construction work.
	8 CCR, Sections 1920 et seq. – 1938 et seq.	Requirements for construction-related fire protection and prevention.
	8 CCR, Electrical Safety Orders (Sections 2299 et seq. – 2974 et seq.)	Establishes safety orders for installation of low and high voltage electrical systems.
	8 CCR, General Industry Safety Orders (Sections 3200 et seq. – 6184 et seq.)	Establishes safety orders for general industry work, including operations and maintenance.
	8 CCR, Sections 3200 et seq. – 3583 et seq.	Requirements for IIPP, PPE, and general site safety.
	8 CCR, Sections 3620 et seq. – 3920 et seq.	Requirements for mobile equipment operation.
	8 CCR, Sections 3940 et seq. – 4647 et seq.	Requirements for power transmission equipment, rotating equipment, moving parts points of operation, etc.
	8 CCR, Sections 4794 et seq. – 4884 et seq.	Requirements for compressed gases and gas systems for cutting and welding.

Administering Agency	Applicable LORS	Requirement/Compliance
	8 CCR, Sections 4850 et seq. – 4853 et seq.	Requirements for electric welding.
	8 CCR, Sections 4884 et seq. – 5049 et seq.	Requirements for cranes and other hoisting equipment.
	8 CCR, Sections 5094 et seq. – 5100 et seq.	Requirements for control of excessive noise exposure and ergonomic hazards.
	8 CCR, Sections 5139 et seq. – 5223 et seq.	Requirements for the control of hazardous substances, including Hazard Communication program requirements.
	8 CCR, Sections 5615 et seq. – 5629 et seq.	Requirements for the control of hazards from flammable liquids, gases, and vapors.
	8 CCR, Sections 6150 et seq. – 6184 et seq.	Requirements for fire protection and prevention.
	8 CCR, Part 6	Provides health and safety requirements for working with tanks and boilers.
	29 CFR 1926	Contains federal health and safety regulations pertaining to construction activities.
	29 CFR 1910	Contains federal health and safety regulations pertaining to general industry.
North County Fire Protection District	Section 25500 et seq. (LaFollette Bill)	Requires that every new or modified facility that handles, treats, stores, or disposes of more than the threshold quantity of any of the listed acutely hazardous materials prepare and maintain a Risk Management Plan.
North County Fire Protection District	Sections 25500 et seq. – 25541 et seq.	Requires the preparation of a Hazardous Material Business Plan that details emergency response plans for a hazardous materials emergency at the facility.
Administering Agency	**Applicable LORS**	**Requirement/Compliance**
North County Fire Protection District	California Fire Cod	Requires the prevention, control, and mitigation of dangerous conditions related to storage, dispensing, use, and handling of hazardous materials and information needed by emergency response personnel.
North County Fire Protection District	NFPA 10: Portable Fire Extinguishers	Requirements for the selection, placement, inspection, maintenance, and employee training for portable fire extinguishers.

	NFPA 12: Carbon Dioxide Fire Extinguishing Systems	Requirements for the installation and use of carbon dioxide extinguishing systems.
	NFPA 13 & 13A: Sprinkler Systems	Guidelines for selection, installation, maintenance, and testing of fire sprinkler systems.
	NFPA 14: Standpipe and Hose Systems	Guidelines for the selection and installation of standpipe and hose fire protection systems.
	NFPA 15: Water Spray Fixed Systems	Guidelines for selection and installation of fixed water spray systems.
	NFPA 22: Water Tanks and Private Fire Protection	Requirements for water tanks that are used for private fire protection.
	NFPA 24: Installation of Private Fire Service Mains and their Appurtenances	Requirements for installation of private fire service mains and appurtenances.
	NFPA 26: Supervision of Valves Controlling Water Supplies	Provides guidance for installation and supervision of valves used to control water supplies.
	NFPA 30: Flammable and Combustible Liquids	Requirements for storage, transfer, and use of flammable and combustible liquids.
Administering Agency	**Applicable LORS**	**Requirement/Compliance**
	NFPA 54: National Fuel Gas Code	Provides fire protection requirements for the use of fuel gas.
	NFPA 70, 70B & 70E: National Electric Code	Guidance on the safe selection and work practices associated with the design, installation, construction, and maintenance of electrical systems.
	NFPA 71: Installation, Maintenance and use of Central Station Signaling Systems	Provides requirements for the installation, maintenance, and use of central station signaling systems.

	NFPA 72A, 72E & 72F: Local Protective Signaling System, Automatic Fire Detection System, Emergency Voice/Alarm Communication System	Provides requirements for the design, installation, use and maintenance of local protective signaling systems, automatic fire detection systems and emergency communication systems.
	NFPA 78: Lightning Protection Code	Provides requirements for lightning protection.
	NFPA 80: Fire Doors and Windows	Provides requirements for fire doors and windows.
	NFPA 90A: Installation of Air Conditioning and Ventilation Systems	Provides guidance for the installation of air conditioning and ventilation systems.
	NFPA 101: Life Safety, Fire in Buildings and Structures	Requirements for the design and construction of means of egress from structures.
	NFPA 291: Fire Flow Testing and Marking of Hydrants	Requirements for flow testing and marking of fire hydrants.
	NFPA 1962: Care, Maintenance and Use of Fire Hoses	Requirements for the care, use and maintenance of fire hoses, connections, and nozzles.
Administering Agency	**Applicable LORS**	**Requirement/Compliance**
Cal/OSHA	ANSI/ASME Boiler and Pressure Vessel Code	Provides specifications and requirements for boilers and pressure vessels.

Appendix B

Forms

MOSS LANDING CEMENT COMPANY, LLC.

Contractors/Vendors/Visitors
Site Specific Hazard Training

The safety of contractors, visitors, and employees is paramount at this facility. The following guidelines were established to enhance your safety and provide you with procedural guidelines while at our facility. Should you have any questions regarding any of our policies, please see any member of management.

- Safety glasses, closed toed shoes, & hardhats are required at all areas. Hearing protection when posted is required and available. Safety glasses, goggles, shoes and hard hats are available at the reception area.
- Goggles are required in areas behind red lines.
- Please observe all posted speed limits, warning signs, & driving patterns.
- Equipment has right-of-way throughout the property.
- All contractors and persons not employed by **MLCC** are required to report to the reception area at the office to sign in prior to starting work for a briefing regarding their safety.
- Safety harness & tie-offs are required to be worn during any work from an elevated position.
- **MLCC, OSHA lockout-tagout policies** and **safety rules** must be followed prior to inspecting/repairing equipment or machinery.
- **DO NOT** under any circumstance, walk behind, drive behind, or park behind any other piece of mobile equipment.
- You are advised to report any unsafe conditions or unsafe acts that **YOU** observe to a member of management.
- Please do not leave designated work areas and travel within the property without a company escort.
- All contractor tools and equipment must meet or exceed OSHA Standards and are subject to inspection.
- Seat belts must be worn at all times when driving on **MLCC** property.
- The company reserves the right to conduct safety inspections, prohibit use of equipment, tools, or vehicles, which do not meet OSHA guidelines.
- We reserve the right to remove any contractor or visitor who does not adhere to our safety policies and practices.
- You may encounter various moving equipment, i.e. trucks, forklifts, etc. Be alert and stay clear of this equipment, making sure the operator knows you are in the vicinity.
- Stay clear of moving and idle machinery unless the controls are locked out by you personally, (conveyors, fans, drives, etc). Much of our equipment can be started from remote locations.
- Exercise caution when walking in work areas and stepping over and around obstacles. Fall protection is required when there is danger of falling.
- Avoid areas where welding or burning operations are conducted. **DO NOT** look at the flash.
- Observe No Smoking signs and areas. **DO NOT** smoke around flammable or explosive materials.
- Stay clear of all electrical transmissions, distribution and control equipment. Power circuits shall be de-energized before work is done on such circuits unless hot-wire tools are used.
- In the event of an emergency evacuation follow the instructions given by supervisors. (3 loud bursts from air horn. Meet by reception area until all clear is given by management,)
- Do not use cell-phones while walking in the plant, or driving in your vehicle.
- First aid kits are available in the main office, the shop and other designated areas.
- Fire extinguishers are located on all mobile equipment and in designated areas throughout the plant.
- No weapons or firearms are permitted on company property.
- Before working with or around any potentially hazardous materials (as defined by the **MLCC** Hazard Communication Program) site Material Safety Data Sheets (MSDS's) must be consulted.
- No hazardous materials are to be brought on-site unless accompanied by an MSDS, or an MSDS has been provided prior to the material being brought on-site.
- No **MLCC** equipment shall be used for contractor work without permission from the **MLCC** Supervisor in charge of said equipment. **MLCC** equipment shall be operated by **MLCC** personnel only, unless authorized by **MLCC** site management.
- All personnel entering Company property in a fuel or chemical delivery vehicle must stay inside the cab of the vehicle. If exiting the vehicle, proper PPE must be worn and instructions from **MLCC** site personnel must be followed.

Persons and equipment found in violations of these rules are subject to be removed from this operation, and are subject to possible OSHA citations.

I acknowledge the above safety guidelines and I understand them. I agree to abide by these practices during this visit and the subsequent visits. I have been provided with a copy of this training document.

Signed: _____ **Date: _____**

Printed: _____

Company Name: _____

Address: _____

Training Conducted by: _____

Form B-1 Facility Management Approval

This Environmental Management Plan (EMP) is fully supported and approved by the Calera Corporation. This includes a commitment to provide manpower, equipment, and materials as necessary to implement the EMP and modifying it as needed, due to expansions, modifications, and improvements to the Facility.

This EMP will be implemented as described herein.

William Day, Vice President	Date

Appendix C

Permits

California Regional Water Quality Control Board
Central Coast Region

Linda Adams
Secretary for Environmental Protection

895 Aerovista Place, Suite 101, San Luis Obispo, California 93401-7906
Phone (805) 549-3147 • FAX (805) 543-0397
http://www.waterboards.ca.gov/centralcoast

Arnold Schwarzenegger
Governor

March 27, 2009

Sam Bose
Moss Landing Cement Company, LLC
P.O. Box 777
Moss Landing, CA 95039

Dear Mr. Bose:

ADOPTED WASTE DISCHARGE REQUIREMENTS ORDER NO. R3-2009-0002, NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT NO. CA0007005 – MOSS LANDING COMMERCIAL PARK AND MOSS LANDING CEMENT COMPANY, MOSS LANDING CEMENT COMPANY FACILITY, MONTEREY COUNTY

Enclosed is Waste Discharge Requirements Order No. R3-2009-0002 (National Pollutant Discharge Elimination System Permit No. CA0007005) for the Moss Landing Cement Company Facility. Order No. R3-2009-0002 was adopted by the Regional Water Quality Control Board at its March 19, 2009 meeting, and is effective May 9, 2009. Please note, as discussed during the Water Board meeting, the Monitoring and Reporting Program has been revised from the original draft permit and requires that you also submit data and reports to the California Coastal Commission.

If you have questions, please contact **Peter von Langen at (805) 549-3688** or Burton Chadwick at (805) 542-4786.

Sincerely,

Susan H McCann

for Roger W. Briggs
Executive Officer

Enclosure: 1. Waste Discharge Requirements Order No. R3-2009-0002

cc: via email

Jae Kim, Tetra Tech (jae.kim@tetratech-ffx.com)

Douglas E. Eberhardt, EPA Region 9 (eberhardt.doug@epa.gov)

Phil S. Isorena, SWRCB – NPDES Unit (pisorena@waterboards.ca.gov)

Dierdre Hall, MBNMS (deirdre.hall@noaa.gov)

Tom Luster, California Coastal Commission (tluster@coastal.ca.gov)

Filename and Path: S:\NPDES\NPDES Facilities\Monterey Co\National Refractory, Moss Landing\Order No. 09-0002\Adopted order\Adopted order transmittal-Moss Landing Cement Plant.doc

California Regional Water Quality Control Board

Central Coast Region

895 Aerovista Place, Suite 101, San Luis Obispo, California 93401
Phone (805) 549-3147 • Fax (805) 543-0397
http://www.waterboards.ca.gov/centralcoast/

Linda S. Adams
Agency Secretary

Arnold Schwarzenegger
Governor

ORDER NO. R3-2009-0002
NPDES NO. CA0007005

WASTE DISCHARGE REQUIREMENTS FOR THE MOSS LANDING COMMERCIAL PARK AND MOSS LANDING CEMENT COMPANY MOSS LANDING CEMENT COMPANY FACILITY

Table 1. Discharger Information

Discharger	Moss Landing Commercial Park, LLC and Moss Landing Cement Company, LLC
Name of Facility	Moss Landing Cement Plant
Facility Address	7697 Highway 1
	Moss Landing, CA 95039
	Monterey County
The U.S. Environmental Protection Agency (USEPA) and the Regional Water Quality Control Board have classified this discharge as a major discharge.	

Discharges by the Moss Landing Cement Plant from the discharge point identified below are subject to waste discharge requirements as set forth in this Order.

Table 2. Discharge Location

Discharge Point	Effluent Description	Discharge Point Latitude	Discharge Point Longitude	Receiving Water
001	Calcium and Magnesium Depleted Seawater	36°, 48' 08" N	121°, 47' 29" W	Monterey Bay

Table 3. Administrative Information

This Order was adopted by the Regional Water Quality Control Board on:	**March 19, 2009**
This Order shall become effective on:	**May 9, 2009**
This Order shall expire on:	**May 9, 2014**
The Discharger shall file a Report of Waste Discharge in accordance with title 23, California Code of Regulations, as application for issuance of waste discharge requirements no later than:	**November 10, 2013**

IT IS HEREBY ORDERED, that in order to meet the provisions contained in division 7 of the California Water Code (commencing with section 13000) and regulations adopted thereunder, and the provisions of the federal Clean Water Act (CWA) and regulations and guidelines adopted thereunder, the Discharger shall comply with the requirements in this Order.

I, Roger W. Briggs Executive Officer, do hereby certify that this Order, with all attachments, is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Coastal Region, on **March 19, 2009**.

for Lisa A McCann
Roger W. Briggs, Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
REGION 3, CENTRAL COAST REGION

TABLE OF CONTENTS

LIST OF TABLES

I. FACILITY INFORMATION

The following Discharger is authorized to discharge in accordance with the conditions set forth in this Order.

Table 4. Facility Information

Discharger	Moss Landing Commercial Park, LLC (7695 Hwy 1, Moss Landing, CA 95039) and Moss Landing Cement Company, LLC (7697 Hwy 1, Moss Landing, CA 95039)
Name of Facility	Moss Landing Cement Plant
Facility Address	7697 Highway 1
	Moss Landing, CA 95039
	Monterey County
Facility Contact, Title, and Phone	Sam Bose, Director of Operations (408) 340-4600
Mailing Address	PO Box 777 Moss Landing, CA 95039
Type of Facility	Industrial
Facility Design Flow	Phase 1 = 0.04 million gallons per day (mgd)(daily average), 0.05 mgd (daily maximum) Phase 2 = 24 mgd (daily average), 25 mgd (daily maximum) Phase 3 = 56 mgd (daily average), 60 mgd (daily maximum)

II. FINDINGS

The California Regional Water Quality Control Board, Central Coast Region (hereinafter the Regional Water Board), finds:

A. Background. The Moss Landing Cement Company, LLC is the operator of the Moss Landing Cement Plant, which is located at 7697 Highway 1, Moss Landing on land owned by the Moss Landing Commercial Park, LLC. Together, the Moss Landing Commercial Park, LLC and the Moss Landing Cement Company, LLC are hereinafter referred to as the Discharger. The Discharger is currently authorized to discharge pursuant to Order No. R3-2001-030 and National Pollutant Discharge Elimination System (NPDES) Permit No. CA-0007005. The Discharger submitted a Report of Waste Discharge, dated May 9, 2008, and applied to renew its NPDES permit to discharge up to 60 mgd, in three phases of development, of calcium and magnesium depleted seawater from the former National Refractories and Minerals Corporation Seawater Magnesia Plant.

For the purposes of this Order, references to the "discharger" or "permittee" in applicable federal and State laws, regulations, plans, or policy are held to be equivalent to references to the Discharger herein.

B. Facility Description. Seawater is pumped from Moss Landing Harbor by up to nine 100 horsepower pumps through two intake lines to the facility. Seawater, which contains calcium and magnesium chloride ($CaCl_2$ and $MgCl_2$), is combined with dolime, lime, brucite (magnesium hydroxide tailings from historical operations of the National Refractories and Minerals Corporation), sodium hydroxide, sodium carbonate, fly ash, and/or calcium and magnesium bearing silicate materials such as olivine and serpentine. The Discharger's precipitation process also utilizes carbon dioxide (CO_2), sparged from flue gases of the neighboring Moss Landing Power Plant. Following precipitating reactions, the seawater mixture will be directed to as many as seven 3-million gallon (capacity) tanks where settling of precipitated solids will occur. Settled material is then dried to be sold to the construction industry as green cement or as a cement supplement. Calcium and magnesium depleted seawater, decanted from the thickening tanks, will be discharged back to Monterey Bay, within the Monterey Bay National Marine Sanctuary, through Discharge Point 001. See section II. A of the Fact Sheet (Attachment F) for a more complete description of this facility.

C. Legal Authorities. This Order is issued pursuant to CWA section 402 and implementing regulations adopted by the USEPA, and Chapter 5.5, Division 7 of the California Water Code (the Water Code). It shall serve as an NPDES permit for point source discharges from this facility to surface waters; and it shall serve as Waste Discharge Requirements (WDRs) pursuant to Article 4, Chapter 4, Division 7 of the Water Code (commencing with section 13260).

D. Background and Rationale for Requirements. The Regional Water Board developed the requirements in this Order based on information submitted as part of the application, through monitoring and reporting programs, and through special studies. Attachments A through F, which contain background information and rationale for the requirements of the

Order, are hereby incorporated into this Order and therefore constitute part of the Findings for this Order.

E. California Environmental Quality Act (CEQA). Pursuant to California Water Code section 13389, this action to adopt an NPDES permit is exempt from the provisions of CEQA, Public Resources Code sections 21100-21177.

F. Technology-Based Effluent Limitations. CWA section 301 (b) and USEPA implementing regulations at 40 CFR 122.44 require that permits include conditions meeting applicable technology-based requirements at a minimum, and any more stringent effluent limitations necessary to meet minimum water quality standards. The discharge authorized by this Order must meet applicable federal technology-based requirements based on Effluent Limitations Guidelines (ELGs) and Standards for industrial categories listed in 40 CFR Parts 402 through 699, and based on best professional judgment (BPJ) in accordance with 40 CFR 125.3. A detailed discussion of development of technology-based effluent limitations is included in the Fact Sheet (Attachment F).

G. Water Quality-Based Effluent Limitations. CWA 301 (b) and NPDES regulations at 40 CFR 122.44 (d) require that permits include limitations more stringent than applicable federal technology-based requirements where necessary to achieve applicable water quality standards.

NPDES regulations at 40 CFR Section 122.44 (d) (1) (i) mandate that permits include effluent limitations for all pollutants that are or may be discharged at levels that have the reasonable potential to cause or contribute to an exceedance of a water quality standard, including numeric and narrative objectives within a standard. Where reasonable potential has been established for a pollutant, but there is no numeric criterion or objective for the pollutant, water quality-based effluent limitations (WQBELs) must be established using: (1) USEPA criteria guidance under CWA section 304 (a), supplemented where necessary by other relevant information; (2) an indicator parameter for the pollutant of concern; or (3) a calculated numeric water quality criterion, such as a proposed State criterion or policy interpreting the State's narrative criterion, supplemented with other relevant information, pursuant to NPDES regulations at 40 CFR 122.44 (d) (1) (vi).

H. Water Quality Control Plans. The Regional Water Board has adopted a Water Quality Control Plan for the Central Coast Region (the Basin Plan) that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for the Pacific Ocean. In addition, the Basin Plan implements State Water Board Resolution No. 88-63, which establishes State policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply (MUN). Because of very high levels of total dissolved solids (TDS) in marine waters, the receiving water for this discharge meets an exception to Resolution No. 88-63, which precludes waters with TDS levels greater than 3,000 mg/L from the MUN designation.

Table 5 presents the beneficial uses established by the Basin Plan for the coastal waters between Soquel Point and the Salinas River.

Table 5. Receiving Water Beneficial Uses Established by the Basin Plan

Discharge Point	Receiving Water	Beneficial Uses
001	Pacific Ocean between Soquel Point and the Salinas River	• Water Contact (REC-1) and Non-Contact Recreation (REC-2) • Industrial Service Supply (IND) • Navigation (NAV) • Shellfish Harvesting (SHELL) • Commercial and Sport Fishing (COMM) • Marine Habitat (MAR) • Rare, Threatened, or Endangered Species (RARE) • Wildlife Habitat (WILD)

I. California Ocean Plan. The State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21, 2005, and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the Pacific Ocean. The Ocean Plan identifies the following beneficial uses of ocean waters of the State.

Table 6. Receiving Water Beneficial Uses Established by the Ocean Plan

Discharge Point	Receiving Water	Beneficial Uses
001	Pacific Ocean	• Industrial Water Supply • Water Contact and Non-Contact Recreation, including Aesthetic Enjoyment • Navigation • Commercial and Sport Fishing • Rare and Endangered Species • Marine Habitat • Mariculture • Fish Migration • Fish Spawning and Shellfish Harvesting • Preservation of Designated Areas of Special Biological Significance

In order to protect the beneficial uses, the Ocean Plan establishes water quality objectives and a program of implementation. Requirements of this Order implement the Ocean Plan.

J. Alaska Rule. On March 30, 2000, USEPA revised its regulation that specifies when new and revised state and tribal water quality standards (WQS) become effective for CWA purposes. [65 Fed. Reg. 24641 (April 27, 2000), codified at 40 CFR 131.21] Under the revised regulation (also known as the Alaska Rule), new and revised standards submitted to USEPA after May 30, 2000 must be approved by USEPA before being used for CWA purposes. The final rule also provides that standards already in effect and submitted to USEPA by May 30, 2000, may be used for CWA purposes, whether or not approved by USEPA.

K. Stringency of Requirements for Individual Pollutants. This Order contains both technology-based and water quality-based effluent limitations (WQBELs) for individual pollutants. As discussed in section IV.B. of the Fact Sheet, the Order establishes

technology-based effluent limitations for total suspended solids (TSS), settleable solids, oil and grease, turbidity, and pH for Discharge Point 001. These technology-based limitations implement the minimum, applicable federal technology-based requirements. The Order also contains effluent limitations in addition to the minimum federal technology-based requirements, necessary to meet applicable water quality standards. These limitations are not more stringent than required by the CWA.

WQBELs have been scientifically derived to implement water quality objectives that protect beneficial uses. Both the beneficial uses and the water quality objectives have been approved pursuant to federal law and are the applicable federal water quality standards. For Discharge Point 001, procedures for calculating individual WQBELs are based on the Ocean Plan, which was approved by USEPA on February 14, 2006. All beneficial uses and water quality objectives contained in the Ocean Plan were approved under state law and submitted to and approved by USEPA prior to May 30, 2000. Any water quality objectives and beneficial uses submitted to USEPA prior to May 30, 2000, but not approved by USEPA before that date, are nonetheless "applicable water quality standards for purposes of the CWA" pursuant to NPDES regulations at 40 CFR 131.21 (c) (1).

Collectively, this Order's restrictions on individual pollutants are no more stringent than required to implement the requirements of the CWA.

L. Antidegradation Policy. NPDES regulations at 40 CFR 131.12 require that State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16, which incorporates the requirements of the federal antidegradation policy. Resolution No. 68-16 requires that existing water quality be maintained unless degradation is justified based on specific findings. As discussed in detail in the Fact Sheet, the permitted discharge is consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16.

M. Anti-Backsliding Requirements. CWA sections 402 (o) (2) and 303 (d) (4) and NPDES regulations at 40 CFR 122.44 (l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require that effluent limitations in a reissued permit be as stringent as those in the previous permit, with some exceptions in which limitations may be relaxed. The requirements of this Order are consistent with the anti-backsliding provisions of the Clean Water Act and with applicable NPDES regulations that pertain to backsliding.

N. Endangered Species Act. This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 - 2097) or the federal Endangered Species Act (16 U.S.C.A. sections 1531 - 1544). This Order requires compliance with effluent limits, receiving water limits, and other requirements to protect the beneficial uses of waters of the State. The Discharger is responsible for meeting all requirements of the State and federal acts pertaining to endangered species.

O. Monitoring and Reporting. NPDES regulations at 40 CFR 122.48 require that all NPDES permits specify requirements for recording and reporting of monitoring results. California Water Code sections 13267 and 13383 authorize the Regional Water Boards to require technical and monitoring reports. The Monitoring and Reporting Plan (MRP), which is provided as Attachment E of this Order, establishes monitoring and reporting requirements to implement federal and State requirements.

P. Standard and Special Provisions. Standard Provisions, which apply to all NPDES discharges pursuant to NPDES regulations at 40 CFR 122.41 - 122.42, and which must be included in every NPDES permit, are provided in Attachment D. The Regional Water Board has also included in this Order special provisions applicable to the Discharger. A rationale for the special provisions contained in this Order is provided in the attached Fact Sheet (Attachment F).

Q. Provisions and Requirements Implementing State Law. The provisions and requirements in subsections IV. B, IV. C, and V. B of this Order are included to implement State law only. These provisions and requirements are not required or authorized under the federal CWA; consequently, violations of these provisions and requirements are not subject to the enforcement remedies that are available for NPDES violations.

R. Consideration of Public Comment. The Regional Water Board, in a public meeting, heard and considered all comments pertaining to the discharge. Details of the public hearing are provided in the Fact Sheet of this Order.

III. DISCHARGE PROHIBITIONS

A. Discharge of wastewater to the Pacific Ocean (Monterey Bay) at a location other than as described by this Order at 36º, 48', 08" N. Latitude, 121º, 47', 29" W. Longitude is prohibited.

B. Discharge of any waste or discharges in any manner other than as described by this Order is prohibited.

C. Discharges to Monterey Bay and within the Monterey Bay National Marine Sanctuary, which are authorized by this Order, shall not exceed the following daily discharge rates during each operational phase, as those operational phases are described by this Order.

Operational Phase	Daily Average Discharge (mgd)	Maximum Daily Discharge (mgd)
1	0.04	0.05
2	24	25
3	56	60

D. The discharge of any radiological, chemical, or biological warfare agent or high level radioactive waste to the Pacific Ocean and within the Monterey Bay National Marine Sanctuary is prohibited.

E. Federal law prohibits the discharge of sludge by pipeline to the Pacific Ocean and within the Monterey Bay National Marine Sanctuary. The discharge of municipal or industrial

waste sludge or other material with high solids content directly to the Ocean or into a waste stream that discharges to the Ocean is prohibited.

F. "Overflow" or "Bypass" of any wastewater other than spent ocean water is prohibited.

G. The discharge of domestic wastewater at Discharge Point 001 is prohibited.

H. The discharge of storm water at Discharge Point 001, pursuant to the limitations and conditions of this Order, is prohibited.

I. The discharge of chemical additives not described herein, including, but not limited to, scale inhibitors, chelants, cleaning compounds, and any organic chemicals (except carbon dioxide and carbonate ion) is prohibited.

J. The discharge of wastewater containing added coloration is prohibited.

K. Wastewater discharged pursuant to this Order shall not be discharged to receiving water at a temperature that adversely affects beneficial uses.

IV. EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

A. Effluent Limitations – Discharge Point No. 001

1. Final Effluent Limitations – Discharge Point No. 001

a. The Discharger shall maintain compliance with the following effluent limitations at Discharge Point 001 at all times, with compliance measured at Monitoring Location EFF-001 as described in the attached MRP (Attachment E).

