**REMEDIAL ACTION PLAN FOR
THE INACTIVE URANIUM
PROCESSING SITE AT
NATURITA, COLORADO**

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**Remedial Action Selection Report
Attachment 2, Geology Report
Attachment 3, Ground Water Hydrology Report
Attachment 4, Supplemental Information**

March 1998

**Appendix B of the
Cooperative Agreement
No. DE-FC04-81AL16257**

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**REMEDIAL ACTION PLAN FOR THE INACTIVE
URANIUM PROCESSING SITE
AT NATURITA, COLORADO**

March 1998

**Prepared for
U.S. Department of Energy
Environmental Restoration Division
UMTRA Project Team
Albuquerque, New Mexico**

**Prepared by
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Albuquerque, New Mexico**

REMEDIAL ACTION PLAN

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LIST OF ACRONYMS

<u>Acronym</u>	<u>Definition</u>
AEC	Atomic Energy Commission
CDPHE	Colorado Department of Public Health and Environment
DOE	U.S. Department of Energy
EA	environmental assessment
EPA	U.S. Environmental Protection Agency
MCL	maximum concentration limit
$\mu\text{R/hr}$	microrentgens per hour
MK-ES	Morrison Knudsen-Environmental Services
NRC	U.S. Nuclear Regulatory Commission
pCi/g	picocuries per gram
pCi/L	picocuries per liter
pCi/m ² s	picocuries per square meter per second
RAC	Remedial Action Contractor
RAP	remedial action plan
SF&C	standard format and content
SRP	standard review plan
TAC	Technical Assistance Contractor
TAD	Technical Approach Document
TDS	total dissolved solids
TER	technical evaluation report
UMTRA	Uranium Mill Tailings Remedial Action
UMTRCA	Uranium Mill Tailings Radiation Control Act
VCA	Vanadium Corporation of America

CHANGE HISTORY

Document version	Date	Pages/comments
Rev. 0, Ver. 1	03/20/98	Initial version.

1.0 INTRODUCTION

The uranium processing site near Naturita, Colorado, is one of 24 inactive uranium mill sites designated to be cleaned up by the U.S. Department of Energy (DOE) under the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA), 42 USC §7901 *et seq.* Part of the UMTRCA requires that the U.S. Nuclear Regulatory Commission (NRC) concur with the DOE's remedial action plan (RAP) and certify that the remedial action conducted at the site complies with the standards promulgated by the U.S. Environmental Protection Agency (EPA). This RAP serves two purposes. First, it describes the activities that are proposed by the DOE to accomplish remediation and long-term stabilization and control of the radioactive materials at the inactive uranium processing site near Naturita, Colorado. Second, this RAP, upon concurrence and execution by the DOE, the state of Colorado, and the NRC, becomes Appendix B of the cooperative agreement between the DOE and the state of Colorado.

1.1 EPA STANDARDS

It is the intent of the DOE, as required by the UMTRCA, to comply with EPA regulations in Subparts A through C of 40 CFR Part 192 in the preparation of this RAP. All remedial action planning and design considerations contained herein reflect the incorporation of this regulatory guidance. Therefore, by performing all remedial action activities in accordance with the design presented in this RAP, the DOE will meet the standards of 40 CFR Part 192.

On January 5, 1983, the EPA promulgated final standards for the disposal (Subpart A) and cleanup (Subpart B) of the inactive uranium processing sites under the UMTRCA (48 FR 590). The standards became effective on March 8, 1983. However, on September 3, 1985, the ground water provisions of the regulations (40 CFR §192.20(a) (2)-(3)) were remanded to the EPA by the U.S. Court of Appeals for the Tenth Circuit. A proposed revision to the standards was issued by the EPA on September 24, 1987 (52 FR 36000 (1987)). The standards were finished in January 1995 (60 FR 2854).

1.2 SITE AND PROPOSED ACTION

History

The Naturita mill was built in 1930 by the Rare Metals Company. It did not become operational until 1939, when Vanadium Corporation of America (VCA) acquired the mill and converted it to a salt-roast, water-leach process for vanadium recovery. The process was modified again in 1942 so that uranium could be extracted. At the end of World War II the mill was shut down. It reopened under contract to the Atomic Energy Commission (AEC) in 1947. Uranium concentrates were shipped to the AEC until 1958, when the mill was again shut down. From 1961 until 1963, an upgrader was operated at the site by VCA. The mill was dismantled in 1963. In 1967, VCA merged with Foote Mineral Company, and the site ownership passed to Foote. In the late 1970s to the early 1980s, a portion of the site belonging to Foote Mineral Company was leased to General Electric to accommodate a uranium ore-buying station.

The portion of the site occupied by the tailings was purchased by Ranchers Exploration and Development Corporation (Ranchers) of Albuquerque, New Mexico, from Foote in 1976. During 1977 through 1979, the tailings were removed by Ranchers from the site area to a heap leach processing plant located along Colorado State Highway 90, about 3 miles (5 kilometers) southwest of the intersection of Highways 90 and 141 at Vancorum (Durita facility). After reprocessing, the tailings were placed in new tailings ponds at the new location and were stabilized with 2 to 10 feet (0.6 to 3 meters) of cover material.

During the operation of the Naturita mill, 704,000 tons (640,000 tonnes) of ore were processed. Prior to the 1958 shutdown, the ore averaged 0.38 percent uranium oxide and 1.8 percent vanadium oxide. During the upgrader operation, ore averaging 0.25 percent uranium oxide and 1.65 percent vanadium oxide was processed. The ore came from throughout the Uravan mineral belt and from other areas.

Description

The Naturita mill site is located in Montrose County, Colorado, approximately 2 miles (3 kilometers) northwest of the town of Naturita along Colorado State Highway 141. The mill site is in Section 15, Township 46 North, Range 16 West (Figure 1.1). The designated site encompasses about 53 acres (21.4 hectares) that include the former tailings area, the mill yard and ore-buying station, and the adjacent ore storage area (Figure 1.2). The former tailings area, which covers about 27 acres (11 hectares), is owned by Hecla Mining Corporation (obtained through the acquisition of Ranchers). The 14-acre (5.7-hectare) mill yard and ore-buying station and the 12-acre (4.9-hectare) former ore storage area are owned by Cyprus Foote Mineral Company.

The designated site is multilevel, with the former tailings area at the lowest elevation of only a few feet above the streambed of the San Miguel River. An equipment and scrap material storage area is on the next higher terrace, followed in ascending order by the mill structures and shop buildings area, the ore buying area, and the former ore storage area on the west side of Highway 141. The vertical relief across the designated site is 90 to 100 feet (27 to 31 meters).

Contaminated materials

The Naturita site is unique in that no tailings pile remains at the site due to the removal and reprocessing activities by Ranchers. The contaminated materials include soils in the mill yard and ore storage area, windblown tailings adjacent to the designated site, several buildings, used mill equipment stored on the site, foundation soils in the former tailings area, and off-site vicinity property material that makes up less than 0.1 percent of the contaminated materials to be stabilized.

The quantities of contaminated materials that would be removed from the designated site and immediately adjacent areas are presented in Table 1.1 and are distributed as shown in Figure 1.3. The removal of these contaminated materials from the Naturita processing site will satisfy the EPA standards in 40 CFR Part 192. However, it is logical to consider applying the supplemental standards provisions of

FIGURE 1.1
LOCATION OF THE NATURITA SITE, COLORADO

TO URAVAN
15 MILES

LEGEND

- MILL YARD
- FORMER TAILINGS AREA
- FORMER ORE STORAGE AREA

FIGURE 1.2
PRESENT CONDITIONS AT THE NATURITA SITE, COLORADO

Table 1.1 Contaminated material volume at the Naturita, Colorado, site

Location ^a	Area acres (hectares)	Volume cubic yards (cubic meters)	Average radium-226 (pCi/g)
Mill yard	13.9 (5.6)	315,520 (241,250)	127
Former ore storage area	3.7 (1.5)	10,340 (7910)	75
Windblown/other material ^b (areas A/B/C and partial areas of E, F, and G)	72.4 (29.3)	209,880 (160,480)	37.4 ^c
Former tailings area	28.2 (11.4)	225,490 (172,410)	90
Demolition debris		10,170 (7780)	
TOTAL	118.2 (47.8)	771,400^d (586,830)	

^aSee Figure 1.3.

^bVolume of proposed supplemental standards area is not included.

^cVolume-weighted average of subareas A/B/C and partial areas of E, F, and G.

^d21,820 cubic yards of contaminated materials from vicinity properties are not included.

pCi/g — picocuries per gram.

40 CFR Part 192 to adjacent windblown areas and portions of the designated processing site where the following justifications are met: cleanup would be costly and difficult because of the steep slopes and rocky terrain; the windblown material does not pose a health risk; major environmental impacts would occur because of cleanup; or workers would be exposed to unsafe conditions. Areas where the use of supplemental standards is being proposed are areas D and F, and partial areas of E and G on Figure 1.3, riverfront wetlands on both banks of the San Miguel River, and an area containing a high-pressure gas pipeline. The application has been developed, is submitted for agency concurrence, and is included in this RAP as Appendix A. The current design includes the remediation of these areas; therefore, the design will be revised if the supplemental standards application is not approved.

FIGURE 1.3
EXTENT OF CONTAMINATION AT THE
NATURITA SITE, COLORADO

Remedial action

The proposed remedial action for the disposal and stabilization of the contaminated materials is to relocate them to the Upper Burbank disposal site at Uravan, a Colorado licensed disposal facility. The Upper Burbank disposal site is approximately 15 road miles (25 km) northwest of the Naturita processing site.

After the removal of contaminated materials, the excavated areas in and around the Naturita processing site will be restored by placing fill, grading, seeding, and restoration of a Blessing Ditch bench as shown in Figure 1.4.

1.3 SCOPE AND CONTENT

This RAP describes the proposed remedial action for the Naturita processing site. An extensive amount of data and supporting information has been generated and evaluated for this remedial action. These data and supporting information are not incorporated into this single document but are included or referenced in the supporting documents.

Attachment 1: *Calculations, Final Design for Review*

Attachment 2: *Geology Report*, describes the details of geologic, geomorphic, and seismic conditions at the Naturita processing site.

Attachment 3: *Ground Water Hydrology Report*, describes the hydrogeology, water quality, and water resources at the processing site. It includes hydrological services calculations contained in Appendix A of Attachment 3.

These documents provide data, analysis, and a more detailed description of the various aspects of the RAP.

1.4 COLLATERAL DOCUMENTS

The environmental assessment (EA) of the Naturita remedial action describes existing conditions at the processing site and the environmental impacts of the remedial action. The EA summarizes the proposed remedial action, the alternatives, and the associated environmental impacts and includes environmental details not reported in the RAP.

The *Technical Approach Document* (TAD) (DOE, 1989) describes the technical approaches and procedures used on the Uranium Mill Tailings Remedial Action (UMTRA) Project. Contained in the document are discussions on major technical areas; design considerations; surface water hydrology and erosion control; geotechnical aspects of disposal cell design; radiological issues, in particular as they pertain to the radon barrier; and the protection of ground water resources.

Copies of these documents, as well as supporting data and calculations for the Naturita project, are on file in the UMTRA Project Office in Albuquerque, New Mexico.

1.5 RAP ORGANIZATION

The compilation and presentation of information contained in this RAP have been modeled after the approach taken in the NRC's site technical evaluation reports (TER). This RAP has been formatted in accordance with the requirements of the NRC's standard format and content (SF&C) guide for documentation as applicable to the UMTRA Project site (NRC, 1989). This document has been generated to facilitate the NRC's preparation of a TER for the proposed remedial action at the Naturita site. The design details or criteria are available in supporting documents, reports, drawings, specifications, and calculations.

2.0 GEOLOGY AT NATURITA SITE

The Naturita site is underlain by unconsolidated alluvial floodplain deposits of the San Miguel River and fill material. The fill material was placed during construction of the site to divert the river and increase the area of the existing alluvial terrace. The alluvium consists of rounded river gravel and cobbles in a silty to clayey-sand matrix and is underlain by the Brushy Basin and Salt Wash Members of the Jurassic Morrison Formation. The Brushy Basin Member consists of interbedded shale, sandstone, and conglomerate lenses; the Salt Wash Member is composed of sandstones with some shales.

The site region lies entirely within the Colorado Plateau Interior seismotectonic province. Most of the recorded earthquakes that affect the Colorado Plateau in this province are at the boundary of the plateau. Attachment 2, Geology Report, provides a more detailed description of the geology at the Naturita site.

3.0 GEOTECHNICAL AND CONSTRUCTION DESCRIPTION

This section and associated reference documents describe the geotechnical engineering aspects of the proposed remedial action at the Naturita, Colorado, processing site and describes the construction activity at the Naturita site. The following aspects of the remedial action are described: the geotechnical information and design details related to the Naturita processing site. Related geologic aspects such as geology, geomorphology, and geomorphic characterization of the Naturita site are presented in Attachment 2. Remedial Action Contractor (RAC) calculations for the remedial action at the Naturita site are in this RAP as Attachment 1 and are part of the DOE's final design for review.

3.1 SITE AND MATERIAL CHARACTERIZATION

The Naturita processing site consists of the abandoned Naturita mill, former tailings area, and ore buying station located on the floodplain of the San Miguel River, between Highway 141 to the west and the San Miguel River to the east. The ore storage area, which is also part of the processing site, is located to the west of Highway 141.

No tailings remain at the Naturita site. Remaining contaminated materials include 1) soils in the mill yard; 2) windblown and waterborne contaminated material adjacent to the designated site and east of the San Miguel River; 3) several buildings; 4) used mill equipment on the site; and 5) foundation soils in the former tailings area.

The former tailings area is underlain by approximately 50 feet of sand and gravel alluvium. In the mill yard area, the alluvium is overlain by a layer of sandy silt fill material, approximately 5 to 10 feet thick. The former tailings area has been inundated by flood waters since the tailings were removed. Except during flooding season, the water table lies 3 to 10 feet below the former tailings-subsoil interface.

3.1.1 Geotechnical investigations

This section describes the scope and results of the geotechnical investigations performed to define the location and properties of the subsurface materials and contaminated materials at the Naturita processing site.

Geotechnical investigations and site characterization programs were performed at the mill site and at vicinity properties adjacent to the mill site (windblown properties). The data obtained during these characterization programs are presented in the *Information to Bidders*.

The scope of the geotechnical investigations included excavating test pits and drilling boreholes. Information from monitor well installation was also obtained. The borings and test pits were logged by a field engineer. The locations of test pits, boreholes, and monitor wells are shown in the *Information to Bidders* for the Naturita processing site. Subsurface investigations for material properties of the underlying soil at the processing site were carried out in conjunction with the investigation to define the limits of contamination. The resulting samples of site

materials were tested and analyzed in the laboratory to develop an insight into the specific engineering characteristics of the materials.

Test pits were excavated with a tracked backhoe. Bulk soil samples were collected from the pits. Individual borehole logs provide precise information about the soil conditions at the site. Generally, hollow stem augers (6.5 inches [16.5 centimeters]) were used until refusal; thereafter, a rotary bit (4.0 inches [10.2 centimeters]) and casing were used to bedrock. Three sampling methods were used: the Standard Penetration Test (ASTM D1586); a 2.42-inch (6.15-centimeter) inside diameter, ring-lined, split barrel sampler; and a 3.0-inch (7.6-centimeter), thin-walled Shelby tube.

The data from the field investigations and laboratory tests were used to define the engineering properties of the soils to be incorporated into the cell and contribute to the geological characterization of the site.

3.1.2 Testing program

The materials at the Naturita site were classified according to the Unified Soil Classification System (ASTM D2487). Atterberg limits (ASTM D4318) and gradation tests (ASTM D422) were performed on selected samples to classify the soils. In addition, the following tests were done: specific gravity (ASTM D854), compaction (ASTM D698), saturated hydraulic conductivity, consolidation (ASTM D2435), and shear strength (EM 1110-2-1906). The results of the individual tests are contained in the *Information to Bidders*. Summary tables are in Calculation: NAT-CALC-006-02 of Part B of the RAP.

The testing program was consistent with the needs of the proposed remedial action. The number of samples tested is considered sufficient to support the necessary geotechnical analyses required to design the Uravan Project disposal cell by the disposal site owner. In particular, the testing approach is consistent with the NRC standard review plan (SRP) (NRC, 1985) and the TAD. Samples were tested in accordance with the standard procedures. Quality assurance and quality control were performed in accordance with standard UMTRA Project procedures.

3.2 GEOTECHNICAL ENGINEERING EVALUATION

The geotechnical engineering evaluation of the Naturita site materials will be performed by the owner of the Uravan Project disposal site. These evaluations will include the following:

- Slope stability.
- Settlement.
- Liquefaction potential.
- Cover design.

3.3 CONSTRUCTION DETAILS

Implementation of the final RAP will require construction activities to be conducted at the Naturita processing site. The salient features of construction activities are described below.

A complete set of drawings and specifications is available in Part B of the RAP.

3.3.1 Construction methods and features

The following paragraphs provide an overview of the implementation of remedial action. Construction features include staging areas, decontamination facilities, temporary drainage ditches, and wastewater collection and retention systems. Locations and sizes of construction features may be changed to facilitate construction activities.