Table 7. Effluent Limitations for Conventional Pollutants

Parameter	Units	Monthly 30-Day Average	Weekly 7-Day Average	Instantaneous Maximum
Oil and Grease	mg/L	25	40	75
Settleable Solids	mL/L	1.0	1.5	3.0
TSS	mg/L	60 [1]	---	---
Turbidity	NTU	75	100	225
pH	s.u.	Within 6.0 to 9.0 at all times		

[1] Discharger shall, as a 30-day average, remove 75% of suspended solids from the influent stream before discharging wastewaters to the ocean, except that the effluent limitation to be met shall not be lower then 60 mg/L.

b. The Discharger shall maintain compliance with the following effluent limitations for toxic pollutants at Discharge Point 001, with compliance measured at Monitoring Location EFF-001 as described in the attached MRP (Attachment E).

Table 8. Protection of Marine Aquatic Life

Parameter	Units	6-Month Median [5]	Daily Maximum [6]	Instantaneous Maximum [7]
Arsenic	µg/L	173	989	2621

Phase 1	lb/day	0.072	0.41	1.1
Phase 2	lb/day	36	206	546
Phase 3	lb/day	87	495	1312
Cadmium	µg/L	34	136	340
Phase 1	lb/day	0.014	0.057	0.14
Phase 2	lb/day	7.1	28	71
Phase 3	lb/day	17	68	170
Chromium(Hex) [1]	µg/L	68	272	680
Phase 1	lb/day	0.028	0.11	0.28
Phase 2	lb/day	14	57	142
Phase 3	lb/day	34	136	340
Copper	µg/L	36	342	954
Phase 1	lb/day	0.015	0.14	0.4
Phase 2	lb/day	7.5	71	199
Phase 3	lb/day	18	171	477
Lead	µg/L	68	272	680
Phase 1	lb/day	0.028	0.11	0.28
Phase 2	lb/day	14	57	142
Phase 3	lb/day	34	136	340
Mercury	µg/L	1.3	5.4	14
Phase 1	lb/day	0.00056	0.0023	0.0057
Phase 2	lb/day	0.28	1.1	2.8
Phase 3	lb/day	0.67	2.7	6.8
Nickel	µg/L	170	680	1700
Phase 1	lb/day	0.071	0.28	0.71
Phase 2	lb/day	35	142	354
Phase 3	lb/day	85	340	851
Selenium	µg/L	510	2040	5100
Phase 1	lb/day	0.21	0.85	2.1
Phase 2	lb/day	106	425	1063
Phase 3	lb/day	255	1021	2552
Silver	µg/L	19	90	233
Phase 1	lb/day	0.0077	0.037	0.1
Phase 2	lb/day	3.9	19	49
Phase 3	lb/day	9.3	45	116
Zinc	µg/L	416	2456	6536
Phase 1	lb/day	0.17	1.0	2.7
Phase 2	lb/day	87	512	1363
Phase 3	lb/day	208	1229	3271
Cyanide [2]	µg/L	34	136	340
Phase 1	lb/day	0.014	0.057	0.14
Phase 2	lb/day	7.1	28	71
Phase 3	lb/day	17	68	170
Total Chlorine Residual [3]	µg/L	68	272	2040
Phase 1	lb/day	0.028	0.11	0.85
Phase 2	lb/day	14	57	425
Phase 3	lb/day	34	136	1021

Ammonia(as N)	µg/L	20400	81600	204000
Phase 1	lb/day	8.5	34	85
Phase 2	lb/day	4253	17014	42534
Phase 3	lb/day	10208	40833	102082
Chronic Toxicity [4], [8]	TUc	-------	34	-------
Phenolic Compounds (non-chlorinated)	µg/L	1020	4080	10200
Phase 1	lb/day	0.43	1.7	4.3
Phase 2	lb/day	213	851	2127
Phase 3	lb/day	510	2042	5104
Chlorinated Phenolics	µg/L	34	136	340
Phase 1	lb/day	0.014	0.057	0.14
Phase 2	lb/day	7.1	28	71
Phase 3	lb/day	17	68	170
Endosulfan	µg/L	0.31	0.61	0.92
Phase 1	lb/day	0.00013	0.00026	0.00038
Phase 2	lb/day	0.064	0.13	0.19
Phase 3	lb/day	0.15	0.31	0.46
Endrin	µg/L	0.068	0.14	0.2
Phase 1	lb/day	0.000028	0.000057	0.000085
Phase 2	lb/day	0.014	0.028	0.043
Phase 3	lb/day	0.034	0.068	0.1
HCH [9]	µg/L	0.14	0.27	0.41
Phase 1	lb/day	0.000057	0.00011	0.00017
Phase 2	lb/day	0.028	0.057	0.085
Phase 3	lb/day	0.068	0.14	0.2
Radioactivity	Not to exceed limits specified in Title 17, Division 5, Chapter 4, Group 3, Article 3, Section 32069 of the California Code of Regulations.			

[1] Discharger may, at its option, meet this limitation as a total chromium limitation.

[2] If the Discharger can demonstrate to the satisfaction of the Regional Water Board (subject to USEPA approval) that an analytical method is available to reliably distinguish between strongly and weakly complexed cyanide, effluent limitations for cyanide may be met by the combined measurement of free cyanide, simple alkali metal cyanides, and weakly complexed organometallic cyanide complexes. In order for the analytical method to be acceptable, the recovery of free cyanide from metal complexes must be comparable to that achieved by the approved method in 40 CFR PART 136, as revised May 14, 1999.

[3] Water quality objectives for total chlorine residual applying to intermittent discharges not exceeding two hours shall be determined using the following equation:

logy=-0.43(logx)+1.8 where: y = the water quality objective (in µg/L) to apply when chlorine is being discharged; and

x = the duration of uninterrupted chlorine discharge in minutes.

The applicable effluent limitation must then be determined using Equation No. 1 from the Ocean Plan.

[4] The Discharger shall conduct chronic toxicity testing if the minimum initial dilution of the effluent falls below 100:1 at the edge of the mixing zone. As the minimum initial dilution for the Moss Landing Cement Company Ocean Outfall is currently calculated as 33:1, chronic toxicity testing is required at this time.

[5] The six-month median shall apply as a moving median of daily values for any 180-day period in which daily values represent flow weighted average concentrations within a 24-hour period. For intermittent discharges, the daily value shall be considered to equal zero for days on which no discharge occurred. The six-month median limit on daily mass emissions shall be determined using the six-month median effluent concentration

as Ce and the observed flow rate Q in millions of gallons per day (each variable referring to Equation 3 of the Ocean Plan).

[6] The daily maximum shall apply to flow weighted 24-hour composite samples. The daily maximum mass emission shall be determined using the daily maximum effluent concentration limit as Ce and the observed flow rate Q in millions of gallons per day (each variable referring to Equation 3 of the Ocean Plan).

[7] The instantaneous maximum shall apply to grab sample determinations.

[8] This parameter shall be used to measure the acceptability of waters for supporting a healthy marine biota until improved methods are developed to evaluate biological response.

Chronic Toxicity - Expressed as Toxic Units Chronic (TUc)

$$TUc = \frac{100}{NOEL}$$

No Observed Effect Level (NOEL) - The NOEL is expressed as the maximum percent effluent or receiving water that causes no observable effect on a test organism, as determined by the result of a critical life stage toxicity test listed in Appendix II.

[9] See Definitions (Attachment A)

Table 9. Protection of Human Health - Non-Carcinogens

Parameter	Units	30-Day Average
Acrolein	µg/L	7480
Phase 1	lb/day	3.1
Phase 2	lb/day	1560
Phase 3	lb/day	3743
Antimony	µg/L	40800
Phase 1	lb/day	17
Phase 2	lb/day	8507
Phase 3	lb/day	20416
Bis(2-Chloroethoxy)Methane	µg/L	150
Phase 1	lb/day	0.062
Phase 2	lb/day	31
Phase 3	lb/day	75
Bis(2-Chloroisopropyl)Ether	µg/L	40800
Phase 1	lb/day	17
Phase 2	lb/day	8507
Phase 3	lb/day	20416
Chlorobenzene	µg/L	19380
Phase 1	lb/day	8.1
Phase 2	lb/day	4041
Phase 3	lb/day	9698
Chromium (III)	µg/L	6460000
Phase 1	lb/day	2694
Phase 2	lb/day	1346910
Phase 3	lb/day	3232584
Di-n-Butyl Phthalate	µg/L	119000
Phase 1	lb/day	50
Phase 2	lb/day	24812
Phase 3	lb/day	59548
Dichlorobenzenes [1]	µg/L	173400
Phase 1	lb/day	72
Phase 2	lb/day	36154

Phase 3	lb/day	86769
Diethyl Phthalate	µg/L	1122000
Phase 1	lb/day	468
Phase 2	lb/day	233937
Phase 3	lb/day	561449
Dimethyl Phthalate	µg/L	27880000
Phase 1	lb/day	11626
Phase 2	lb/day	5812980
Phase 3	lb/day	13951152
2-Methyl-4,6-Dinitrophenol	µg/L	7480
Phase 1	lb/day	3.1
Phase 2	lb/day	1560
Phase 3	lb/day	3743
2,4-Dinitrophenol	µg/L	136
Phase 1	lb/day	0.057
Phase 2	lb/day	28
Phase 3	lb/day	68
Ethylbenzene	µg/L	139400
Phase 1	lb/day	58
Phase 2	lb/day	29065
Phase 3	lb/day	69756
Fluoranthene	µg/L	510
Phase 1	lb/day	0.21
Phase 2	lb/day	106
Phase 3	lb/day	255
Hexachlorocyclopentadiene	µg/L	1972
Phase 1	lb/day	0.82
Phase 2	lb/day	411
Phase 3	lb/day	987
Nitrobenzene	µg/L	167
Phase 1	lb/day	0.069
Phase 2	lb/day	35
Phase 3	lb/day	83
Thallium	µg/L	68
Phase 1	lb/day	0.028
Phase 2	lb/day	14
Phase 3	lb/day	34
Toluene	µg/L	2890000
Phase 1	lb/day	1205
Phase 2	lb/day	602565
Phase 3	lb/day	1446156
Tributyltin	µg/L	0.048
Phase 1	lb/day	0.00002
Phase 2	lb/day	0.0099
Phase 3	lb/day	0.024
1,1,1-Trichloroethane	µg/L	18360000
Phase 1	lb/day	7656
Phase 2	lb/day	3828060

Phase 3	lb/day	9187344

Table 10. Protection of Human Health – Carcinogens

Parameter	Units	30-Day Average
Acrylonitrile	µg/L	3.4
Phase 1	lb/day	0.0014
Phase 2	lb/day	0.71
Phase 3	lb/day	1.7
Aldrin	µg/L	0.00075
Phase 1	lb/day	0.00000031
Phase 2	lb/day	0.00016
Phase 3	lb/day	0.00037
Benzene	µg/L	201
Phase 1	lb/day	0.084
Phase 2	lb/day	42
Phase 3	lb/day	100
Benzidine	µg/L	0.0023
Phase 1	lb/day	0.00000098
Phase 2	lb/day	0.00049
Phase 3	lb/day	0.0012
Beryllium	µg/L	1.1
Phase 1	lb/day	0.00047
Phase 2	lb/day	0.23
Phase 3	lb/day	0.56
Bis(2-Chloroethyl)Ether	µg/L	1.5
Phase 1	lb/day	0.00064
Phase 2	lb/day	0.32
Phase 3	lb/day	0.77
Bis(2-Ethylhexyl)Phthalate	µg/L	119
Phase 1	lb/day	0.05
Phase 2	lb/day	25
Phase 3	lb/day	60
Carbon Tetrachloride	µg/L	31
Phase 1	lb/day	0.013
Phase 2	lb/day	6.4
Phase 3	lb/day	15
Chlordane [1]	µg/L	0.00078
Phase 1	lb/day	0.00000033
Phase 2	lb/day	0.00016
Phase 3	lb/day	0.00039
Chlorodibromomethane	µg/L	292
Phase 1	lb/day	0.12
Phase 2	lb/day	61
Phase 3	lb/day	146
Chloroform	µg/L	4420
Phase 1	lb/day	1.8

Phase 2	lb/day	922
Phase 3	lb/day	2212
DDT (total) [1]	µg/L	0.0058
Phase 1	lb/day	0.0000024
Phase 2	lb/day	0.0012
Phase 3	lb/day	0.003
1,4 Dichlorobenzene	µg/L	612
Phase 1	lb/day	0.26
Phase 2	lb/day	128
Phase 3	lb/day	306
3,3'-Dichlorobenzidine	µg/L	0.28
Phase 1	lb/day	0.00011
Phase 2	lb/day	0.057
Phase 3	lb/day	0.14
1,2-Dichloroethane	µg/L	952
Phase 1	lb/day	0.4
Phase 2	lb/day	198
Phase 3	lb/day	476
1,1-Dichloroethylene	µg/L	31
Phase 1	lb/day	0.013
Phase 2	lb/day	6.4
Phase 3	lb/day	15
Dichlorobromomethane	µg/L	211
Phase 1	lb/day	0.088
Phase 2	lb/day	44
Phase 3	lb/day	105
Methylene Chloride	µg/L	15300
Phase 1	lb/day	6.4
Phase 2	lb/day	3190
Phase 3	lb/day	7656
1,3-Dichloropropylene	µg/L	303
Phase 1	lb/day	0.13
Phase 2	lb/day	63
Phase 3	lb/day	151
Dieldrin	µg/L	0.0014
Phase 1	lb/day	0.00000057
Phase 2	lb/day	0.00028
Phase 3	lb/day	0.00068
2,4-Dinitrotoluene	µg/L	88
Phase 1	lb/day	0.037
Phase 2	lb/day	18
Phase 3	lb/day	44
1,2-Diphenylhydrazine	µg/L	5.4
Phase 1	lb/day	0.0023
Phase 2	lb/day	1.1
Phase 3	lb/day	2.7
Halomethanes [1]	µg/L	4420

Phase 1	lb/day	1.84
Phase 2	lb/day	922
Phase 3	lb/day	2212
Heptachlor	µg/L	0.0017
Phase 1	lb/day	0.00000071
Phase 2	lb/day	0.00035
Phase 3	lb/day	0.00085
Heptachlor Epoxide	µg/L	0.00068
Phase 1	lb/day	0.00000028
Phase 2	lb/day	0.00014
Phase 3	lb/day	0.00034
Hexachlorobenzene	µg/L	0.0071
Phase 1	lb/day	0.000003
Phase 2	lb/day	0.0015
Phase 3	lb/day	0.0036
Hexachlorobutadiene	µg/L	476
Phase 1	lb/day	0.2
Phase 2	lb/day	99
Phase 3	lb/day	238
Hexachloroethane	µg/L	85
Phase 1	lb/day	0.035
Phase 2	lb/day	18
Phase 3	lb/day	43
Isophorone	µg/L	24820
Phase 1	lb/day	10
Phase 2	lb/day	5175
Phase 3	lb/day	12420
N-Nitrosodimethylamine	µg/L	248
Phase 1	lb/day	0.1
Phase 2	lb/day	52
Phase 3	lb/day	124
N-Nitrosodi-n-Propylamine	µg/L	13
Phase 1	lb/day	0.0054
Phase 2	lb/day	2.7
Phase 3	lb/day	6.5
N-Nitrosodiphenylamine	µg/L	85
Phase 1	lb/day	0.035
Phase 2	lb/day	18
Phase 3	lb/day	43
PAHs (total) [1]	µg/L	0.3
Phase 1	lb/day	0.00012
Phase 2	lb/day	0.062
Phase 3	lb/day	0.15
PCBs [1]	µg/L	0.00065
Phase 1	lb/day	0.00000027
Phase 2	lb/day	0.00013
Phase 3	lb/day	0.00032

TCDD Equivalents [1]	µg/L	0.00000013
Phase 1	lb/day	0.000000000055
Phase 2	lb/day	0.000000028
Phase 3	lb/day	0.000000066
1,1,2,2-Tetrachloroethane	µg/L	78
Phase 1	lb/day	0.033
Phase 2	lb/day	16
Phase 3	lb/day	39
Tetrachloroethylene	µg/L	68
Phase 1	lb/day	0.028
Phase 2	lb/day	14
Phase 3	lb/day	34
Toxaphene	µg/L	0.0071
Phase 1	lb/day	0.000003
Phase 2	lb/day	0.0015
Phase 3	lb/day	0.0036
Trichloroethylene	µg/L	918
Phase 1	lb/day	0.38
Phase 2	lb/day	191
Phase 3	lb/day	459
1,1,2-Trichloroethane	µg/L	320
Phase 1	lb/day	0.13
Phase 2	lb/day	67
Phase 3	lb/day	160
2,4,6-Trichlorophenol	µg/L	9.9
Phase 1	lb/day	0.0041
Phase 2	lb/day	2.1
Phase 3	lb/day	4.9
Vinyl Chloride	µg/L	1224
Phase 1	lb/day	0.51
Phase 2	lb/day	255
Phase 3	lb/day	612

[1] See definitions (Attachment A)

c. Initial Dilution: The minimum initial dilution at the point of discharge to Monterey Bay and within the Monterey Bay National Marine Sanctuary shall not be less than 33 to 1 (seawater to effluent) at any time.

2. Interim Effluent Limitations

This section of the standardized permit template is not applicable to this facility.

B. Land Discharge Specifications

This section of the standardized permit template is not applicable to this facility.

C. Reclamation Specifications

This section of the standardized permit template is not applicable to this facility.

V. RECEIVING WATER LIMITATIONS

A. Surface Water Limitations

The following receiving water limitations are based on water quality objectives contained in the Ocean Plan and are a required part of this Order. Compliance shall be determined from samples collected at stations representative of the area within the waste field where initial dilution is completed.

1. Within a zone bounded by the shoreline and a distance of 1,000 feet from the shoreline or the 30-foot depth contour, whichever is further from the shoreline, and in areas outside this zone used for water contact sports, as determined by the Regional Water Board, but including all kelp beds, the following bacteriological objectives shall be maintained throughout the water column.

   30-Day Geometric Mean – The following standards are based on the geometric mean of the five most recent samples from each receiving water monitoring location.

   a. Total coliform density shall not exceed 1,000 per 100 mL, and

   b. Fecal coliform density shall not exceed 200 per 100 mL, and

   c. Enterococcus density shall not exceed 35 per 100 mL.

   Single Sample maximum;

   a. Total coliform density shall not exceed 10,000 per 100 ml, and

   b. Fecal coliform density shall not exceed 400 per 100 mL, and

   c. Enterococcus density shall not exceed 104 per 100 mL, and

   d. Total coliform density shall not exceed 1,000 per 100 mL when the fecal coliform to total coliform ratio exceeds 0.1.

2. At all areas where shellfish may be harvested for human consumption, as determined by the Regional Water Board, the following bacteriological objectives shall be maintained throughout the water column:

   a. The median total coliform density shall not exceed 70 organisms per 100 mLs, and in not more than 10 percent of samples shall coliform density exceed 230 organisms per 100 mLs.

3. Floating particulates and grease and oil shall not be visible.

4. The discharge of waste shall not cause aesthetically undesirable discoloration of the ocean surface.

5. Natural light shall not be significantly reduced at any point outside the initial dilution zone as the result of the discharge of waste.

6. The rate of deposition of inert solids and the characteristics of inert solids in ocean sediments shall not be changed such that benthic communities are degraded.

7. The dissolved oxygen concentration shall not at any time be depressed more than 10 percent from that which occurs naturally, as a result of the discharge of oxygen demanding waste material.

8. The pH shall not be changed at any time more than 0.2 units from that which occurs naturally.

9. The dissolved sulfide concentration of waters in and near sediments shall not be significantly increased above that present under natural conditions.

10. The concentration of substances set forth in Chapter IV, Table B of the Ocean Plan in marine sediments shall not be increased to levels that would degrade indigenous biota.

11. The concentration of organic materials in marine sediments shall not be increased to levels that would degrade marine life.

12. Nutrient levels shall not cause objectionable aquatic growths or degrade indigenous biota.

13. Discharges shall not cause exceedances of water quality objectives for ocean waters of the State established in Table B of the Ocean Plan.

14. Marine communities, including vertebrate, invertebrate and plant species, shall not be degraded.

15. The natural taste, odor, and color of fish, shellfish, or other marine resources used for human consumption shall not be altered.

16. The concentration of organic materials in fish, shellfish, or other marine resources used for human consumption shall not bioaccumulate to levels that are harmful to human health.

17. Discharge of radioactive waste shall not degrade marine life.

B. Groundwater Limitations

Activities at the facility shall not cause exceedance or deviation from the following water quality objectives for groundwater established by the Basin Plan.

1. Groundwater shall not contain taste or odor producing substances in concentrations that adversely affect beneficial uses.

2. Radionuclides shall not be present in concentrations that are deleterious to human, plant, animal, or aquatic life; or result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life.

VI. PROVISIONS

A. Standard Provisions

1. The Discharger shall comply with all Standard Provisions included in Attachment D of this Order.

2. The Discharger shall comply with the following provision:

a. Prior to making any change in the point of discharge, place of use, or purpose of use of treated wastewater that results in a decrease in flow in any portion of an inland watercourse, the Discharger must file a petition with the State Water Board, Division of Water Rights, and receive approval for such a change. (Wat. Code § 1211.)

B. Monitoring and Reporting Program Requirements

The Discharger shall comply with the Monitoring and Reporting Program (MRP), and future revisions thereto, in Attachment E of this Order. All monitoring shall be conducted according to 40 CFR Part 136, *Guidelines Establishing Test Procedures for Analysis of Pollutants.*

C. Special Provisions

1. Reopener Provisions

a. This permit may be reopened and modified in accordance with NPDES regulations at 40 CFR 122 and 124, as necessary, to include additional conditions or limitations based on newly available information or to implement any U.S. EPA approved, new, State water quality objective.

2. Special Studies, Technical Reports and Additional Monitoring Requirements

a. Toxicity Reduction Requirements

If the discharge consistently exceeds an effluent limitation for toxicity specified by Section IV of this Order, the Discharger shall conduct a Toxicity Reduction Evaluation (TRE) in accordance with the Discharger's TRE Workplan.

A TRE is a study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the

reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE. A TIE is a set of procedures to identify the specific chemical(s) responsible for toxicity. These procedures are performed in three phases – characterization, identification, and confirmation using aquatic organism toxicity tests. The TRE shall include all reasonable steps to identify the source of toxicity. The Discharger shall take all reasonable steps to reduce toxicity to the required level once the source of toxicity is identified.

The Discharger shall maintain a TRE Workplan which describes steps that the Discharger intends to follow in the event that a toxicity effluent limitation established by this Order is exceeded in the discharge. The Workplan shall be prepared in accordance with current technical guidance and reference material, including EPA/600/2-88-070 (for industrial discharges) or EPA/600/2-88/062 (for municipal discharges), and shall include, at a minimum:

- Actions that will be taken to investigate/identify the causes/sources of toxicity,
- Actions that will be evaluated to mitigate the impact of the discharge, to correct the non-compliance, and/or to prevent the recurrence of acute or chronic toxicity (this list of action steps may be expanded, if a TRE is undertaken), and
- A schedule under which these actions will be implemented.

When monitoring measures toxicity in the effluent above a limitation established by this Order, the Discharger shall resample immediately, if the discharge is continuing, and retest for whole effluent toxicity. Results of an initial failed test and results of subsequent monitoring shall be reported to the Executive Officer (EO) as soon as possible following receipt of monitoring results. The EO will determine whether to initiate enforcement action, whether to require the Discharger to implement a TRE, or to implement other measures. The Discharger shall conduct a TRE giving due consideration to guidance provided by the USEPA's Toxicity Reduction Procedures, Phases 1, 2, and 3 (EPA document nos. EPA 600/3-88/034, 600/3-88/035, and 600/3-88/036, respectively). A TRE, if necessary, shall be conducted in accordance with the following schedule:

Table 11. Toxicity Reduction Evaluation Schedule

Action Step	When Required
Take all reasonable measures necessary to immediately reduce toxicity, where the source is known.	Within 24 hours of identification of noncompliance.
Initiate TRE in accordance with Workplan.	Within 7 days of notification by EO.
Conduct the TRE following the procedures in the	Within the period specified in the Workplan

Workplan.	(not to exceed one year, without an approved Workplan).
Submit the results of the TRE, including summary of findings, required corrective action, and all results and data.	Within 60 days of completion of the TRE.
Implement corrective actions to meet Permit limits and conditions.	To be determined by the EO.

3. Best Management Practices and Pollution Prevention

a. Pollutant Minimization Goal

The goal of the Pollutant Minimization Program is to reduce potential sources of Ocean Plan Table B toxic pollutants through pollutant minimization (control) strategies, including pollution prevention measures, to maintain effluent concentrations at or below the effluent limitation.

b. Determining the Need for a Pollutant Minimization Program

(1) The Discharger shall develop and implement a Pollutant Minimization Program if:

(a) A calculated effluent limitation is less than the reported Minimum Level,

(b) The concentration of the pollutant is reported as DNQ, and

(c) There is evidence showing that the pollutant is present in the effluent above the calculated effluent limitation. Such evidence may include: health advisories for fish consumption; presence of whole effluent toxicity; results of benthic or aquatic organism tissue sampling; sample results from analytical methods more sensitive than methods included in the permit; and the concentration of the pollutant is reported as DNQ and the effluent limitation is less than the MDL.

(2) Alternatively, the Discharger shall develop and implement a Pollutant Minimization Program if:

(a) A calculated effluent limitation is less than the Method Detection Limit (MDL),

(b) The concentration of the pollutant is reported as ND, and

(c) There is evidence showing that the pollutant is present in the effluent above the calculated effluent limitation. Such evidence may include: health advisories for fish consumption; presence of whole effluent toxicity; results of benthic or aquatic organism tissue sampling; sample results from analytical methods more sensitive than methods included in the permit; and the concentration of the pollutant is reported as DNQ and the effluent limitation is less than the MDL.

c. Elements of a Pollutant Minimization Program

A Pollutant Minimization Program shall include actions and submittals acceptable to the Regional Water Board including, but not limited to, the following.

(1) An annual review and semiannual monitoring of potential sources of the reportable pollutant, which may include fish tissue monitoring and other bio-uptake sampling;

(2) Quarterly monitoring for the reportable pollutant in influent to the wastewater treatment system;

(3) Submittal of a control strategy designed to proceed toward the goal of maintaining concentrations of the reportable priority pollutant in the effluent at or below the calculated effluent limitation;

(4) Implementation of appropriate cost-effective control measures for the pollutant, consistent with the control strategy;

(5) An annual status report that shall be sent to the Executive Officer that includes:

(i) All Pollutant Minimization Program monitoring results for the previous year;

(ii) A list of potential sources of the reportable pollutant;

(iii) A summary of all actions taken in accordance with the control strategy; and

(iv) A description of actions to be taken in the following year.

4. Construction, Operation and Maintenance Specification

This section of the standardized permit template is not applicable to the Facility.

5. Special Provisions for Municipal Facilities (POTWs Only)

This section of the standardized permit template is not applicable to the Facility.

6. Other Special Provisions

a. **Discharges of Storm Water.** For the control of storm water discharged from the site, the Discharger shall seek authorization to discharge under and meet the requirements of the State Water Resources Control Board's Water Quality Order 97-03-DWQ, NPDES General Permit No. CAS000001, *Waste Discharge Requirements for Discharges of Storm Water Associated with Industrial Activities Excluding Construction Activities.*

b. **Phase 1 Discharge Characterization Study.** In addition to monitoring required by section IV. A of the Monitoring and Reporting Plan (Attachment E), in order to more fully characterize the discharge, the Discharger shall perform the following monitoring of influent and effluent at Discharge Point 001 during Phase 1 of operations. Monitoring results for the entire Phase 1 period of operations shall be summarized and submitted to the Regional Water Board within 30 days of completion of Phase 1 operations. The Discharger shall not initiate discharges under Phase 2 until the Regional Water Board Executive Officer has reviewed results of this Phase 1 Discharge Characterization Study and has confirmed in writing that the character of the discharge is as contemplated by this Order and is therefore properly regulated by this Order. If monitoring requirements established for this Phase 1 Discharge Characterization Study are duplicated in section IV. A of the Monitoring and Reporting Plan, monitoring performed for this Phase 1 Discharge Characterization Study shall satisfy the requirements of the Monitoring and Reporting Plan.

Table 12. Phase 1 Discharge Characterization Monitoring Requirements

Parameter	Units	Sample Type	Sample Location	Minimum Sampling Frequency
Flow	mgd	Metered	Eff-001	Daily
Specific Conductivity	µmhos/cm	Grab	Inf-001 Eff-001	Daily
Total Dissolved Solids (TDS)	mg/L	Grab	Inf-001 Eff-001	Weekly
Settleable Solids	ml/L	Grab	Inf-001 Eff-001	Weekly
Total Suspended Solids (TSS)	mg/L	Grab	Inf-001 Eff-001	Weekly
Turbidity	NTU	Grab	Inf-001 Eff-001	Daily
pH	Units	Grab	Inf-001 Eff-001	Daily
Chronic Toxicity [1]	TUc	Grab	Inf-001 Eff-001	Monthly
Ocean Plan Table B Metals [2],[4]	µg/L	24-hr composite	Inf-001 Eff-001	Monthly
Ocean Plan Table B Pollutants [3], [4]	µg/L	24-hr composite	Inf-001 Eff-001	Monthly
1,3-Butadiene [5]	µg/L	24-hr composite	Inf-001 Eff-001	Monthly
Acetaldehyde [5]	µg/L	24-hr composite	Inf-001 Eff-001	Monthly
Formaldehyde [5]	µg/L	24-hr composite	Inf-001 Eff-001	Monthly
Naphthalene [5]	µg/L	24-hr composite	Inf-001 Eff-001	Monthly
Propylene Oxide [5]	µg/L	24-hr composite	Inf-001 Eff-001	Monthly

Parameter	Units	Sample Type	Sample Location	Minimum Sampling Frequency
Xylenes [5]	µg/L	24-hr composite	Inf-001 Eff-001	Monthly
Total Organic Carbon (TOC) [5]	µg/L	24-hr composite	Inf-001 Eff-001	Monthly

[1] Whole effluent chronic toxicity monitoring shall be conducted according to the requirements established in section V. of this Monitoring and Reporting Plan; however, tests shall be performed with a vertebrate, an invertebrate, and an aquatic plant during each monitoring event performed for the Phase 1 Discharge Characterization Study.

[2] The metals with applicable water quality objectives established by Table B of the Ocean Plan (2005) – As, Cd, Cr^{+6}, Cu, Pb, Hg, Ni, Se, Ag, Zn.

[3] The pollutants, excluding radioactivity and acute toxicity, with applicable water quality objectives established by Table B of the Ocean Plan (2005). Monitoring for the Table B metals, which occurs quarterly, shall satisfy that portion (for the Table B metals) of this monitoring requirement.

[4] Analyses, compliance determination, and reporting for these pollutants shall adhere to applicable provisions of the Ocean Plan, including the Standard Monitoring Procedures presented in Appendix III of the Ocean Plan. The Discharger shall instruct its analytical laboratory to establish calibration standards so that the Minimum Levels (MLs) presented in Appendix II of the Ocean Plan are the lowest calibration standards. The Discharger and its analytical laboratory shall select MLs, which are below applicable water quality criteria of Table B; and when applicable water quality criteria are below all MLs, the Discharger and its analytical laboratory shall select the lowest ML.

[5] The analytical method selected for a parameter shall be the one that can measure the lowest detected limit for that parameter.

7. Compliance Schedules

This section of the standardized permit template is not applicable to the Facility.

VII. COMPLIANCE DETERMINATION

Compliance with the effluent limitations contained in Section IV of this Order will be determined as specified below:

A. General.

Compliance with effluent limitations for reportable pollutants shall be determined using sample reporting protocols defined in the MRP and Attachment A of this Order. For purposes of reporting and administrative enforcement by the Regional and State Water Boards, the Discharger shall be deemed out of compliance with effluent limitations if the concentration of the reportable pollutant in the monitoring sample is greater than the effluent limitation and greater than or equal to the reported Minimum Level (ML).

B. Multiple Sample Data.

When determining compliance with a measure of central tendency (arithmetic mean, geometric mean, median, etc.) of multiple sample analyses and the data set contains one or more reported determinations of “Detected, but Not Quantified” (DNQ) or “Not Detected” (ND), the Discharger shall compute the median in place of the arithmetic mean in accordance with the following procedure:

1. The data set shall be ranked from low to high, ranking the reported ND determinations lowest, DNQ determinations next, followed by quantified values (if any). The order of the individual ND or DNQ determinations is unimportant.

2. The median value of the data set shall be determined. If the data set has an odd number of data points, then the median is the middle value. If the data set has an even number of data points, then the median is the average of the two values around the middle unless one or both of the points are ND or DNQ, in which case the median value shall be the lower of the two data points where DNQ is lower than a value and ND is lower than DNQ.

ATTACHMENT A – DEFINITIONS, ACRONYMS, AND ABBREVIATIONS

Acute Toxicity:

a. Acute Toxicity (TUa)

Expressed in Toxic Units Acute (TUa)

$$TUa = \frac{100}{\text{96-hr LC}_{50\%}}$$

b. Lethal Concentration 50% (LC 50)

LC 50 (percent waste giving 50% survival of test organisms) shall be determined by static or continuous flow bioassay techniques using standard marine test species as specified in Ocean Plan Appendix III. If specific identifiable substances in wastewater can be demonstrated by the discharger as being rapidly rendered harmless upon discharge to the marine environment, but not as a result of dilution, the LC 50 may be determined after the test samples are adjusted to remove the influence of those substances.

When it is not possible to measure the 96-hour LC 50 due to greater than 50 percent survival of the test species in 100 percent waste, the toxicity concentration shall be calculated by the expression:

$$TUa = \frac{\log (100 - S)}{1.7}$$

where:

S = percentage survival in 100% waste. If S > 99, TUa shall be reported as zero.

Areas of Special Biological Significance (ASBS) are those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All Areas of Special Biological Significance are also classified as a subset of STATE WATER QUALITY PROTECTION AREAS.

Average Monthly Effluent Limitation (AMEL): The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.

Average Weekly Effluent Limitation (AWEL): The highest allowable average of daily discharges over a calendar week (Sunday through Saturday), calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week.

Chlordane shall mean the sum of chlordane-alpha, chlordane-gamma, chlordene-alpha, chlordene-gamma, nonachlor-alpha, nonachlor-gamma, and oxychlordane.

Chronic Toxicity: This parameter shall be used to measure the acceptability of waters for supporting a healthy marine biota until improved methods are developed to evaluate biological response.

a. Chronic Toxicity (TUc)

Expressed as Toxic Units Chronic (TUc)

$$TUc = \frac{100}{NOEL}$$

b. No Observed Effect Level (NOEL)

The NOEL is expressed as the maximum percent effluent or receiving water that causes no observable effect on a test organism, as determined by the result of a critical life stage toxicity test listed in Ocean Plan Appendix II.

Daily Discharge: Daily Discharge is defined as either: (1) the total mass of the constituent discharged over the calendar day (12:00 am through 11:59 pm) or any 24-hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g., concentration).

The daily discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day or other 24-hour period defined as a day) or by the arithmetic mean of analytical results from one or more grab samples taken over the course of the day.

For composite sampling, if 1 day is defined as a 24-hour period other than a calendar day, the analytical result for the 24-hour period will be considered as the result for the calendar day in which the 24-hour period ends.

DDT shall mean the sum of 4,4'DDT, 2,4'DDT, 4,4'DDE, 2,4'DDE, 4,4'DDD, and 2,4'DDD.

Degrade: Degradation shall be determined by comparison of the waste field and reference site(s) for characteristic species diversity, population density, contamination, growth anomalies, debility, or supplanting of normal species by undesirable plant and animal species. Degradation occurs if there are significant differences in any of three major biotic groups, namely, demersal fish, benthic invertebrates, or attached algae. Other groups may be evaluated where benthic species are not affected, or are not the only ones affected.

Detected, but Not Quantified (DNQ) are those sample results less than the reported Minimum Level, but greater than or equal to the laboratory's MDL.

Dichlorobenzenes shall mean the sum of 1,2- and 1,3-dichlorobenzene.

Downstream Ocean Waters shall mean waters downstream with respect to ocean currents.

Dredged Material: Any material excavated or dredged from the navigable waters of the United States, including material otherwise referred to as "spoil".

Enclosed Bays are indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between headlands or outermost harbor works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. This definition includes but is not limited to: Humboldt Bay, Bodega Harbor, Tomales Bay, Drakes Estero, San Francisco Bay, Morro Bay, Los Angeles Harbor, Upper and Lower Newport Bay, Mission Bay, and San Diego Bay.

Endosulfan shall mean the sum of endosulfan-alpha and -beta and endosulfan sulfate.

Estuaries and Coastal Lagoons are waters at the mouths of streams that serve as mixing zones for fresh and ocean waters during a major portion of the year. Mouths of streams that are temporarily separated from the ocean by sandbars shall be considered as estuaries. Estuarine waters will generally be considered to extend from a bay or the open ocean to the upstream limit of tidal action but may be considered to extend seaward if significant mixing of fresh and salt water occurs in the open coastal waters. The waters described by this definition include but are not limited to the Sacramento-San Joaquin Delta as defined by Section 12220 of the California Water Code, Suisun Bay, Carquinez Strait downstream to Carquinez Bridge, and appropriate areas of the Smith, Klamath, Mad, Eel, Noyo, and Russian Rivers.

Halomethanes shall mean the sum of bromoform, bromomethane (methyl bromide) and chloromethane (methyl chloride).

HCH shall mean the sum of the alpha, beta, gamma (lindane) and delta isomers of hexachlorocyclohexane.

Initial Dilution is the process that results in the rapid and irreversible turbulent mixing of wastewater with ocean water around the point of discharge.

For a submerged buoyant discharge, characteristic of most municipal and industrial wastes that are released from the submarine outfalls, the momentum of the discharge and its initial buoyancy act together to produce turbulent mixing. Initial dilution in this case is completed when the diluting wastewater ceases to rise in the water column and first begins to spread horizontally.

For shallow water submerged discharges, surface discharges, and non-buoyant discharges, characteristic of cooling water wastes and some individual discharges, turbulent mixing results primarily from the momentum of discharge. Initial dilution, in these cases, is considered to be completed when the momentum induced velocity of the discharge ceases to produce significant mixing of the waste, or the diluting plume reaches a fixed distance from the discharge to be specified by the Regional Water Board, whichever results in the lower estimate for initial dilution.

Instantaneous Maximum Effluent Limitation: the highest allowable value for any single grab sample or aliquot (i.e., each grab sample or aliquot is independently compared to the instantaneous maximum limitation).

Instantaneous Minimum Effluent Limitation: the lowest allowable value for any single grab sample or aliquot (i.e., each grab sample or aliquot is independently compared to the instantaneous minimum limitation).

Kelp Beds, for purposes of the bacteriological standards of the Ocean Plan, are significant aggregations of marine algae of the genera Macrocystis and Nereocystis. Kelp beds include the total foliage canopy of Macrocystis and Nereocystis plants throughout the water column.

Mariculture is the culture of plants and animals in marine waters independent of any pollution source.

Material: (a) In common usage: (1) the substance or substances of which a thing is made or composed (2) substantial; (b) For purposes of the Ocean Plan relating to waste disposal, dredging and the disposal of dredged material and fill, MATERIAL means matter of any kind or description which is subject to regulation as waste, or any material dredged from the navigable waters of the United States. See also, DREDGED MATERIAL.

Maximum Daily Effluent Limitation (MDEL): the highest allowable daily discharge of a pollutant.

MDL (Method Detection Limit) is the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero, as defined in title 40 of the Code of Federal Regulations, PART 136, Appendix B.

Minimum Level (ML) is the concentrations at which the entire analytical system must give a recognizable signal and acceptable calibration point. The ML is the concentration in a sample that is equivalent to the concentration of the lowest calibration standard analyzed by a specific analytical procedure, assuming that all the method-specified sample weights, volumes and processing steps have been followed.

Natural Light: Reduction of natural light may be determined by the Regional Water Board by measurement of light transmissivity or total irradiance, or both, according to the monitoring needs of the Regional Water Board.

Not Detected (ND) are those sample results less than the laboratory's MDL.

Ocean Waters are the territorial marine waters of the state as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. If a discharge outside the territorial waters of the state could affect the quality of the waters of the state, the discharge may be regulated to assure no violation of the Ocean Plan will occur in ocean waters.

PAHs (polynuclear aromatic hydrocarbons) shall mean the sum of acenaphthylene, anthracene, 1,2-benzanthracene, 3,4-benzofluoranthene, benzo[k]fluoranthene, 1,12-benzoperylene, benzo[a]pyrene, chrysene, dibenzo[ah]anthracene, fluorene, indeno[1,2,3-cd]pyrene, phenanthrene and pyrene.

PCBs (polychlorinated biphenyls) shall mean the sum of chlorinated biphenyls whose analytical characteristics resemble those of Aroclor-1016, Aroclor-1221, Aroclor-1232, Aroclor-1242, Aroclor-1248, Aroclor-1254 and Aroclor-1260.

Pollutant Minimization Program (PMP) means waste minimization and pollution prevention actions that include, but are not limited to, product substitution, waste stream recycling, alternative waste management methods, and education of the public and businesses. The goal of the PMP shall be to reduce all potential sources of Ocean Plan Table B pollutants through pollutant minimization (control) strategies, including pollution prevention measures as appropriate, to maintain the effluent concentration at or below the water quality-based effluent limitation. Pollution prevention measures may be particularly appropriate for persistent bioaccumulative priority pollutants where there is evidence that beneficial uses are being impacted. The Regional Water Board may consider cost effectiveness when establishing the requirements of a PMP. The completion and implementation of a Pollution Prevention Plan, if required pursuant to Water Code section 13263.3(d), shall be considered to fulfill the PMP requirements.

Reported Minimum Level is the ML (and its associated analytical method) chosen by the Discharger for reporting and compliance determination from the MLs included in this Order. The MLs included in this Order correspond to approved analytical methods for reporting a sample result that are selected by the Regional Water Board either from Appendix II of the Ocean Plan in accordance with section III.C.5.a. of the Ocean Plan or established in accordance with section III.C.5.b. of the Ocean Plan. The ML is based on the proper application of method-based analytical procedures for sample preparation and the absence of any matrix interferences. Other factors may be applied to the ML depending on the specific sample preparation steps employed. For example, the treatment typically applied in cases where there are matrix-effects is to dilute the sample or sample aliquot by a factor of ten. In such cases, this additional factor must be applied to the ML in the computation of the reported ML.

Satellite Collection System is the portion, if any, of a sanitary sewer system owned or operated by a different public agency than the agency that owns and operates the wastewater treatment facility that a sanitary sewer system is tributary to.

Shellfish are organisms identified by the California Department of Health Services as shellfish for public health purposes (i.e., mussels, clams and oysters).

Significant Difference is defined as a statistically significant difference in the means of two distributions of sampling results at the 95 percent confidence level.

Six-month Median Effluent Limitation: the highest allowable moving median of all daily discharges for any 180-day period.

State Water Quality Protection Areas (SWQPAs) are non-terrestrial marine or estuarine areas designated to protect marine species or biological communities from an undesirable alteration in natural water quality. All AREAS OF SPECIAL BIOLOGICAL SIGNIFICANCE (ASBS) that were previously designated by the State Water Board in Resolution No.s 74-28,

74-32, and 75-61 are now also classified as a subset of State Water Quality Protection Areas and require special protections afforded by the Ocean Plan.

TCDD Equivalents shall mean the sum of the concentrations of chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans (2,3,7,8-CDFs) multiplied by their respective toxicity factors, as shown in the table below.

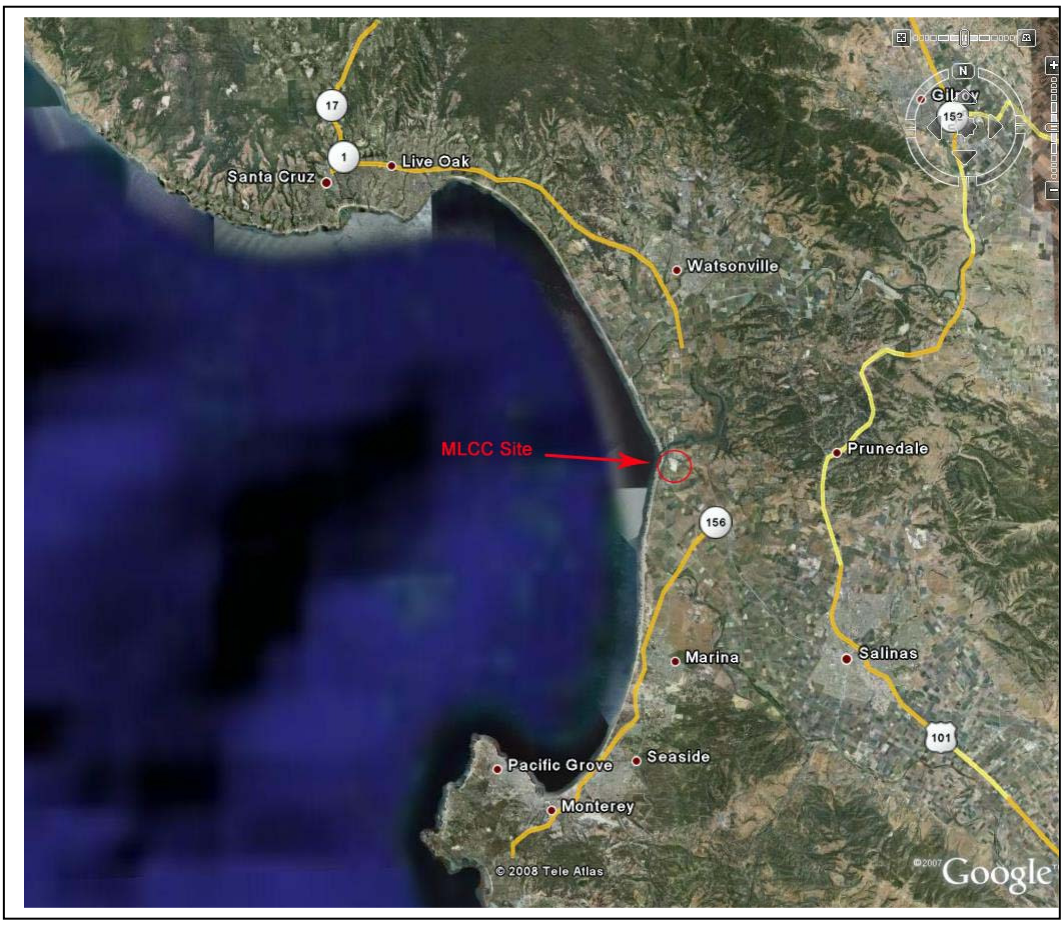
Isomer Group	Toxicity Equivalence Factor
2,3,7,8-tetra CDD	1.0
2,3,7,8-penta CDD	0.5
2,3,7,8-hexa CDDs	0.1
2,3,7,8-hepta CDD	0.01
octa CDD	0.001
2,3,7,8 tetra CDF	0.1
1,2,3,7,8 penta CDF	0.05
2,3,4,7,8 penta CDF	0.5
2,3,7,8 hexa CDFs	0.1
2,3,7,8 hepta CDFs	0.01
octa CDF	0.001

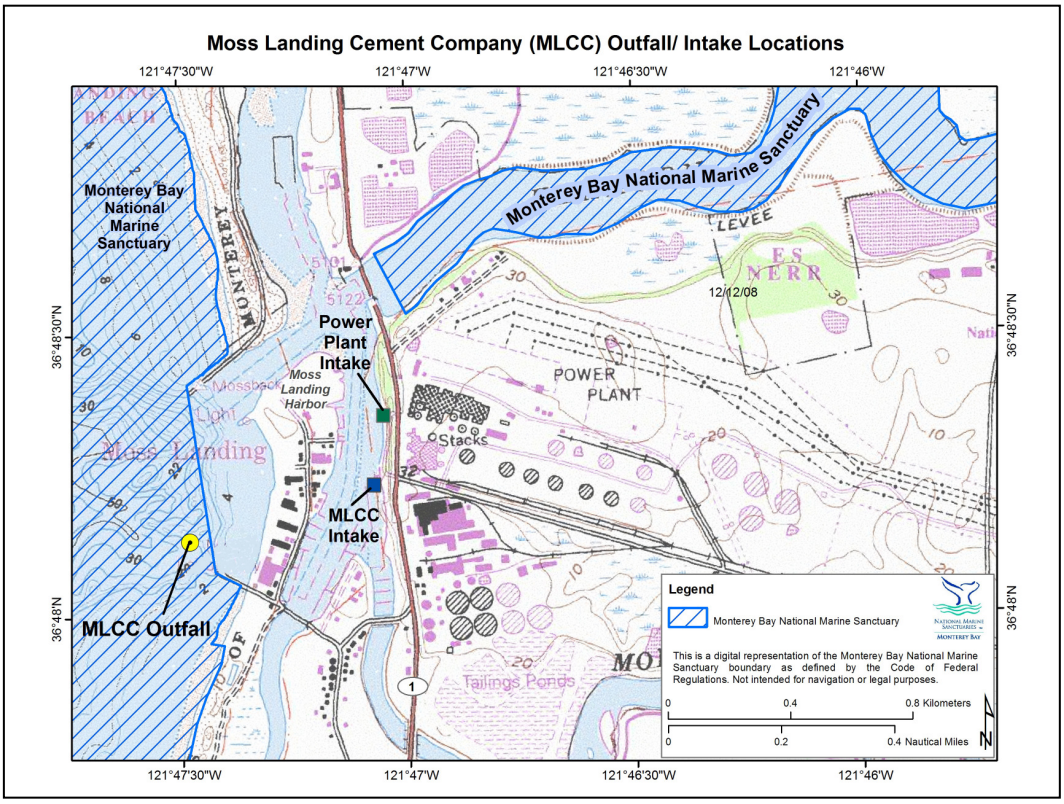
Toxicity Reduction Evaluation (TRE) is a study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A TOXICITY IDENTIFICATION EVALUATION (TIE) may be required as part of the TRE, if appropriate. (A TIE is a set of procedures to identify the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.)

Waste: As used in the Ocean Plan, waste includes a Discharger's total discharge, of whatever origin, i.e., gross, not net, discharge.

Water Reclamation: The treatment of wastewater to render it suitable for reuse, the transportation of treated wastewater to the place of use, and the actual use of treated wastewater for a direct beneficial use or controlled use that would not otherwise occur.