Existing barbed wire and chain link fences will be relocated as necessary at the Naturita site, with new gates installed to control access to the site. Gates on State Highway 141 will provide access to a site. Decontamination pads will be constructed at the site. Vehicles leaving contaminated areas will be monitored and washed, if necessary, to prevent the spread of contamination.

Temporary diversion ditches will be constructed to prevent off-site surface water runoff from entering the site during remedial action operations. A washwater recirculation pond will be constructed at the site. The washwater recirculation pond is designed to receive water from truck decontamination and wash basins and shower facilities.

Dewatering activities during contaminated material excavations are expected to be minimal since excavation depths are generally shallow. Should dewatering be necessary during an unusually high flood stage of the adjacent San Miguel River, a contractor-designed dewatering system and water retention pond will be installed at the Naturita processing site to hold ground water removed during the excavation(s). A portable wastewater treatment plant could be used to process any accumulated contaminated water before discharge.

Drainage and washwater recirculation pond

Surface water runoff from undisturbed contaminated and uncontaminated areas at the site will be diverted around contaminated site areas through the construction of diversion ditches. These temporary diversion ditches are designed to carry runoff resulting from a 10-year storm event.

A lined stormwater retention basin and lined stormwater collection ditches will be used at the site during the demolition phase of the work to prevent runoff from this material. The retention basin and collection ditches will be removed before the removal of contaminated materials from the site.

The cleanup work at the Naturita processing site will be performed in small lots, one area at a time, and will begin from higher elevations to lower elevations. Site

restoration will immediately follow the removal of contaminated material. This excavation procedure will eliminate the generation of contaminated stormwater runoff at the Naturita processing site after the demolition debris at the site is removed.

A 50,000-gallon (189-cubic meter) washwater recirculation pond will be constructed at the site for holding the water from vehicle decontamination and from washbasin and shower facilities located on the site. This water will be recycled and reused as vehicle decontamination water until it becomes too contaminated for further use. At that time, it will be pumped in small amounts to the haul trucks and mixed with the contaminated material leaving the site.

Dewatering

The depth of excavation planned in the San Miguel River floodplain areas is generally shallow, between 1.5 and 5 feet (0.5 and 1.5 meters). Hence, elaborate seepage controls, such as a slurry wall, will not be needed during excavation. Furthermore, excavation in the floodplain areas will be scheduled during a low water stage in the San Miguel River, which will minimize dewatering needs. If this is not possible, a dewatering system will be designed and installed. Any contaminated water generated from dewatering operations will be stored on the site and treated with a portable water treatment plant.

Arrangements for a supply of additional construction water will be made, such as from the San Miguel River for dust control water requirements at the Naturita site.

Demolition

All buildings and structures at the Naturita mill site will be demolished. The demolition material, including several scrap heaps of metals and miscellaneous debris, will be hauled to the Uravan Project disposal site. Radiologically contaminated asbestos will also be buried within the Uravan Project disposal cell. Nonradiological hazardous materials will be sent off the site to other approved disposal sites.

Equipment decontamination pad

Equipment leaving contaminated areas will be monitored for contamination. To prevent contaminated materials from being carried out of the construction areas, a decontamination pad with a holding tank and pump will be provided to wash contaminated equipment.

One or more decontamination pads and associated equipment may be needed so that trucks can be washed often enough to meet the construction schedule. It will be up to the subcontractor to use as many decontamination pads as necessary to meet the construction schedule.

Dust control

Dust generated by excavation, earth movement, vehicle use, temporary stockpiling of materials, and similar activities will be controlled by spraying water or water and water-based surfactants. Special care will be taken to control dust created by decontamination and demolition of buildings and by temporary stockpiling or mixing of contaminated materials. Only uncontaminated water will be used to control dust in uncontaminated areas. In areas with contaminated soils, washwater recirculation pond water may be used for dust control.

Schedules for spraying the roads and excavation areas will vary daily and will be adjusted as required. The frequency of spraying will increase when combinations of low soil moisture and high wind speed are encountered.

Construction sequence

The following construction sequence is planned for the remedial action. However, the construction subcontractor will be allowed to execute the work with flexibility within the constraints of the project specifications and with the RAC's approval. The actual construction sequence, therefore, may differ somewhat from the planned sequence. A more detailed construction sequence can be found in Part B of the RAP.

- Mobilize and construct temporary construction facilities at the Naturita site, including access control, decontamination facilities, and washwater recirculation pond. Abandon and seal existing monitor wells at the Naturita site and improve the highway drainage system, such as culverts and ditches on the east side of Highway 141, to divert surface runoff off the site from work areas. Install a silt fence along the San Miguel River to prevent suspended solids discharge to the river during remediation activities.
- Remove stockpiled demolition and vicinity property debris materials from the site.
- Conduct vicinity property remedial actions in Naturita and surrounding areas and stockpile debris in designated areas in the mill yard at the Naturita processing site.
- Excavate contaminated materials at the Naturita processing site and adjacent windblown materials and haul these materials and stockpiled demolition material to the Uravan Project disposal site. Removal of contaminated materials from the processing site will be done in such a manner as to prevent clean site areas from receiving runoff from contaminated areas:
 - Former ore storage area materials.
 - Mill yard materials, including stockpiled demolition debris and vicinity property materials.

After removal of the ore storage area and mill yard area materials, including wastewater retention pond and collection ditch synthetic liner material, the cleanup work at the processing site will be done in small increments, one area at a time, working from higher elevations to lower elevations, with restoration of cleaned-up areas completed immediately after excavation has been completed. Working in this manner will eliminate production of contaminated runoff from upland areas during remediation work.

- Develop/utilize a commercial borrow area to supply fill material for site restoration at the processing site.
- Dismantle/demolish all temporary facilities that cannot be decontaminated and haul these to the Urvan Project disposal site. This applies to sediments from the washwater retention ponds and any contaminated soils adjacent to temporary facilities.
- Following removal of all contaminated materials and replacement with clean fill, regrade the site. Restore all disturbed areas, including borrow areas, wetlands, and the Blessing Ditch bench, and clean up and demobilize the site.

3.3.2 Testing and inspection

The Naturita site remedial action inspection plan (in preparation) will provide the details of the methods, procedures, and frequencies by which construction materials and activities are to be tested and inspected to verify compliance with the design specifications.

Quality assurance audits and in-process surveillances shall be conducted by the DOE and the Technical Assistance Contractor (TAC) to verify and ensure that remedial action activities are performed in accordance with approved UMTRA Project requirements and the *UMTRA Project Quality Assurance Plan* (DOE, 1990a).

3.4 SUMMARY

Based on the design presented and described in Parts A and B of the RAP, the supporting documents, the design drawings, the specifications, and the attachments, the DOE concludes that the design complies with the EPA site remediation standards (40 CFR §192.02(a)).

4.0 SURFACE WATER HYDROLOGY

The Naturita site is located approximately 0 to 650 feet (0 to 200 meters) from the San Miguel River. Portions of the site are within the 100-year floodplain and the 10-year floodplain, as are some of the adjacent vicinity properties that are contaminated with windblown material. Upon completion of remedial action, all contaminated materials will have been removed from the site as required by 40 CFR Part 192. Higher concentrations may be left behind in those areas covered by supplemental standards if approved by the Colorado Department of Public Health and Environment (CDPHE) and NRC.

5.0 WATER RESOURCES PROTECTION

This section summarizes the water resources protection strategy and compliance with the EPA ground water protection standards for the Naturita site. A detailed ground water hydrology report is included as Attachment 3.

5.1 HYDROGEOLOGIC CHARACTERIZATION OF THE PROCESSING SITE

5.1.1 Identification of hydrogeologic units

The Naturita processing site is located in the San Miguel River Valley of the Colorado Plateau physiographic province and is underlain by unconsolidated alluvial floodplain deposits and fill material. The alluvium was deposited by the San Miguel River before the river course was altered by the addition of fill material at the processing site. The alluvium is considered the uppermost aquifer at the processing site and is contaminated from processing-related activities. The alluvium is underlain by the Brushy Basin and the Salt Wash Members of the Jurassic Morrison Formation. The Brushy Basin consists of interbedded shale, sandstone, and conglomerate lenses. The Salt Wash consists predominantly of sandstone with some shale. The Brushy Basin and the Salt Wash have not been affected by uranium processing activities. The bedrock strata dip 2 to 4 degrees to the northeast.

5.1.2 Hydraulic and transport properties

Unconfined ground water occurs within the alluvial floodplain deposits and ranges from 3 to 18 feet (0.9 to 5.5 meters) below land surface. The observed saturated thickness is approximately 15 feet (4.6 meters) in the vicinity of the site. Ground water is confined in the Salt Wash, with the potentiometric surface higher in elevation than the water table in the alluvium. These two hydrostratigraphic units are separated by an aquitard (Brushy Basin) consisting of thick, laterally extensive, interbedded shales with some sandstones.

The occurrence of shallow ground water in the alluvial aquifer is limited by the lateral extent of the alluvium in the vicinity of the site. The average hydraulic conductivity for the alluvial aquifer is 3.0 feet per day (1×10^{-3} centimeters per second) and the average linear ground water velocity is 0.06 feet per day (2×10^{-5} centimeters per second). The alluvial aquifer is recharged principally by the San Miguel River southeast of the site and also from infiltration of precipitation. The ground water flow direction in the alluvium is approximately subparallel to the San Miguel River. Ground water discharges from the alluvial aquifer into the San Miguel River northwest of the site where the river valley narrows.

The Salt Wash Member is a major regional ground water system in the Naturita area. The recharge area for the Salt Wash aquifer consists of the upturned edge of this formation on the southwestern flank of the Uncompahgre Uplift. The potential area of natural discharge from the Salt Wash aquifer is the San Miguel River northwest of the Naturita processing site before the river reaches Uravan, Colorado. The point where the Salt Wash contacts the downcutting San Miguel River northwest of

the processing site has not been determined, but this appears to be the most likely area of discharge based on available literature.

5.1.3 Extent of existing contamination

To determine whether uranium processing activities at the Naturita processing site influenced ground water quality in the alluvial aquifer, the DOE collected samples from on-site/downgradient monitor wells and analyzed for constituents listed in Table 1 to Subpart A and Appendix I to 40 CFR Part 192.

The pH values for on-site/downgradient alluvial ground water range from 6.72 to 7.63, and the average total dissolved solids (TDS) concentration is 1705 milligrams per liter. The ground water is characterized as a mixed cation (sodium, potassium, calcium, magnesium)/mixed anion (chloride, bicarbonate, sulfate) type. The alluvial ground water on the site and downgradient has similar pH, but a higher TDS concentration and different water type than background ground water quality. This probably indicates the effects of the processing activities at the site. Hazardous constituents found in ground water samples above the laboratory method detection limits include arsenic, aluminum, antimony, barium, cadmium, copper, cyanide, fluoride, lead, mercury, molybdenum, nickel, nitrate, selenium, silver, strontium, thallium, tin, uranium, and zinc, and activities of net gross alpha and radium-226 and -228. Concentrations of arsenic, cadmium, chromium, molybdenum, selenium, and uranium and activities of net gross alpha and radium-226 and -228 exceed the proposed EPA maximum concentration limits (MCL) (Table 3.14 of Attachment 3). Analyses show a maximum observed uranium concentration of 5.2 milligrams per liter and a maximum observed vanadium concentration of 9.3 milligrams per liter.

In summary, concentrations of arsenic, cadmium, molybdenum, selenium, and uranium, and activities of net gross alpha and radium-226 and -228 exceed the proposed EPA MCLs. Also, water quality analysis of samples collected from on-site/downgradient monitor wells show significant statistical variation from background ground water quality for concentrations of arsenic, fluoride, molybdenum, tin, and uranium. Vanadium and cadmium do not exhibit a significant statistical variation from background water quality but will be included in future analyses. An analysis of variance was not conducted on antimony, chromium, lead, nitrate, silver, strontium, thallium, radium-226 and -228, and gross alpha on on-site/downgradient samples. In addition, toluene and methylene chloride were present in concentrations above analytical detection limits. Therefore, a complete list of hazardous constituents that may be potential contaminants in alluvial ground water at the processing site consists of arsenic, cadmium, chromium, fluoride, methylene chloride, molybdenum, selenium, strontium, thallium, tin, toluene, uranium, and vanadium, and activities of net gross alpha and radium-226 and -228.

Ground water in the Salt Wash is not contaminated as a result of milling operations at the processing site. Ground water samples from two monitor wells in this aquifer have shown that concentrations of uranium have approached the MCL of 0.044 milligrams per liter. Concentrations of selenium and molybdenum and activities of radium-226 and -228 and net gross alpha have also sporadically approached and exceeded the MCL. These elevated concentrations and activities

are most likely a result of oxidation and dissolution of uranium mineralization within the Salt Wash.

5.1.4 Water use

Seven wells located within 2 miles (3 kilometers) of the processing site are used for domestic purposes. Four wells in the alluvium and one in the Salt Wash are hydraulically upgradient of the processing site. The two remaining wells are located on the opposite side of the river (north), one in the San Miguel River Valley downgradient of the site and one southwest of the town of Nucla. There is no potential for contamination of these wells. The Salt Wash aquifer is not hydraulically interconnected with the alluvium in the vicinity of the site, and the river represents a discharge point for the alluvial ground water.

The shallow alluvial ground water has a very low potential for use since it is limited to the small area of alluvium in and adjacent to the San Miguel River. Alternative supplies of reliable, good quality water are available from the town of Naturita. Most water for domestic use is derived from surface water. Future use of ground water in the alluvium for domestic consumption is not expected.

5.2 GROUND WATER CLEANUP AND CONTROL OF EXISTING CONTAMINATION

The DOE is required to demonstrate that cleanup or control of existing processing-related ground water contamination at the Naturita site will comply with the EPA ground water protection standards in Subpart B of 40 CFR Part 192. Ground water cleanup will be addressed under a separate DOE program and National Environmental Policy Act process using strategies and options outlined in a programmatic environmental impact statement that has been developed for the UMTRA Project. The need for and extent of ground water cleanup at the Naturita site will be evaluated based on the extent of existing contamination, the potential for current or future use of ground water from the uppermost aquifer, and protection of human health and the environment.

The current level of characterization at the Naturita processing site is sufficient to address only whether the remedial action will comply with Subpart A of the EPA ground water protection standards. Additional investigations will be conducted as necessary to determine the appropriate ground water cleanup strategy for the Naturita processing site. The surface remedial action will not preclude or interfere with any potential ground water remediation activities at the processing site.

Existing contamination does not represent a risk to human health or the environment because there is currently no consumption of the contaminated ground water in the uppermost aquifer. Potential use of contaminated ground water at the Naturita processing site could be prevented by institutional controls if necessary. The distribution of hazardous constituents in ground water will decrease with time since the contaminants discharge as ground water base flow to the San Miguel River. No surface water quality impacts from the discharge of this ground water have been identified in the San Miguel River. Existing contamination in ground water in the alluvium will eventually be diluted and flushed out of the aquifer system by natural processes.

6.0 RADON ATTENUATION AND SITE CLEANUP

6.1 INTRODUCTION

This section summarizes the radiation survey plan with respect to reasonable assurance that compliance with EPA standards outlined in 40 CFR Part 192 will be achieved. Parametric data for contaminated material is also provided for the contingency of performing radon flux calculations as needed.

6.2 MATERIAL CHARACTERIZATION DATA

The proposed remedial action will remove contaminated materials from the former tailings pile, mill yard, and ore storage areas along with an estimated 8000 cubic yards (6100 cubic meters) of contaminated demolition debris from the office building, 11 other site structures, and a large quantity of on-site scrap metal and milling equipment within the designated Naturita site boundary. Windblown and waterborne material distributed over adjacent vicinity properties, as well as approximately 300 cubic yards (230 cubic meters) of contaminated material from remote vicinity properties in the Naturita community, will also be included in cleanup.

The EPA has determined that the primary health risk associated with these materials is radon. Any final disposal plans may need to consider some form of engineered radon barrier. Radon barrier design parameter data and support calculations have been developed to facilitate use of the RAECOM model (NRC, 1984) to determine the cover thickness necessary to control radon flux. Radon barrier thickness may be determined based on methods specified in the TAD (DOE, 1989).

Specific parameters discussed include 1) long-term moisture content, 2) radon diffusion coefficient, 3) radon emanations, 4) dry density, 5) specific gravity, 6) porosity, 7) layer thickness, and 8) average radium-226 concentrations.

6.2.1 Long-term moisture

The average long-term moisture content for the contaminated material was determined by sample testing to assess minus 15 bar capillary moisture content. In general, the average value obtained from a series of individual sample tests was selected to characterize the media.

Separate sample sets were tested for the former tailings area (eight samples) and the mill yard (three samples) to determine their respective long-term moisture contents. Minus 15 bar moisture measurements of radiologically contaminated material from the former tailings pile area (five samples) ranged from 3.58 to 6.98 percent by weight for radiologically contaminated material and averaged 5.10. On the other hand, similar tests of three samples of uncontaminated soil from the former tailings pile area yielded values of 10.48, 7.48, and 4.22 percent by weight and averaged 7.39. Although combining the two data sets yielded an average of 5.98, the minus 15 bar value of 5.10 percent by weight was conservatively selected for the former tailings pile subsoil.

Similar testing of mill yard materials yielded 11.47, 12.66, and 11.9 percent by weight, and the average value of 12.01 percent was selected as representative of the mill yard materials.