ATTACHMENT B – LOCATION MAPS

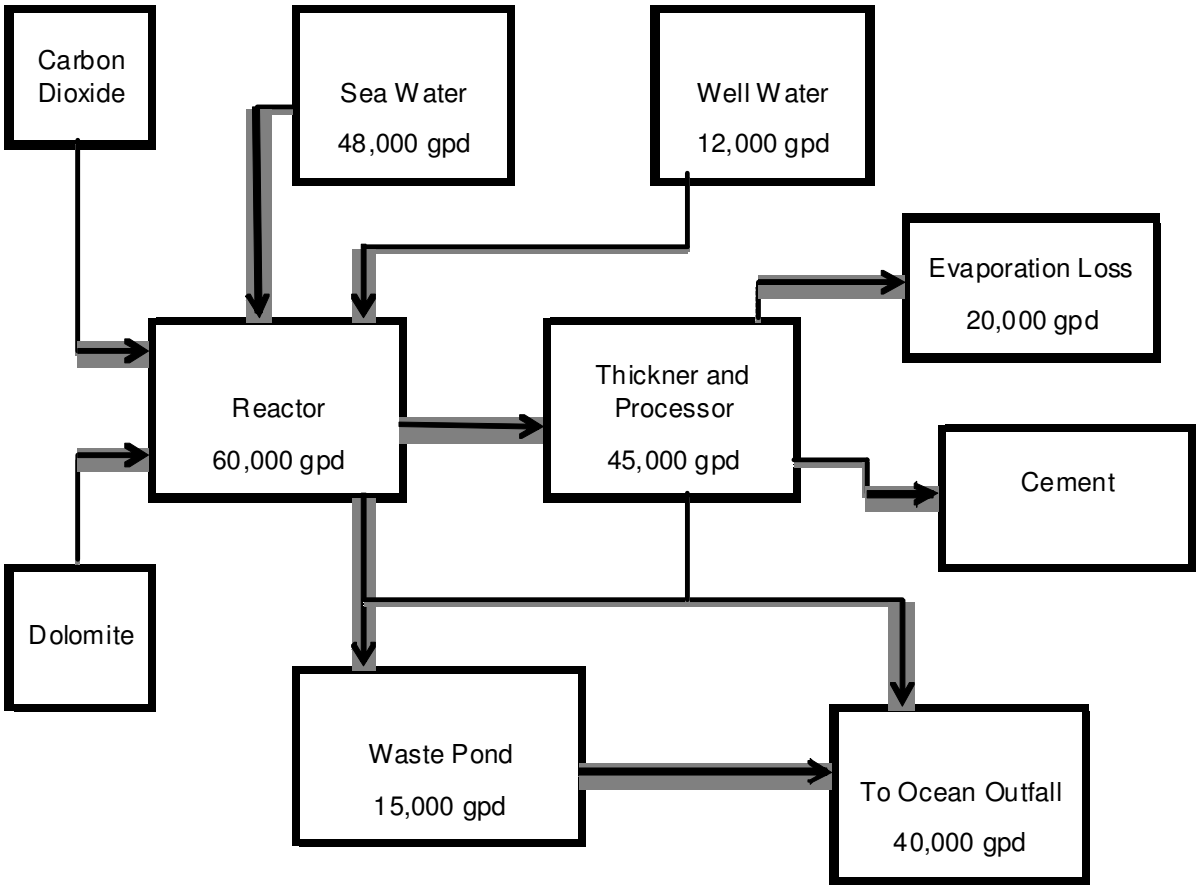




ATTACHMENT C – FLOW SCHEMATIC

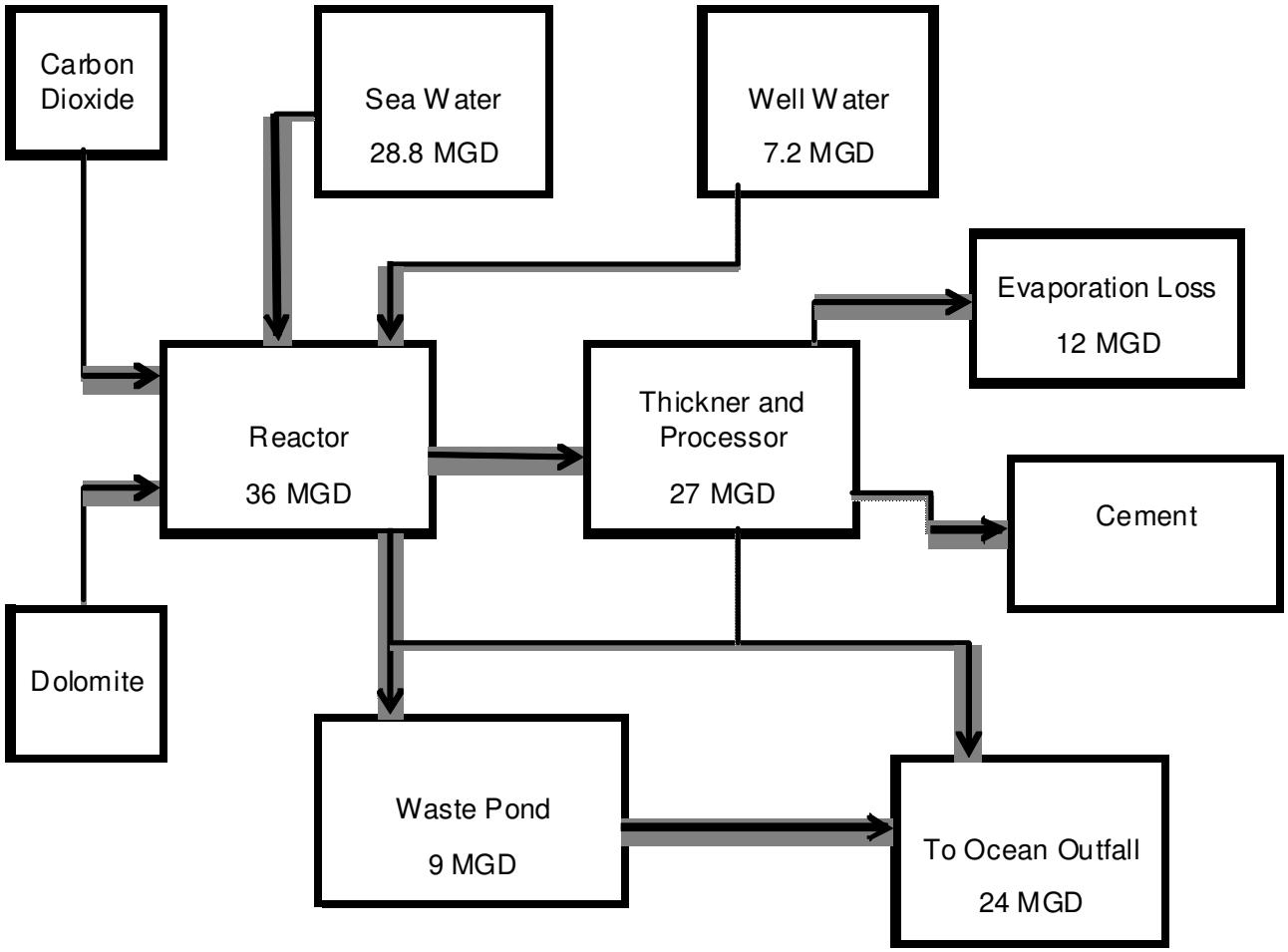
SCHEMATIC DRAWING OF WATER FLOW

Phase I Pilot Process



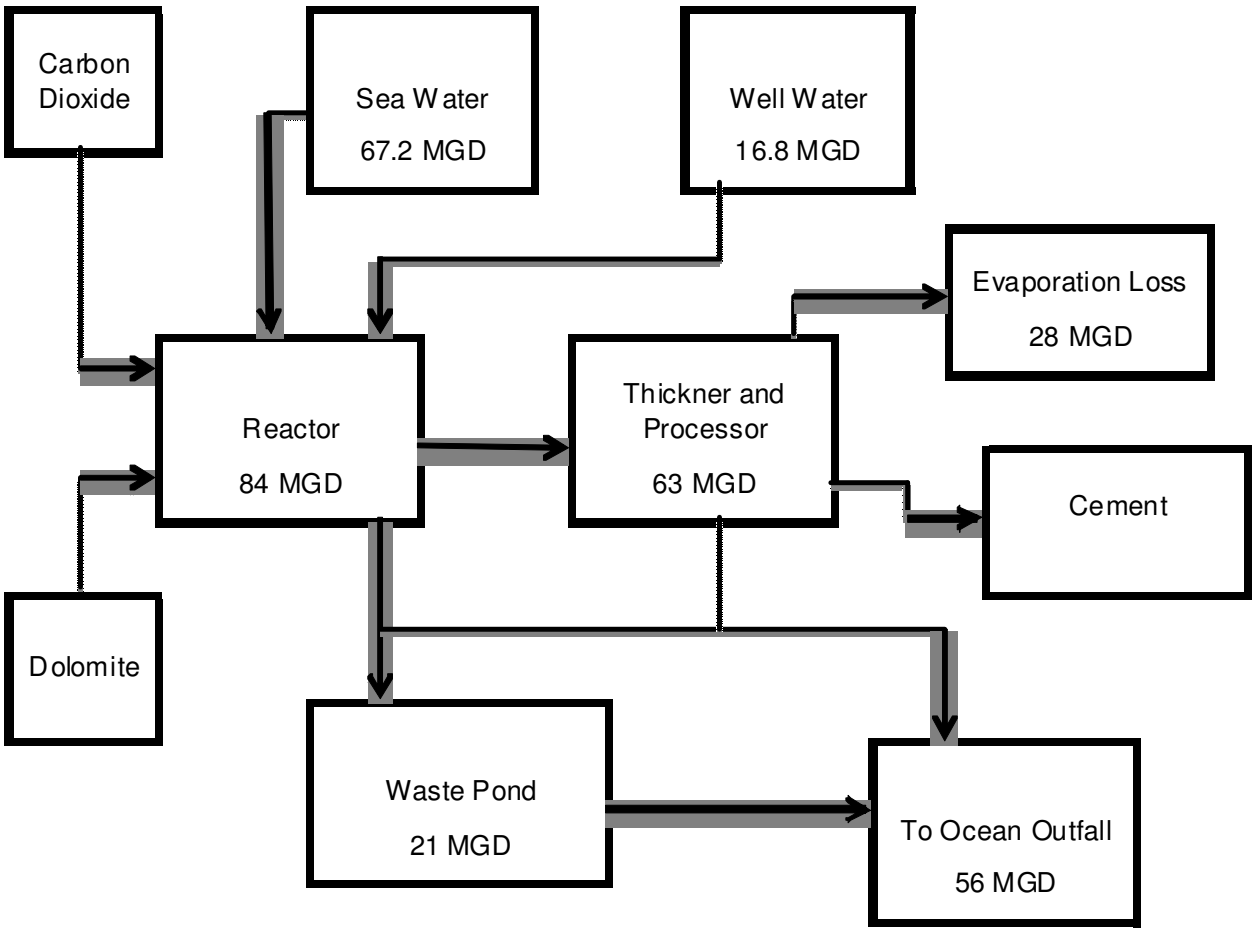
SCHEMATIC DRAWING OF WATER FLOW

Phase II Prototype Process



SCHEMATIC DRAWING OF WATER FLOW

Phase III Full-Scale Process



ATTACHMENT D – FEDERAL STANDARD PROVISIONS

I. STANDARD PROVISIONS – PERMIT COMPLIANCE

A. Duty to Comply

1. The Discharger must comply with all of the conditions of this Order. Any noncompliance constitutes a violation of the CWA and the CWC and is grounds for enforcement action, for permit termination, revocation and reissuance, or denial of a permit renewal application [*40 CFR §122.41(a)*].

2. The Discharger shall comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions, even if this Order has not been modified to incorporate the requirement [*40 CFR §122.41(a)(1)*].

B. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a Discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Order [*40 CFR §122.41(c)*].

C. Duty to Mitigate

The Discharger shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this Order that has a reasonable likelihood of adversely affecting human health or the environment [*40 CFR §122.41(d)*].

D. Proper Operation and Maintenance

The Discharger shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Discharger to achieve compliance with the conditions of this Order. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems that are installed by a Discharger only when necessary to achieve compliance with the conditions of this Order [*40 CFR §122.41(e)*].

E. Property Rights

1. This Order does not convey any property rights of any sort or any exclusive privileges [*40 CFR §122.41(g)*].

2. The issuance of this Order does not authorize any injury to persons or property or invasion of other private rights, or any infringement of State or local law or regulations [*40 CFR §122.5(c)*].

F. Inspection and Entry

The Discharger shall allow the Regional Water Quality Control Board (Regional Water Board), State Water Resources Control Board (State Water Board), United States Environmental Protection Agency (USEPA), and/or their authorized representatives (including an authorized contractor acting as their representative), upon the presentation of credentials and other documents, as may be required by law, to [*40 CFR §122.41(i)*] [*CWC 13383(c)*]:

1. Enter upon the Discharger's premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this Order [*40 CFR §122.41(i)(1)*];

2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Order [*40 CFR §122.41(i)(2)*];

3. Inspect and photograph, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order [*40 CFR §122.41(i)(3)*];

4. Sample or monitor, at reasonable times, for the purposes of assuring Order compliance or as otherwise authorized by the CWA or the CWC, any substances or parameters at any location [*40 CFR §122.41(i)(4)*].

G. Bypass

1. Definitions

   a. “Bypass” means the intentional diversion of waste streams from any portion of a treatment facility [*40 CFR §122.41(m)(1)(i)*].

   b. “Severe property damage” means substantial physical damage to property, damage to the treatment facilities, which causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production [*40 CFR §122.41(m)(1)(ii)*].

2. Bypass not exceeding limitations – The Discharger may allow any bypass to occur which does not cause exceedances of effluent limitations, but only if it is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions listed in Standard Provisions – Permit Compliance I.G.3 and I.G.5 below [*40 CFR §122.41(m)(2)*].

3. Prohibition of bypass – Bypass is prohibited, and the Regional Water Board may take enforcement action against a Discharger for bypass, unless [*40 CFR §122.41(m)(4)(i)*]:

a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage [*40 CFR §122.41(m)(4)(A)*];

b. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass that occurred during normal periods of equipment downtime or preventive maintenance [*40 CFR §122.41(m)(4)(B)*]; and

c. The Discharger submitted notice to the Regional Water Board as required under Standard Provision – Permit Compliance I.G.5 below [*40 CFR §122.41(m)(4)(C)*].

4. The Regional Water Board may approve an anticipated bypass, after considering its adverse effects, if the Regional Water Board determines that it will meet the three conditions listed in Standard Provisions – Permit Compliance I.G.3 above [*40 CFR §122.41(m)(4)(ii)*].

5. Notice

a. Anticipated bypass. If the Discharger knows in advance of the need for a bypass, it shall submit a notice, if possible at least 10 days before the date of the bypass [*40 CFR §122.41(m)(3)(i)*].

b. Unanticipated bypass. The Discharger shall submit notice of an unanticipated bypass as required in Standard Provisions - Reporting V.E below [*40 CFR §122.41(m)(3)(ii)*].

H. Upset

Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation [*40 CFR §122.41(n)(1)*].

1. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of paragraph H.2 of this section are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review [*40 CFR §122.41(n)(2)*].

2. Conditions necessary for a demonstration of upset. A Discharger who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs or other relevant evidence that [*40 CFR §122.41(n)(3)*]:

a. An upset occurred and that the Discharger can identify the cause(s) of the upset [*40 CFR §122.41(n)(3)(i)*];

b. The permitted facility was, at the time, being properly operated [*40 CFR §122.41(n)(3)(i)*];

c. The Discharger submitted notice of the upset as required in Standard Provisions – Reporting V.E.2.b [*40 CFR §122.41(n)(3)(iii)*]; and

d. The Discharger complied with any remedial measures required under Standard Provisions – Permit Compliance I.C above [*40 CFR §122.41(n)(3)(iv)*].

3. Burden of proof. In any enforcement proceeding, the Discharger seeking to establish the occurrence of an upset has the burden of proof [*40 CFR §122.41(n)(4)*].

II. STANDARD PROVISIONS – PERMIT ACTION

A. General

This Order may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Discharger for modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any Order condition [*40 CFR §122.41(f)*].

B. Duty to Reapply

If the Discharger wishes to continue an activity regulated by this Order after the expiration date of this Order, the Discharger must apply for and obtain a new permit [*40 CFR §122.41(b)*].

C. Transfers

This Order is not transferable to any person except after notice to the Regional Water Board. The Regional Water Board may require modification or revocation and reissuance of the Order to change the name of the Discharger and incorporate such other requirements as may be necessary under the CWA and the CWC [*40 CFR §122.41(l)(3)*] [*40 CFR §122.61*].

III. STANDARD PROVISIONS – MONITORING

A. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity [*40 CFR §122.41(j)(1)*].

B. Monitoring results must be conducted according to test procedures under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503 unless other test procedures have been specified in this Order [*40 CFR §122.41(j)(4)*] [*40 CFR §122.44(i)(1)(iv)*].

IV. STANDARD PROVISIONS – RECORDS

A. Except for records of monitoring information required by this Order related to the Discharger's sewage sludge use and disposal activities, which shall be retained for a period of at least five years (or longer as required by 40 CFR Part 503), the Discharger shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the Regional Water Board Executive Officer at any time [*40 CFR §122.41(j)(2)*].

B. Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements [*40 CFR §122.41(j)(3)(i)*];
2. The individual(s) who performed the sampling or measurements [*40 CFR §122.41(j)(3)(ii)*];
3. The date(s) analyses were performed [*40 CFR §122.41(j)(3)(iii)*];
4. The individual(s) who performed the analyses [*40 CFR §122.41(j)(3)(iv)*];
5. The analytical techniques or methods used [*40 CFR §122.41(j)(3)(v)*]; and
6. The results of such analyses [*40 CFR §122.41(j)(3)(vi)*].

C. Claims of confidentiality for the following information will be denied [*40 CFR §122.7(b)*]:

1. The name and address of any permit applicant or Discharger [*40 CFR §122.7(b)(1)*]; and
2. Permit applications and attachments, permits and effluent data [*40 CFR §122.7(b)(2)*].

V. STANDARD PROVISIONS – REPORTING

A. Duty to Provide Information

The Discharger shall furnish to the Regional Water Board, State Water Board, or USEPA within a reasonable time, any information which the Regional Water Board, State Water Board, or USEPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Order or to determine compliance with this Order. Upon request, the Discharger shall also furnish to the Regional Water Board, State Water Board, or USEPA copies of records required to be kept by this Order [*40 CFR §122.41(h)*] [*CWC 13267*].

B. Signatory and Certification Requirements

1. All applications, reports, or information submitted to the Regional Water Board, State Water Board, and/or USEPA shall be signed and certified in accordance with paragraph (2.) and (3.) of this provision [*40 CFR §122.41(k)*].

2. All permit applications shall be signed as follows:

   a. For a municipality, State, federal, or other public agency: by either a principal executive officer or ranking elected official. For purposes of this provision, a principal executive officer of a federal agency includes: (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of USEPA) [*40 CFR §122.22(a)(3)*].

3. All reports required by this Order and other information requested by the Regional Water Board, State Water Board, or USEPA shall be signed by a person described in paragraph V.B.2 above, or by a duly authorized representative of that person. A person is a duly authorized representative only if:

   a. The authorization is made in writing by a person described in paragraph (2.) of this provision [*40 CFR §122.22(b)(1)*];

   b. The authorization specified either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company (a duly authorized representative may thus be either a named individual or any individual occupying a named position) [*40 CFR §122.22(b)(2)*]; and

   c. The written authorization is submitted to the Regional Water Board, State Water Board, or USEPA [*40 CFR §122.22(b)(3)*].

4. If an authorization under Standard Provisions – Reporting V.B.3. above is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (3.) of this provision must be submitted to the Regional Water Board, State Water Board or USEPA prior to or together with any reports, information, or applications, to be signed by an authorized representative [40 CFR §122.22(c)].

5. Any person signing a document under Standard Provisions – Reporting V.B.2 or V.B.3 above shall make the following certification:

   "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted

is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations" [*40 CFR §122.22(d)*].

C. Monitoring Reports

1. Monitoring results shall be reported at the intervals specified in the MRP in this Order [*40 CFR §122.41(l)(4)*].

2. Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the Regional Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices [*40 CFR §122.41(l)(4)(i)*].

3. If the Discharger monitors any pollutant more frequently than required by this Order using test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, or as specified in this Order, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Regional Water Board [*40 CFR §122.41(l)(4)(ii)*].

4. Calculations for all limitations, which require averaging of measurements, shall utilize an arithmetic mean unless otherwise specified in this Order [*40 CFR §122.41(l)(4)(iii)*].

D. Compliance Schedules

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this Order, shall be submitted no later than 14 days following each schedule date [*40 CFR §122.41(l)(5)*].

E. Twenty-Four Hour Reporting

1. The Discharger shall report any noncompliance that may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the Discharger becomes aware of the circumstances. A written submission shall also be provided within five (5) days of the time the Discharger becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance [*40 CFR §122.41(l)(6)(i)*].

2. The following shall be included as information that must be reported within 24 hours under this paragraph [*40 CFR §122.41(l)(6)(ii)*]:

   a. Any unanticipated bypass that exceeds any effluent limitation in this Order [*40 CFR §122.41(l)(6)(ii)(A)*].

b. Any upset that exceeds any effluent limitation in this Order [*40 CFR §122.41(l)(6)(ii)(B)*].

c. Violation of a maximum daily discharge limitation for any of the pollutants listed in this Order to be reported within 24 hours [*40 CFR §122.41(l)(6)(ii)(C)*].

3. The Regional Water Board may waive the above-required written report under this provision on a case-by-case basis if an oral report has been received within 24 hours [*40 CFR §122.41(l)(6)(iii)*].

F. Planned Changes

The Discharger shall give notice to the Regional Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required under this provision only when [*40 CFR §122.41(l)(1)*]:

1. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR §122.29(b) [*40 CFR §122.41(l)(1)(i)*]; or

2. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants that are not subject to effluent limitations in this Order. (40 C.F.R. § 122.41(l)(1)(ii).)

3. The alteration or addition results in a significant change in the Discharger's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan [*40 CFR §122.41(l)(1)(iii)*].

G. Anticipated Noncompliance

The Discharger shall give advance notice to the Regional Water Board or State Water Board of any planned changes in the permitted facility or activity that may result in noncompliance with General Order requirements [*40 CFR §122.41(l)(2)].*

H. Other Noncompliance

The Discharger shall report all instances of noncompliance not reported under Standard Provisions – Reporting E.3, E.4, and E.5 at the time monitoring reports are submitted. The reports shall contain the information listed in Standard Provision – Reporting V.E [*40 CFR §122.41(l)(7)*].

I. Other Information

When the Discharger becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the

Regional Water Board, State Water Board, or USEPA, the Discharger shall promptly submit such facts or information [*40 CFR §122.41(l)(8)*].

VI. STANDARD PROVISIONS – ENFORCEMENT

A. The Regional Water Board is authorized to enforce the terms of this permit under several provisions of the Water Code, including, but not limited to, sections 13385, 13386, and 13387.

VII. ADDITIONAL PROVISIONS – NOTIFICATION LEVELS

A. Non-Municipal Facilities

Existing manufacturing, commercial, mining, and silvicultural Dischargers shall notify the Regional Water Board as soon as they know or have reason to believe (40 C.F.R. § 122.42(a)):

1. That any activity has occurred or will occur that would result in the discharge, on a routine or frequent basis, of any toxic pollutant that is not limited in this Order, if that discharge will exceed the highest of the following "notification levels" (40 C.F.R. § 122.42(a)(1)):

   a. 100 micrograms per liter (µg/L) (40 C.F.R. § 122.42(a)(1)(i));

   b. 200 µg/L for acrolein and acrylonitrile; 500 µg/L for 2,4 dinitrophenol and 2 methyl 4,6 dinitrophenol; and 1 milligram per liter (mg/L) for antimony (40 C.F.R. § 122.42(a)(1)(ii));

   c. Five (5) times the maximum concentration value reported for that pollutant in the Report of Waste Discharge (40 C.F.R. § 122.42(a)(1)(iii)); or

   d. The level established by the Regional Water Board in accordance with section 122.44(f). (40 C.F.R. § 122.42(a)(1)(iv).)

2. That any activity has occurred or will occur that would result in the discharge, on a non-routine or infrequent basis, of any toxic pollutant that is not limited in this Order, if that discharge will exceed the highest of the following “notification levels" (40 C.F.R. § 122.42(a)(2)):

   a. 500 micrograms per liter (µg/L) (40 C.F.R. § 122.42(a)(2)(i));

   b. 1 milligram per liter (mg/L) for antimony (40 C.F.R. § 122.42(a)(2)(ii));

   c. Ten (10) times the maximum concentration value reported for that pollutant in the Report of Waste Discharge (40 C.F.R. § 122.42(a)(2)(iii)); or

   d. The level established by the Regional Water Board in accordance with section 122.44(f). (40 C.F.R. § 122.42(a)(2)(iv).)

ATTACHMENT D-1 - CENTRAL COAST WATER BOARD STANDARD PROVISIONS (JANUARY 1985)

I. Central Coast General Permit Conditions

A. Central Coast Standard Provisions – Prohibitions

1. Introduction of "incompatible wastes" to the treatment system is prohibited.

2. Discharge of high-level radiological waste and of radiological, chemical, and biological warfare agents is prohibited.

3. Discharge of "toxic pollutants" in violation of effluent standards and prohibitions established under Section 307(a) of the Clean Water Act is prohibited.

4. Discharge of sludge, sludge digester or thickener supernatant, and sludge drying bed leachate to drainageways, surface waters, or the ocean is prohibited.

5. Introduction of pollutants into the collection, treatment, or disposal system by an "indirect discharger" that:

   a. Inhibit or disrupt the treatment process, system operation, or the eventual use or disposal of sludge; or,

   b. Flow through the system to the receiving water untreated; and,

   c. Cause or "significantly contribute" to a violation of any requirement of this Order, is prohibited.

6. Introduction of "pollutant free" wastewater to the collection, treatment, and disposal system in amounts that threaten compliance with this order is prohibited.

B. Central Coast Standard Provisions – Provisions

1. Collection, treatment, and discharge of waste shall not create a nuisance or pollution, as defined by Section 13050 of the California Water Code.

2. All facilities used for transport or treatment of wastes shall be adequately protected from inundation and washout as the result of a 100-year frequency flood.

3. Operation of collection, treatment, and disposal systems shall be in a manner that precludes public contact with wastewater.

4. Collected screenings, sludges, and other solids removed from liquid wastes shall be disposed in a manner approved by the Executive Officer.

5. Publicly owned wastewater treatment plants shall be supervised and operated by persons possessing certificates of appropriate grade pursuant to Title 23 of the California Administrative Code.

6. After notice and opportunity for a hearing, this order may be terminated for cause, including, but not limited to:

   a. violation of any term or condition contained in this order;

   b. obtaining this order by misrepresentation, or by failure to disclose fully all relevant facts;

   c. a change in any condition or endangerment to human health or environment that requires a temporary or permanent reduction or elimination of the authorized discharge; and,

   d. a substantial change in character, location, or volume of the discharge.

7. Provisions of this permit are severable. If any provision of the permit is found invalid, the remainder of the permit shall not be affected.

8. After notice and opportunity for hearing, this order may be modified or revoked and reissued for cause, including:

   a. Promulgation of a new or revised effluent standard or limitation;

   b. A material change in character, location, or volume of the discharge;

   c. Access to new information that affects the terms of the permit, including applicable schedules;

   d. Correction of technical mistakes or mistaken interpretations of law; and,

   e. Other causes set forth under Sub-part D of 40 CFR Part 122.

9. Safeguards shall be provided to assure maximal compliance with all terms and conditions of this permit. Safeguards shall include preventative and contingency plans and may also include alternative power sources, stand-by generators, retention capacity, operating procedures, or other precautions. Preventative and contingency plans for controlling and minimizing the affect of accidental discharges shall:

   a. identify possible situations that could cause "upset", "overflow" or "bypass", or other noncompliance. (Loading and storage areas, power outage, waste treatment unit outage, and failure of process equipment, tanks and pipes should be considered.)

   b. evaluate the effectiveness of present facilities and procedures and describe procedures and steps to minimize or correct any adverse environmental impact resulting from noncompliance with the permit.

10. Physical Facilities shall be designed and constructed according to accepted engineering practice and shall be capable of full compliance with this order when

properly operated and maintained. Proper operation and maintenance shall be described in an Operation and Maintenance Manual. Facilities shall be accessible during the wet-weather season.

11. Production and use of reclaimed water is subject to the approval of the Regional Water Board. Production and use of reclaimed water shall be in conformance with reclamation criteria established in Chapter 3, Title 22, of the California Administrative Code and Chapter 7, Division 7, of the California Water Code. An engineering report pursuant to section 60323, Title 22, of the California Administrative Code is required and a waiver or water reclamation requirements from the Regional Water Board is required before reclaimed water is supplied for any use, or to any user, not specifically identified and approved either in this Order or another order issued by this Board.

C. Central Coast Standard Provisions – General Monitoring Requirements

1. If results of monitoring a pollutant appear to violate effluent limitations based on a weekly, monthly, 30-day, or six-month period, but compliance or non-compliance cannot be validated because sampling is too infrequent, the frequency of sampling shall be increased to validate the test within the next monitoring period. The increased frequency shall be maintained until the Executive Officer agrees the original monitoring frequency may be resumed.

   For example, if copper is monitored annually and results exceed the six-month median numerical effluent limitation in the permit, monitoring of copper must be increased to a frequency of at least once every two months (Central Coast Standard Provisions – Definitions I.G.13.). If suspended solids are monitored weekly and results exceed the weekly average numerical limit in the permit, monitoring of suspended solids must be increased to at least four (4) samples every week (Central Coast Standard Provisions – Definitions I.G.14.).

2. Water quality analyses performed in order to monitor compliance with this permit shall be by a laboratory certified by the State Department of Health Services for the constituent(s) being analyzed. Bioassay(s) performed in order to monitor compliance with this permit shall be in accord with guidelines approved by the State Water Resources Control Board and the State Department of Fish and Game. If the laboratory used or proposed for use by the discharger is not certified by the California Department of Health Services or, where appropriate, the Department of Fish and Game due to restrictions in the State's laboratory certification program, the discharger shall be considered in compliance with this provision provided:

   a. Data results remain consistent with results of samples analyzed by the Central Coast Water Board;

   b. A quality assurance program is used at the laboratory, including a manual containing steps followed in this program that is available for inspections by the staff of the Central Coast Water Board; and,

c. Certification is pursued in good faith and obtained as soon as possible after the program is reinstated.

3. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. Samples shall be taken during periods of peak loading conditions. Influent samples shall be samples collected from the combined flows of all incoming wastes, excluding recycled wastes. Effluent samples shall be samples collected downstream of the last treatment unit and tributary flow and upstream of any mixing with receiving waters.

4. All monitoring instruments and devices used by the discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary to ensure their continued accuracy.

D. Central Coast Standard Provisions – General Reporting Requirements

1. Reports of marine monitoring surveys conducted to meet receiving water monitoring requirements of the Monitoring and Reporting Program shall include at least the following information:

   a. A description of climatic and receiving water characteristics at the time of sampling (weather observations, floating debris, discoloration, wind speed and direction, swell or wave action, time of sampling, tide height, etc.).

   b. A description of sampling stations, including differences unique to each station (e.g., station location, grain size, rocks, shell litter, calcareous worm tubes, evident life, etc.).

   c. A description of the sampling procedures and preservation sequence used in the survey.

   d. A description of the exact method used for laboratory analysis. In general, analysis shall be conducted according to Central Coast Standard Provisions – C.1 above, and Federal Standard Provision – Monitoring III.B. However, variations in procedure are acceptable to accommodate the special requirements of sediment analysis. All such variations must be reported with the test results.

   e. A brief discussion of the results of the survey. The discussion shall compare data from the control station with data from the outfall stations. All tabulations and computations shall be explained.

2. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule shall be submitted within 14 days following each scheduled date unless otherwise specified within the permit. If reporting noncompliance, the report shall include a description of the reason, a description and schedule of tasks necessary to achieve compliance, and an estimated date for achieving full compliance. A second report shall be submitted within 14 days of full compliance.

3. The “Discharger” shall file a report of waste discharge or secure a waiver from the Executive Officer at least 180 days before making any material change or proposed change in the character, location, or plume of the discharge.

4. Within 120 days after the discharger discovers, or is notified by the Central Coast Water Board, that monthly average daily flow will or may reach design capacity of waste treatment and/or disposal facilities within four (4) years, the discharger shall file a written report with the Central Coast Water Board. The report shall include:

   a. the best estimate of when the monthly average daily dry weather flow rate will equal or exceed design capacity; and,

   b. a schedule for studies, design, and other steps needed to provide additional capacity for waste treatment and/or disposal facilities before the waste flow rate equals the capacity of present units.

   In addition to complying with Federal Standard Provision – Reporting V.B., the required technical report shall be prepared with public participation and reviewed, approved and jointly submitted by all planning and building departments having jurisdiction in the area served by the waste collection, treatment, or disposal facilities.

5. All “Dischargers” shall submit reports to the:

   California Regional Water Quality Control Board
   Central Coast Region
   895 Aerovista Place, Suite 101
   San Luis Obispo, CA 93401-7906

   In addition, "Dischargers" with designated major discharges shall submit a copy of each document to:

   Regional Administrator
   US Environmental Protection Agency, Region 9
   Attention: CWA Standards and Permits Office (WTR-5)
   75 Hawthorne Street
   San Francisco, California 94105

6. Transfer of control or ownership of a waste discharge facility must be preceded by a notice to the Central Coast Water Board at least 30 days in advance of the proposed transfer date. The notice must include a written agreement between the existing “Discharger” and proposed “Discharger” containing specific date for transfer of responsibility, coverage, and liability between them. Whether a permit may be transferred without modification or revocation and reissuance is at the discretion of the Board. If permit modification or revocation and reissuance is necessary, transfer may be delayed 180 days after the Central Coast Water Board's receipt of a complete permit application. Please also see Federal Standard Provision – Permit Action II.C.

7. Except for data determined to be confidential under Section 308 of the Clean Water Act (excludes effluent data and permit applications), all reports prepared in accordance with this permit shall be available for public inspection at the office of the Central Coast Water Board or Regional Administrator of EPA. Please also see Federal Standard Provision – Records IV.C.

8. By January 30th of each year, the discharger shall submit an annual report to the Central Coast Water Board. The report shall contain both tabular and graphical summaries of the monitoring data obtained during the previous year. The discharger shall discuss the compliance record and corrective actions taken, or which may be needed, to bring the discharge into full compliance. The report shall address operator certification and provide a list of current operating personnel and their grade of certification. The report shall inform the Board of the date of the Facility's Operation and Maintenance Manual (including contingency plans as described Central Coast Standard Provision – Provision B.9., above), of the date the manual was last reviewed, and whether the manual is complete and valid for the current facility. The report shall restate, for the record, the laboratories used by the discharger to monitor compliance with effluent limits and provide a summary of performance relative to Section C above, General Monitoring Requirements.

   If the facility treats industrial or domestic wastewater and there is no provision for periodic sludge monitoring in the Monitoring and Reporting Program, the report shall include a summary of sludge quantities, analyses of its chemical and moisture content, and its ultimate destination.

   If applicable, the report shall also evaluate the effectiveness of the local source control or pretreatment program using the State Water Resources Control Board's "Guidelines for Determining the Effectiveness of Local Pretreatment Programs."

E. Central Coast Standard Provisions – General Pretreatment Provisions

1. Discharge of pollutants by "indirect dischargers" in specific industrial sub-categories (appendix C, 40 CFR Part 403), where categorical pretreatment standards have been established, or are to be established, (according to 40 CFR Chapter 1, Subchapter N), shall comply with the appropriate pretreatment standards:

   a. By the date specified therein;

   b. Within three (3) years of the effective date specified therein, but in no case later than July 1, 1984; or,

   c. If a new indirect discharger, upon commencement of discharge.

F. Central Coast Standard Provisions – Enforcement

1. Any person failing to file a report of waste discharge or other report as required by this permit shall be subject to a civil penalty not to exceed $5,000 per day.

2. Upon reduction, loss, or failure of the treatment facility, the "Discharger" shall, to the extent necessary to maintain compliance with this permit, control production or all discharges, or both, until the facility is restored or an alternative method of treatment is provided.

G. Central Coast Standard Provisions – Definitions

(Not otherwise included in Attachment A to this Order)

1. A “composite sample" is a combination of no fewer than eight (8) individual samples obtained at equal time intervals (usually hourly) over the specified sampling (composite) period. The volume of each individual sample is proportional to the flow rate at the time of sampling. The period shall be specified in the Monitoring and Reporting Program ordered by the Executive Officer.

2. “Daily Maximum” limit means the maximum acceptable concentration or mass emission rate of a pollutant measured during a calendar day or during any 24-hour period reasonably representative of the calendar day for purposes of sampling. It is normally compared with results based on "composite samples” except for ammonia, total chlorine, phenolic compounds, and toxicity concentration. For all exceptions, comparisons will be made with results from a “grab sample”.

3. “Discharger", as used herein, means, as appropriate: (1) the Discharger, (2) the local sewering entity (when the collection system is not owned and operated by the Discharger), or (3) "indirect discharger" (where "Discharger" appears in the same paragraph as "indirect discharger”, it refers to the discharger.)

4. “Duly Authorized Representative" is one where:

   a. the authorization is made in writing by a person described in the signatory paragraph of Federal Standard Provision V.B.;

   b. the authorization specifies either an individual or the occupant of a position having either responsibility for the overall operation of the regulated facility, such as the plant manager, or overall responsibility for environmental matters of the company; and,

   c. the written authorization was submitted to the Central Coast Water Board.

5. A "grab sample" is defined as any individual sample collected in less than 15 minutes. "Grab samples” shall be collected during peak loading conditions, which may or may not be during hydraulic peaks. It is used primarily in determining compliance with the daily maximum limits identified in Central Coast Standard Provision – Provision G.2. and instantaneous maximum limits.

6. "Hazardous substance” means any substance designated under 40 CFR Part 116 pursuant to Section 311 of the Clean Water Act.

7. "Incompatible wastes” are:

a. Wastes which create a fire or explosion hazard in the treatment works;

b. Wastes which will cause corrosive structural damage to treatment works, but in no case wastes with a pH lower than 5.0 unless the works is specifically designed to accommodate such wastes;

c. Solid or viscous wastes in amounts which cause obstruction to flow in sewers, or which cause other interference with proper operation of treatment works;

d. Any waste, including oxygen demanding pollutants (BOD, etc), released in such volume or strength as to cause inhibition or disruption in the treatment works and subsequent treatment process upset and loss of treatment efficiency; and,

e. Heat in amounts that inhibit or disrupt biological activity in the treatment works or that raise influent temperatures above 40°C (104°F) unless the treatment works is designed to accommodate such heat.

8. "Indirect Discharger" means a non-domestic discharger introducing pollutants into a publicly owned treatment and disposal system.

9. "Log Mean" is the geometric mean. Used for determining compliance of fecal or total coliform populations, it is calculated with the following equation:

$$\text{Log Mean} = (C1 \times C2 \times ... \times Cn)1/n,$$

in which "n" is the number of days samples were analyzed during the period and any "C" is the concentration of bacteria (MPN/100 ml) found on each day of sampling. "n" should be five or more.

10. "Mass emission rate" is a daily rate defined by the following equations:

$$\text{mass emission rate (lbs/day)} = 8.34 \times Q \times C; \text{ and,}$$

$$\text{mass emission rate (kg/day)} = 3.79 \times Q \times C,$$

where "C" (in mg/L) is the measured daily constituent concentration or the average of measured daily constituent concentrations and "Q" (in mgd) is the measured daily flow rate or the average of measured daily flow rates over the period of interest.

11. The "Maximum Allowable Mass Emission Rate," whether for a month, week, day, or six-month period, is a daily rate determined with the formulas in paragraph G.10, above, using the effluent concentration limit specified in the permit for the period and the average of measured daily flows (up to the allowable flow) over the period.

12. "Maximum Allowable Six-Month Median Mass Emission Rate" is a daily rate determined with the formulas in Central Coast Standard Provision – Provision G.10, above, using the "six-month Median" effluent limit specified in the permit, and the average of measured daily flows (up to the allowable flow) over a 180-day period.

13. "Median" is the value below which half the samples (ranked progressively by increasing value) fall. It may be considered the middle value, or the average of two middle values.

14. "Monthly Average" (or "Weekly Average", as the case may be) is the arithmetic mean of daily concentrations or of daily mass emission rates over the specified 30-day (or 7-day) period.

$$\text{Average} = (X1 + X2 + ... + Xn) / n$$

in which "n" is the number of days samples were analyzed during the period and "X" is either the constituent concentration (mg/L) or mass emission rate (kg/day or lbs/day) for each sampled day. "n" should be four or greater.

15. "Municipality" means a city, town, borough, county, district, association, or other public body created by or under state law and having jurisdiction over disposal of sewage, industrial waste, or other waste.

16. "Overflow" means the intentional or unintentional diversion of flow from the collection and transport systems, including pumping facilities.

17. "Pollutant-free wastewater" means inflow and infiltration, storm waters, and cooling waters and condensates which are essentially free of pollutants.

18. "Primary Industry Category" means any industry category listed in 40 CFR Part 122, Appendix A.

19. "Removal Efficiency" is the ratio of pollutants removed by the treatment unit to pollutants entering the treatment unit. Removal efficiencies of a treatment plant shall be determined using "Monthly averages" of pollutant concentrations (C, in mg/L) of influent and effluent samples collected about the same time and the following equation (or its equivalent):

$$C_{Effluent} \text{ Removal Efficiency } (\%) = 100 \times (1 - C_{effluent} / C_{influent})$$

20. "Severe property damage" means substantial physical damage to property, damage to treatment facilities which causes them to become inoperable, or substantial and permanent loss to natural resources which can reasonably be expected to occur in the absence of a "bypass". It does not mean economic loss caused by delays in production.

21. "Sludge" means the solids, residues, and precipitates separated from, or created in, wastewater by the unit processes of a treatment system.

22. To "significantly contribute" to a permit violation means an "indirect discharger" must:

    a. Discharge a daily pollutant loading in excess of that allowed by contract with the "Discharger" or by Federal, State, or Local law;

b. Discharge wastewater which substantially differs in nature or constituents from its average discharge;

c. Discharge pollutants, either alone or in conjunction with discharges from other sources, which results in a permit violation or prevents sewage sludge use or disposal; or

d. Discharge pollutants, either alone or in conjunction with pollutants from other sources that increase the magnitude or duration of permit violations.

23. "Toxic Pollutant" means any pollutant listed as toxic under Section 307 (a) (1) of the Clean Water Act or under 40 CFR Part 122, Appendix D. Violation of maximum daily discharge limitations are subject to 24-hour reporting (Federal Standard Provisions V.E.).

24. “Zone of Initial Dilution" means the region surrounding or adjacent to the end of an outfall pipe or diffuser ports whose boundaries are defined through calculation of a plume model verified by the State Water Resources Control Board.

Attachment E – Monitoring and Reporting Program – Table of Contents

LIST OF TABLES

ATTACHMENT E – MONITORING AND REPORTING PROGRAM (MRP)

NPDES regulations at 40 CFR 122.48 require that all NPDES permits specify monitoring and reporting requirements. Water Code sections 13267 and 13383 also authorize the Regional Water Board to require technical and monitoring reports. This MRP establishes monitoring and reporting requirements, which implement the federal and California regulations.

I. GENERAL MONITORING PROVISIONS

A. Laboratories analyzing monitoring samples shall be certified by the Department of Health Services, in accordance with Water Code section 13176, and must include quality assurance/quality control data with their reports.

B. Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge. All samples shall be taken at the monitoring locations specified below and, unless otherwise specified, before the monitored flow joins or is diluted by any other waste stream, body of water, or substance. Monitoring locations shall not be changed without notification to and approval of the Regional Water Board.

C. Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated, and maintained to ensure that the accuracy of the measurements is consistent with the accepted capability of that type of device. Devices selected shall be capable of measuring flows with a maximum deviation of less than ±10 percent from true discharge rates throughout the range of expected discharge volumes. Guidance in selection, installation, calibration, and operation of acceptable flow measurement devices can be obtained from the following references:

1. A Guide to Methods and Standards for the Measurement of Water Flow, U.S. Department of Commerce, National Bureau of Standards, NBS Special Publication 421, May 1975, 96 pp. (Available from the U.S. Government Printing Office, Washington, D.C. 20402. Order by SD Catalog No. C13.10:421)

2. Water Measurement Manual, U.S. Department of Interior, Bureau of Reclamation, Second Edition, Revised Reprint, 1974, 327 pp. (Available from the U.S. Government Printing Office, Washington D.C. 20402. Order by Catalog No. 172.19/2:W29/2, Stock No. S/N 24003-0027).

3. Flow Measurement in Open Channels and Closed Conduits, U.S. Department of Commerce, National Bureau of Standards, NBS Special Publication 484, October 1977, 982 pp. (Available in paper copy or microfiche from National Technical Information Services (NTIS) Springfield, VA 22151. Order by NTIS No. PB-273 535/5ST.)

4. NPDES Compliance Sampling Manual, U.S. Environmental Protection Agency, Office of Water Enforcement, Publication MCD-51, 1977, 140 pp (Available from the

General Services Administration (8FFS), Centralized Mailing Lists Services, Building 41, Denver Federal Center, CO 80225.)

D. All monitoring instruments and devices used by the Discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary to ensure their continued accuracy. All flow measurement devices shall be calibrated at least once per year to ensure continued accuracy of the devices.

E. Monitoring results, including noncompliance, shall be reported at intervals and in a manner specified in this MRP.

F. Unless otherwise specified by this MRP, all monitoring shall be conducted according to test procedures established at 40 CFR 135, *Guidelines Establishing Test Procedures for Analysis of Pollutants*. All analyses shall be conducted using the lowest practical quantification limit achievable using the specified methodology. Where effluent limitations are set below the lowest achievable quantitation limits, pollutants not detected at the lowest practical quantitation limits will be considered in compliance with effluent limitations. Analysis for toxics listed by the California Toxics Rule shall also adhere to guidance and requirements contained in the Policy for *Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (2005). Analyses for toxics listed in Table B of the California Ocean Plan (2005) shall adhere to guidance and requirements contained in that document.

II. MONITORING LOCATIONS

The Discharger shall establish the following monitoring locations to demonstrate compliance with the effluent limitations, discharge specifications, and other requirements in this Order:

Table E-1. Monitoring Locations

Discharge Point Name	Monitoring Location Name	Monitoring Location Description
---	INF-001	At a location where a representative sample of intake seawater can be obtained prior to its contact with any operations, chemical application, other water or waste streams, and/or treatment.
001	EFF-001	At a point where an effluent sample can be collected that is representative of discharges to the Pacific Ocean, but before dilution occurs with ocean water and other waste streams not authorized by this Order (e.g., Moss Landing Marine Laboratories and Monterey Bay Aquarium Research Institute).

III. INFLUENT MONITORING REQUIREMENTS

A. Monitoring Location INF-001

The Discharger shall monitor influent seawater at Monitoring Location INF-001, during all phases of operation, in accordance with the following schedule.

Table E-2. Influent Seawater Monitoring Requirements

Parameter	Units	Sample Type	Minimum Sampling Frequency
pH	Units	Grab	Daily
Temperature	° F	Grab	Weekly
Turbidity	NTU	Grab	Weekly
Specific Conductivity	µmhos/cm	Grab	Weekly
Settleable Solids	mL/L/hr	Grab	Weekly
TDS	mg/L	Grab	Monthly
Ocean Plan Table B Metals [1]	µg/L	Grab	Annually [2]

[1] The metals with applicable water quality objectives established by Table B of the Ocean Plan (2005) – As, Cd, Cr+6, Cu, Pb, Hg, Ni, Se, Ag, Zn. Analyses, compliance determination, and reporting for these pollutants shall adhere to applicable provisions of the Ocean Plan, including the Standard Monitoring Procedures presented in Appendix III of the Ocean Plan. The Discharger shall instruct its analytical laboratory to establish calibration standards so that the Minimum Levels (MLs) presented in Appendix II of the Ocean Plan are the lowest calibration standards. The Discharger and its analytical laboratory shall select MLs, which are below applicable water quality criteria of Table B; and when applicable water quality criteria are below all MLs, the Discharger and its analytical laboratory shall select the lowest ML.

[2] Monitoring for the Ocean Plan Table B metals shall be performed during the first year following the effective date of this Order and every year thereafter.

IV. EFFLUENT MONITORING REQUIREMENTS

A. Monitoring Location EFF-001

The Discharger shall monitor its discharge to Monterey Bay at Monitoring Location EFF-001, during all phases of operation, in accordance with the following schedule.

Table E-3. Effluent Monitoring Requirements

Parameter	Units	Sample Type	Minimum Sampling Frequency
Flow	mgd	Metered	Daily
pH	Units	Grab	Daily
Temperature	℃	Grab	Weekly
Specific Conductivity	µmhos/cm	Grab	Weekly
TDS	mg/L	Grab	Weekly
Settleable Solids	ml/L	Grab	Weekly
TSS	mg/L	Grab	Monthly
Turbidity	NTU	Grab	Monthly
Oil and Grease	mg/L	Grab	Annually
Chronic Toxicity [1]	TUc	Grab	Quarterly
Ocean Plan Table B Pollutants [2], [3]	µg/L	Grab	Annually
1,3-Butadiene [4]	µg/L	Grab	Annually
Acetaldehyde [4]	µg/L	Grab	Annually
Formaldehyde [4]	µg/L	Grab	Annually
Naphthalene [4]	µg/L	Grab	Annually
Propylene Oxide [4]	µg/L	Grab	Annually
Xylenes [4]	µg/L	Grab	Annually

Parameter	Units	Sample Type	Minimum Sampling Frequency
Total Organic Carbon (TOC) [4]	µg/L	24-hr composite	Annually

[1] Whole effluent chronic toxicity monitoring shall be conducted according to the requirements established in section V. of this Monitoring and Reporting Plan.

[2] The pollutants, excluding radioactivity and acute toxicity, with applicable water quality objectives established by Table B of the Ocean Plan (2005).

[3] Analyses, compliance determination, and reporting for these pollutants shall adhere to applicable provisions of the Ocean Plan, including the Standard Monitoring Procedures presented in Appendix III of the Ocean Plan. The Discharger shall instruct its analytical laboratory to establish calibration standards so that the Minimum Levels (MLs) presented in Appendix II of the Ocean Plan are the lowest calibration standards. The Discharger and its analytical laboratory shall select MLs, which are below applicable water quality criteria of Table B; and when applicable water quality criteria are below all MLs, the Discharger and its analytical laboratory shall select the lowest ML.

[4] The analytical method selected for a parameter shall be the one that can measure the lowest detected limit for that parameter.

V. WHOLE EFFLUENT TOXICITY TESTING REQUIREMENTS

A. Chronic Toxicity

The presence of chronic toxicity shall be estimated as specified in *Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms*, EPA-821/600/R-95/136; *Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms*, EPA-600-4-91-003; *Procedures Manual for Conducting Toxicity Tests developed by the Marine Bioassay Project, SWRCB 1996, 96-1WQ; and/or Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms*, EPA/600/4-87-028 or subsequent editions.

Chronic toxicity measures a sub lethal effect (e.g., reduced growth or reproduction) to experimental test organisms exposed to an effluent compared to that of the control organisms. The no observed effect concentration (NOEC) is the maximum tested concentration in a medium which does not cause known adverse effects upon chronic exposure in the species in question (i.e. the highest effluent concentration to which organisms are exposed in a chronic test that causes no observable adverse effects on the test organisms; (e.g., the highest concentration of a toxicant to which the values for the observed responses are not statistically significantly different from the controls). Examples of chronic toxicity include but are not limited to measurements of toxicant effects on reproduction, growth, and sublethal effects that can include behavioral, physiological, and biochemical effects. Test results shall be reported in chronic toxicity units (TUc), where TUc = 100/NOEC. For this discharge, the presence of chronic toxicity at more than 34 TUc shall trigger the TRE requirements of the Order.

If the effluent to be discharged to a marine or estuarine system (e.g., salinity values in excess of 1,000 mg/L) originates from a freshwater supply, salinity of the effluent must be increased with dry ocean salts (e.g., FORTY FATHOMS®) to match salinity of the receiving water. This modified effluent shall then be tested using marine species.

Test species shall include a vertebrate, an invertebrate, and an aquatic plant. After a screening period, monitoring may be reduced to the most sensitive species. Screening phase chronic toxicity monitoring shall be conducted with approved test protocols and species shown in Table E-4 below.

Table E-4. Approved Tests – Chronic Toxicity

Species	Test	Tier [1]	Reference [2]
Giant Kelp, *Macrocystis pyrifera*	percent germination; germ tube length	1	a, c
Red abalone, *Haliotis rufescens*	abnormal shell development	1	a, c
Oyster, *Crassostrea gigas*; mussels, *Mytilus spp.*	abnormal sell development; percent survival	1	a, c
Urchin, *Strongylocentrotus purpuratus;* sand dollar, *Dendraster excentricus*	percent normal development; percent fertilization	1	a, c
Shrimp, *Homesimysis costata*	percent survival; growth	1	a, c
Shrimp*, Menidia beryllina*	percent survival; fecundity	2	b, d
Topsmelt, *Atherinops affinis*	larval growth rate; percent survival	1	a, c
Silverside, *Menidia beryllina*	larval growth rate; percent survival	2	b, d

[1] First tier methods are preferred for compliance monitoring. If first tier organisms are not available, the Discharger can use a second tier test method following approval by the Regional Water Board

[2] Protocol References:

a. Chapman, G.A., D.L. Denton, and J.M. Lazorchak. 1995. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms. U.S. EPA Report No. EPA/600/R-95/136

b. Klemm, D.J., G.E. Morrison, T.J. Norberg-King, W.J. Peltier, and M.A. Heber. 1994. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Marine and Estuarine Organisms. U.S. EPA Report No. EPA-600-4-91-003.

c. SWRCB 1996. Procedures Manual for Conducting Toxicity Tests Developed by the Marine Bioassay Project. 96-1WQ.

d. Webber, C.I., W.B. Horning II, D.J. Klemm, T.W. Nieheisel, P.A. Lewis, E.L. Robinson, J. Menkedick and F. Kessler (eds). 1998. Short-term methods for estimating the chronic toxicity of effluents and receiving waters to marine and estuarine organisms. EPA/600/4-87/028.

Authorized dischargers shall conduct toxicity tests using effluent dilutions of 100%, 85%, 70%, 50%, and 25%. Dilution and control waters shall be obtained from an area of the receiving waters, typically upstream, which is unaffected by the discharge. Standard dilution water can be used, if the receiving water itself exhibits toxicity or if approved by the Regional Water Board. If the dilution water used in testing is different from the water in which the test organisms were cultured, a second control sample using culture water shall be tested.

The sensitivity of test organisms to a reference toxicant shall be determined concurrently with each bioassay and reported with the test results.

B. Toxicity Reporting

1. The Discharger shall include a full report of toxicity test results with the regular monthly monitoring report and include the following information.

a. toxicity test results,

b. dates of sample collection and initiation of each toxicity test, and

c. and/or chronic toxicity discharge limitations (or value).

2. Toxicity test results shall be reported according to the appropriate guidance - *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, Fifth Edition, U.S. EPA Office of Water, EPA-821-R-02-012 (2002) or the latest edition, or, EPA-821-R-02-012 (2002) or subsequent editions.

3. If the initial investigation TRE workplan is used to determine that additional (accelerated) toxicity testing is unnecessary, these results shall be submitted with the monitoring report for the month in which investigations conducted under the TRE workplan occurred.

4. Within 14 days of receipt of test results exceeding the chronic toxicity discharge limitation, the Discharger shall provide written notification to the Executive Officer of:

   a. Findings of the TRE or other investigation to identify the cause(s) of toxicity,

   b. Actions the Discharger has taken/will take, to mitigate the impact of the discharge and to prevent the recurrence of toxicity. When corrective actions, including TRE, have not been completed, a schedule under which corrective actions will be implemented, or the reason for not taking corrective action, if no action has been taken.

VI. LAND DISCHARGE MONITORING REQUIREMENTS

This section of the standardized permit form is not applicable.

VIII. RECEIVING WATER MONITORING REQUIREMENTS – SURFACE WATER AND GROUNDWATER

This section of the standardized permit form is not applicable.

IX. OTHER MONITORING REQUIREMENTS

A. Video Tape Survey of Diffuser and Diffuser Area

A video tape reconnaissance survey of the diffuser and diffuser area shall be conducted annually. Surveys shall occur during periods of safe diving conditions and water clarity conducive to good video taping. The surveys shall include the diffuser and bottom area within at least 20 feet on each side of the diffuser. The videotape shall be submitted to the Regional Water Board and shall be accompanied by a diver narrative describing bottom conditions, any fish or macroinvertebrates, and any apparent effects of the diffuser and outfall system.

X. REPORTING REQUIREMENTS

A. General Monitoring and Reporting Requirements

1. The Discharger shall comply with all Standard Provisions (Attachment D) related to monitoring, reporting, and recordkeeping.

2. If there is no discharge during any reporting period, the report shall so state.

3. Each monitoring report shall contain a separate section titled "Summary of Non-Compliance" which discusses the compliance record and corrective actions taken or planned that may be needed to bring the discharge into full compliance with waste discharge requirements. This section shall clearly list all non-compliance with waste discharge requirements, as well as all excursions of effluent limitations.

4. The Discharger shall inform the Regional Water Board well in advance of any proposed construction activity that could potentially affect compliance with applicable requirements

5. The Discharger shall report the results of chronic toxicity testing, TRE and TIE as required in the Attachment E, Monitoring and Reporting, Section V.G.

B. Self Monitoring Reports (SMRs)

1. At any time during the term of this permit, the State or Regional Water Board may notify the Discharger to electronically submit SMRs using the State Water Board's California Integrated Water Quality System (CIWQS) Program Web site (http://www.waterboards.ca.gov/ciwqs/index.html). Until such notification is given, the Discharger shall submit hard copy SMRs. The CIWQS Website will provide additional directions for SMR submittal in the event there will be service interruption for electronic submittal.

2. The Discharger shall report in the SMR the results for all monitoring specified in this MRP under sections III through IX. The Discharger shall submit monthly SMRs including the results of all required monitoring using USEPA-approved test methods or other test methods specified in this Order. If the Discharger monitors any pollutants more frequently than required by this Order, the results of this monitoring shall be included in the calculations and reporting of the data submitted in the SMR.

3. Monitoring periods and reporting for all required monitoring shall be completed according to the following schedule:

Table E-5. Monitoring Periods and Reporting Schedule

Sampling Frequency	Monitoring Period Begins On…	Monitoring Period	SMR Due Date
Continuous	**May 9, 2009**	All	Submit with monthly SMR

Daily	**May 9, 2009**	(Midnight through 11:59 PM) or any 24-hour period that reasonably represents a calendar day for purposes of sampling.	Submit with monthly SMR
Monthly	First day of calendar month following permit effective date or on permit effective date if that date is first day of the month	1st day of calendar month through last day of calendar month	Submit with monthly SMR
Quarterly	Closest of January 1, April 1, July 1, or October 1 following (or on) permit effective date	January 1 through March 31 April 1 through June 30 July 1 through September 30 October 1 through December 31	Submit with next monthly SMR
Semiannually	Closest of January 1 or July 1 following (or on) permit effective date	January 1 through June 30 July 1 through December 31	Submit with monthly SMR
Annually	January 1 following (or on) permit effective date	January 1 through December 31	Submit with Annual Report

4. The Discharger shall report with each sample result the applicable Minimum Level (ML) and the current Method Detection Limit (MDL), as determined by the procedure in 40 CFR Part 136.

   a. Sample results greater than or equal to the reported ML shall be reported as measured by the laboratory (i.e., the measured chemical concentration in the sample).

   b. Sample results less than the reported ML, but greater than or equal to the laboratory's MDL, shall be reported as "Detected, but Not Qualified," or DNQ. The estimated chemical concentration of the sample shall also be reported.

      For the purposes of data collection, the laboratory shall write the estimated chemical concentration next to the DNQ as well as the words "Estimated Concentration" (may be shortened to "Est. Conc."). The laboratory may, if such information is available, include numerical estimates of the data quality for the reported result. Numerical estimates of data quality may be percent accuracy (± a percentage of the reported value), numerical ranges (low to high), or any other means considered appropriate by the laboratory.

   c. Sample results less than the laboratory's MDL shall be reported as "Not Detected", or ND.

   d. Dischargers are to instruct laboratories to establish calibration standards so that the ML value (or its equivalent if there is a differential treatment of samples relative to calibration standards) is the lowest calibration standard. At no time is the Discharger to use analytical data derived from *extrapolation* beyond the lowest point of the calibration curve.

5. The Discharger shall submit SMRs in accordance with the following requirements:

a. The Discharger shall arrange all reported data in a tabular format. The data shall be summarized to clearly illustrate whether the facility is operating in compliance with interim and/or final effluent limitations. The Discharger is not required to duplicate the submittal of data that is entered in a tabular format within CIWQS. When electronic submittal of data is required and CIWQS does not provide for entry into a tabular format within the system, the Discharger shall electronically submit the data in a tabular format as an attachment.

b. The Discharger shall attach a cover letter to the SMR. The information contained in the cover letter shall clearly identify violations of the WDRs; discuss corrective actions taken or planned; and the proposed time schedule for corrective actions. Identified violations must include a description of the requirement that was violated and a description of the violation.

c. SMRs must be submitted to the Regional Water Board, signed and certified as required by the Standard Provisions (Attachment D), to the address listed below:

Central Coast Regional Water Quality Control Board
895 Aerovista Place, Suite 101
San Luis Obispo, California 93401

6. An Annual Self Monitoring Report shall be due on February 1 following each calendar year and shall include:

a, All data required by this MRP for the corresponding monitoring period, including appropriate calculations to verify compliance with effluent limitations.

b. A discussion of any incident of non-compliance and corrective actions taken.

C. Discharge Monitoring Reports (DMRs)

1. As described in Section X.B.1 above, at any time during the term of this permit, the State or Regional Water Board may notify the Discharger to electronically submit SMRs that will satisfy federal requirements for submittal of Discharge Monitoring Reports (DMRs). Until such notification is given, the Discharger shall submit DMRs in accordance with the requirements described below.

2. DMRs must be signed and certified as required by the standard provisions (Attachment D). The Discharger shall submit the original DMR and one copy of the DMR to the address listed below.

Standard Mail
State Water Resources Control Board
Division of Water Quality
c/o DMR Processing Center
PO Box 100
Sacramento, CA 95812-1000

Fed Ex / UPS / Other Private Carrier
State Water Resources Control Board
Division of Water Quality
c/o DMR Processing Center
1001 I Street, 15th Floor
Sacramento, CA 95814

3. All discharge monitoring results must be reported on the official USEPA pre-printed DMR forms (EPA Form 3320-1). Forms that are self-generated will not be accepted unless they follow the exact same format of EPA Form 3320-1.

D. Other Reports

1. The Discharger shall report the results of any special monitoring, TREs, or other data or information that results from the Special Provisions, Section VI.C, of the Order. The Discharger shall submit such reports with the first monthly SMR scheduled to be submitted on or immediately following the report due date.

2. Notifications. To help coordinate ongoing project review by the Central Coast Water Board and California Coastal Commission, data and reports submitted to the Central Coast Water Board as part of this Order shall also be submitted to the individual listed below:

Tom Luster
California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, CA 94105

3. Notifications. The regulations for the Monterey Bay National Marine Sanctuary at 15 CFR Part 922.132 prohibit discharges from within the boundaries of the MBNMS. Discharges occurring outside the MBNMS that subsequently enter and injure Sanctuary resources or qualities are similarly prohibited. In order to protect the health of the MBNMS, the permittee must immediately notify the MBNMS office at 888-902-2778 for any spills that are likely to enter ocean waters. In addition to facilitating potential enforcement investigations, the MBNMS seeks to track this information in order to evaluate existing and direct the implementation of new management measures. The Discharger shall send annual reports to MBNMS staff and notify MBNMS staff prior to changes in Facility Design Flow, specifically, before going to Permit Phase 2 and Permit Phase 3. All correspondence shall be sent to the individual listed below:

Permit Coordinator
Monterey Bay National Marine Sanctuary
299 Foam Street Monterey, CA 93940

ATTACHMENT F – FACT SHEET – TABLE OF CONTENTS

LIST OF TABLES

ATTACHMENT F – FACT SHEET

As described in Section II of this Order, this Fact Sheet includes the legal requirements and technical rationale that serve as the basis for the requirements of this Order.

I. PERMIT INFORMATION

The following table summarizes administrative information related to the Facility.

Table F-1. Facility Information

WDID	3272006001
Discharger	Moss Landing Commercial Park and Moss Landing Cement Company, LLC
Name of Facility	Moss Landing Cement Company Facility
Facility Address	7697 Highway 1
	Moss Landing, CA 95039
	Monterey County
Facility Contact, Title and Phone	Sam Bose, Director of Operations (408) 340-4600 Brent Constantz, Managing Member (408) 340-4600
Authorized Person to Sign and Submit Reports	Sam Bose, Director of Operations (408) 340-4600
Mailing Address	PO Box 777, Moss Landing, CA 95039
Billing Address	PO Box 777, Moss Landing, CA 95039
Type of Facility	Green Cement Plant
Major or Minor Facility	Major
Threat to Water Quality	2
Complexity	B
Pretreatment Program	NA
Reclamation Requirements	NA
Facility Permitted Flow	Phase 1 = 0.04 million gallons per day (mgd) (daily average), 0.05 mgd (daily maximum) Phase 2 = 24 mgd (daily average), 25 mgd (daily maximum) Phase 3 = 56 mgd (daily average), 60 mgd (daily maximum)
Facility Design Flow	Phase 1 = 0.04 mgd (daily average), 0.05 mgd (daily maximum) Phase 2 = 24 mgd (daily average), 25 mgd (daily maximum) Phase 3 = 56 mgd (daily average), 60 mgd (daily maximum)
Watershed	NA
Receiving Water	Pacific Ocean (Monterey Bay)
Receiving Water Type	Pacific Ocean

A. Moss Landing Cement Company, LLC is the operator of the Moss Landing Cement Company Plant. Moss Landing Commercial Park, LLC owns the property at 7697 Highway 1, Moss Landing, CA, on which the facility is located. Together Moss Landing Cement Company, LLC and Moss Landing Commercial Park, LLC are referred to as the Discharger. The facility extracts calcium and magnesium from seawater and by precipitation processes produces cement or an intermediate product for the production of cement.

For the purposes of this Order, references to the "discharger" or "permittee" in applicable federal and state laws, regulations, plans, or policy are held to be equivalent to references to the Discharger herein.

B. The facility is a green cement plant, which is operated at the location of the former National Refractories and Minerals Corporation cement plant and discharges calcium and magnesium depleted seawater to Monterey Bay within the Monterey Bay National Marine Sanctuary (waters of the United States).

C. The Discharger filed a Report of Waste Discharge and submitted an application to renew the facility's Waste Discharge Requirements (WDRs) and National Pollutant Discharge Elimination System (NPDES) permit on May 9, 2008. A site visit to assist with development of this Order was conducted on September 25, 2008.

II. FACILITY DESCRIPTION

A. Description of Wastewater and Treatment or Controls

Seawater is pumped from Moss Landing Harbor by up to nine 100-horsepower pumps through two intake lines to the facility. Seawater, which contains calcium chloride and magnesium chloride ($CaCl_2$ and $MgCl_2$), is combined with dolime, lime, brucite (magnesium hydroxide tailings from historical operations of the National Refractories and Minerals Corporation), sodium hydroxide, sodium carbonate, fly ash, and/or calcium and magnesium-bearing silicate materials such as olivine and serpentine. The Discharger's precipitation process also utilizes carbon dioxide (CO_2), sparged from flue gases of the neighboring Moss Landing Power Plant. Following precipitating reactions, the seawater mixture will be directed to as many as seven 3-million gallon (capacity) tanks where settling of precipitated solids will occur. Settled material will be dried to be sold to the construction industry as green cement or as a cement supplement. Calcium and magnesium depleted seawater, decanted from the thickening tanks, will be discharged back to Monterey Bay through Discharge Point 001.

If necessary, chlorine can be added at the seawater intake to prevent microbiological fouling. No scale inhibitors, chelants, or other cleaning compounds will be used. In the event of plant shut down, intake pumps can be shut off and flow within the plant will be held in one or more of the on-site ponds. Well water may be used for washing production equipment.

Initially, the Discharger plans to operate a pilot-scale operation with a daily average discharge of 0.04 mgd and a daily maximum discharge of 0.05 mgd. This Phase 1 operation will be followed by a prototype operation with a daily maximum discharge of 25 mgd, and ultimately, by a full-scale operation with discharge of up to 60 mgd. Modifications to operational procedures and equipment will likely be required after Phase 1 and/or Phase 2 based on the experience of the earlier phases of operation.

This facility and its discharge will be similar to that of the National Refractories and Minerals Corporation which has occupied the same location. Both operations extract minerals from seawater for the manufacture of cement, with a difference being the use of carbon dioxide from an external source by the Moss Landing Cement Company.

Only the discharge of calcium and magnesium depleted seawater will occur under this permit. The previous permit also authorized the discharge of domestic wastewater and industrial storm water. Neither of the two latter sources is addressed in this permit. Domestic wastewater generated at the Moss Landing Commercial Park will be treated in a septic system and leach field. Discharge of storm water must be authorized by State Water Resources Control Board's Water Quality Order 97-03-DWQ, NPDES General Permit No. CAS000001 (*Waste Discharge Requirements for Discharges of Storm Water Associated with Industrial Activities Excluding Construction Activities*).

Water Board staff evaluated the potential effects of entrainment and impingement using a volumetric approach that compared the Moss Landing Cement Plant project to previous 316(b) studies at the adjacent Moss Landing Power Plant (MLPP). The proposed discharge in Phase 1 (maximum flow 0.05 mgd or 35 gpm) would have a flow about 24,500 times lower than the combined maximum intake volume of the MLPP cooling water system (approximately 1226 MGD). For comparison to the maximum Phase 1 flow of 35 gpm, the circulating pump on a standard small V8 GM-based sterndrive engine uses approximately 50 gpm of Moss Landing Harbor seawater for cooling. The proposed maximum discharge flows in Phase 2 (maximum flow 25 mgd) and Phase 3 (maximum flow 60 mgd) would have flows about 49 and 20 times lower, respectively, than the combined maximum intake volume of the MLPP cooling water system. Based on review of entrainment modeling studies (Fecundity Hind casting, Adult Equivalent Losses, and Empirical Transport Model) at MLPP, the relatively low flows of Moss Landing Harbor water through the Moss Landing Cement Plant would have negligible potential impingement and entrainment impacts.

B. Discharge Points and Receiving Waters

Wastewater is discharged from Discharge Point 001 to the Monterey Bay near Moss Landing Harbor, waters of the United States, through a 620-foot (189 m), 51-inch (inside diameter) outfall/diffuser system. The last 130 feet of pipe consists of a diffuser section, which has 32 nozzles placed to gradually diffuse the discharge to the ocean environs.

The Discharger's diffuser sustained damages during the 1989 Loma Prieta earthquake. Studies conducted by the Moss Landing Marine Laboratories at that time determined there is low potential for significant environmental impact because of the damage. The outfall/diffuser system is visually inspected on an annual basis during normal operations. The Discharger continues to use the existing outfall/diffuser system without repair. The minimum initial dilution factor was determined to be 33:1 (seawater: effluent). The Discharger currently allows the Moss Landing Marine Laboratories and Monterey Bay Aquarium Research Institute to use its outfall. These dischargers are not subject to or authorized to discharge pursuant to this Order. Similarly, this Order does not authorize discharges to Monterey Bay, via Discharge Point 001, by any tenant of the Moss Landing Commercial Park other than the Moss Landing Cement Company, LLC. The Discharger has established and will maintain an effluent compliance monitoring location that is prior to any other sources entering the outfall line.

The receiving water for this discharge is part of the Monterey Bay National Marine Sanctuary, designated as such on September 15, 1992. The purpose of the National

Marine Sanctuaries Program is to protect areas of the marine environment which possess conservation, recreational, ecological, historical, research, educational, or aesthetic qualities of special national significance. The first priority of the Program is the long-term protection of resources within designated sanctuaries. The Monterey Bay Sanctuary has been recognized for its unique and diverse biological and physical characteristics.

C. Summary of Existing Requirements and Self-Monitoring Report (SMR) Data

Effluent limits contained in the previous Order for Discharge Point 001 are presented in the following tables.

Table F-2. Effluent Limitations for Conventional and Non-Conventional Pollutants

Parameter	Units	Effluent Limitations		
		Average Monthly	Average Weekly	Daily Maximum
TSS	mg/L	60	--	90
	lb/day	30,000		45,000
Oil & Grease	mg/L	25	40	75
Settleable Solids	mL/L	1.0	1.5	3.0
Turbidity	NTU	75	100	225
Acute Toxicity	TUa	1.5	2.0	2.5
pH	pH Units	6.0 – 9.0		

Table F-3. Effluent Limitations for Toxic Pollutants for the Protection of Marine Aquatic Life

Pollutant	Unit	6-Month Median	Daily Maximum	Instantaneous Maximum
Arsenic	mg/L	0.2	0.99	2.6
Cadmium	mg/L	0.03	0.2	0.34
Chromium (+6)	mg/L	0.07	0.3	0.68
Copper	mg/L	0.04	0.34	0.95
Lead	mg/L	0.07	0.3	0.68
Mercury	mg/L	1.0	5.4	13.0
Nickel	mg/L	0.2	0.68	1.7
Selenium	mg/L	0.51	2.0	5.1
Silver	mg/L	0.02	0.09	0.23
Zinc	mg/L	0.4	2.5	6.5
Cyanide	mg/L	0.17	0.68	1.7
Total Residual Chlorine	mg/L	0.07	0.3	2.0
Ammonia (as N)	mg/L	20.4	81.6	204.0
Chronic Toxicity	TUc	---	34.0	---
Phenolic Compounds (non-chlorinated)	mg/L	1.0	4.08	10.2
Chlorinated Phenolics	mg/L	0.03	0.14	0.34
Endosulfan	µg/L	0.3	0.61	0.92
Endrin	µg/L	0.07	0.14	0.20
HCH	µg/L	0.14	0.27	0.41

Pollutant	Unit	6-Month Median	Daily Maximum	Instantaneous Maximum
Radioactivity	Not to exceed limits specified in Title 17, Division 1, Chapter 5, Subchapter 4, Group 3, Article 3, Section 30253 of the California Code of Regulations. Reference to Section 30253 is prospective, including future changes to any incorporated provisions of federal law, as the changes take effect.			

Table F-4. Effluent Limitations for Toxic Pollutants for the Protection of Human Health (Non-Carcinogens)

Pollutant	Unit	30-day Average
Acrolein	mg/L	7.5
Antimony	mg/L	41.0
Bis(2-Chloroethoxy)Methane	mg/L	0.15
Bis(2-Chloroisopropyl)Ether	mg/L	41.0
Chlorobenzene	mg/L	19.0
Chromium (III)	g/L	6.5
Di-n-Butyl Phthalate	g/L	0.12
Dichlorobenzenes [1]	g/L	0.18
1,1-Dichloroethylene	g/L	0.24
Diethyl Phthalate	g/L	1.1
Dimethyl Phthalate	g/L	28.0
4,6-Dinitro-2-methylphenol	mg/L	7.5
2,4-Dinitrophenol	mg/L	0.14
Ethylbenzene	g/L	0.14
Fluoranthene	mg/L	0.51
Hexachlorocyclopentadiene	mg/L	2.0
Isophorone	µg/L	5.1
Nitrobenzene	mg/L	0.17
Thallium	mg/L	0.48
Toluene	µg/L	2.9
1,1,2,2-Tetrachloroethane	µg/L	0.041
Tributylin	µg/L	0.048
1,1,1-Trichloroethane	µg/L	18.0
1,1,2-Trichloroethane	µg/L	1.5

Table F-5. Effluent Limitations for Toxic pollutants for the Protection of Human Health (Carcinogens)

Pollutant	Unit	30-day Average
Acrylonitrile	µg/L	3.4
Aldrin	ng/L	0.75
Benzene	mg/L	0.20
Benzidine	ng/L	2.3
Beryllium	µg/L	1.1
Bis(2-chloroethyl) ether	µg/L	1.5
Bis(2-ethylhexyl) phthalate	mg/L	0.12

Pollutant	Unit	30-day Average
Carbon Tetrachloride	mg/L	0.031
Chlordane	ng/L	0.78
Chloroform	mg/L	4.4
DDT	ng/L	5.8
1,4-Dichlorobenzene	mg/L	0.61
3,3-Dichlorobenzidine	µg/L	0.28
1,2-Dichloroethane	mg/L	4.4
Dichloromethane	mg/L	15.0
1,3-Dichloropropene	mg/L	0.30
Dieldrin	µg/L	1.4
2,4-Dinitrotoluene	mg/L	0.088
1,2-Diphenylhydrazine	µg/L	5.4
Halomethanes	mg/L	4.4
Heptachlor	µg/L	0.024
Hexachlorobenzene	ng/L	7.1
Hexachlorobutadiene	mg/L	0.48
Hexachloroethane	mg/L	0.085
N-nitrosodimethylamine	mg/L	0.25
N-nitrosodiphenylamine	mg/L	0.085
PAHs	µg/L	0.30
PCBs	ng/L	0.65
TCDD Equivalents	ng/L	0.13
Tetrachloroethylene	mg/L	3.4
Toxaphene	ng/L	7.1
Trichloroethylene	mg/L	0.92
2,4,6-Trichlorophenol	µg/L	9.9
Vinyl Chloride	mg/L	1.2

D. Compliance Summary

There has been no discharge from this facility since 2001.

E. Planned Changes

The Discharger intends to resume operations at this facility in three phases of operation, with Phase 3, the intended long-term mode of operation, to be accomplished during the anticipated five-year term of this Order. Phase 1 of operations will be a pilot scale operation and will result in a daily average discharge rate of 0.04 mgd and a daily maximum discharge rate of 0.05 mgd. Phase 2 will result in daily average and daily maximum discharge rates of 24 and 25 mgd; and Phase 3 will result in a daily average and daily maximum discharge rates of 56 and 60 mgd, respectively. There is no set schedule for initiation of Phases 2 and 3; however, the Discharger expects to be in Phase 3 of operations during the five-year term of this Order.

Section VI. C. 6. b of this Order establishes a requirement for the Discharger to perform a Discharge Characterization Study during Phase 1 of operations. The Regional Water Board must review results of this study and provide written confirmation to the Discharger that characteristics of the discharge are as contemplated by this Order before the Discharger will become authorized to discharge in its Phase 2 of operations.

III. APPLICABLE PLANS, POLICIES, AND REGULATIONS

The requirements contained in the proposed Order are based on the requirements and authorities described in this section.

A. Legal Authorities

This Order is issued pursuant to the federal Clean Water Act (CWA) section 402 and implementing regulations adopted by the USEPA, and Chapter 5.5, Division 7 of the California Water Code (CWC). It shall serve as an NPDES permit for point source discharges from this facility to surface waters. This Order also serves as WDRs pursuant to CWC Article 4, Chapter 4, Division 7.

B. California Environmental Quality Act (CEQA)

Pursuant to California Water Code section 13389, this action to adopt an NPDES permit is exempt from the provisions of CEQA, Public Resources Code sections 21100-21177.

C. State and Federal Regulations, Policies, and Plans

1. **Water Quality Control Plans.** The Regional Water Board has adopted a *Water Quality Control Plan for the Central Coast Region* (the Basin Plan) that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for receiving waters within the Region. To address ocean waters, the Basin Plan incorporates by reference the *Water Quality Control Plan for Ocean Waters of California* (the Ocean Plan), which was adopted in 1972 and amended in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The most recent amendment to the Ocean Plan was adopted by the State Water Resources Control Board (the State Water Board) on April 21, 2005, and became effective on February 14, 2006.

   The Basin Plan implements State Water Board Resolution No. 88-63, which establishes State policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply (MUN). Because of very high levels of total dissolved solids (TDS) in marine waters, the receiving waters for discharges from the Moss Landing Cement Company facility meet an exception to Resolution No. 88-63, which precludes waters with TDS levels greater than 3,000 mg/L from the MUN designation. Beneficial uses established by the Basin Plan and the Ocean Plan for the coastal waters between Soquel Point and the Salinas River, including Monterey Bay, are described in section II. H of the Order.

   Requirements of this Order implement the Basin Plan and Ocean Plan.

2. **Thermal Plan.** The State Water Board adopted a *Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Water and Enclosed Bays and Estuaries of California* (Thermal Plan) on May 18, 1972, and amended this plan on September 18, 1975. This plan contains the following temperature objective for existing discharges to enclosed bays and coastal waters of California.

   Elevated temperature waste discharges shall comply with limitations necessary to assure protection of beneficial uses.

   The Ocean Plan defines elevated temperature wastes as:

   Liquid, solid, or gaseous material discharged at a temperature higher than the natural temperature of receiving water.

3. **California Ocean Plan**. The State Water Board adopted the *Water Quality Control Plan for Ocean Waters of California, California Ocean Plan* (Ocean Plan) in 1972 and amended it in 1978, 1983, 1988, 1990, 1997, 2000, and 2005. The State Water Board adopted the latest amendment on April 21. 2005 and it became effective on February 14, 2006. The Ocean Plan is applicable, in its entirety, to point source discharges to the Pacific Ocean.

4. **Alaska Rule.** On March 30, 2000, USEPA revised its regulation that specifies when new and revised state and tribal water quality standards become effective for CWA purposes. [65 Fed. Reg. 24641 (April 27, 2000), codified at 40 CFR 131.21] Under the revised regulation (also known as the Alaska Rule), new and revised standards submitted to USEPA after May 30, 2000 must be approved by USEPA before being used for CWA purposes. The final rule also provides that standards already in effect and submitted to USEPA by May 30, 2000, may be used for CWA purposes, whether or not approved by USEPA.

5. **Antidegradation Policy.** NPDES regulations at 40 CFR 131.12 require that State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16, which incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that the existing quality of waters be maintained unless degradation is justified based on specific findings. The Regional Water Board's Basin Plan implements and incorporates by reference both the State and federal antidegradation policies. The permitted discharge is consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16.

6. **Anti-Backsliding Requirements.** Sections 402(o)(2) and 303(d)(4) of the Clean Water Act (CWA) and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require that effluent limitations in a reissued permit must be as stringent as those in the previous permit, with some exceptions in which limitations may be relaxed.

D. Impaired Water Bodies on CWA 303 (d) List

CWA section 303 (d) requires states to identify specific water bodies where water quality standards are not expected to be met after implementation of technology-based effluent limitations on point sources. For all 303 (d) listed water bodies and pollutants, the Regional Water Board must develop and implement TMDLs (Total Maximum Daily Loads) that will specify WLAs (Waste Load Allocations) for point sources and Load Allocations for non-point sources.

The State's 2006 303(d) list of impaired water bodies, which was approved by USEPA in June 2007, does not identify Monterey Bay in the vicinity of the discharge as impaired.

E. Other Plans Policies and Regulations

1. **Discharges of Storm Water.** For the control of storm water discharged from the site of the facility, the Order requires, if applicable, the Discharger to seek authorization to discharge under and meet the requirements of the State Water Resources Control Board's Water Quality Order 97-03-DWQ, NPDES General Permit No. CAS000001 (*Waste Discharge Requirements for Discharges of Storm Water Associated with Industrial Activities Excluding Construction Activities*).

IV. RATIONALE FOR EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

The CWA requires point source dischargers to control the amount of conventional, non-conventional, and toxic pollutants that are discharged into the waters of the United States. The control of pollutants discharged is established through effluent limitations and other requirements in NPDES permits. NPDES regulations establish two principal bases for effluent limitations. At 40 CFR 122.44 (a) permits are required to include applicable technology-based limitations and standards; and at 40 CFR 122.44 (d) permits are required to include water quality-based effluent limitations (WQBELs) to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water. When numeric water quality objectives have not been established, but a discharge has the reasonable potential to cause or contribute to an excursion above a narrative criterion, WQBELs may be established using one or more of three methods described at 40 CFR 122.44 (d) - (1) WQBELs may be established using a calculated water quality criterion derived from a proposed State criterion or an explicit State policy or regulation interpreting its narrative criterion; 2) WQBELs may be established on a case-by-case basis using USEPA criteria guidance published under CWA Section 304 (a); or 3) WQBELs may be established using an indicator parameter for the pollutant of concern.

A. Discharge Prohibitions

1. Discharge Prohibition III. A (No discharge to Monterey Bay at a location other than as described by the Order). The Order authorizes a single, specific point of discharge to Monterey Bay; and this prohibition reflects CWA section 402's prohibition against discharges of pollutants except in compliance with the Act's permit requirements, effluent limitations, and other enumerated provisions. This prohibition is also retained from the previous permit.

2. Discharge Prohibition III. B (Discharges in a manner, except as described by the Order, are prohibited). Because limitations and conditions of the Order have been prepared based on specific information provided by the Discharger and specific wastes described by the Discharger, the limitations and conditions of the Order do not adequately address waste streams not contemplated during drafting of the Order. To prevent the discharge of such waste streams that may be inadequately regulated, the Order prohibits the discharge of any waste that was not described to and contemplated by the Regional Water Board during the process of permit reissuance.

3. Discharge Prohibition III. C. (Discharges to Monterey Bay shall not exceed defined maximum discharge rates). As limitations and conditions of the Order have been prepared based on specific information provided by the Discharger and specific wastes described by the Discharger, the limitations and conditions of the Order may not adequately address waste streams that were not contemplated during drafting of the Order. In particular, section VI. C. 6. b of the Order requires the Discharger to more fully characterize its discharge; and through review of that characterization data, the Regional Water Board will need to confirm its understanding of the character of the discharge before it will authorize a discharge at the higher Phase 2 rate.

4. Discharge Prohibition III. D. (Discharge of any radiological, chemical, or biological warfare agent or high level radioactive waste is prohibited). This prohibition restates a discharge prohibition established in section III. H. of the Ocean Plan.