Capillary moisture testing of the windblown, vicinity property, and ore storage soils was not performed. Since the geotechnical properties of these materials are similar to those of the tested mill yard soils, a value of 12.01 percent by weight was also assumed for the windblown, vicinity property, and ore storage materials.

6.2.2 Radon diffusion

Average radon diffusion coefficients for contaminated mill yard, ore storage, and off-site material (windblown areas) were determined using a single soil sample from each contaminated area. Radon diffusion for each type of material was measured in the laboratory as a function of moisture content ranging from 3.5 to 20 percent by weight. For each soil sample, approximately five diffusion measurements were made, each at a different moisture content within the moisture content range. Test results for contaminated material were plotted and a best fit curve was obtained for each material category using a least squares methodology. Diffusion coefficients of 0.017, 0.019, and 0.018 square centimeters per second were estimated for the contaminated material to be excavated from the mill yard, ore storage, and windblown areas, respectively. Each diffusion coefficient value selected corresponds to the individual estimated long-term moisture content of 12.01 percent by weight for the subarea's material, or 43 and 37 percent saturation for the combined mill yard/ore storage layer and windblown material, respectively. Considering the diffusion coefficient measurements of the mill yard and ore storage soil samples as independent samples of the combined mill yard/ore storage layer, the average diffusion coefficient for the layer is the arithmetic mean of the values obtained at the 43 percent saturation, or 0.018 square centimeters per second. Since the diffusion coefficient measurements of contaminated materials from the former pile area were not made as a function of moisture, it was assumed that the diffusion coefficients could be estimated using their empirical derived dependence on moisture (NRC, 1984). A value of 0.0297 square centimeters per second was chosen for the former tailings pile material at a 5.10 percent long-term moisture content. This value was compared with diffusion coefficient measurements, at the 5.10 percent moisture content, for mill yard and ore storage soils and was shown to be conservative relative to assuming that the former mill tailings foundation soil could be represented by either of the two materials.

6.2.3 Radon emanation

Twelve standard measurements of radon emanation for contaminated materials from the mill yard, ore storage, and windblown areas ranged from 0.06 to 0.35. In general, radon emanation has been shown to be statistically independent of both moisture and radium-226 concentrations using standard regression and statistical analysis.

Average emanation factors of 0.34, 0.10, and 0.22 were calculated from four measurements made on a sample of contaminated material from the mill yard, ore storage, and windblown areas, respectively, with corresponding standard error of

the means of 0.01, 0.02, and 0.01. No emanation measurements were performed on the former tailings pile material; the volume-weighted average emanation factor of 0.33 for the mill yard and ore storage area is assumed to be representative of this material.

6.2.4 Dry densities and porosities

The dry densities, specific gravities, and porosities for the various types of contaminated material were determined using standard tests and procedures and assuming a design compaction of 95 and 90 percent, respectively, in accordance with ASTM D698.

Eleven maximum dry density and five specific gravity measurements of material from contaminated areas ranged from 1.20 to 2.09 grams per cubic centimeter and 2.51 to 2.80, respectively. The respective average compacted density in grams per cubic centimeter (90 percent compaction) and specific gravity for each contaminated area were 1.73 and 2.70 for the former tailings area (five samples measured for density only), 1.49 and 2.71 (three samples) for the mill yard and 1.47 and 2.51 for the ore storage area (one sample), and 1.44 and 2.76 for the windblown area. Since no specific gravity measurements were made on the soils from the former tailings pile area, the average 2.70 value calculated for the mill yard was assumed to be representative of this material. An average dry density and specific gravity of 1.47 grams per cubic centimeter and 2.60 were assumed for the vicinity property material, and corresponding values of 2.40 grams per cubic centimeter and 3.00 were used for demolition debris. On this basis, estimated porosities for contaminated soils from the former pile, mill yard, ore storage, and windblown areas were 0.36, 0.45, 0.41, and 0.48, respectively.

6.2.5 Layer thickness

Based upon volumes of the various types of contaminated materials, layer thicknesses may be determined as necessary for radon barrier calculations. These values, of course, will depend upon final material disposition.

6.2.6 Radium-226 concentrations

Average radium-226 concentrations were estimated for each contaminated subarea of the Naturita site based on an assessment of radiometric measurements (hand-held and borehole gamma logs) and radiochemical and gamma spectroscopic measurements of contaminated material collected from surface soil samples, test pits, and boreholes constructed within the subareas. The division of the site into subareas is shown in Figure 1.3. Incremental radium-226 depth profiles were constructed at each measurement grid point within a subarea. The average radium-226 concentration for the subarea was determined by integrating the profiles over the volume contained between the topographical surfaces defining the ground surface and the excavation depth required to comply with EPA cleanup standards. Estimated design volumes, areas, and average radium-226 concentrations for contaminated materials at the Naturita site are shown in Table 1.1.

6.2.7 Ambient radon concentration

An ambient radon concentration in air of 2.3 picocuries per liter was obtained from background air samples collected for 24 hours in the vicinity of the Naturita processing site using continuous radon samplers (FBDU, 1981). However, recent pre-remedial action radon monitoring at a distant background location for four quarters (April 25, 1989, through March 12, 1990) using integrating Track-Etch® detectors indicates that an ambient radon concentration of 0.6 picocuries per liter would be more appropriate (DOE, 1990b) for RAECOM calculations.

6.3 EVALUATION OF RADON BARRIER

Using the parametric data provided above, an evaluation may be undertaken to determine radon flux given similar information regarding cover material.

6.4 SITE CLEANUP

Extensive field sampling and radiological surveys, including the cobbles-to-fines study, have been conducted by a number of investigators to determine the extent and degree of contamination at the Naturita processing site. The distribution of contaminated materials as a function of excavation depths is shown in Figure 1.3.

6.4.1 Radiological site characterization

Details of site characterization data are presented in Calculation 17-730-01-02 (*Contaminated Material Excavation-Excavation Extent and Depth, Volume and Radium-226 Concentration*) in Attachment 1. Measurements of background radioactivity near the Naturita site and measurements of existing radiological site conditions are summarized in Table 6.1.

Approximately 771,400 cubic yards (589,820 cubic meters) of contaminated materials cover 115.2 acres (47.5 hectares) at the Naturita processing site and immediately adjacent vicinity properties, including approximately 21,820 cubic yards (16,690 cubic meters) of vicinity properties and 240,000 cubic yards (182,400 cubic meters) of contaminated soil thinly dispersed over 166.6 acres (61.4 hectares) in area D west of Highway 141 and partial areas of E, F, and G (Figure 1.3). A copy of the application for supplemental standards to exclude the remediation of area D and other areas adjacent to the processing site is in Appendix A. The application is submitted for review and approval by the CDPHE and the NRC. Estimated design volumes, areas, and average radium-226 concentrations for the various major contaminated materials are presented in Table 1.1. Depths of contamination range from 1.0 foot (0.30 meter) for windblown areas on the east bank of the San Miguel River to approximately 14.1 feet (4.3 meters) in the mill yard, with a volume-weighted average depth of contamination of approximately 4.0 feet (1.2 meter). The radium-226 contamination on the site and vicinity properties ranges from 8 to 3300 picocuries per gram, and has a volume-weighted average of approximately 90 picocuries per gram.

Characterization data to date have not indicated potential for preferentially mobilized thorium-230 at the site. Further investigations to characterize the

Table 6.1 Background radioactivity and radiological conditions at the Naturita, Colorado, site

Parameter	Background data	Site data
Gamma exposure rate		
Range ($\mu\text{R/hr}$)	11.8 - 15.1	8 - 369
Average ($\mu\text{R/hr}$)	13.5	36 ^a
Radon concentration		
Range (pCi/L)	0.4 - 0.6	0.8 - 2.9
Average (pCi/L)	0.5	2.0
Radium-226 concentration		
Range in soil (pCi/g)	0.6 - 5.4	0.5 - 822
Average in soil (pCi/g)	2.1	62.1 ^b
Radon flux		
Range (pCi/m ² s)	N/A	2.4 - 30
Ground water (pCi/L) ^c		
Natural uranium	N/A	5.2 ppm
Radium-226		28.6
Lead-210		13.5

^aArea-weighted average.

^bVolume-weighted average.

^cMaximum on-site concentration from monitor well.

N/A — not available.

pCi/g — picocuries per gram.

pCi/L — picocuries per liter.

pCi/m²s — picocuries per square meter per second.

ppm — parts per million.

$\mu\text{R/hr}$ — microrentgens per hour.

potential for thorium-230 mobility have been performed in conjunction with test pitting to determine cobbly soil characteristics (described in Attachment 4). Three locations of elevated natural uranium have been identified and could have been caused by varied activities (e.g., ore spillage during hauling days). Additional uranium characterization was performed during test pitting to determine cobbly soil characteristics (also described in Attachment 4).

6.4.2 Standards for cleanup

The DOE is committed to removing radiologically contaminated materials from the site and has identified offsite locations such that all EPA standards in 40 CFR Part 192 are met. All disturbed areas on the processing site and vicinity properties will be restored to grade for adequate control of surface drainage. No contaminated materials or buildings are to be released for unrestricted use. All buildings on the site will be demolished, and all contaminated debris and building components will be disposed of in an acceptable manner.

The supplemental standard provisions of 40 CFR Part 192 appropriate to vicinity properties are being considered for application in several areas as described in Calculation 17-730-02-04, *Proposed Supplemental Standards Areas*, of Attachment 1. These areas include steep slopes where conventional cleanup techniques cannot be employed and where disturbances would likely cause future erosion problems; areas containing protected vegetation, wildlife habitat, or cultural resources; and utility easements such as the high-pressure gas line within Area E. The application for supplemental standards derived from this calculation is included in this RAP report as Appendix A for review and concurrence.

Subsoil conditions in the alluvial floodplain at the Naturita site generally consist of a high percentage of barren cobbles and gravels greater than a number 4 mesh sieve (approximately 75 percent by weight) that are essentially free from radiological contamination. Radiological contamination is associated with the finer fraction passing a number 4 mesh sieve (0.19-inch x 0.19-inch [0.48-centimeter x 0.48-centimeter] openings). Excavation depths currently estimated from available characterization data will remove radium-226 concentrations in the finer fraction to less than 5 and 15 picocuries per gram above background for surface and subsurface soils. However, if radium-226 concentrations exceeding 5 or 15 picocuries per gram in the finer fraction are encountered in soils containing a high percentage of cobbles/gravels during construction, soil cleanup may be based on *bulk* radium-226 concentrations of 5 and 15 picocuries per gram of radium-226 above background calculated from the CTF test pit study. This application of CTF correction shall be in accordance with the NRC's concurrence on the bulk applicability of EPA soil cleanup standards for radionuclides (see NRC correspondence dated September 17, 1991, in Appendix B of this report) and procedure OP-003-4, "Soil Verification Using Cobbles-to-Fines Correction" (see Attachment 4).

The bulk soil cleanup standards for thorium-230 in 15-centimeter-thick soil layers, averaged over grid areas of 100 square meters, will be determined on a grid-specific basis. Measured residual bulk radium-226 concentrations (less than 5 and 15 picocuries per gram for 15-centimeter surface and subsurface soil layers, respectively) will be used to calculate appropriate excavation depths for bulk thorium-230 removal to ensure that the effective bulk radium-226 concentration in 1000 years (due to the radioactive decay of thorium-230) will not exceed the 5 and 15 picocuries per gram above background soil cleanup standard for bulk radium-226 concentrations. This approach is outlined in the supplemental standard titled the *Generic Protocol for Thorium-230 Cleanup/Verification at UMTRA Project Sites* (see Appendix B), submitted to the NRC for concurrence and implementation at Naturita and other UMTRA Project sites. Bulk thorium-230 exceeding the supplemental standard limits and encountered below the water table in the saturated zone will be addressed in accordance with the thorium-230 cleanup protocol for contamination in the saturated zone (see Appendix B).

Uranium concentrations (and mobility, if necessary) in subsoil below the design excavation limits for radium-226 and thorium-230 will be assessed using a pathway analysis approach to evaluate potential environmental, ground water, and public health impacts. The need for additional remedial action for uranium will be based on this analysis and on uranium verification results (see SOP RAC-OP-007, Uranium

Cleanup and Verification at Naturita, located in Attachment 4), and any required cleanup criteria will be developed as a supplemental standard under criterion (f) of 40 CFR §192.21 and the provision that residual uranium concentrations will be as low as reasonably achievable. CDPHE and NRC approval for the derived supplemental standard will be sought for implementation.

6.4.3 Verification of cleanup

Excavation control monitoring will be conducted during remedial action to prevent both inadequate underexcavation and costly overexcavation in cleanup to the EPA standards. Verification sampling will ensure that bulk radium-226 concentrations averaged over 15-centimeter depth increments and areas no greater than 100 square meters will meet the 5 picocuries per gram and 15 picocuries per gram above background standards promulgated by the EPA for respective surface and subsurface soils.

Independent radiological surveillances and health/safety audits will be conducted by the DOE and the TAC during remedial action to ensure that all activities are performed to meet federal, state, and local standards and guidelines. Quality control and assurance requirements and procedures are in place to ensure that adequate cleanup and subsequent verification are properly implemented and documented (DOE, 1990a).

Final verification surveys will be performed to document average bulk radium-226 concentrations on all 100-square-meter areas remediated. Residual bulk thorium-230 concentrations will be verified in accordance with the current NRC-approved protocol (supplemental standard) for thorium-230 cleanup and verification (see Appendix B). Uranium concentration verification will be in accordance with SOP RAC-OP-007. Nine-plug composite surface soil samples will be collected for each 100-square-meter area at the final excavation depth (if above the water table) and analyzed by gamma spectroscopy or radiochemical methods to verify compliance with EPA standards for radium-226 or approved supplemental standards for other radionuclides. For contaminated cobbly soils, an NRC-approved procedure (*Soil Verification Using Cobbles-to-Fines Correction* [see Appendix B]) will be implemented at the site for bulk radionuclide determination, excavation control, and site verification. A number of test pits have been constructed in the former tailings area, mill yard, and ore storage areas to determine the average mass partition function for the site and its lower 95 percent confidence limit, as well as the average radionuclide concentration (and the upper 95 percent confidence limit) of the large soil size fraction retained on a number 4 mesh sieve (*Statistical Mass Partition Function - Alternative 1 (Test Pits)*, Section 5.4, in the NRC-approved cobbly soil cleanup procedure in Appendix B). Site verification efforts in cobbly soils may use these site parameters and radiometric measurements for every 100-square-meter grid of the finer soil fraction passing a number 4 mesh sieve to assess bulk radionuclide concentrations. Background bulk radionuclide concentrations will also be determined for three background locations containing cobbly surface/subsurface soils.

In addition, a nine-point composite hand-held instrument gamma measurement technique may be used in windblown-contaminated areas north of the former

tailings area. Regression analysis will be used to correlate composite nine-point gamma count-rate measurements per 100-square-meter grid with radium-226 concentration measurements. Accordingly, verification of windblown areas would be based on the mean gamma count rate at the upper 95 percent confidence level corresponding to total radium-226 concentrations for 5 and 15 picocuries per gram for surface and subsurface soil remediation. If the site health physics manager decides that the nine-point composite gamma measurement technique is appropriate for these areas, a hand-held verification protocol will be developed for site-specific conditions and must be approved by the DOE UMTRA Project Office prior to implementation. The RTRAK® mobile gamma detection unit may also be used for verification of contaminated areas that are too large to sample by hand methods and along the haul road.

6.5 SUMMARY AND CONCLUSION

The DOE has committed to clean up the Naturita processing site and associated vicinity properties in accordance with EPA standards, NRC guidelines, and UMTRA Project health and safety requirements. An application for supplemental standards has been developed to exclude those areas identified in Calculation 17-730-02-04 of Attachment 1 from remedial action and is included in Appendix A of this RAP report for CDPHE and NRC review and approval. Data have been collected, verified, and analyzed to provide a reasonable preliminary design. Additional characterization and media testing will be performed to provide more representative material and radon diffusion parameters for the former tailings area, mill yard, ore storage, and windblown soils. These additional activities will complement the available database and ensure the fulfillment of the DOE commitment to clean up the site in accordance with the UMTRCA and EPA standards. The final excavation elevations are shown on the final contaminated material excavation plan in Figure 6.1.

7.0 LIST OF CONTRIBUTORS

The following individuals contributed to the preparation of this RAP.

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UNITED STATES CODE

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ATTACHMENT 2
GEOLOGY REPORT

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LIST OF ACRONYMS**Acronym****Definition**

CDPHE

Colorado Department of Public Health and Environment

NRC

U.S. Nuclear Regulatory Commission

UMTRA

Uranium Mill Tailings Remedial Action

CHANGE HISTORY

Document version	Date	Pages/comments
Rev. 0, Ver. 1	03/20/98	Initial version.

1.0 INTRODUCTION

1.1 SCOPE AND PREVIOUS STUDIES

The purposes of these studies were basic regional and site characterization with identification of potential local geologic hazards that could affect cleanup and short-term stability at the processing site. The disposal site is to be determined by others subject to approval by the Colorado Department of Public Health and Environment (CDPHE) and the U.S. Nuclear Regulatory Commission (NRC). On-site stabilization is not considered an option because of floodplain conditions.

The scope of work performed included the following:

- Compilation and analysis of previous published and unpublished geologic literature and maps.
- All pertinent stratigraphic, lithologic, tectonic, seismologic, geophysical, geomorphic, mineral resource, and soils literature, and maps of the site region were reviewed.
- Review of site-specific Uranium Mill Tailings Remedial Action (UMTRA) Project subsurface geologic data, including logs of exploratory boreholes advanced in the site area.

Subsurface geologic data obtained in the site area for this study consist of logs of boreholes and backhoe test pits advanced on the site to assess ground water conditions, subsurface stratigraphy, and engineering characteristics.

Logs of all known boreholes and test pits are included in Attachment 1, Vol. II, *Information for Bidders*.

- Ground reconnaissance and field verification of geologic and geomorphic features in the site region were performed by geologists concurrently with the other phases of this study from July through August 1988 and April through June 1989.

The following topics relevant to the contaminated materials in the Naturita site region are discussed:

- Characterization of the regional geologic setting and its correlation to site geology.
- Identification of potential local geologic hazards, including slope stability hazards; impact from future mineral resources development; and problems related to site stratigraphy or unconsolidated deposits, fractures, or structure.

1.2 CONTENT AND ORGANIZATION

This attachment is divided into three sections. The purpose of this study was to provide information on the regional geologic setting of the processing site and specific information on the former mill site as an aid for cleanup activities of surficial deposits and for ground water cleanup if required. Sections 2.0 and 3.0 present the basic information on the regional setting and natural processes acting on the site region.

2.0 REGIONAL GEOLOGIC SETTING

2.1 REGIONAL PHYSIOGRAPHY

The site region lies entirely in the Canyon Lands section of the Colorado Plateau physiographic province (Hunt, 1967) (Figure 2.1.) The Canyon Lands are characterized by deeply incised drainages and isolated mesas. The dominant landform of the region is the broad Uncompahgre Plateau in the northeast portion of the site region, which has been dissected to a depth of 3000 feet (900 meters) by Unaweep Canyon. The Uncompahgre Plateau is bounded on the southwest by subprovinces within the Paradox Basin that consist of the folded/faulted belts containing the collapsed diapiric salt anticlines and the broad, relatively flat plain of the Great Sage Plains. The Paradox Basin proper is defined by stratigraphy rather than by physiography.

The evolution of the present topography dates largely from the uplift of the Colorado Plateau in Late Miocene time. This uplift resulted in a northward tilt of the entire plateau. The drainages that formed on the low-relief Miocene surface became entrenched as uplift progressed. Cater (1970) offers evidence that uplift may still be continuing. The following paragraphs describe the physiographic subprovinces within the site region and the development of the geomorphic features.

Uncompahgre Plateau. This structure is gently tilted to the northwest, resulting in deep gulches eroded in the Cretaceous and Jurassic rocks that are separated by long, narrow mesas extending northwest toward the Gunnison River Valley. The southwest side of the plateau is approximately bounded by the San Miguel River, which later converges with the Dolores River to flow on a fairly direct northwest trend to its junction with the Colorado River as it flows around the northwest end of the plateau. Unaweep Canyon represents the ancestral channel of the Gunnison River that flowed south across the width of the plateau in Late Tertiary time. It is now drained by two opposite-flowing minor creeks that are tributaries to the Dolores River on the southwest and to the modern Gunnison River to the northeast. The canyon, which is about a mile wide and incised about 2000 feet (600 meters) into the Precambrian basement rock, provides evidence for the age and extent of uplift of the Uncompahgre Plateau. Elevations on the plateau range from 9545 feet (2605 meters) at the axis of the uplift to 6000 feet (1800 meters) on the nearby floor of the Unaweep Canyon (Cater, 1966).

Paradox Basin. Several of the folds that include the faulted collapsed salt anticlines have been dissected by the Dolores River and its tributaries. The erosional cycle, caused by the Miocene uplift, superposed the meanders of the Dolores River upon the underlying structures (Cater, 1970; Hunt, 1969). This was partly accomplished by the widespread, very thick deposits of the Mancos Shale, and perhaps Early Tertiary sediments that overlay the region. The low-relief surface formed on these easily eroded sediments exerted very little structural control on the drainage (Cater, 1970). Except for localized occurrences, the soft Mancos Shale has been eroded from the region, exposing the anticlinal structures. The full thickness of the Mancos Shale is still present outside the Paradox Basin in the southeast edge of the

AFTER: WOODWARD-CLYDE CONSULTANTS, 1983; HUNT, 1967

FIGURE 2.1
PHYSIOGRAPHIC PROVINCES OF NATURITA SITE REGION, COLORADO
AND UTAH

region. In contrast to the Dolores River, the San Miguel River is primarily aligned with the northwest trend of the folded and faulted belt of the salt anticlines along the southeast margin of the Uncompahgre Plateau. Both drainages, however, originate within a few miles of each other on the western flanks of the San Juan Mountains. This range, which lies in the Western Mountains physiographic province, marks the southeast limits of the Paradox Basin and Uncompahgre Plateau as well as the eastern boundary of the Colorado Plateau.

Great Sage Plains. This subprovince is characterized by low relief, generally flat-lying bedrock with little folding, and relatively shallow incisions of the regional drainage. Bedrock exposed in the area is the Dakota Sandstone, the same formation that is exposed on mesa tops throughout the Paradox Basin and the Uncompahgre Plateau.

Regional geomorphology

With the uplift of the Colorado Plateau in the Miocene age and the differential uplift of the Uncompahgre Uplift during the Pliocene, the modern drainages became established as a result of the accelerated erosion. It is uncertain whether tectonic activity essentially stopped before or shortly after the end of the Pliocene or has continued into the present time. Sinnock (1981a) and Cater (1970, 1966) believe that the Unaweep Canyon was formerly occupied by the Gunnison River and that the Colorado River has been in essentially the same position since the Miocene. Cater (1970, 1966) believes that the uplift of the Uncompahgre Plateau continued into the early Pleistocene and that the major trunk streams have not greatly deepened their canyons for some time. In the Paradox Basin area, downdip migration of structurally controlled drainages is relatively inactive at the present because the base level of the master stream of the region, the Dolores River, is being lowered very slowly.

The development of the present landforms of the river valleys was strongly influenced by Pleistocene glaciation. Sinnock (1981b) identified four sets of glacial moraines of Bull Lake and Pinedale age in the upper Gunnison River area that are correlated with episodes in the San Juan Mountains. Evidence for successive periods of glaciation has also been recognized on the La Sal Mountains to the northwest and Battlement Mesa to the northeast.

Terraces occur at various elevations above the Colorado, Dolores, San Miguel, and Gunnison Rivers as well as various creeks in the site area. They contain stream deposits that range in age from Early to Late Pleistocene. The oldest gravels are from 33 to 492 feet (10 to 150 meters) above modern stream levels and may be of pre-Bull Lake age. Younger terraces correlated with Pinedale and Bull Lake glaciations (Sinnock, 1981a, Epis et al., 1980) generally occur between 16 and 82 feet (5 to 25 meters) above the modern channels. The modern floodplains are composed of unconsolidated deposits that have thicknesses of 66 feet (20 meters) or more along the Colorado River.

Scarp retreat is the dominant process of valley widening on the Colorado Plateau and is particularly important in the Canyon Lands physiographic province (Schumm

and Chorley, 1966). Hunt (1969) has estimated scarp retreat on the Colorado River in Utah as 1.8 feet (0.55 meter) per 1000 years and a maximum average of 74 feet (22.6 meters) per 1000 years on the Book Cliffs escarpment in Utah and Colorado. This higher rate may be erroneous (Woodward-Clyde Consultants, 1983; Heyman, 1983).

Vegetation. Vegetation in the lower elevations consists of piñon and juniper on rocky terrain and sagebrush on deep soil areas. Riparian vegetation is comprised of cottonwood, willow, and tamarisk (salt cedar). Scrub oak, serviceberry, and chokeberry are common in higher elevations with stands of ponderosa pine, fir, and spruce occurring in some areas of the Uncompahgre Plateau (Cater, 1970).

2.2 STRATIGRAPHIC SETTING

Bedrock in the site region consists of a thick sequence of marine and continental sedimentary rocks, representing the Paleozoic and Mesozoic Systems. Tertiary-aged sediments, if any existed, have been eroded from the surface. The northeastern portion of the site region, comprised of the Uncompahgre Plateau, has mostly nonmarine sedimentary rocks with the Paleozoic sequence missing so that Middle Triassic-aged rocks are resting unconformably on Precambrian basement rocks. In the southwestern portion of the site region, comprised of the Paradox Basin, the Precambrian basement rocks are overlain by marine limestones and shales of Cambrian to Mississippian age and an extremely thick sequence of Late Paleozoic evaporites and clastics. The stratigraphic column of formations found in the site region is shown on Figure 2.2, and Table 2.1 contains a description of the units.

Because of the extensive erosion that has occurred in this Canyon Lands section of the Colorado Plateau and the relatively deep incision of the drainages, unconsolidated Quaternary deposits, mostly river terrace sediments, are largely restricted to the narrow valleys. Some older river deposits occur on strath terraces several hundred feet above the stream bed.

The bedrock on the Uncompahgre Plateau is essentially undisturbed and dips gently to the northeast. In the Paradox Basin, most areas have nearly flat-lying to gently dipping sandstone-capped mesas that contrast with the faulted ridges and moderately to steeply dipping slopes that form the flanks of collapsed salt anticline valleys. The bedrock geology for the site region is shown on Figures 2.2 and 2.3.

2.3 STRUCTURAL SETTING

The Naturita site is located in the northeastern part of the Colorado Plateau. The Colorado Plateau is a stable, intercontinental subplate having a greater thickness than the adjoining regions. Its margins exhibit crustal structures similar to the more disturbed bordering provinces, while the central portion exhibits characteristics of large continental plates.

Several episodes of major orogenies have produced the structural configuration of the plateau. During Precambrian time, two major shear zone systems were

GEOLOGIC AGE	FORMATION	THICKNESS (FT)	CHARACTERISTICS	
CRETACEOUS	MANCOS SHALE	2,000-5,000	GRAY SHALE; FORMS VALLEYS AND SLOPES; AQUICLUDE	
	DAKOTA SANDSTONE	0-200	GRAY AND BROWN SANDSTONE, SHALE AND CONGLOMERATE; CAPS MESAS AND FORMS CLIFFS; LOW-QUALITY, LOW-QUANTITY AQUIFER	
	BURRO CANYON FORMATION	50-250	BLUFF, CONGLOMERATIC SANDSTONE AND MAROON AND GREEN MUDSTONES; FORMS SLOPES, SANDSTONES FORM CLIFFS; LOW-QUALITY, LOW-QUANTITY AQUIFER	UNCONFORMITY
JURASSIC	MORRISON FORMATION	300-500	BRUSHY BASIN MEMBER; VARICOLORED SHALES, SOME SANDSTONE; FORMS SLOPES; SANDSTONES YIELD WATER	NATURITA PROCESSING SITE
			SALT WASH MEMBER; LIGHT-COLORED SANDSTONE, RED MUDSTONE; OCCASIONAL LIMESTONE; FORMS BENCHES; SANDSTONES YIELD WATER	
	SUMMERVILLE FORMATION	0-400	VARICOLORED MUDSTONES; THIN SANDSTONE UNITS; FORMS SLOPES; AQUICLUDE	
	ENTRADA SANDSTONE	50-1,000	MOAB MEMBER; FINE-GRAINED WHITE SANDSTONES; FORMS STEPS; AQUIFER	
			SLICK ROCK MEMBER; LIGHT-COLORED MASSIVE SANDSTONE; FORMS CLIFFS; AQUIFER	
TRIASSIC(?)	KAYENTA FORMATION	0-200	LENTICULAR SANDSTONES AND RED-PURPLE MUDSTONES; FORMS BENCHES; SANDSTONES ARE POTENTIAL LOW-QUANTITY AQUIFERS	UNCONFORMITY
TRIASSIC	WINGATE SANDSTONE	200-400	LIGHT-COLORED MASSIVE SANDSTONES; FORMS CLIFFS; LOW-QUANTITY AQUIFER	
OLDER SEDIMENTARY ROCKS				

REF: FBDU, 1981

FIGURE 2.2
SIMPLIFIED STRATIGRAPHIC COLUMN
FOR THE NATURITA AREA, COLORADO

Table 2.1 Description of stratigraphic units in Naturita site area

Age (geologic period)	Unit group or formation	Approximate thickness in site area (feet)(meters)	Description
Quaternary	Unconsolidated alluvium		Undifferentiated alluvial river terrace deposits.
Tertiary		0	No sedimentary deposits in site area. Igneous intrusives occur largely as dikes intruded in the Precambrian rocks of the Uncompahgre Plateau.
Upper Cretaceous	Mancos Shale	0-150 (0-46)	Uniform gray-blue marine shale; contains some distinctive sandstone marker beds. Typically 4000 feet (1200 meters) thick in uneroded section. Due to erosion, only isolated localities remain in salt anticline areas.
Lower Cretaceous	Dakota Sandstone	180 (55)	Chiefly sandstone; consists of a basal unit that contains chert pebbles. A middle gray-to-black carbonaceous shale unit contains a thin coal seam. The upper marine sandstone unit is missing at most places. Cross-bedding is common.
Lower Cretaceous	Burro Canyon Formation	180 (55)	Gray-to-light-brown fluvial sandstone with a basal conglomerate overlain by a shale-mudstone. Colored light-red, purple to grayish-green. The mudstone contains abundant limestone modules in some areas.
Upper Jurassic	Morrison Formation	820 (250)	<u>Brushy Basin Member.</u> Composed of variegated bentonitic and montmorillonite fluvial and lacustrine shale, mudstone, and sandstone. Has conglomeratic lenses that locally may be mineralized with uranium and vanadium ore. Common colors are red, purple, gray, and pink. Bedding typically is lenticular.

Table 2.1 Description of stratigraphic units in Naturita site area (Continued)

Age (geologic period)	Unit group or formation	Approximate thickness in site area (feet)(meters)	Description
			<u>Salt Wash Member.</u> Consists of interbedded fluvial sandstone and siltstone. The sandstone is commonly gray to yellow to pale orange, fine- to medium-grained with local seams of pebbles. Bedding is lenticular to cross-bedded. The upper units of sandstone may contain major uranium and vanadium ore deposits in this area.
Jurassic	Summerville Formation	100 (30)	Chocolate-colored to red or white marine shale with siltstone. It interfingers with the underlying Entrada Sandstone in some areas. Characteristically has ripple marks with some mud cracks.
Jurassic	Entrada Sandstone	110 (34)	<u>Moab Member.</u> Interfingers with the Summerville Formation in some areas. Generally white and cross-bedded sandstone that grades into horizontal bedding.
			<u>Slick Rock Member.</u> Usually forms the entire Entrada Formation over most of Colorado. Consists of a light-brown, buff, or pink fine-grained sandstone and forms smooth, unjointed slopes or cliffs from which it gets its name.
			<u>Dewey Bridge Member.</u> This lower unit interfingers with the Carmel Member west of the region. It consists of reddish-brown, massive bedded siltstone and contains scattered, well-rounded, coarse sand grains called Entrada berries.

Table 2.1 Description of stratigraphic units in Naturita site area (Continued)

Age (geologic period)	Unit group or formation	Approximate thickness in site area (feet)(meters)	Description
Jurassic	Navajo Sandstone	0	This formation is missing at the site area but rapidly thickens in the western part of the site region to about 250 feet (75 meters). It consists of fine-grained, cross-bedded sandstone, colored orange-gray to light-gray. It is considered a classic example of eolian deposition.
Upper Triassic	Kayenta Formation	200 (60)	Irregularly bedded fluvial red, buff, gray, and lavender conglomeratic sandstone with some interbedded siltstone and shale. The finer sediments are usually dark reddish-brown.
Triassic	Wingate Sandstone	200 (60)	Eolian deposit of fine-grained, well-sorted, cross-bedded sandstone with occasional thin lenses of limestone. It forms prominent red-brown to tan cliffs in the site region.
	Chinle Formation	200 (60)	Reddish-brown and orange-red siltstone interbedded with lenses of sandstone, shale, and mudstone. Locally contains lenses of limestone deposited in shallow lakes.
	Moenkopi Formation	90 (27)	Includes red-brown siltstone, claystone, sandstone, conglomerate, and some distinctive limestone units. It contains ripple marks, cross-bedding, salt casts, and shrinkage cracks.