5. Discharge Prohibition III. E. (Discharge of sludge or sludge digester supernatant to the Ocean is prohibited). This prohibition restates a discharge prohibition established in section III. H. of the Ocean Plan.

6. Discharge Prohibition III. F (Overflows and bypasses prohibited). The discharge of untreated or partially treated wastewater from the Discharger's collection, treatment, or disposal facilities represents an unauthorized bypass pursuant to 40 CFR 122.41 (m), or an unauthorized discharge, which poses a threat to human health and/or aquatic life, and therefore, is explicitly prohibited by the Order.

7. Discharge Prohibition III.G. (Discharge of domestic wastewater is prohibited). Based on information provided by the Discharger, the Regional Water Board understands that there will be no component of domestic wastewater in discharges from this facility. This prohibition acknowledges that understanding and provides protection of the receiving water, as the Regional Water Board has not included other common limitations and conditions in the Order for the control of domestic wastewater.

8. Discharge Prohibition III.H. (Discharge of storm water is prohibited). Based on information provided by the Discharger, the Regional Water Board understands that there will be no storm water component in discharges from this facility. This prohibition acknowledges that understanding and provides protection for the receiving water, as the Regional Water Board has not included other common limitations and conditions in the Order for the control of storm water.

9. Discharge Prohibition III.I. (Discharge of chemical additives is prohibited). Based on information provided by the Discharger, the Regional Water Board understands that no chemicals will be added to the discharge, except for dolomite, lime, and other similar inorganic materials. The Regional Water Board also understands that no organic (carbon containing) materials, except carbon dioxide and carbonate ion, will be added to the discharge. This prohibition acknowledges the Regional Water Board's understanding that a very limited number of similar inorganic materials can be introduced to the facility's discharge and provides protection for the receiving water, as the Regional Water Board has not included limitations and conditions in the Order for the control of such chemical additives.

10. Discharge Prohibition III.J. (Discharge of wastewater containing added coloration is prohibited). Based on information provided by the Discharger, the Regional Water Board understands that the discharge will be of the same color as incoming seawater. Because the facility's process of removing calcium and magnesium from seawater relies on precipitation reactions, this prohibition is meant to prohibit carryover of precipitated solids in the discharge, as well as post-precipitation reactions that could cause coloration of the receiving water in the vicinity of the outfall.

11. Discharge Prohibition III. K. (Discharge of wastewater to receiving water at a temperature that adversely affects beneficial uses is prohibited.) Based on information provided by the Discharger, the Regional Water Board understands that the temperature of seawater will not be significantly raised as it moves from the intake location to the facility's outfall in Monterey Bay within the Monterey Bay National Marine Sanctuary. The Thermal Plan requires that such discharges do not cause natural water temperature to increase to assure protection of the beneficial uses. Based on the Discharger's description of its process, and based generally on the objectives of the Thermal Plan, the Regional Water Board has established this prohibition to prevent thermal impacts to the receiving water.

B. Technology-Based Effluent Limitations

1. Scope and Authority

NPDES regulations at 40 CFR 122.44 (a) require that permits include applicable technology-based limitations and standards. Where the USEPA has not yet developed technology based standards for a particular industry or a particular pollutant, CWA Section 402 (a) (1) and USEPA regulations at 40 CFR 125.3 authorize the use of best professional judgment (BPJ) to derive technology-based effluent limitations on a case-by-case basis. When BPJ is used, the permit writer must consider specific factors outlined at 40 CFR 125.3.

The State Water Board, in Table A of the Ocean Plan, has also established technology based requirements for conventional pollutants (suspended and settleable matter, oil and grease, turbidity, and pH), which are applicable to this facility as an industrial discharger for which Effluent Limitations Guidelines have not been established.

2. Applicable Technology-Based Effluent Limitations

Technology-based effluent limitations applicable to Discharge Point 001 during Phases 1, 2, and 3 and established by the Order are summarized as follows.

Table F-6. Summary of Technology-Based Effluent Limitations

Parameter	Units	Monthly 30-Day Average	Weekly 7-Day Average	Instantaneous Maximum
Oil and Grease	mg/L	25	40	75
Settleable Solids	ml/L	1.0	1.5	3.0
TSS	mg/L	60 [1]	--	--
Turbidity	NTU	75	100	225
pH	s.u.	Within 6.0 to 9.0 at all times		

[1] Discharger shall, as a 30-day average, remove 75% of suspended solids from the influent stream before discharging wastewaters to the ocean, except that the effluent limitation to be met shall not be lower then 60 mg/L.

C. Water Quality-Based Effluent Limitations (WQBELs)

1. Scope and Authority

NPDES regulations at 40 CFR 122.44 (d) require that permits include limitations more stringent than applicable federal technology-based requirements where necessary to achieve applicable water quality standards, including numeric and narrative objectives within a standard.

The process for determining “reasonable potential” for discharges to cause or contribute to an exceedance of a water quality standard and for calculating WQBELs, when necessary, is intended to protect the designated uses of receiving waters as specified in the Basin and Ocean Plans, and achieve applicable water quality objectives and criteria that are contained in the Basin Plan and in other applicable State and federal rules, plans, and policies, including applicable water quality criteria from the Ocean Plan.

Where reasonable potential has been established for a pollutant, but there is no numeric criterion or objective for the pollutant, WQBELs must be established in accordance with the requirements of 40 CFR 122.44 (d) (1) (vi), using (1) USEPA criteria guidance under CWA section 304 (a), supplemented where necessary by other relevant information; (2) an indicator parameter for the pollutant of concern; or (3) a calculated numeric water quality criterion, such as a proposed state criterion or policy interpreting the state’s narrative criterion, supplemented with other relevant information.

2. Applicable Beneficial Uses and Water Quality Criteria and Objectives

Beneficial uses for ocean waters of the Central Coast Region are established by the Basin Plan and the Ocean Plan and are described by Section II. (Findings) H of the Order.

Water quality criteria applicable to ocean waters of the Region are established by the Ocean Plan, which includes water quality objectives for bacterial characteristics, physical characteristics, chemical characteristics, biological characteristics, and radioactivity. The water quality objectives from the Ocean Plan are incorporated as receiving water limitations into this Order. In addition, Table B of the Ocean Plan contains numeric water quality objectives for 83 toxic pollutants for the protection of marine aquatic life and human health.

3. Determining the Need for WQBELs

Procedures for performing a Reasonable Potential Analysis (RPA) for ocean dischargers are described in Section III. C. and Appendix VI. of the Ocean Plan. The typical procedure is a statistical method that projects an effluent data set that accounts for long term variability of pollutants in the effluent, limitations associated with sparse data sets, and uncertainty associated with censored data sets. The procedure assumes a lognormal distribution of an existing effluent data set, and compares the 95th percentile concentration, at a 95 percent confidence level, with the applicable water quality criterion from Table B of the Ocean Plan. A finding of reasonable potential results when the 95th percentile concentration exceeds the applicable criterion.

When effluent data are not available, as in the circumstances of this facility, the Regional Water Board may decide that WQBELs are necessary after a review of such information as the facility or discharge type, solids loading, lack of dilution, potential toxic effects, fish tissue data, 303 (d) status of the receiving water, or the presence of threatened or endangered species or their critical habitat, or other information.

Without recent effluent data, the Regional Water Board has determined that effluent limitations from the previous permit for all Ocean Plan Table B toxic pollutants will be retained but will be updated in this Order to reflect changes in water quality criteria established by the current (2005) Ocean Plan. The importance given to certain of the Table B pollutants (e.g., chlorine, whole effluent chronic toxicity, and the metals As, Cd, Cr^{+6}, Cu, Pb, Hg, Ni, Se, Ag, and Zn) by the Regional Water Board is reflected in the compliance monitoring frequencies established in the Monitoring and Reporting Program.

4. WQBEL Calculations

As described by Section III. C of the Ocean Plan, effluent limits for Table B pollutants are calculated according to the following equation.

$$Ce = Co + Dm (Co - Cs)$$

where:

Ce = the effluent limitation (µg/L)

Co = the water quality objective to be met at the completion of initial dilution (µg/L)
Cs = background seawater concentration
Dm = minimum probable initial dilution expressed as parts seawater per part wastewater

For this facility, Dm is unchanged from Order No. 01-030 (Dm = 33). Initial dilution is the process that results in the rapid and irreversible mixing of the discharge with ocean water at the outfall.

As site-specific water quality data are not available for the ambient water, in accordance with Table B implementing procedures, Cs equals zero for all pollutants, except the following:

Table F-7. Background Seawater Concentrations

Pollutant	Background Seawater Concentration (µg/L)
Arsenic	3
Copper	2
Mercury	0.0005
Silver	0.16
Zinc	8

Implementing provisions at Section III. C of the Ocean Plan requires that, in addition to concentration-based limits, effluent limitations for Table B pollutants be expressed in terms of mass. The Order therefore includes mass-based effluent limitations, which are based on flows of: 0.05, 25, and 60 mgd for Phases 1, 2, and 3 of operation, respectively.

Effluent limitations for the Table B pollutants are tabulated in Section IV. A. 1 of this Order.

5. Whole Effluent Toxicity (WET)

Whole effluent toxicity (WET) protects the receiving water quality from the aggregate toxic effect of a mixture of pollutants in the effluent. WET tests measure the degree of response of exposed aquatic test organisms to an effluent. The WET approach allows for protection of the narrative "no toxics in toxic amounts" criterion while implementing numeric criteria for toxicity. There are two types of WET tests: acute and chronic. An acute toxicity test is conducted over a short time period and measures mortality. A chronic toxicity test is conducted over a longer period of time and may measure mortality, reproduction, and growth.

Implementing provisions of section III. C. of the Ocean Plan express a preference for chronic toxicity limitations when the minimum initial dilution of a discharge is less than 100:1, and therefore, the Regional Water Board is establishing effluent limitations for chronic, not acute, whole effluent toxicity for the facility.

D. Final Effluent Limitations

Final, technology-based and water quality-based effluent limitations established by the Order are discussed in sections IV.B. and IV.C. of this fact sheet.

1. Satisfaction of Anti-Backsliding Requirements

The Order retains both technology and water quality based effluent limitations established by the previous permit, and therefore, applicable anti-backsliding provisions of the Clean Water Act and of NPDES regulations are satisfied.

2. Satisfaction of Antidegradation Policy

The Order does not authorize increases in the concentration or mass of pollutants discharged from the facility, and therefore, is consistent with applicable anti-degradation policy expressed by NPDES regulations at 40 CFR 131.12 and by State Water Board Resolution No. 68-16.

3. Stringency of Requirements for Individual Pollutants

This Order contains both technology-based and water quality-based effluent limitations for individual pollutants. The technology-based effluent limitations consist of restrictions on TSS, settleable solids, turbidity; oil and grease, and pH. Restrictions on these pollutants are discussed in section IV. B of the Fact Sheet. In addition, this Order contains effluent limitations more stringent than the minimum, technology-based requirements that are necessary to meet water quality standards. These limitations are not more stringent than required by the CWA.

Final, technology and water quality-based effluent limitations are summarized in sections IV. A of the Order.

E. Interim Effluent Limitations

The Order does not establish interim effluent limitations and schedules for compliance with final limitations. Interim limitations are authorized only in certain circumstances, when immediate compliance with newly established final WQBELs is not feasible. Interim effluent limitations are not authorized for WQBELs, which are based on water quality criteria of the Ocean Plan.

F. Land Discharge Specifications

This section of the standardized permit is not applicable.

G. Reclamation Specifications

This section of the standardized permit is not applicable.

V. RATIONALE FOR RECEIVING WATER LIMITATIONS

A. Surface Water

Receiving water quality is a result of many factors, some unrelated to the discharge. This Order considers these factors and is designed to minimize the influence of the discharge on the receiving water. Receiving water limitations within the proposed Order generally include the receiving water limitations of the previous Order; however, these limitations have been supplemented and modified to reflect all applicable, general water quality objectives of the Ocean Plan (2005).

B. Groundwater

Groundwater limitations established by the Order include general objectives for groundwater established by the Basin Plan for the Central Coast Region.

VI. RATIONALE FOR MONITORING AND REPORTING REQUIREMENTS

NPDES regulations at 40 CFR 122.48 require all NPDES permits to specify recording and reporting of monitoring results. CWC sections 13267 and 13383 authorize the Water Boards to require technical and monitoring reports. The MRP, Attachment E of this Order, establishes monitoring and reporting requirements to implement federal and State requirements. Following is the rationale for the monitoring and reporting requirements contained in the MRP for this facility.

A. Influent Monitoring

Intake seawater monitoring is established by the Order for pH, temperature, turbidity, specific conductivity, settleable solids, TDS, and Ocean Plan Table B metals to allow comparison with effluent concentrations and thereby determine whether significant amounts of pollutants are being added to seawater that is discharged from the facility.

B. Effluent Monitoring

Effluent monitoring is required for all pollutants and pollutant parameters which have effluent limitations established in section IV.A. of the Order. In addition some effluent monitoring is required to provide further characterization of discharges from this facility.

C. Whole Effluent Toxicity Testing Requirements

Whole effluent toxicity (WET) protects the receiving water quality from the aggregate toxic effect of a mixture of pollutants in the effluent. A chronic toxicity test is conducted over a longer period of time and may measure mortality, reproduction, and growth. Section III. C. 3. c. (4) of the Ocean Plan requires dischargers to conduct chronic toxicity testing if the minimum initial dilution of the effluent is below 100:1. This Order includes routine monitoring requirements for chronic toxicity in the MRP (Attachment E) as specified in the Ocean Plan.

Chronic toxicity is to be calculated using the following formula:

$$TUc = \frac{100}{NOEL}$$

Where: No Observed Effect Level (NOEL) is expressed as the maximum percent effluent or receiving water that causes no observable effect on a test organism, as determined by the result of a critical life stage toxicity test as listed in Appendix II of the Ocean Plan.

D. Receiving Water Monitoring

1. Surface Water

The Order requires the Discharger to participate in a receiving water monitoring program. The Discharger has indicated a willingness to participate in a regional monitoring program in the Monterey Bay, such as CCLEAN. The receiving water monitoring program may be revised based on program development.

2. Groundwater

This section of the standardized permit template is not applicable.

E. Other Monitoring Requirements

1. Video Tape Survey of Diffuser and Diffuser Area

The requirements of this provision are retained from the previous permit. A video tape reconnaissance survey of the diffuser and diffuser area shall be conducted annually. Surveys shall occur during periods of safe diving conditions and water clarity conducive to good video taping. The surveys shall include the diffuser and bottom area within at least 20 feet on each side of the diffuser. The videotape shall be submitted to the Regional Water Board and shall be accompanied by a diver narrative describing bottom conditions, any fish or macroinvertebrates, and any apparent effects of the outfall.

VII. RATIONALE FOR PROVISIONS

A. Standard Provisions

Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment D to the Order.

NPDES regulations at 40 CFR 122.41 (a) (1) and (b - n) establish conditions that apply to all state-issued NPDES permits. These conditions must be incorporated into the permits either expressly or by reference. If incorporated by reference, a specific citation to the regulations must be included in the Order. 40 CFR 123.25 (a) (12) allows the State to omit or modify conditions to impose more stringent requirements. In accordance with 40 CFR123.25, this Order omits federal conditions that address enforcement authority

specified in 40 CFR 122.41 (j) (5) and (k) (2), because the enforcement authority under the Water Code is more stringent. In lieu of these conditions, this Order incorporates by reference Water Code section 13387 (e).

B. Special Provisions

1. Reopener Provisions

The Order may be modified in accordance with the requirements set forth at 40 CFR 122 and 124, to include appropriate conditions or limits based on newly available information, or to implement any new State water quality objectives that are approved by the USEPA. As effluent is further characterized through additional monitoring, and if a need for additional effluent limitations becomes apparent after additional effluent characterization, the Order will be reopened to incorporate such limitations.

2. Special Studies and Additional Monitoring Requirements

The Order requires the facility to maintain a Toxicity Reduction Work Plan. When toxicity monitoring measures chronic toxicity above the effluent limitation established by the Order, the Discharger is required to resample and retest. When all monitoring results are available, the Executive Officer can determine whether to initiate enforcement action, whether to require the Discharger to implement toxicity reduction evaluation (TRE) requirements, or whether other measures are warranted.

3. Best Management Practices and Pollution Prevention

Pollution minimization requirements are based on section III. C. 9 of the Ocean Plan. The Discharger is required to develop a Pollutant Minimization Program only if required to do so in writing by the Executive Officer.

4. Construction, Operation, and Maintenance Specifications

This section of the standardized permit template is not applicable.

5. Special Provisions for Municipal Facilities (POTWs Only)

This section of the standardized permit template is not applicable.

6. Other Special Provisions

a. Discharges of Storm Water

The Order does not address discharges of storm water from the facility, except to require coverage by and compliance with applicable provisions of General Permit No. CAS000001 - *Waste Discharge Requirements for Discharges of Storm Water Associated with Industrial Activities*.

b. Phase 1 Discharge Characterization Study.

During Phase 1 of operations, the Discharger is required to more completely characterize its discharge. Although the Regional Water board understands the discharge to be simply calcium and magnesium depleted seawater, this additional characterization work is designed to provide more data regarding the Ocean Plan Table B pollutants, and to look for pollutants attributable to stack gases from the Moss Landing Power Plant and/or to residuals of the precipitation process which will remove calcium and magnesium from seawater. Effluent monitoring during Phase 1 will include analysis for such pollutants as 1,3-butadiene, acetaldehyde, formaldehyde, naphthalene, propylene oxide, xylenes, and total organic carbon (TOC) – pollutants not included in Table B of the Ocean Plan but sometimes present in air emissions from natural gas-fired power plants. (USEPA, *AP-42, Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources*, Tables 3.1 - 2a and 3.1 – 3, (Fifth Edition, 1995).

Although the Regional Water Board does not anticipate these pollutants to be present within the discharge, this analysis is required to ensure protection of the receiving water. Certain other pollutants (acrolein, benzene, ethylbenzene, PAHs, toluene, and lead) may also be present in air emissions of gas fired power plants; however, these pollutants are listed in Table B of the Ocean Plan.

7. Compliance Schedules

The Order does not establish interim effluent limitations and schedules of compliance with final limitations.

VIII. PUBLIC PARTICIPATION

The Central Coast Regional Water Quality Control Board considered the issuance of waste discharge requirements (WDRs) that serve as a National Pollutant Discharge Elimination System (NPDES) permit for the Facility. As a step in the WDR adoption process, the Regional Water Board staff developed tentative WDRs. The Regional Water Board encouraged public participation in the WDR adoption process.

A. Notification of Interested Parties

The Regional Water Board notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for the discharge and provided them with an opportunity to submit their written comments and recommendations. Notification was provided in Moss Landing, California and through publication in the Monterey Herald on December 26, 2008. Additionally, the draft waste discharge requirements were mailed to interested parties on December 19, 2008.

B. Written Comments

The Central Coast Regional Water Quality Control (Water Board) received the following comment letters by 5:00 p.m. on January 26, 2009:

1. Support letter from Monterey Bay Aquarium Research Institute

2. Support letter from Moss Landing Marine Laboratories
3. Support letter from Monterey County Supervisor Mr. Louis Calcagno
4. Authorization letter from Monterey Bay National Marine Sanctuary

C. Public Hearing

The Regional Water Board held a public hearing on the tentative WDRs during its regular Board meeting on the following date and time and at the following location:

Date: **March 19, 2009**
Time: **11:00 a.m.**
Location: **Watsonville City Council Chambers**
275 Main Street – 4th Floor
Watsonville, CA 95076

Interested persons were invited to attend. At the public hearing, the Regional Water Board heard testimony, pertinent to the discharge, WDRs, and permit.

D. Waste Discharge Requirements Petitions

Any person aggrieved by this action of the Central Coast Water Board may petition the State Water Board to review the action in accordance with Water Code section 13320 and California Code of Regulations, title 23, sections 2050 and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of the order, except that if the thirtieth day following the date of the order falls on a Saturday, Sunday, or state holiday, the petition must be received by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the internet at http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

E. Information and Copying

The Report of Waste Discharge (ROWD), related documents, tentative effluent limitations and special provisions, comments received, and other information are on file and may be inspected at the address above at any time between 8:00 a.m. and 5:00 p.m., Monday through Friday. Copying of documents may be arranged through the Regional Water Board by calling (805) 549-3147.

F. Register of Interested Persons

Any person interested in being placed on the mailing list for information regarding the WDRs and NPDES permit should contact the Regional Water Board, reference this facility, and provide a name, address, and phone number.

G. Additional Information

Requests for additional information or questions regarding this Order should be directed to Peter von Langen at (805) 549-3688 or PvonLangen@waterboards.ca.gov.

Linda S. Adams
Secretary for
Environmental Protection

Department of Toxic Substances Control

Maureen F. Gorsen, Director
1001 "I" Street
P.O. Box 806
Sacramento, California 95812-0806

Arnold Schwarzenegger
Governor

ATTN: SAM BOSE
MOSS LANDING CEMET COMPANY LLC
PO BOX 777
MOSS LANDING CA 95039

EPA ID Number Issued: December 18, 2008
Location Address:
7697 HIGHWAY 1
MOSS LANDING CA 9503996

PERMANENT RECORD - DO NOT DESTROY
YOUR CALIFORNIA EPA IDENTIFICATION NUMBER IS:

CAL000339079

This is to acknowledge that a permanent California Environmental Protection Agency Identification (EPA ID) Number has been assigned to your place of business.

An EPA ID Number is assigned to a person or business at a specific site. It is only valid for the location and person or business to which it was assigned. If your business has multiple generation sites, each site must have its own unique number. If you stop handling hazardous waste, move your business, change ownership, change mailing address, or change the type or amount of waste you handle, you must notify the Department of Toxic Substances Control immediately. If your business has moved, your EPA ID Number must be canceled. A new number must be obtained for your new location if you continue to generate hazardous waste.

This EPA ID Number must be used for all manifesting, record keeping, and reporting requirements. Please retain this notice in your files.

Department of Toxic Substances Control
Office of Data Evaluation and Environmental Indicators
Generator Information Services Section
Telephone: (916) 255-1136 or California Only Toll-free Number: (800) 618-6942

Operator's Initials: PMIKLAT

version: April 2008

Appendix D

Revision Log

Calera Corporation
Moss Landing, California

Form D-2 Revision Log

Revision Date	Section(s)	Description

Appendix E

Plans/Documents

Plans referenced in this Appendix are under development.
Final plan documents are included in the Safety Manual available for review at
[*Insert specific location on site*]

1.0 HEALTH AND SAFETY FACTORS

The site-specific injury and illness prevention programs and safety training programs, which are intended to protect worker health and safety during construction and operation of the proposed action, are described in the following sections.

1.1 INJURY AND ILLNESS PREVENTION PROGRAMS

Before beginning construction activities, Calera would develop a site-specific construction injury and illness prevention program. Once the construction of the proposed action is complete a site-specific injury and illness prevention program for operations and maintenance activities would be implemented.

1.1.1 Construction Injury and Illness Prevention Programs

Consistent with Cal/OSHA's policy on multi-employer work sites, each employer would be responsible for the health and safety of their own employees. Periodic health and safety audits would be conducted by Calera to verify contractor and subcontractor compliance with contractual health and safety obligations.

Construction Safety Program. The overall written construction safety program would include provisions to ensure compliance with Cal/OSHA's Injury and Illness Prevention Program (IIPP) requirements (California Code of Regulations [CCR] Title 8, Section 1509) and would include:

- A written Code of Safe Practices that relates to construction operations;
- Identification of the person or persons responsible for implementing the construction safety program;
- Posting of the Code of Safe Practices at a conspicuous location at the job site office, and providing it to each supervisor who shall have it readily available;
- A description of the system for identifying workplace hazards, including work place inspections, job hazard analysis, and written hazard assessments;
- Periodic meetings with employee representatives, supervisors, and management to discuss safety issues, including compliance assessments, accidents, injuries, and new or modified health and safety procedures;
- A system for ensuring employee and subcontractor compliance;
- Routine "tool box" or "tailgate" safety meetings conducted with employees and supervisors;
- A system for promoting employees' feedback and suggestions for improving workplace safety;
- Procedures for promptly correcting unsafe conditions; and
- Identification of safety training and experience requirements for specific work activities.

Construction Personal Protective Equipment Program. Contractor employees would use personal protective equipment (PPE) during construction as specified in the construction PPE program. Required PPE would be identified through hazard assessment and general industry standards. The specific PPE ensemble

required for each job task would be specified in the job hazard analysis (JHA) for that task. The use of PPE for site activities includes, but is not limited to, the items described in Table 4.11-2. All PPE worn on site would comply with Cal/OSHA and American National Standards Institute (ANSI) requirements. Respiratory protection would be included in the PPE program. Employees would not be required to wear respiratory protection, or to work in areas requiring respiratory protection until they have received a medical evaluation, respirator fit-testing, and training on the proper use, limitations, and care of respirators.

Construction Exposure Monitoring Program. An exposure monitoring program would be developed to evaluate potential employee exposures to hazardous/toxic materials. Potential exposures would be identified during the task-specific JHAs. Air monitoring may be conducted if necessary to evaluate the potential for employee exposures to the contaminants of concern. Airborne exposures would be controlled through the implementation of engineering controls, administrative controls, or PPE. Air monitoring would also be required in support of other safety programs, including confined space entry, hot work permits, and emergency response. Sound-level monitoring would also be performed as necessary during the construction phase, and initially during new facility operation to evaluate potential employee noise exposures. Odor complaints would be investigated and mitigated as needed.

Construction Emergency Action Plan. An emergency action plan (EAP) would be developed specifically for the construction phase of the proposed action. The EAP would designate responsibilities and actions to be taken in the event of an emergency at the site. All employees working at the site would be trained on the contents of the program. The EAP would include:

- Emergency roles and responsibilities;
- Emergency notification procedures; and
- Egress routes and mustering points.

Construction Written Safety Programs. Additional written safety programs that would be established for the construction phase include, but are not limited to:

- Hazard communication program;
- Confined space program;
- Control of hazardous energy program (Lock Out/Tag Out);
- Hearing conservation program;
- Respiratory protection program;
- Blood-borne pathogens control program;
- Injury and accident reporting and investigation program;
- Ergonomics program;
- Emergency response program, including first aid and medical services;
- Elevated work procedures;
- Heavy equipment procedures;
- Hot work procedures;
- Crane and hoist procedures;
- Compressed gas and air handling procedures;
- Subcontractor safety programs;
- Equipment inspection programs; and
- Excavation and trenching program

1.1.2 Operations and Maintenance Injury and Illness Prevention Programs

On co mpletion of construction and startup of th e proposed action and im plementation of routine operations, the construction injury and illness preven tion programs would transition into a n operations-oriented progra m that r eflect the h azards and controls necessary during routine operations and maintenance of MLMDP. The MLMDP progra m w ould reflect any unique hazards specific ally associated with maintenance and operation of this facility.

Program outlines for the operations safety programs that would be im plemented are provided below. These include: Injury and Illness Prevention Plan, Fire Protection and Prevention Plan, Emergency Action Plan, Hazardous Material Management Program, and PPE Program.

Injury and Illness Prevention Plan. The primary mitigation measures for worker hazards during normal plant operation and m aintenance are contained in th e IIPP, as required by 8 CCR, Section 3203. The written IIPP designates an indi vidual who is responsi ble for implementing the program. It also describes safety training and procedures for tra cking safety training. JHAs identify safety hazards rel ated to work tasks and establish procedures for avoiding, corr ecting, reporting, and notify ing em ployees of these hazards.