Table 2.1 Description of stratigraphic units in Naturita site area (Continued)

Age (geologic period)	Unit group or formation	Approximate thickness in site area (feet)(meters)	Description
Permian	Cutler Formation	200 to 1400 (60-430)	Continental clastic consisting of coarse arkosic material derived from uplifted Uncompahgre highlands. Locally attained thicknesses up to 15,000 feet (4600 meters). The overburden pressure of this unit caused salt flowage and diapirism in underlying saline deposits. It is a crudely bedded, poorly sorted, cross-laminated, purplish-red-maroon conglomerate with thin portions of shale and mudstone.
Pennsylvanian	Hermosa Group	13,000 (4000)	<p><u>Honaker Trail Formation.</u> Near the Uncompahgre Uplift the unit is a gray-green arkosic sandstone that grades westward into a sequence of cherty limestone and red-gray calcareous siltstone. Up to 2000 feet (600 meters) thick.</p> <p><u>Paradox Formation.</u> Composed of cyclical evaporite deposits and black shales grading outward from the center of Paradox Basin into carbonates (dolomite and limestones) at the edge of the basin. Only sediments, including evaporites such as halite, gypsum, and potash, are included in this formation. The carbonates are considered parts of overlying (Honaker) or underlying (Pinkerton Trail) formations. Because of salt flowage and diapirism, the original maximum thickness of 5000 to 7000 feet (1500 to 2100 meters) increased locally to 14,000 feet (4300 meters).</p>

Table 2.1 Description of stratigraphic units in Naturita site area (Continued)

Age (geologic period)	Unit group or formation	Approximate thickness in site area (feet)(meters)	Description
			<u>Pinkerton Trail</u> . Light- to dark-gray silty shale overlain by fossiliferous limestone. It was the last normal marine deposit before major subsidence began in the basin. It is the oldest sedimentary deposit exposed in the site region.
Pennsylvanian	Molas Formation	200 (60)	Reddish-brown to variegated siltstone, red shale, calcareous mudstone, and lenses of gray limestone. The deposition fills the karst topography of the red wall limestone.
Lower Mississippian	Redwall Limestone	275 (84)	Equivalent to the Leadville Limestone name used in the eastern part of the region. It consists of thick and thinly bedded limestone interbedded with dolomite and contains fossiliferous chert.
Late Devonian	Ouray Formation	75 (23)	Persistent thickness from 50 to 150 feet (15 to 46 meters) that is widespread over the Colorado Plateau. It consists of limestone with distinctive green waxy shale beds at top and bottom.
Devonian	Elbert/Aneth Formation	250 (76)	Thinly bedded dolomite interbedded with dark shales.
Cambrian	Muav Limestone/Bright Angel Shale	350 (107)	Massive limestone with shale partings underlain by alternating sequences of sandstone, siltstone, and limestone.
	Ignacio Formation	150 (46)	Basal conglomerate sandstone formed on top of the Precambrian basement rock.
Precambrian	Basement Complex	Unknown	Undifferentiated granite, schist, gneiss, and pegmatite dikes.

FROM: WOODWARD-CLYDE
CONSULTANTS, 1983
NOTE: BOLD OUTLINE SHOWS
PARADOX BASIN

0 10 20 30 40 miles
0 10 20 30 40 50 kilometers

EXPLANATION OF GEOLOGIC SYMBOLS

TERTIARY	QUATERNARY	Qa	Alluvium	CRETACEOUS	Kuu	Mesaverde Group	
		QTV	Volcanic rocks		Kul	Mancos Shale	
		Ti	Intrusive igneous rocks		Ku	Cretaceous rocks, undifferentiated	
		Te ₃	Duchesne River and Uinta Formations		K	Dakota Sandstone	
		Tv	Volcanic rocks	JURASSIC	J	Morrison Formation; San Raphael Group	
		Te ₂	Green River and Wasatch Formations		R	Glen Canyon Group; Chinle and Moenkopi Formations	
		Te ₁	Flagstaff and Fort Union - North Horn Formations	TRIASSIC	PERMIAN	Pwl	White Rim (De Chelley) Sandstone
		Pw	Cutler, Cedar Mesa, Elephant Canyon, Halgaito, Organ Rock Formations				
		IP	Hermosa Group				
				PENN			

FIGURE 2.3
GEOLOGIC MAP OF NATURITA SITE REGION, COLORADO
AND UTAH

established that formed the framework which influenced development of subsequent structures (Figure 2.4). These were the northeast-trending Colorado Lineament, extending from Arizona to Minnesota, and the opposite northwest-trending Olympic-Wichita Lineament, which reaches from southern Oklahoma to Washington. These broad zone lineaments intersect within the site region (Baars and Stevenson, 1981a). Stone (1969) characterized the shear zones as left lateral and right lateral wrench faults because of the vertical component of the movement. Movement was observed as 1) reversal of fault dip along a fault line; 2) development of belts of en echelon parafold features; and 3) abrupt stratigraphic changes across the zone.

Regional structures that developed during the second major orogeny in Late Paleozoic (Pennsylvanian time) include the following:

- The Ancestral Uncompahgre-San Luis Uplift, which was aligned along the Olympic-Wichita Lineament.
- The Paradox Basin, where subsidence occurred simultaneous with uplift of the Uncompahgre Uplift.
- The uplift of the Ancestral Rocky Mountains. It was the development of these northward-trending structures in Central Colorado that defined the configuration of the Colorado Plateau (Tweto, 1980).

The Laramide Orogeny was the third episode of major structural development in the region beginning in Late Cretaceous and continuing into Early Tertiary. The effects within the site region are seen as a folded belt through the Paradox Basin and uplifts primarily along alignments of existing basement faults. Structures created within the Colorado Plateau were the Piceance Basin and the Uinta Basin separated by the Douglas Creek Arch in the northern plateau region; the initiation of the Uncompahgre Uplift; and the Monument Upwarp and the San Juan Basin in the southern part of the Plateau (Figure 2.5).

The Uncompahgre Uplift, which comprises about 40 percent of the site region, developed along the approximate boundaries of the Ancestral (Pennsylvanian) Uncompahgre Uplift within the site region except that the southeast portion does not extend beyond the boundary of the Colorado Plateau as it formerly did, but terminates against the San Juan Mountains' volcanic center.

Following the Laramide Orogeny, which ended in the Eocene epoch, was a period of volcanism during Oligocene time primarily in the Rio Grande Rift (Thompson and Zoback, 1979). The rift lies 110 miles (177 kilometers) to the east of the site and separates the Western Mountains Seismotectonic Province from the Eastern or Rocky Mountain Province. The Colorado Plateau was otherwise in a period of tectonic quiescence. Most of the structures of the Colorado Plateau were rejuvenated by a fourth period of orogeny following a long period of stability in Miocene time (Tweto, 1980).

FROM: BAARS AND STEVENSON, 1981a

MAJOR PRECAMBRIAN LINEAMENTS
THAT FORMED REGIONAL
STRUCTURAL FRAMEWORK

EXPLANATION

- BASEMENT UPLIFT
- COLORADO PLATEAU
- SHEAR COUPLE
- THRUST FAULT
- MAXIMUM PRINCIPAL STRESS

FROM: WOODWARD-CLYDE
CONSULTANTS, 1983

STRUCTURAL FEATURES OF COLORADO PLATEAU
AFFECTED DURING LARAMIDE OROGENY

FIGURE 2.4
TECTONIC FRAMEWORK FOR COLORADO PLATEAU AND
NATURITA SITE REGION, COLORADO AND UTAH

Modified From: Kirkham and Rogers, 1981

LEGEND

- Seismotectonic Provinces
- - - Structural Provinces
- · · Border Zone/Interior Boundary

FIGURE 2.5
STRUCTURAL AND SEISMOTECTONIC SETTING OF
NATURITA SITE REGION, COLORADO AND UTAH

The site region contains two major structural elements: the Uncompahgre Uplift and the folded and faulted belt within the Paradox Basin, which both trend northeast along the alignment of the Olympic-Wichita Lineament.

- **Uncompahgre Uplift.** There is some disagreement over when the major uplift occurred, but there is general agreement that there was activity on the faulted monoclinical folds on its southwestern and northeastern boundaries. Cater (1970, 1966) believes that most of the movement occurred in mid-Pliocene and probably continued into the Pleistocene. The uplift appears as a northeast-tilted fault block but has a slight anticline fold axis located very close to the southwestern flank. The uplift is approximately 25 to 30 miles (40 to 48 kilometers) wide and more than 1000 miles (1600 kilometers) long (Figure 2.5).
- **Paradox Basin and faulted folded belt.** The Paradox Basin was formed as a faulted depression that complemented the uplift movement of the Ancestral Uncompahgre Uplift (Baars and Stevenson, 1981b). The limits of the basin are defined by the zero-deposition contour of the Paradox salt member of the Hermosa Formation. The deepest part of the evaporite deposit, where it is at least 4000 feet (1200 meters) thick, is in a faulted zone bordering the uplift. As the clastic detritus accumulated, eventually amounting to about 15,000 feet (4600 meters) thick, the overburden pressure together with continued fault movement resulted in diapiric (piercement) intrusion of the salt into the overburden. The growing salt cores formed anticlinal folds controlled by the location of the faults and salt thickness (Baars and Stevenson, 1981b; Cater, 1970) (Figure 2.6).

Nearly 6000 feet (1800 meters) of displacement has occurred on the basement faults underlying the Paradox Valley anticline (Cater, 1970). The salt anticlines were enhanced by compressional folding stress during the Laramide Orogeny, which resulted in a series of folds across the width of the Paradox Basin trending northwest and aligned parallel to the uplifted block of the Uncompahgre Plateau. Subsequently, the first of two stages of collapse occurred as compressional forces relaxed, initiating graben faulting on the crests of the salt anticlines with blocks downfaulted as much as several hundred feet. The salt cores were deeply buried at this time.

The second stage of collapse of the salt anticlines occurred as a result of deep incision of regional drainages. After a long period of quiescence, the Colorado Plateau was strongly uplifted and tilted slightly to the north. Streams which had meandered across the low relief of the Miocene surface deeply eroded the region and were superposed across the buried anticlinal structures. The Dolores River eventually dissected the Gypsum and Paradox salt anticlines. Cater (1970) believed that dissolution of the salts occurred along the river as a result of stream flow and increased ground water circulation. Cater theorizes that this relief of overburden pressure by erosion and by dissolution caused salt flowage within the core toward the river, and the beds in the crest collapsed gradually outward from the river incision.

EXPLANATION

DIAPIRIC SALT ANTICLINE EXPOSURE AFTER MAP
 COMPILED BY WOODWARD-CLYDE CONSULTANTS, 1983 FROM
 NUMEROUS SOURCES

NOTE: STRUCTURES SHOWN FOR EXPOSED DIAPIRIC SALT ANTICLINE
 INDICATE SURFACE COLLAPSE FEATURES RATHER THAN THE
 DIAPIRIC STRUCTURE

FIGURE 2.6
MAP OF FOLDED STRUCTURES
IN DRY FLATS SITE REGION, COLORADO AND UTAH

Other regional structures

Laccolith igneous intrusions caused the development of the La Sal Mountains, located at the northeast perimeter of the site region. This intrusion in Middle Miocene, when the Colorado Plateau was otherwise relatively quiet, occurred at the intersection of the continental lineaments (Figure 2.4). The same fault system that caused the salt accumulation and the subsequent diapiric salt anticlinal structure of Paradox Valley focused the igneous intrusion of the La Sal Mountains, which pierced the salt anticline (Cater, 1970). A similar laccolith intrusion, Abajo Mountain, developed along the Colorado Lineament southwest of the La Sal Mountains. The San Juan Mountains, which bound the Uncompahgre Uplift to the southeast, are Laramide uplift structures consisting of an intrusive dome with volcanic calderas on its flanks.

2.4 RESOURCE DEVELOPMENT

The principal resources for the site region are gas and oil, uranium, coal, and potash. The mining and processing of uranium ore has caused the most disturbance of surface conditions in the site area.

The Naturita processing site lies just east of the Uravan Mineral Belt and the nearest mining district (Chenoweth, 1980, 1978). Major uranium occurrences are found in the Salt Wash Member of the Morrison Formation of Jurassic age. Minor quantities have been found in the Triassic-aged Chinle Formation and in the Permian-aged Cutler Formation. Host rocks are sandstone units formed by fluvial channels associated with floodplain deposits of mudstone. A few mineralized zones are known to have been localized along fold crests or fault zones. The nearest known uranium production mines are located about 4 miles (6.4 kilometers) west of the Naturita site, with the significant deposits all occurring west of the Dolores River in Montrose County (Woodward-Clyde Consultants, 1983).

Most of the hydrocarbon production in the site region is of natural gas, with oil production being relatively minor. Production is from faulted anticline structures and from stratigraphic traps in the Paradox Basin. Scott and Klippen (1981) reported that there had been over 280 miles (448 kilometers) of seismic reflection data collected to investigate petroleum potential in the Paradox Basin. Most production has been from the Permian Cutler Formation and the Honaker Trail Formation of Pennsylvanian age (Krivanek, 1981). The nearest production to the Naturita site has been the Montrose Dome gas field, 3 miles (4.8 kilometers) southwest, which was operated in 1958. The nearest present gas field is Andy's Mesa field located 10 miles (16 kilometers) south of the Naturita site. There are no known oil production fields in the site region (Woodward-Clyde Consultants, 1983).

Potash occurs with the Paradox salt member of the Pennsylvanian-aged Hermosa Formation. The only known production comes from the Moab, Utah, area located outside the site region, although nearly all of the basin within the site region has a potential for potash deposits. Conventional mining procedures were used until 1970, when solution mining was adapted to avoid the problems associated with salt flowage in deep tunnels (Wong et al., 1987). The study by Woodward-Clyde

Consultants (1983) shows that most commercial mining zones are below 2500 feet (760 meters) but are known to occur at depths from 430 feet to 10,000 feet (130 to 3000 meters) or more. The economic cutoff depth is approximately 4000 feet (1200 meters) because of salt flowage. Some mining-induced seismicity has occurred with the operation in Utah.

Minerals associated with natural brines in the Paradox Basin could be important sources for several metals. Most natural brine occurrences are too small for economic purposes; however, some artificial brines (by solution mining) are produced in the Moab, Utah, area (Woodward-Clyde Consultants, 1983).

There are two mines within 8 miles (13 kilometers) of the Naturita site that obtain coal from the Dakota Formation. The only current working mine, the Hamilton strip mine, is 7 miles (11 kilometers) east of the site and produces coal from a seam about 3 to 4 feet (1 to 1.2 meters) thick from depths less than 24 feet (7 meters) (BLM, 1993). Another strip mine, the New Horizon mine, is 3 miles (5 kilometers) northeast and could reopen in the future (BLM, 1993). The coal is currently used for a small power plant near Nucla, Colorado. Coal deposits at the Naturita site consist of a few seams typically 1 to 2 inches (2.5 to 5 centimeters) thick that occur within a carbonaceous shale ranging from 10 to 30 feet (3 to 9 meters) below the surface.

The site region lies just outside of the Colorado Metallic Mineral Belt, which includes the Telluride, Ouray, and Rico mining districts in the volcanic caldera region on the edge of the San Juan Mountains. Most mineralization there occurs in the volcanic rocks (Romberger, 1980). There are no economic ore deposits within the vicinity of the former mill tailing site that would interfere with or affect cleanup of the Naturita site.

3.0 PROCESSING SITE GEOLOGY

3.1 Geologic setting

The Naturita processing site lies mostly within the floodplain on the south side of the San Miguel River. The river valley is incised into the Brushy Basin member of the Morrison Formation with thick alluvial deposits underlying the river bed and forming low discontinuous terraces along the banks. Elevations across the 53-acre (21-hectare) site range from 5292 to 5350 feet (1613 to 1631 meters) above mean sea level.

The 27-acre (11-hectare) former tailings area is on the lowest gravel terrace with the mill buildings situated on the slope immediately above. A poorly defined upper terrace was extended by placement of fill to accommodate the mill structures. Portions of the mill operation formerly extended across State Highway 141 on the upper terrace, onto the slopes of the north toe of Sawtooth Ridge. These lower slopes consisted of moderate to steep slopes of weathered shale of the Brushy Basin member of the Morrison Formation. Locally along the toe of the ridge there is evidence of slope failures that is characteristic of the high-plasticity clays of the Brushy Basin wherever it occurs on steep to moderate slopes.

Figure 3.1 shows the location of test holes and some of the test pits that were used to explore the site, and geologic cross sections are shown in Figures 3.2 and 3.3. A preliminary characterization of the Naturita mill site was provided by Ford, Bacon & Davis Utah (FBDU, 1977). Regional faults and structures are discussed in Kirkham and Rogers (1981).

3.2 Alluvial deposits

The alluvial deposits on the lower terrace consist of clayey gravel to sandy cobbles, interbedded with layers of silty clay and sandy clay. The cobbles range to 7-inch (17 centimeters) maximum diameter. The maximum thickness of alluvium found in the borings was 24 feet (7.3 meters). The water table lies within the alluvium and is approximately the same as the level of the river. The depth to water is typically 3 to 13 feet (1 to 4 meters) below the surface of the lower terrace. Water has been encountered in test pits at 5 feet (1.5 meters) depth in the former site of the mill tailings.

The hillside fill on which most of the mill buildings were constructed has a thickness of up to 39 feet (12 meters) and consists of material taken mostly from the upper terrace along the highway. The gravelly fill likely came from the lower floodplain. The boring logs indicate variable materials ranging from clayey gravel with cobbles to sandy clay with fragments of sandstone and shale.

3.3 Bedrock

Bedrock forming the valley and directly underlying the site is the Jurassic aged Morrison Formation. The upper member is the Brushy Basin, which consists of claystone and clayey shale with interbedded lenses of silty sandstone that occur as

NOTE: PLAN INCLUDES ALL BOREHOLES AND MONITOR WELLS WITH SELECTED TEST PIT LOCATIONS.

FIGURE 3.1
LOCATIONS OF CROSS SECTIONS
NATURITA PROCESSING SITE, COLORADO

FIGURE 3.2
CROSS SECTION A-A'
NATURITA PROCESSING SITE, COLORADO

FIGURE 3.3
CROSS SECTION B-B'
NATURITA PROCESSING SITE, COLORADO

channel fill deposits. The clay minerals are principally montmorillonite. The lower contact of this unit, which locally has a thickness of approximately 400 feet (120 meters), was penetrated at approximately 165 feet (50 meters) depth. The lower member, the Salt Wash, has a thick upper unit of fine-grained channel fill sandstone deposits, with a total thickness in this area measured at 377 feet (115 meters) (Cadigan, 1967). Cadigan also reports that the volume of sandstone in the Brushy Basin is only about 9 percent compared with 62 percent for the Salt Wash member. Typically the channel deposits in the Salt Wash merge laterally to appear in most cases as a continuous sandstone layer.

The Salt Wash is the regional aquifer and also the primary uranium and vanadium ore bearing strata in the region. The primary host rock, within the Uravan mineral belt, is the uppermost sandstone unit. The upper contact outcrops in the San Miguel River valley just downstream from the processing site, and the full thickness is exposed in the channel bottom over a distance of 7 miles (11 kilometers) downstream.

3.4 Structure

The site is on the west flank of the Nucla syncline so that the bedrock strata dips approximately 1.5 to 2 degrees northeast toward the axis of the syncline. The syncline, part of the folded belt of the Paradox Basin, controls the trend of the San Miguel River and adjoins the faulted boundary of the Uncompahgre Uplift structure. The syncline axis plunges toward the southeast, upriver, toward Nucla.

4.0 REGIONAL GEOLOGIC STABILITY

There are two concerns for the short-term stability of the site: flooding and the potential for slope failure on the steep slopes in the ore storage area south of the highway.

The potential for flooding is discussed in another attachment of the RAP. The only concern for slope failure is where extensive cleanup of contamination may be attempted in the former ore storage area, such as removal of 10 feet (3 meters) or more of material resulting in oversteepening of the existing slopes.

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ATTACHMENT 3

GROUND WATER HYDROLOGY REPORT

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LIST OF ACRONYMS AND ABBREVIATIONS

<u>Acronym</u>	<u>Definition</u>
ANOVA	analysis of variance
cm/s	centimeters per second
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
MCL	maximum concentration limit
NA	not applicable
ND	no data
ND	not determined
NV	not valid
pCi/L	picocuries per liter
PVC	polyvinyl chloride
REDC	Ranchers Exploration and Development Corporation
TAD	Technical Approach Document
TDS	total dissolved solids
UMTRCA	Uranium Mill Tailings Radiation Control Act
USBR	U.S. Bureau of Reclamation

CHANGE HISTORY

Document version	Date	Pages/comments
Rev. 0, Ver. 1	07/25/94	Initial version.
	08/03/94	Minor editing changes.
Rev. 0, Ver. 2	08/31/94	Moderately revised.
Rev. 0, Ver. 3	6/6/97	References to Dry Flats disposal site deleted.

1.0 INTRODUCTION

The U.S. Environmental Protection Agency (EPA) has established health and environmental protection regulations to correct and prevent ground water contamination resulting from processing activities at inactive uranium milling sites (40 CFR Part 192). The Uranium Mill Tailings Radiation Control Act (UMTRCA) of 1978 designated responsibility to the U.S. Department of Energy (DOE) for assessing the inactive uranium milling sites. The DOE has determined that each assessment shall include information on site characterization, a description of the proposed action, and a summary of the water resources protection strategy that describes how the proposed action will comply with the EPA ground water protection standards.

Site characterization activities discussed in this section include the following:

- Definition of hydrogeologic characteristics of the environment, including hydrostratigraphy, aquifer parameters, areas of aquifer recharge and discharge, potentiometric surface, and ground water velocity.
- Comparison of existing water quality with background water quality and the maximum concentration limits (MCL) of the EPA ground water protection standards.
- Definition of physical and chemical characteristics of the potential contaminant source, including concentration and leachability in relation to migration in ground water and hydraulically connected surface water.
- Description of water resource use, including availability, current and future use, value, and alternative supplies.

On January 5, 1983, the EPA promulgated final standards for the disposal and cleanup of the inactive uranium processing sites under the UMTRCA (48 FR 590 (1983)). The standards became effective on March 8, 1983. However, on September 3, 1985, the ground water provisions of the regulations (40 CFR §192.20(a) (2)-(3)) were remanded to the EPA by the U.S. Court of Appeals for the Tenth Circuit. A proposed revision to the standards was issued by the EPA on September 24, 1987 (52 FR 36000 (1987)). The standards were finalized in January 1995 (60 FR 2854).

2.0 HYDROGEOLOGIC SITE CHARACTERIZATION SUMMARY

To comply with the EPA ground water protection standards (52 FR 36000 (1987)), the DOE has characterized the hydrogeology, ground water quality, and water resources at the Naturita processing site. Major points are summarized below.

- Three distinct hydrostratigraphic units occur within the upper 300 feet (90 meters) of sediments beneath the site. In descending order these are 1) alluvial deposits of the San Miguel River; 2) shales and mudstones of the Brushy Basin Member of the Jurassic Morrison Formation; and 3) sandstones of the Salt Wash Member of the Jurassic Morrison Formation.
- Unconfined ground water occurs in the alluvium. The average hydraulic conductivity of the alluvial aquifer is 3.0 feet per day (feet/day) [1×10^{-3} centimeters per second] and the average linear ground water velocity is 0.06 feet/day (2×10^{-5} centimeters per second). Confined ground water occurs in the Salt Wash. The average hydraulic conductivity of the Salt Wash is 0.06 feet/day (2×10^{-5} centimeters per second) and the average linear ground water velocity is 0.002 feet/day (7×10^{-7} centimeters per second). The Brushy Basin is a thick, low-hydraulic-conductivity unit that functions as an aquitard. There is no observed hydraulic interconnection between the alluvium and the Salt Wash in the vicinity of the processing site.
- Shallow ground water is limited by the lateral extent of the alluvium in the vicinity of the processing site. The alluvium is recharged by infiltration from the San Miguel River southeast of the site and discharges into the river northwest of the site. The ground water flow direction is northwest through the San Miguel River Valley. The Salt Wash is recharged along the upturned flank of the Uncompahgre Uplift. The potential area of natural discharge is the San Miguel River northwest of the Naturita processing site before the river reaches Uravan, Colorado. Ground water in the Salt Wash flows northeast along the dip slope of the bedrock strata.
- Background ground water quality in the alluvium at the processing site is characterized by concentrations of molybdenum, selenium, uranium, and nitrate that exceed the EPA MCLs. The exceedance of the nitrate MCL may be the result of laboratory contamination or improper preservation of the sample in the field. Background ground water quality in the Salt Wash is characterized by concentrations of molybdenum, selenium, and uranium and activities of net gross alpha and radium-226 and -228 that exceed the EPA MCLs. This is a result of naturally occurring mineralization in the Salt Wash beneath the processing site. Leachate from contaminated materials has not migrated through the Brushy Basin because of the strong upward hydraulic gradient between the Salt Wash and the alluvium.
- Tailings have been removed from the processing site, and only residual radioactive materials/soils are present. Contamination resulting from tailings and processing activities is limited to the alluvium.
- Contaminant migration in the alluvial ground water at the processing site is controlled by the relatively oxidizing alkaline characteristics in the alluvium. The neutralization potential of the alluvium is supported by the near-neutral pH in the alluvial ground water. Geochemical processes that occur under neutral pH conditions, including

adsorption and precipitation, remove some radionuclides and metals from solution. However, uranium and vanadium do not precipitate completely from solution because they form relatively soluble anionic species in the oxidizing alkaline environment at the site. Also, elevated activities of combined radium-226 and -228 may have been enhanced by sodium chloride from the salt roasting of uranium ore at the site.

- Contaminated alluvial ground water discharges to the San Miguel River, where no impacts on surface water quality have been observed.
- Seven wells located within 2 miles (3.2 kilometers) of the site are used for domestic purposes. Four wells in the alluvium and one in the Salt Wash are hydraulically upgradient from the processing site. The two remaining wells are located north of the river, one in the San Miguel River Valley downgradient of the site and one southwest of Nucla, Colorado. There is no potential for contamination of these wells because the Salt Wash aquifer is not hydraulically interconnected with the alluvium, and the river represents a discharge point for the alluvial ground water.
- The shallow ground water has a very low potential for use since it is limited to the alluvium in and adjacent to the San Miguel River. Alternative supplies of good quality water are readily available from the town of Naturita, whose primary supply is surface water from the San Miguel River and whose secondary supply is ground water from a deep well in the Salt Wash aquifer. Future use of ground water in the alluvium for domestic consumption is not expected.

3.0 GROUND WATER INVESTIGATIONS

3.1 PREVIOUS INVESTIGATION

Several bibliographies were reviewed to identify geological, hydrological, and hydrogeological investigations of the Naturita site and vicinity. A number of regional studies were identified, but no specific, detailed hydrogeological characterization was found in the literature for the processing or disposal site vicinities. Five reconnaissance studies of the Paradox Basin were conducted as part of a program to evaluate the potential for storage of nuclear waste in salt deposits; one of these studies (Ackerman and Rush, 1984) included the area of the Naturita processing site. The literature review included the following:

- Bibliographies and indices of Colorado Geology (American Geological Institute, 1983a,b; 1976).
- Publications of the U.S. Geological Survey (USGS, 1972; 1971-1985; 1964).
- Publications through the U.S. Geological Survey (Ackerman and Rush, 1984; Iorns et al., 1965, 1964; Howard and Love, 1945; Waring and Knetchel, 1936; La Rue, 1916).
- Publications through the Colorado Geological Survey (Pearl, 1974; 1971).
- A study of the regional hydrology (Weir et al., 1983).

Preliminary site-specific investigations conducted at the Naturita processing site include an engineering assessment (FBDU, 1981), a radiological characterization of uranium mill tailings (Showalter, 1985), and an environmental assessment (DOE, 1983).

In 1985 and 1986, eight 2-inch (5-centimeter) diameter polyvinyl chloride (PVC) monitor wells were installed and nine exploratory boreholes were drilled and cored to characterize the Naturita processing site. The depths of the monitor wells ranged from 15 to 249 feet (4.6 to 75.9 meters), and the depths of the boreholes ranged from 12 to 120 feet (3.7 to 36.6 meters). During 1989, an additional six 3-inch (8-centimeter) diameter PVC monitor wells (i.e., standpipes) were installed to characterize the processing site; these wells range in depth from 5.5 to 9 feet (1.7 to 2.7 meters). The potentially affected water-bearing formations are the alluvial floodplain deposits of the San Miguel River, the Brushy Basin, and the Salt Wash Members of the Jurassic Morrison Formation. Lithologic logs and samples were obtained from all of the boreholes and monitor well locations. Table 3.1 summarizes monitor well information for the processing site. Surface water sampling locations at the processing site are shown in Figure 3.1; the locations of monitor wells, abandoned boreholes, source material test pits, and hydrogeologic cross sections at the processing site are shown in Figure 3.2.

Following the installation and development of the monitor wells, water samples were collected and analyzed and slug injection/withdrawal tests were performed to estimate the hydraulic characteristics of the aquifer materials near the screened

interval of the wells. The monitor wells were surveyed and static ground water elevations were measured to determine vertical and horizontal hydraulic gradients and ground water flow directions.

3.2 HYDROGEOLOGY

The Naturita processing site is located in the San Miguel River Valley of the Colorado Plateau physiographic province and is underlain by unconsolidated alluvial floodplain deposits and fill material. The alluvium was deposited by the San Miguel River before the course of the river was altered by the addition of fill material at the processing site. The alluvium is underlain by the Brushy Basin Member and the Salt Wash Member of the Jurassic Morrison Formation. The bedrock strata dip 2 to 4 degrees northeastward. A simplified stratigraphic column is shown in Figure 3.3, and two cross sections at the Naturita processing site are shown in Figures 3.4 and 3.5.

The alluvial aquifer consists of rounded river gravel and cobbles in a silty to clayey-sand matrix. The alluvium ranges in thickness from 11 to 24 feet (3.4 to 7.3 meters), with an average thickness of 20 feet (6.1 meters). The alluvial aquifer is south of a meander in the San Miguel River Valley and is of limited areal extent in the vicinity of the processing site.

The Brushy Basin is composed of varicolored shales with some fine- to very fine-grained sandstones and conglomerates. It ranges in thickness from 110 to 165 feet (33.5 to 50.3 meters).

The Salt Wash consists of fine- to coarse-grained sandstones with some shales. The top of this unit is approximately 130 to 165 feet (39.6 to 50.3 meters) below land surface near the site. The total thickness of this unit has not been determined, but it is at least 80 feet (24.4 meters) thick in the vicinity of the processing site.

Ground water occurs in the area of the Naturita processing site in two distinct and separate hydrogeologic units. Ground water occurs within the unconsolidated alluvial floodplain deposits under unconfined conditions and within the Salt Wash under confined conditions. These two hydrogeologic units are separated by an aquitard (Brushy Basin) consisting of thick, laterally extensive interbedded shales with some sandstones (Figures 3.4 and 3.5). The alluvium is considered the uppermost aquifer beneath the processing site.

The occurrence of shallow ground water in the alluvial aquifer is limited by the lateral extent of the alluvium in the vicinity of the site. Depths to the water table range between 3 and 18 feet (0.9 to 5.5 meters) below land surface. The observed saturated thickness is approximately 15 feet (4.6 meters) in the vicinity of the site. The alluvial aquifer is recharged principally by seepage from the San Miguel River southeast of the site and from infiltration of precipitation. Ground water discharges from the alluvial aquifer into the San Miguel River northwest of the site where the river valley narrows. Seasonal fluctuations in the San Miguel River have a direct influence on the water table of the alluvial aquifer. In general, the water table fluctuates less than 3 feet (0.9 meter) seasonally, but during high snowmelt, runoff, or drought conditions the fluctuations can be more extreme.

The Brushy Basin does not contain significant amounts of ground water. It functions as an aquitard, forming the confining unit for ground water within the underlying Salt Wash. There is no observed hydraulic interconnection between the alluvium and the Salt Wash in the vicinity of the processing site.

The Salt Wash is a major regional ground water system in the Naturita area. The recharge area for the Salt Wash aquifer consists of the upturned edge of the formation on the southwestern flank of the Uncompahgre Uplift (Gibbs and Hill, Inc., 1982). The potential area of natural discharge from the Salt Wash aquifer is in the San Miguel River channel. The point where the Salt Wash is exposed in the channel of the San Miguel River northwest of the processing site is approximately 1.5 miles (2.4 kilometers) downstream of the processing site. Below this point, the aquifer is exposed for approximately 7 miles (11.3 kilometers) (Cater, 1970). Ground water in the Salt Wash aquifer is confined, as indicated by a potentiometric surface that is higher in elevation than the water table in the alluvial aquifer (Table 3.2 and Figure 3.6).

3.3 HYDRAULIC CHARACTERISTICS

Ground water elevations in the alluvial aquifer were used to construct a water table map to determine the direction of ground water flow and hydraulic gradient in the alluvium underlying the processing site. The ground water flow direction is northwest through the narrow San Miguel River Valley and the hydraulic gradient is approximately 0.005 foot per foot (0.002 meter per meter) (Calculation NAT-08-89-14-06-00) (Figure 3.7). The hydraulic gradient in the Salt Wash aquifer is approximately 0.003 foot per foot (0.001 meter per meter) (Calculation NAT-08-89-14-06-00), with ground water flow toward the northeast along the dipslope of the bedrock strata. The vertical hydraulic gradient between the alluvial aquifer and the Salt Wash aquifer is 0.04 foot per foot (0.01 meter per meter) (Calculation NAT-08-89-14-06-00) in an upward direction. This upward vertical hydraulic gradient and the thickness and low hydraulic conductivity of the Brushy Basin prevent any downward migration of shallow alluvial ground water into the Salt Wash aquifer. Since no downward migration of ground water is expected into the Salt Wash aquifer, only two monitor wells were installed at the site. Consequently, a potentiometric surface map was not constructed and the ground water flow direction was not determined for the Salt Wash.

Falling-head slug withdrawal tests were conducted in monitor wells to measure the hydraulic conductivities of the alluvial aquifer and Salt Wash aquifer. Several methods were used to analyze the slug test data. Calculated hydraulic conductivities averaged 3.0 feet/day (1×10^{-3} centimeters per second) in the alluvial aquifer (Calculation NAT-06-89-14-02-00) and 0.06 feet/day (2×10^{-5} centimeter per second) in the Salt Wash aquifer (Calculation NAT-06-89-14-02-00) (Table 3.3). The slug test data indicate the range of variability in hydraulic conductivity in each aquifer.

Darcy's Law was used to calculate the average linear ground water velocity in the alluvial aquifer and the Salt Wash aquifer. Using the average hydraulic conductivity derived from the slug tests of 3.0 feet/day (1×10^{-3} centimeters per second), a hydraulic gradient of 0.005, and an estimated effective porosity of 0.20 (Driscoll,

1986; Freeze and Cherry, 1979), the average linear ground water velocity in the alluvial aquifer is 0.06 feet/day (2×10^{-5} centimeters per second) (Calculation NAT-08-89-14-07-00). For the Salt Wash aquifer, the average linear ground water velocity is 0.002 feet/day (7×10^{-7} centimeters per second), using the average hydraulic conductivity of 0.06 feet/day (2×10^{-5} centimeters per second), a hydraulic gradient of 0.003, and an estimated effective porosity of 0.10 (Driscoll, 1986; Freeze and Cherry, 1979) (Calculation NAT-08-89-14-07-00).