The IIPP contains the following information and procedures:

- Identity of the person(s) with authority and responsibility for implementing the program;
- A system for ensuring that employees comply with safe and healthy work practices;
- A system for facilitating employer–employee communications regarding safety;
- Procedures for identify ing and evalua ting wo rkplace hazards, i ncluding ins pections to identify hazards and unsafe conditions;
- Methods for correcting unhealthy/unsafe conditions in a timely manner;
- An employee training program that includes:
  - introducing the program;
  - training of new, transferred, or promoted employees;
  - training on new processes and equipment;
  - supervisors training; and
  - evaluation of contractor training.
- Methods of documenting inspections and tr aining, and for maintaining appropriate records.

Emergency Action Plan. In addition to the incor poration of various safety and envir onmental features and design measures to minimize emergencies and their effects on public and worker safety, the MLMDP would have a site-specifi c Emergency Action Plan. The Emergency Action Plan would address potential emergencies, including chemical releases, fires, bomb threats, pressure vessel ruptures, aqueous a mmonia releases, and other catastro phic events. It describes evacuation routes, ala rm systems, points of contact, assembly areas, responsibi lities, and other actions t o be taken in the event of an emergency. The plan includes a layout m ap, a fire extinguis her list, and a description of arrangements with local emergency response agencies for responding to emergencies.

Hazardous Materials Management Program. Several chemicals would be stored and used during operation of the MLMDP. The storage and handling of chemicals would follow applicable regulations to minimize risk to wor kers and the surro unding comm unity. Che micals would be identified and stored i n appropriate chem ical storage facilities. Bulk chem icals would be stored in aboveground storage tanks; other chemicals would be stored in thei r delivery co ntainers. Che mical storage and che mical feed are as would be surrounded by temporary or permanent containment or curbing to contain leaks and spills. The

containment areas would be sized to hold an appropriate volume (considering the potential for the local hazard contingencies) as designated by a California registered Professional Engineer.

Safety showers and emergency eyewash stations or bottles would be provided at all chemical treatment and storage areas, laboratories, and battery rooms in accordance with 8 CCR requirements (within 50 feet, or 10 seconds of travel time). Standard PPE for use during chemical handling activities would be provided. First-aid kits, fire blankets and evacuation stretchers are located in work areas around the plant. Standard PPE would be readily available for use during minor chemical spill containment and cleanup activities by plant personnel. Adequate supplies of absorbent material would also be available onsite for minor spill cleanup. A hazardous material emergency response team, trained in managing the accidental release of the chemicals used and stored at the plant, would be available through contract. Emergency contact numbers would be available to summon assistance from these contractors and for notification of local agencies. These procedures would be detailed in the Emergency Action Plan.

Personal Protective Equipment Program. PPE requirements for work at MLMDP would be identified during the job hazard analyses process. The PPE requirements would be developed and incorporated into the site-specific injury and illness prevention program. The PPE program would include the following:

- Hazard analysis and prescription of PPE;
- Personal protective devices;
- Head protection;
- Eye and face protection;
- Body protection;
- Hand protection;
- Foot protection;
- Safety belts and life lines;
- Protection for electric shock; and
- Respiratory protective equipment.

Operations and Maintenance Written Safety Program. Additional written safety programs would be developed and implemented as necessary to address hazards that are identified with operation and maintenance of MLMDP. These programs would be made components of the overall operations and maintenance injury and illness prevention program for the MLMDP facility. These programs include, but are not limited to, the following:

- Blood-Borne Pathogens Control Program;
- Hazard Communication Program;
- Hearing Conservation Program
- Hazardous Energy Control Program;
- Confined Space Entry Program;
- Safe Work Practices Program;
- Ergonomics Program;
- General Facility Safety Procedures:
  - Compressed Gas Safety Procedures;
  - Heavy Equipment Safety Procedures;
  - Hand Tools and Equipment Guarding Procedures;
  - Hoist and Rigging Safety Procedures;
  - Slips, Trips, and Falls Prevention Procedures; and
  - Hot Work Safety Procedures;

- Fall Protection Program; and
- Contractor Safety Program.

2.0 SAFETY TRAINING PROGRAMS

To ensure that employees recognize and understand how to protect themselves from hazards that exist at the MLMDP, comprehensive training programs for construction and operations personnel would be implemented. The following sections provide an overview of the training programs that would be required for workers at MLMDP.

2.1 CONSTRUCTION SAFETY TRAINING PROGRAM

Workers participating in the construction phase of the proposed action would participate in applicable training programs designed to protect themselves and others from injuries while working at the site. All construction personnel would be required to attend a basic site safety orientation training course. Additional training would be provided to each individual based specifically on their job responsibilities or craft for those requirements where previous satisfactory training cannot be documented. All training courses would be documented and attendance records maintained at a centralized location.

2.2 OPERATION AND MAINTENANCE SAFETY TRAINING PROGRAMS

Operations and maintenance employees assigned to the proposed action would be given instructions regarding their responsibility for the safe conduct of their work. These instructions would be given at the time the employee is first hired and as an ongoing training program of hazard recognition and avoidance. Employees would also be instructed in the safety procedures pertinent to their employment tasks. Safe working conditions, work practices, and protective equipment requirements would be communicated in the following manner:

- A new, promoted, or transferred employee would receive safety training orientation;
- Safety meetings would be held with employees;
- "Toolbox/tailgate" safety meetings would be conducted periodically for each crew. General safety topics and specific hazards that may be encountered would be discussed. Comments and suggestions from all employees would be encouraged;
- A periodic staff safety meeting would be held for supervisors;
- Hazard communication training, including California Proposition 65 warnings and discharge prohibitions, would be conducted as necessary when new hazardous materials are introduced to the workplace;
- Material safety data sheets would be available as required for all appropriate chemicals;
- A bulletin board with required postings and other information would be maintained at the plant site; and
- Warning signs (e.g., hazardous waste storage area, confined space area) would be posted in hazardous areas that comply with applicable regulations (i.e., bilingual, font size).

Safety training would be provided to each new employee as described below:

- A list of safe work rules for the MLMDP facility would be explained to each new employee;
- A copy of the applicable Safe Work Practices would be given to each new employee. The provisions would be incorporated into training for the qualifications programs so that employees may fully understand what the protective provisions mean;
- The Hazard Communication Program and requirements for personal protection for the types of hazards that may be encountered at the MLMDP facility site would be explained and documented;
- Unusual hazards that are found onsite would be explained in detail to each new employee, including any specific requirements for personal protection; and
- Safety requirements for the new employee's specific job assignment would be explained by the foreman upon initial assignment and upon any reassignment.

An element of the Operations and Maintenance Safety Training Program includes addressing compliance with contractor safety while on site. Contractors would be provided with a list of potential job safety hazards for their assigned activity by a foreman, including safety rules, chemical exposure hazards, physical hazards, and personal protection equipment. Contractors would also be invited to attend "tailgate" safety meetings.

3.0 FIRE PROTECTION

The fire suppression and protection procedures as they pertain to construction and operation of the proposed action are presented in Section 4.11.5.1. Section 4.11.5.2 presents a detailed description of fire protection systems that would be installed at MLMDP.

3.1 CONSTRUCTION FIRE SUPPRESSION AND PREVENTION

Onsite Construction Fire Suppression and Prevention. The MLMDP Project would rely on both onsite fire protection systems and local fire protection services. The contractor would develop a Fire Protection and Prevention Plan to be followed throughout all phases of construction and would provide the specified fire-fighting equipment. The fire protection and prevention program would address each of the following requirements:

- General requirements;
- Responsibilities;
- Housekeeping;
- Employee alarm/communication system;
- Portable fire extinguishers;
- Fixed fire fighting equipment;
- Fire control;
- Perimeter fire buffer maintenance;
- Flammable and combustible liquid storage;
- Use and handling of flammable and combustible liquids;
- Dispensing and disposal of flammable and combustible liquids;
- Servicing and refueling areas; and

- Training.

Construction fire prevention procedures would be developed in accordance with applicable regulations (8 CCR, Section 1620 et seq.) and would be followed as necessary to prevent construction-related fires. Special emphasis would be given to operations involving open flames, such as welding, metal cutting, and brazing. Hot work permits would be required for specific activities that present the potential for fire and personnel involved in such operations would receive appropriate training by the contractor. In addition, a fire watch, utilizing the appropriate class of extinguishers or other equipment, would be maintained during hot work operations. Site personnel would not be expected to fight fires past the incipient stage.

Materials brought on site by contractors must conform to contract requirements, insofar as flame resistance or fireproof characteristics are concerned. Specific materials in this category include fuels, paints, solvents, plastic materials, lumber, paper, boxes, and crating materials. Specific attention would be given to compressed gases and storage of fuels, solvents, and paint.

Elements of the onsite fire suppression system during construction would consist of portable fire extinguishers. Periodic fire prevention inspections would be conducted by the contractor's safety representative.

Fire extinguishers would be inspected monthly and replaced immediately if defective or in need of recharge. All fire-fighting equipment would be located to allow for unobstructed access to the equipment and would be conspicuously marked. Combustible materials would be controlled in covered roll-off dumpsters. Designated, approved flammable materials storage areas and flammable materials storage containers would be provided with adequate fire prevention systems.

Offsite Construction Fire Suppression Support. The MLMDP onsite fire suppression system would be supported by the North County Fire Protection District (NCFPD). The NCFPD would provide backup assistance and support to MLMDP in the event of a construction-related fire. The local fire response units would be provided information regarding the type and location of potential fire hazards at the site. This information would be included in emergency response planning.

3.2 OPERATIONS FIRE SUPPRESSION AND PREVENTION

Fire protection at the proposed action would include measures relating to safeguarding human life, preventing personnel injury, preserving property, and minimizing down time due to fire or explosion. It would principally involve physical arrangements, such as alarm systems, specific equipment for coal fire suppression and fire extinguishers. Fire protection measures would include measures to prevent the inception of fires. Of concern are adequate exits, fire-safe construction, reduction of ignition sources, and control of fuel sources.

The overall fire prevention and protection program for the facility would be designed and implemented to protect both personnel and property. The program would specifically address:

- Names and/or job titles responsible for maintaining equipment and accumulation of flammable or combustible material control;
- Procedures in the event of fire;
- Fire alarm and protection equipment;
- System and equipment maintenance;
- Perimeter fire buffer maintenance;
- Monthly inspections;

- Annual inspections;
- Fire-fighting demonstrations and training; and
- Housekeeping practices.

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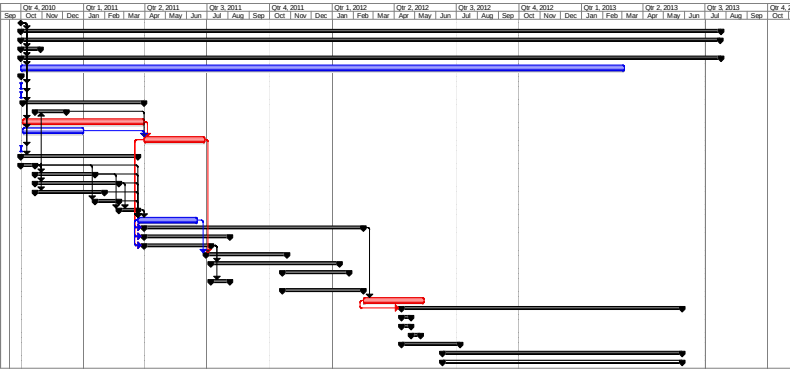
Appendix D – Task 5.4 Preliminary Phase II Project Schedule

			Year 1												Year 2												Year 3											
		Months after award -------	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Phase II	**Phase IIA**	**Design**																																				
	Task 6.0	Process and Infrastructure Design																																				
		Environmental Assessment																																				
	Phase IIB	**Construct**																																				
	Task 7.0	Construction Management																																				
	Task 8.0	Construction																																				
	Phase IIC	**Operations**																																				
	Task 9.0	Operations Management																																				
	Task 10.0	Equipment Shakedown and Optimizatoin																																				
	Task 11.0	Operation and Monitoring																																				
	Task 12.0	Data Analysis and Reporting																																				

Appendix E – Task 6.7 Final Project Schedule

ID	Text1	Task Name	Duration	Start	Finish
1		NOTICE TO PROCEED - PHASE II	0 days	Fri 10/1/10	Fri 10/1/10
2	1.0	PROJECT MANAGEMENT	732 days	Fri 10/1/10	Wed 7/24/13
3	1.1	Project Management Practices	731 days	Fri 10/1/10	Tue 7/23/13
5	1.2	Project Management Plan	21 days	Fri 10/1/10	Fri 10/29/10
8	1.3	Project Communication	732 days	Fri 10/1/10	Wed 7/24/13
58	2.0	RESEARCH & DEVELOPMENT	30 mons	Fri 10/1/10	Mon 3/4/13
59	3.0	CONCEPTUAL DESIGN	1 day	Fri 10/1/10	Fri 10/1/10
60	3.1	Prepare Conceptual Design	1 day	Fri 10/1/10	Fri 10/1/10
61	3.2	Techno-Economic Analysis and CO2 Lifecycle Analysis	1 day	Fri 10/1/10	Fri 10/1/10
62	4.0	SITE PLANNING AND PERMITTING	126 days	Mon 10/4/10	Wed 3/30/11
63	4.1	Site Planning	30 days	Fri 10/22/10	Mon 12/6/10
66	4.2	Permitting	6 mons	Mon 10/4/10	Wed 3/30/11
67	4.3	Environmental Assessment	3 mons	Mon 10/4/10	Fri 12/31/10
68		DECISION POINT 1	3 mons	Thu 3/31/11	Mon 6/27/11
69	5.0	PRELIMINARY DESIGN	1 day	Fri 10/1/10	Fri 10/1/10
70	6.0	DETAIL DESIGN	120 days	Fri 10/1/10	Mon 3/21/11
71	6.1	Process FlowDiagrams	15 days	Fri 10/1/10	Thu 10/21/10
75	6.2	Process Design	60 days	Fri 10/22/10	Mon 1/17/11
82	6.3	Equipment Specification and Sizing	85 days	Fri 10/22/10	Mon 2/21/11
88	6.4	Architectural Plant Design	70 days	Fri 10/22/10	Mon 1/31/11
95	6.5	Detailed Cost Estimate and Design Specification	25 days	Tue 1/18/11	Mon 2/21/11
98	6.6	Final Process Design review	20 days	Tue 2/22/11	Mon 3/21/11
101		DECISION POINT 2	3 mons	Tue 3/22/11	Thu 6/16/11
102	7.0	PLANT CONSTRUCTION	230 days	Thu 3/31/11	Wed 2/15/12
103	7.1	Acquisition of Plant Hardware	90 days	Thu 3/31/11	Wed 8/3/11
109	7.2	Construction Planning	70 days	Thu 3/31/11	Wed 7/6/11
119	7.3	Civil and Foundation Construction	85 days	Thu 6/30/11	Wed 10/26/11
125	7.4	Mechanical, Pipping, Strutural Fabrication and Installation	135 days	Thu 7/7/11	Wed 1/11/12
132	7.5	Power & Electrical Construction	70 days	Thu 10/20/11	Wed 1/25/12
137	7.6	Construction of tie-in to existing facilities and utilities	20 days	Thu 7/7/11	Wed 8/3/11
141	7.7	Construction Reviewand Documentation	85 days	Thu 10/20/11	Wed 2/15/12
147		DECISION POINT 3	3 mons	Thu 2/16/12	Mon 5/14/12
148	8.0	TESTING	294 days	Thu 4/12/12	Tue 5/28/13
149	8.1	Development of Standard Operating Procedures	10 days	Thu 4/12/12	Wed 4/25/12
153	8.2	Development of Safety Procedures	10 days	Thu 4/12/12	Wed 4/25/12
156	8.3	Personnel Training	10 days	Thu 4/26/12	Wed 5/9/12
159	8.4	Shakedown or Start up Activities	62 days	Thu 4/12/12	Fri 7/6/12
166	8.5	Plant Operation and Optimization	252 days	Mon 6/11/12	Tue 5/28/13
170	8.6	Validation	252 days	Mon 6/11/12	Tue 5/28/13



Appendix F – Task 6.8 Final Cost Estimates and Analysis

EST-W, 7/95

PROJECT DESCRIPTION: Building Materials Demonstration Plant
CLIENT: Calera
FILE: Apr10 Caleral Prelim Estimate Moss Landing Demo Plt ExpR2.xls
LOCATION: Moss Landing, CA
SHEET:
QTY BY: N/A
AREA/SITE: Demo Plant Expansion
PRODUCTIVITY FACTOR: 1.30
EST BY: plr
PLANT: CO2 Capture & Sequestration
LABOR WAGE RATE (US$): $73.00
DATE: May 3, 2010
ACCOUNT:
CHECK:
SUBJECT: OOM ESTIMATE COST SUMMARY
* Includes productivity adjustment

COST CODE	DESCRIPTION	QTY	MEAS UNIT	UNIT COSTS MATL	UNIT COSTS LABOR	UNIT COSTS SC/OTH	D HIRE UNIT MH	TOTAL MHRS * S/C	TOTAL MHRS * D HIRE	COSTS IN US$ EQUIPMENT	COSTS IN US$ BULK	COSTS IN US$ LABOR	COSTS IN US$ SC/OTHER	COSTS IN US$ TOTAL
	PROCESS EQUIPMENT & DUCTWORK													
21	PUMPS & DRIVERS	17	EA						730	153,800		53,300		207,100
22	COMPRESSORS, BLOWERS, FANS & DRIVERS (INCL Vac Pr	1	EA						260			19,000		19,000
24	TANKS & STORAGE FACILITIES	22	EA					760	1,690	629,400		123,400	175,000	927,800
25.1	MATL HANDLING & PROCESSING - CONVEYORS	6	EA						1,170	305,100		85,400		390,500
25.2	MATL HANDLING & PROCESSING - FEEDERS	13	EA						580	199,600		42,300		241,900
25.9	MATL HANDLING & PROCESSING - OTHER	1	EA						500	50,000		36,500		86,500
26	WATER TREATMENT	4	EA						3,250	15,201,000		237,300		15,438,300
27.1	OTHER MECHANICAL - PACKAGE UNITS		EA											
27.21	OTHER MECHANICAL - PHYSICAL PROCESSING - FILTERS	2	EA						530	551,300		38,700		590,000
27.22	OTHER MECHANICAL - PHYSICAL PROCESSING - AGITAT	6	EA						470	132,000		34,300		166,300
27.7	OTHER MECHANICAL - STACKS, FLARES, CHIMNEYS	1	EA						90	18,200		6,600		24,800
28	ELECTRICAL EQUIPMENT	1	LT						2,310	767,900		168,600		936,500
	MOBILE EQUIPMENT	1	LT						100	60,000		7,300		67,300
	FREIGHT	5	%							900,400				900,400
	TOTAL PROCESS EQUIPMENT		EA						11,680	18,968,700		852,700	175,000	19,996,400
17	INSTRUMENTS	129	EA						4,930		364,100	359,900		724,000
15	PIPING	6984	LF						9,310		182,300	679,600		861,900
13	STEELWORK	47	STON						2,720		160,600	198,600		359,200
18	INSULATION		LF											
16	ELECTRICAL	50000	LF						5,850		124,900	427,100		552,000
12	CONCRETE	591	CY						7,220		155,900	527,100		683,000
14	BUILDING		SF											
11	SITEWORK	1	LT						380		6,800	27,700		34,500
18	PAINTING	3665	SF						920		5,900	67,200		73,100
	TOTAL OTHER DIRECT COSTS								31,330		1,000,500	2,287,200		3,287,700
	SUBTOTAL DIRECT COSTS								43,010	18,968,700	1,000,500	3,139,900	175,000	23,284,100
	Construction Indirect Labor & material	43,010	DH hr	$15.0			0.25		10,750		645,200	784,800		1,430,000
											160,900	1,052,300		1,213,200
	SUBTOTAL CONSTRUCTION INDIRECT COST								10,750		806,100	1,837,100		2,643,200
	SUBTOTAL FIELD COSTS								53,760	18,968,700	1,806,600	4,977,000	175,000	25,927,300
	Startup Labor & Material	18,968,700	EQP$	7.0%		2.1%	0.30		5,690		1,327,800	388,900		1,716,700
											69,600	577,700		647,300
	SUBTOTAL STARTUP COSTS								5,690		1,397,400	966,600		2,364,000
	TOTAL FIELD COSTS PLUS STARTUP COSTS								59,450	18,968,700	3,204,000	5,943,600	175,000	28,291,300
	Engineering Costs										167,300	1,671,600	23,900	1,862,800
	Other Design Office Costs										119,500	835,800	47,800	1,003,100
	TOTAL HOME OFFICE COSTS										286,800	2,507,400	71,700	2,865,900
	TOTAL CONSTRUCTED COST													31,157,200
	TOTAL COST EXCL CALERA, ESCALATION, & CONTINGENCY													31,157,200
	ESCALATION AFTER 1Q 2010	31,157,200	TOT$			5.0%							1,557,900	1,557,900
	CONTINGENCY	32715100	TOT$			30.0%							9,814,500	9,814,500
	round													400
	TOTAL													42,530,000

Staffing Plan

The purpose of this staffing plan is to make certain the project has sufficient staff with the right skills and experience to ensure successful project completion. This is a forecast for a 6 month operation of the absorber demo with a re-examination in 1Qtr 2011 on future use of absorber. If absorber is to be permanent fixture then we need permanent staffing. Until that time, construction and start up operations will be staffed by existing Calera Corp employees on a temporary assignment basis.

Role Requirements

The following is a detailed breakdown of the roles required to execute the project. It includes: the project role, the project responsibility of the role, skills required, number of staff required to fulfill the role, the estimated start date and the expected duration the staff resource will be needed on the project.

Role	Plant Responsibility	Skills Required	Number of Staff Required	Estimated Start Date	Duration Required FY10-11
Site Team					
Site Manager	Plans, Directs & Lead operations team to enable product manufacture to meet customer requirements.	Leadership Skills, Basic Business Management & Calera Technology Understanding	1	10/1/10	9 months
Control Room Operator	Maintain & Monitor plant performance for safe & efficient operations.	MLCC Demo Absorber Experience	1	11/1/10	7 months
CEM Operator	Emissions monitoring	Understands the operation and maintenance of CEMS system	1	11/1/10	7 months
Field Operator	Configures & Operates plant equipment	MLCC Demo Absorber Experience	2	11/1/10	7 months
Maintenance Operator	Complete and /or coordinate all maintenance activities and inventory replenishment	Experienced Mechanical	1	11/1/10	7 months
Maintenance Operator	Ensure all electrical and instrument systems operational	Electrical/DCS/ Instrumentation	1	11/1/10	7 months
Dewatering Operator	Configures & Operates dewatering plant equipment	MLCC Demo Dewatering Experience	1	11/1/10	7 months

Staff Resource Loading Chart
The following includes the estimated weekly task schedule for each staff resource assigned to the project.

Role	Number of Staff Required	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Site Manager	1		X	X	X	X	C	
Control Room Operator	1		O	M/CU	O	M/CU	C	
CEM Operator	1		O	M	O	M/I	C	
Field Operators	2		O	M/SU	O	M/SU	C/I	
Maintenance Operator	1		M	M	M	M	C/I	
Elec/Instrument.	1		M	M	M	M	I	
Dewatering Operator	1		O	M/SU	O	M/SU	C	

M = Maintenance
C = Clean
SU = Set Up
O = Operate
I = Inventory Check & Replenishment
X = Management Reporting & assisting with any item that needs to be done

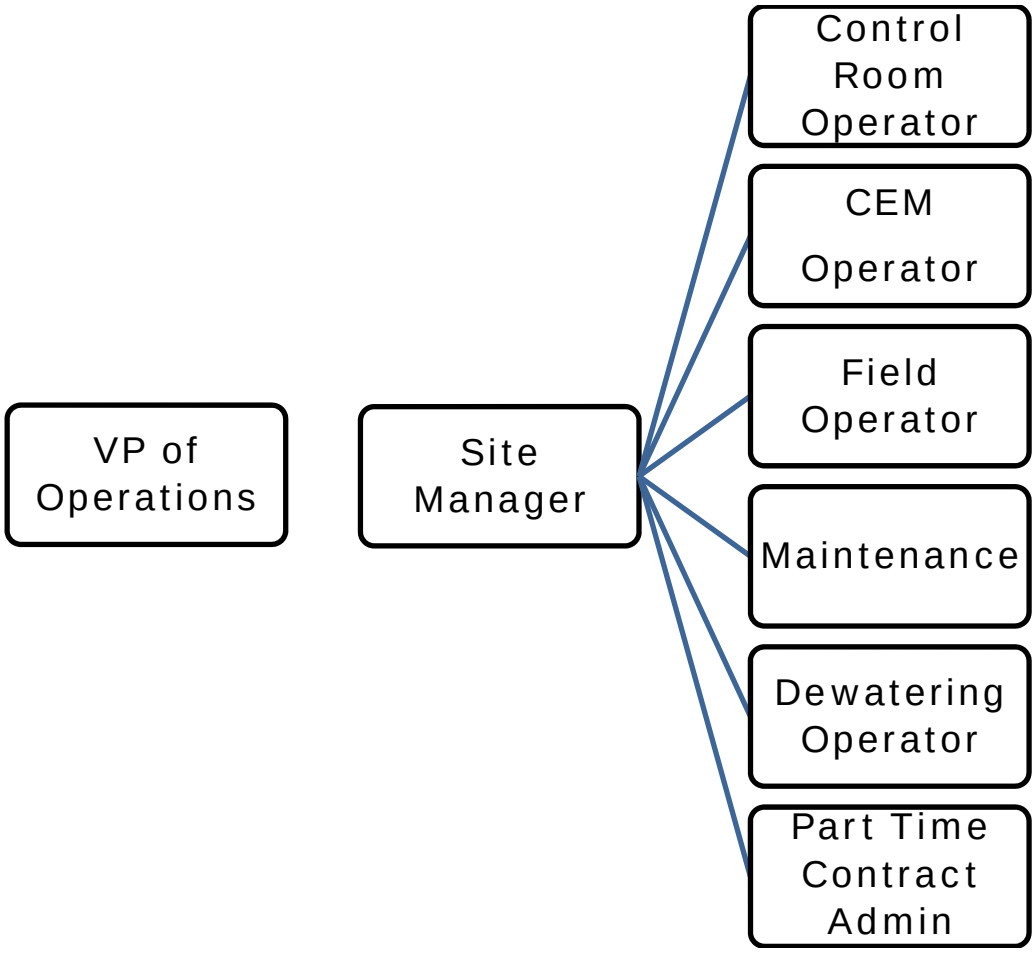
Temporary Assignment Employee Compensation

The most flexible and incentivizing compensation would be to pay the participants a ‘per diem’ rate for food, lodging and incidentals as well as their base salary. From a forecasting viewpoint for both Calera Corp and the employee this would be the best alternative. Taken from the US Government Department of Defense Per Diem tables, the general rate is $116/day with an increase for variances depending on location. This figure covers food, lodging and all incidentals.

LOCATION (1)	County and/or Other Defined Location (2)	Seasons (Beg-End)	Max Lodging	Local Meals	Prop. Meals	Incidentals	Maximum Per Diem	Effective Date
ALL PLACES NOT LISTED	STANDARD CONUS RATE	01/01-12/31	70	41	26	5	**116**	10/01/2009

Project Organization Chart

The project organization chart is a graphical picture of the organization and reporting relationships of the project.


VP of Operations
Site Manager
Control Room Operator
CEM Operator
Field Operator
Maintenance
Dewatering Operator
Part Time Contract Admin