3.4 BACKGROUND GROUND WATER QUALITY

Background ground water quality is defined as the quality of ground water expected at the site if contamination had not occurred from the designated uranium processing facility. Background ground water quality has been determined by analyzing ground water collected from monitor wells 546, 547, and 549 in the alluvial aquifer and monitor wells 502 and 503 in the Salt Wash aquifer (Figure 3.2). The alluvial monitor wells are located upgradient in areas that have not been affected by uranium recovery operations. The depth to the Salt Wash ranges from 130 to 165 feet (39.6 to 50.3 meters). The Salt Wash is overlain by the Brushy Basin, which consists of shales and siltstones. It is unlikely that contaminants from residual radioactive materials have migrated through the Brushy Basin to the Salt Wash because of the strong upward hydraulic gradient. Therefore, ground water quality in these two monitor wells appears to be representative of background conditions. Background ground water quality for the Brushy Basin was not determined since the formation functions as an aquitard.

Background ground water quality was characterized in the alluvial aquifer and the Salt Wash aquifer by analyzing constituents listed in Table 1 to Subpart A and Appendix I to 40 CFR Part 192. Background ground water quality by parameter is presented for the alluvial aquifer and Salt Wash aquifer in Tables 3.4 and 3.5, respectively. A statistical treatment of background water quality in the alluvial aquifer and the Salt Wash aquifer that includes minimum, mean, median, maximum, percentage of nondetects, the 99 percent confidence interval, and other important statistical parameters is provided in Tables 3.6 and 3.7, respectively. Background ground water quality can be characterized by describing an average concentration and statistical maximum. The procedures for calculating average and statistical maximum concentrations are discussed in the *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities - Interim Final Guidance* (EPA, 1989) and are described in the TAD. Average concentrations of hazardous constituents are represented statistically by a mean or median, depending on the proportion of nondetects and whether the distribution is normal or nonparametric. The statistical maximum may be represented as the 99 percent confidence maximum for normal or lognormal distributions or as a nonparametric confidence interval if the distribution is neither normal or lognormal. In some cases, it is not appropriate to use statistics and the maximum observed concentration is chosen as a "statistical maximum." In other cases, the statistical maximum may be the detection limit. Summaries of the hazardous constituents that exceed the analytical detection limits and the average and statistical maximum values are presented in Table 3.8 for the alluvial aquifer and Table 3.9 for the Salt Wash aquifer.

Background ground water quality in the alluvial aquifer has pH values that range from 6.66 to 7.32, and the ground water is characterized as a mixed cation (sodium, potassium, magnesium, calcium/sulfate/bicarbonate) type (Figure 3.8). The average total dissolved solids (TDS) content is approximately 1100 milligrams per liter. Analyses of ground water samples indicate that background concentrations of only molybdenum, selenium, uranium, and nitrate exceed the EPA MCLs, and concentrations of all other hazardous constituents are below the EPA MCLs (Table 3.10). Nitrate exceeds the proposed EPA MCL, but this occurs only once at well 549 and the concentration is abnormally high compared with previous concentrations from the monitor wells. This exceedance of the nitrate MCL may be the result of laboratory contamination or improper preservation of the sample in the field. Additional samples have been collected and analyzed, and nitrate concentrations have consistently been less than the MCL at this well.

Background ground water quality in the Salt Wash aquifer is affected by the presence of naturally occurring uranium mineralization, which may be related to an alteration front underlying the processing site. Ground water is characterized as a sodium/sulfate/chloride type (Figure 3.8). The average TDS concentration is 5684 milligrams per liter, and the pH values range from 7.03 to 7.42. Ground water analyses indicate that background concentrations of arsenic, molybdenum, selenium, and uranium and activities of net gross alpha and radium-226 and -228 exceed the EPA MCLs (Table 3.11). All other hazardous constituents are below the EPA MCLs.

3.5 RESIDUAL RADIOACTIVE MATERIAL CHARACTERIZATION

Radioactive materials were processed at the Naturita site from 1942 to 1963. The milling process at the site consisted of extracting uranium and vanadium from the feed ore by a complex chemical leaching and precipitation process. This consisted of salt roasting and quenching the calcine in a carbonate solution, followed by carbonate leaching and sulfuric acid leaching in percolation tanks (Merritt, 1971). From 1961 until 1963, an upgrader plant was operated to separate sand from slime. The slime concentrate was sent to Durango, Colorado, for further treatment (Merritt, 1971). Process water for the uranium milling operations was taken from the San Miguel River. The water intake was located along the river northeast of the site, and water flowed through a channel to the main pump located just north of the mill site.

The tailings were located in one large pile, bounded by the old mill site to the southeast, Colorado State Highway 141 on the southwest, and the San Miguel River on the northeast. The former tailings pile covered approximately 27 acres (10.9 hectares) of the 53-acre (21.4-hectare) area that comprises the processing site. In 1976, Ranchers Exploration and Development Corporation (REDC) purchased the tailings area from Foote Mineral Company. From 1977 through 1979, the tailings were removed by REDC to a new heap leaching reprocessing plant located along Colorado State Highway 90, approximately 3 miles (5 kilometers) southwest of the intersection of State Highways 141 and 90 at Vancorum, Colorado (FBDU, 1981).

The present surface of the former tailings area is flat with native vegetation established over the area. The site is fenced with a variety of fence types, and maintenance and security are provided. The soil beneath the former tailings pile is composed of alluvial deposits of the San Miguel River.

Vicinity property materials are estimated to make up approximately 54 percent of the total material to be stabilized within the proposed disposal cell. These materials will most likely be a mixture of contaminated soils and native soils, with varying amounts of construction debris. The vicinity property materials to be contained in the proposed disposal cell are anticipated to contain lower concentrations of hazardous constituents than the on-site contaminated soils.

As part of a radiation protection survey, the extent of radium-226 migration into the alluvium beneath the site was investigated. Activities of radium-226 generally decrease from a maximum activity of 341 picocuries per gram in soil extracts to less than 1.0 picocurie per gram over a 7-foot (2-meter) interval below land surface. In some test pits, however, the activities increase with depth from approximately 1.0 picocuries per gram to a maximum of 199 picocuries per gram over a 5-foot (1.5-meter) interval. This may be the observed effect of radium coprecipitating with barite in the soil zone. Radium sulfate is only slightly soluble in ground water and soil pore fluids at the site.

3.6 EXTENT OF EXISTING CONTAMINATION

To determine whether uranium processing activities at the Naturita site have influenced ground water quality in the alluvial aquifer, samples were collected from on-site/downgradient monitor wells and analyzed for constituents listed in Table 1 to Subpart A and Appendix I to 40 CFR Part 192. Ground water has been sampled from six monitor wells (616, 619, 630, 632, 637, and 656) in the former tailings area, two monitor wells (505 and 506) in the mill yard, and one monitor well (548) downgradient from the processing site (Figure 3.2). Results of water quality analyses for on-site/downgradient monitor wells are presented by parameter in Table 3.12. The following evaluations were based on water quality data collected through July 1989. Results from additional water sampling have substantiated these evaluations.

The pH values for on-site/downgradient alluvial ground water range from 6.72 to 7.63, and the average TDS concentration is 1705 milligrams per liter. The ground water is characterized as a mixed cation (sodium, potassium, calcium, magnesium)/mixed anion (chloride, bicarbonate, sulfate) type (Figure 3.8). The alluvial ground water on the site and downgradient has a similar pH, but a higher TDS concentration and different water type than background ground water quality. The difference in TDS concentration and water type from background ground water quality probably indicates the effects of the processing activities at the site. Hazardous constituents found in ground water samples above the laboratory method detection limits include aluminum, antimony, arsenic, barium, cadmium, chromium, copper, cyanide, fluoride, lead, mercury, molybdenum, nickel, nitrate, selenium, silver, strontium, thallium, tin, uranium, vanadium, and zinc and activities of net gross alpha and radium-226 and -228 (Table 3.12). Concentrations of arsenic, cadmium, chromium, molybdenum, selenium, and uranium and activities of

net gross alpha and radium-226 and -228 exceed the proposed EPA MCLs (Table 3.13). Analyses show a maximum observed uranium concentration of 5.2 milligrams per liter and a maximum observed vanadium concentration of 9.3 milligrams per liter.

The EPA statistical procedures (EPA, 1989) were used to assess ground water contamination at the processing site. Maximum observed concentrations of hazardous constituents in on-site/downgradient monitor wells were compared with the statistical maximum for background ground water quality to determine whether there was a statistical difference. If the maximum observed concentrations in on-site/downgradient monitor wells exceeded the statistical maximum for background water quality, further EPA statistical procedures were used to verify the excursion.

Maximum observed concentrations of 18 hazardous constituents in on-site/downgradient monitor wells exceeded the statistical maximum for background water quality (Table 3.14). These constituents are aluminum, antimony, arsenic, cadmium, chromium, fluoride, lead, molybdenum, nickel, nitrate, silver, strontium, thallium, tin, uranium, and vanadium and activities of radium-226 and -228, and gross alpha. Of these hazardous constituents, the maximum observed concentrations or activities that exceed EPA MCLs include those for arsenic, cadmium, chromium, molybdenum, and uranium, and activities of net gross alpha, and radium-226 and -228 (Calculation NAT-04-90-14-11-00).

Analysis of variance (ANOVA) was performed on aluminum, arsenic, cadmium, fluoride, molybdenum, nickel, tin, uranium, and vanadium to determine whether on-site/downgradient samples are the same population as background samples (Calculation NAT-04-90-14-11-00). No ANOVA was conducted on antimony, chromium, lead, nitrate, silver, strontium, thallium, radium-226 and -228, and gross alpha because 1) concentrations were less than analytical detection limits (antimony), except for isolated samples; 2) maximum observed concentrations were less than MCLs (lead, nitrate, and silver); 3) insufficient data exist to conduct statistics (the sample size was less than four for strontium and thallium); and 4) maximum observed concentrations or activities were greater than or equal to MCLs (chromium, radium-226 and -228, and gross alpha).

Results by an ANOVA indicate that concentrations of arsenic, fluoride, molybdenum, tin, and uranium are not within the range of variability of background ground water quality and that these hazardous constituents are contaminants in on-site/downgradient alluvial ground water. The ANOVA suggested that the null hypothesis was not accepted and that the mean concentrations are different between populations. The null hypothesis was accepted for vanadium and cadmium, indicating their mean concentrations are the same as background ground water quality. However, since both vanadium and cadmium have elevated concentrations, they will be included in future ground water analysis. The mill was originally used to process vanadium.

Priority pollutant scans for compounds listed in Appendix I to 40 CFR Part 192 using EPA-suggested methods were performed on several ground water samples from monitor wells completed in the alluvium. Toluene and methylene chloride were present in concentrations above the analytical detection limits. Toluene

concentrations of 8.0 micrograms per liter were measured in ground water samples from monitor wells 547 and 548. Toluene may have been used during the milling process, although a solvent extraction cycle is not known to have been used at the site. A methylene chloride concentration of 9.0 micrograms per liter was measured in a ground water sample from monitor well 632. Methylene chloride is a spurious laboratory contaminant and can be detected during a volatile organic analysis (EPA, 1986). The presence of methylene chloride is probably not related to uranium processing. Analytical results are on file at the Jacobs Engineering Albuquerque UMTRA Project Office, Albuquerque, New Mexico.

In summary, concentrations of arsenic, cadmium, chromium, molybdenum, selenium, and uranium and activities of net gross alpha and radium-226 and -228 exceed the EPA MCLs. Also, water quality analysis of samples collected from on-site/downgradient monitor wells shows significant statistical variation from background ground water quality for concentrations of arsenic, fluoride, molybdenum, tin, and uranium. Vanadium and cadmium do not exhibit a significant statistical variation from background water quality but will be included in future analysis. An ANOVA was not conducted on antimony, chromium, lead, nitrate, silver, strontium, thallium, radium-226 and -228, and gross alpha on on-site/downgradient samples. In addition, toluene and methylene chloride were present in concentrations above analytical detection limits. Therefore, a complete list of hazardous constituents that may be potential contaminants in alluvial ground water at the processing site consists of arsenic, cadmium, chromium, fluoride, methylene chloride, molybdenum, selenium, strontium, thallium, tin, toluene, uranium, and vanadium and activities of net gross alpha and radium-226 and -228.

Contaminant distribution (isopleth) maps of uranium and radium-226 and -228 are shown in Figures 3.9 and 3.10, respectively. Isopleth maps for other constituents are not provided because data are insufficient, concentrations are generally less than the analytical detection limit, or contouring is not applicable. Based on uranium concentrations in the alluvial ground water, a contaminant plume extends at least 1500 feet (460 meters) downgradient from the mill yard and has a maximum width of approximately 900 feet (275 meters) (Figure 3.9). Contaminated alluvial ground water discharges to the San Miguel River, where no impacts on surface water quality have been observed (Table 3.15).

Ground water in the Salt Wash is not contaminated as a result of milling operations at the processing site. Ground water samples from two monitor wells (502 and 503) have shown that concentrations of uranium have approached the MCL of 0.044 milligrams per liter (Figure 3.2 and Table 3.5). Concentrations of selenium and molybdenum and activities of radium-226 and -228 and net gross alpha have also sporadically approached and exceeded the MCL (Table 3.11). These elevated concentrations and activities are most likely related to naturally occurring uranium mineralization within the Salt Wash. Background ground water quality statistics by parameter for the Salt Wash are shown in Table 3.7.

3.7 GEOCHEMICAL CONDITIONS

Adsorption/desorption processes within the alluvial aquifer influence the concentration and the extent of migration of contaminants at the site. Field

measurements of pH, Eh, temperature, specific conductance, and alkalinity were conducted on ground water samples from the alluvial aquifer (Table 3.16).

These field measurements and ground water quality data show that the ground water in the alluvial aquifer is relatively oxidizing and has near-neutral pH (pH = 7.0). Also, ground water in the Salt Wash aquifer is alkaline (pH > 7.0) and is relatively oxidizing, based on elevated concentrations of uranium above the EPA MCL (0.044 milligrams per liter).

Contaminant migration in the alluvial ground water at the site is influenced by the relatively oxidizing alkaline characteristics in this aquifer. Geochemical processes that occur under neutral pH conditions, including adsorption and precipitation, remove some radionuclides (radium and thorium) and metals (aluminum, iron, and manganese) from solution (Shepherd and Cherry, 1980). However, uranium and vanadium should not be removed completely from solution because they form relatively soluble anionic species in the oxidizing alkaline environment at the site. Also, the elevated activities of combined radium-226 and -228 may have been enhanced by the use of sodium chloride from the salt roasting of uranium ore at the site (Figure 3.10).

Contaminants found in alluvial ground water (specifically, uranium and vanadium) are probably directly related to the uranium milling operation at the site. No contaminant sources other than the milling processes that affect ground water quality within the alluvium have been identified at the site.

3.8 GROUND WATER USE, VALUE, AND ALTERNATIVE SUPPLIES

Seven wells located within 2 miles (3.2 kilometers) of the site are used for domestic purposes. Four wells in the alluvium and one in the Salt Wash are hydraulically upgradient of the processing site. The two remaining wells are located on the opposite side of the river (north), one in the San Miguel River Valley downgradient of the site and one southwest of the town of Nucla. There is no potential for contamination of these wells. The Salt Wash aquifer is not hydraulically interconnected with the alluvium, and the river represents a discharge point for the alluvial ground water. No impacts on surface water quality have been observed from contaminated alluvial ground water at the site. River water downstream from the site is used for irrigation and at isolated farm houses. The town of Naturita, hydraulically upgradient of the site, provides water to nonresidential water users from the San Miguel River via a water station located at the town hall. In summary, there are no known uses of ground water within the potentially affected hydrogeologic setting of the processing site.

Qualitatively, the shallow ground water has a very low monetary value since it is limited to the alluvium in and adjacent to the San Miguel River. Alternative supplies of good quality water are readily available from the town of Naturita, whose primary supply is surface water from the San Miguel River and secondary supply is ground water from a deep well in the Salt Wash aquifer. The town of Naturita charges water users outside the town limits \$17 for the first 5000 gallons (19,000 liters) and \$2 for each additional 1000 gallons (4000 liters) (Town of Naturita, 1989).

Future demand for ground water in the vicinity of the site is not expected to increase because of the low and stable population density and the lack of anticipated development, particularly in the area downgradient from the site. In the unlikely event of renewed interest in uranium mining in the area, anyone involved in the operation would probably reside in established communities, such as Naturita or Nucla, and any required water would probably be obtained from the San Miguel River and the Salt Wash aquifer.

FIGURE 3.1
SURFACE WATER SAMPLING LOCATIONS
AT THE NATURITA PROCESSING SITE, COLORADO

FIGURE 3.2
LOCATION OF MONITOR WELLS, TEST PITS, ABANDONED BOREHOLES, AND
HYDROGEOLOGIC CROSS SECTIONS AT THE NATURITA PROCESSING SITE, COLORADO

GEOLOGIC AGE	FORMATION	THICK- NESS (FT)	CHARACTERISTICS	
CRETACEOUS	MANCOS SHALE	2,000-5,000	GRAY SHALE; FORMS VALLEYS AND SLOPES; AQUICLUDE	
	DAKOTA SANDSTONE	0-200	GRAY AND BROWN SANDSTONE, SHALE AND CONGLOMERATE; CAPS MESAS AND FORMS CLIFFS; LOW-QUALITY, LOW-QUANTITY AQUIFER	
	BURRO CANYON FORMATION	50-250	BLUFF, CONGLOMERATIC SANDSTONE AND MAROON AND GREEN MUDSTONES; FORMS SLOPES, SANDSTONES FORM CLIFFS; LOW-QUALITY, LOW-QUANTITY AQUIFER	UNCONFORMITY
JURASSIC	MORRISON FORMATION	300-500	BRUSHY BASIN MEMBER; VARICOLORED SHALES, SOME SANDSTONE; FORMS SLOPES; SANDSTONES YIELD WATER	← NATURITA PROCESSING SITE
			SALT WASH MEMBER; LIGHT-COLORED SANDSTONE, RED MUDSTONE; OCCASIONAL LIMESTONE; FORMS BENCHES; SANDSTONES YIELD WATER	
	SUMMERVILLE FORMATION	0-400	VARICOLORED MUDSTONES; THIN SANDSTONE UNITS; FORMS SLOPES; AQUICLUDE	
	ENTRADA SANDSTONE	50-1,000	MOAB MEMBER; FINE-GRAINED WHITE SANDSTONES; FORMS STEPS; AQUIFER	
			SLICK ROCK MEMBER; LIGHT-COLORED MASSIVE SANDSTONE; FORMS CLIFFS; AQUIFER	
TRIASSIC(?)	KAYENTA FORMATION	0-200	LENTICULAR SANDSTONES AND RED-PURPLE MUDSTONES; FORMS BENCHES; SANDSTONES ARE POTENTIAL LOW-QUANTITY AQUIFERS	UNCONFORMITY
TRIASSIC	WINGATE SANDSTONE	200-400	LIGHT-COLORED MASSIVE SANDSTONES; FORMS CLIFFS; LOW-QUANTITY AQUIFER	
OLDER SEDIMENTARY ROCKS				

REF: FBDU, 1981

FIGURE 3.3
SIMPLIFIED STRATIGRAPHIC COLUMN
FOR THE NATURITA AREA, COLORADO

FIGURE 3.4
HYDROGEOLOGIC CROSS SECTION A-A' AT THE NATURITA PROCESSING SITE, COLORADO

NOTES: 1. SEE FIGURE 3.2 FOR CROSS SECTION LOCATION.
2. LAND SURFACE BASED ON TOPOGRAPHIC SURVEY.

FIGURE 3.5
HYDROGEOLOGIC CROSS SECTION B-B' AT THE NATURITA PROCESSING SITE, COLORADO

FIGURE 3.6
STATIC GROUND WATER LEVELS IN THE ALLUVIUM AND SALT WASH AT THE
NATURITA PROCESSING SITE, COLORADO

- (DATA FROM JULY 1989)

3-18

TABLE 3.1 MONITOR WELL INFORMATION, NATURITA SITE, COLORADO
 SITE: NAT01 NATURITA
 REPORT DATE: 06/08/93

LOCATION ID	NORTH COORDINATE (FT)	EAST COORDINATE (FT)	GROUND ELEVATION (FT MSL)	BOREHOLE DEPTH (FT)	BOREHOLE DIAMETER (INCHES)	CASING ELEVATION (FT MSL)	CASING DEPTH (FT)	CASING DIAMETER (INCHES)	SCREEN BEGINNING DEPTH (FT)	SCREEN LENGTH (FT)	FLOW CODE	FORMATION OF COMPLETION
0502	51036.2	49272.1	5348.86	249.00	6.000	5350.27	249.00	2.000	229.25	20.0	U	JS
0503	50723.1	49917.1	5301.08	165.00	6.000	5302.49	165.00	2.000	140.00	25.0	U	JS
0505	51535.5	49583.9	5297.92	24.00	6.000	5300.92	23.00	2.000	16.00	5.0	O	AL
0506	51372.2	49320.8	5304.66	27.00	6.000	5306.28	27.00	2.000	22.50	5.0	O	AL
0546	50554.4	50063.6	5302.10	23.00	6.000	5304.12	17.00	2.000	10.00	5.0	U	AL
0547	50424.0	50284.9	5303.10	23.00	6.000	5304.83	22.00	2.000	10.00	10.0	U	AL
0548	52995.3	48641.8	5288.70	23.00	2.000	5290.36	14.60	2.000	16.00	5.0	D	AL
0549	50329.6	50202.4	5302.40	15.00	5.580	5304.48	17.00	2.000	11.50	5.0	U	AL
0616	52049.0	48642.5	5288.50	7.60	99.900	5290.85	10.00	3.000	7.50	2.5	O	AL
0619	52313.9	48946.6	5288.90	8.00	99.900	5291.10	10.00	3.000	7.50	2.5	O	AL
0630	52133.8	49352.2	5289.80	7.50	99.900	5292.52	10.00	3.000	7.50	2.5	O	AL
0632	51723.2	49131.1	5289.00	8.00	99.900	5291.65	10.00	3.000	7.50	2.5	O	AL
0637	51777.7	49427.9	5288.50	5.50	99.900	5291.31	8.00	3.000	5.50	2.5	O	AL
0656	52458.2	48625.5	5287.90	9.00	99.900	5288.90	10.00	3.000	7.50	2.5	O	AL

FORMATION OF COMPLETION CODE:
 JS - JURASSIC SALT WASH FORMATION
 AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
 U - UPGRADIENT
 O - ON-SITE
 D - DOWN GRADIENT

DATA FILE: M:\DART\NAT01\MW110001.DAT

TABLE 3.2 STATIC GROUNDWATER LEVELS, NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
REPORT DATE: 06/08/93

LOCATION ID	NORTH COORDINATE (FT)	EAST COORDINATE (FT)	FORMATION OF COMPLETION	FLOW CODE	CASING ELEVATION (FT MSL)	GROUND ELEVATION (FT MSL)	LOG DATE	LOG TIME	DEPTH FROM TOP OF CASING (FT)	DEPTH FROM GROUND (FT)	GROUNDWATER ELEVATION (FT MSL)
0502	51036.2	49272.1	JS	U	5350.27	5348.86	01/29/86	09:45	50.00	48.59	5300.27
							03/31/86	08:50	50.07	48.66	5300.20
							06/06/86	15:15	49.84	48.43	5300.43
							06/10/86	09:15	50.00	48.59	5300.27
							07/16/89	15:15	50.37	48.96	5299.90
							04/22/90	12:20	51.90	50.49	5298.37
							12/07/90	07:30	51.76	50.35	5298.51
							04/19/91	14:00	51.25	49.84	5299.02
							08/04/91	16:30	51.44	50.03	5298.83
							01/14/92	11:45	51.42	50.01	5298.85
							06/26/92	10:35	51.42	50.01	5298.85
0503	50723.1	49917.1	JS	U	5302.49	5301.08	01/29/86	13:55	FLOWING	FLOWING	-
							03/31/86	09:20	FLOWING	FLOWING	-
							06/06/86	11:00	FLOWING	FLOWING	-
							06/09/86	13:10	FLOWING	FLOWING	-
							06/29/86	09:00	FLOWING	FLOWING	-
							07/12/89	10:30	FLOWING	FLOWING	-
							04/18/90	09:30	.90	-0.51	5301.59
							12/07/90	14:20	0.82	-0.59	5301.67
							04/18/91	11:15	FLOWING	FLOWING	-
							08/02/91	14:48	0.71	-0.70	5301.78
							06/25/92	16:00	0.60	-0.81	5301.89
0505	51535.5	49583.9	AL	O	5300.92	5297.92	01/29/86	16:15	12.61	9.61	5288.31
							03/31/86	09:05	12.03	9.03	5288.89
							06/06/86	15:00	11.22	8.22	5289.70
							06/10/86	09:00	11.07	8.07	5289.85
							06/14/86	10:00	11.07	8.07	5289.85
							04/07/87	12:30	11.91	8.91	5289.01
							07/13/89	10:45	13.53	10.53	5287.39
							04/19/90	15:00	12.86	9.86	5288.06
							12/06/90	08:25	13.15	10.15	5287.77
							04/18/91	13:30	11.85	8.85	5289.07
							08/01/91	08:40	13.26	10.26	5287.66
							01/13/92	15:55	12.88	9.88	5288.04
0506	51372.2	49320.8	AL	O	5306.28	5304.66	01/30/86	11:40	17.58	15.96	5288.70
							06/06/86	15:10	16.49	14.87	5289.79
							06/09/86	12:50	16.56	14.94	5289.72
							04/09/87	13:00	16.76	15.14	5289.52

FORMATION OF COMPLETION CODE:
JS - JURASSIC SALT WASH FORMATION
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
U - UPGRADIENT
O - ON-SITE

TABLE 3.2 STATIC GROUNDWATER LEVELS, NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
REPORT DATE: 06/08/93

LOCATION ID	NORTH COORDINATE (FT)	EAST COORDINATE (FT)	FORMATION OF COMPLETION	FLOW CODE	CASING ELEVATION (FT MSL)	GROUND ELEVATION (FT MSL)	LOG DATE	LOG TIME	DEPTH FROM TOP OF CASING (FT)	DEPTH FROM GROUND (FT)	GROUNDWATER ELEVATION (FT MSL)
0506	51372.2	49320.8	AL	O	5306.28	5304.66	07/13/89	14:39	18.42	16.80	5287.86
							04/19/90	13:00	18.59	16.97	5287.69
							12/06/90	14:10	18.52	16.90	5287.76
							04/18/91	13:37	17.60	15.98	5288.68
							08/01/91	10:16	18.27	16.65	5288.01
							01/13/92	14:00	18.58	16.96	5287.70
							06/24/92	10:10	17.52	15.90	5288.76
0546	50554.4	50063.6	AL	U	5304.12	5302.10	06/16/86	19:45	6.14	4.12	5297.98
							06/26/86	09:00	6.10	4.08	5298.02
							04/07/87	14:45	5.12	3.10	5299.00
							07/12/89	15:45	8.07	6.05	5296.05
							04/20/90	12:20	7.10	5.08	5297.02
							12/02/90	14:32	7.21	5.19	5296.91
							04/18/91	11:05	5.77	3.75	5298.35
							07/31/91	09:45	7.97	5.95	5296.15
							01/13/92	11:15	6.87	4.85	5297.25
							06/24/92	17:10	7.05	5.03	5297.07
0547	50424.0	50284.9	AL	U	5304.83	5303.10	06/16/86	18:30	6.57	4.84	5298.26
							06/25/86	14:20	6.50	4.77	5298.33
							04/09/87	08:30	5.43	3.70	5299.40
							07/17/89	10:15	8.63	6.90	5296.20
							04/22/90	10:20	8.20	6.47	5296.63
							12/03/90	09:13	7.64	5.91	5297.19
							04/18/91	09:45	6.08	4.35	5298.75
							07/31/91	11:40	8.36	6.63	5296.47
							01/13/92	09:25	7.22	5.49	5297.61
							06/25/92	09:49	7.25	5.52	5297.58
0548	52995.3	48641.8	AL	D	5290.36	5288.70	06/17/86	08:15	8.05	6.39	5282.31
							06/25/86	09:45	8.47	6.81	5281.89
							04/10/87	08:30	8.55	6.89	5281.81
							07/17/89	16:02	9.99	8.33	5280.37
							04/21/90	14:00	10.26	8.60	5280.10
							12/04/90	13:30	9.43	7.77	5280.93
							04/19/91	16:50	8.40	6.74	5281.96
							08/02/91	10:45	9.79	8.13	5280.57
							01/14/92	09:15	9.19	7.53	5281.17
0549	50329.6	50202.4	AL	U	5304.48	5302.40	04/09/87	10:45	4.77	2.69	5299.71

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
O - ON-SITE
U - UPGRADIENT
D - DOWN GRADIENT

TABLE 3.2 STATIC GROUNDWATER LEVELS, NATURITA SITE, COLORADO
 SITE: NATO1 NATURITA
 REPORT DATE: 06/08/93

LOCATION ID	NORTH COORDINATE (FT)	EAST COORDINATE (FT)	FORMATION OF COMPLETION	FLOW CODE	CASING ELEVATION (FT MSL)	GROUND ELEVATION (FT MSL)	LOG DATE	LOG TIME	DEPTH FROM TOP OF CASING (FT)	DEPTH FROM GROUND (FT)	GROUNDWATER ELEVATION (FT MSL)
0549	50329.6	50202.4	AL	U	5304.48	5302.40	07/13/89	09:45	8.05	5.97	5296.43
							04/20/90	11:00	6.89	4.81	5297.59
							12/03/90	11:20	7.13	5.05	5297.35
							04/18/91	10:00	5.52	3.44	5298.96
							07/31/91	15:12	7.84	5.76	5296.64
							01/12/92	10:30	6.74	4.66	5297.74
							06/25/92	11:40	6.72	4.64	5297.76
0616	52049.0	48642.5	AL	O	5290.85	5288.50	07/14/89	11:18	7.92	5.57	5282.93
							04/20/90	14:10	8.20	5.85	5282.65
							12/01/90	13:40	7.64	5.29	5283.21
							04/18/91	15:03	6.77	4.42	5284.08
							08/01/91	12:50	7.83	5.48	5283.02
							01/09/92	14:30	7.47	5.12	5283.38
							06/26/92	15:50	7.15	4.80	5283.70
0619	52313.9	48946.6	AL	O	5291.10	5288.90	07/16/89	10:45	7.70	5.50	5283.40
							04/21/90	12:40	8.49	6.29	5282.61
							12/01/90	14:28	8.00	5.80	5283.10
							04/19/91	10:30	6.76	4.56	5284.34
							08/03/91	09:50	7.97	5.77	5283.13
							01/11/92	14:40	7.92	5.72	5283.18
							06/27/92	14:20	7.20	5.00	5283.90
0630	52133.8	49352.2	AL	O	5292.52	5289.80	07/14/89	13:20	6.67	3.95	5285.85
							04/20/90	16:05	6.45	3.73	5286.07
							12/01/90	14:45	7.23	4.51	5285.29
							04/19/91	12:00	5.64	2.92	5286.88
							08/01/91	15:03	7.10	4.38	5285.42
							01/10/92	13:45	7.12	4.40	5285.40
							06/28/92	08:54	6.00	3.28	5286.52
0632	51723.2	49131.1	AL	O	5291.65	5289.00	07/16/89	08:50	6.94	4.29	5284.71
							04/20/90	14:35	6.70	4.05	5284.95
							12/02/90	10:22	6.54	3.89	5285.11
							04/18/91	16:11	5.40	2.75	5286.25
							08/01/91	13:52	6.47	3.82	5285.18
							01/10/92	09:55	6.20	3.55	5285.45
							06/27/92	08:39	5.74	3.09	5285.91
0637	51777.7	49427.9	AL	O	5291.31	5288.50	07/16/89	10:00	5.35	2.54	5285.96
							04/20/90	15:40	5.10	2.29	5286.21

FORMATION OF COMPLETION CODE:
 AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
 U - UPGRADIENT
 O - ON-SITE

TABLE 3.2 STATIC GROUNDWATER LEVELS, NATURITA SITE, COLORADO
 SITE: NAT01 NATURITA
 REPORT DATE: 06/08/93

LOCATION ID	NORTH COORDINATE (FT)	EAST COORDINATE (FT)	FORMATION OF COMPLETION	FLOW CODE	CASING ELEVATION (FT MSL)	GROUND ELEVATION (FT MSL)	LOG DATE	LOG TIME	DEPTH FROM TOP OF CASING (FT)	DEPTH FROM GROUND (FT)	GROUNDWATER ELEVATION (FT MSL)
0637	51777.7	49427.9	AL	0	5291.31	5288.50	12/01/90	14:00	4.84	2.03	5286.47
							04/19/91	13:50	3.95	1.14	5287.36
							08/03/91	11:41	5.08	2.27	5286.23
							01/11/92	12:25	4.55	1.74	5286.76
							06/27/92	10:30	4.13	1.32	5287.18
0656	52458.2	48625.5	AL	0	5288.90	5287.90	07/14/89	10:00	6.65	5.65	5282.25
							04/20/90	13:40	7.16	6.16	5281.74
							12/01/90	13:14	6.21	5.21	5282.69
							04/18/91	15:05	6.65	5.65	5282.25
							08/03/91	08:41	6.59	5.59	5282.31
							01/09/92	11:30	6.14	5.14	5282.76
							06/26/92	14:30	5.86	4.86	5283.04

FORMATION OF COMPLETION CODE:
 AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
 0 - ON-SITE

DATA FILE: M:\DART\NAT01\GWL10001.DAT

FIELDS DISPLAYED WITH A DASH INDICATE THE DATA IS UNAVAILABLE

Table 3.3 Hydraulic conductivities from slug tests at the Naturita site, Colorado

Hydrostratigraphic unit	Monitor well no.	Bouwer-Rice ^a (feet/day)	Hvorslev ^b (feet/day)	Skibitske ^c (feet/day)	Ferris-Knowles ^c (feet/day)	Cooper-Bredehoft ^d (feet/day)	Mean value ^a (feet/day)
Alluvial aquifer (unconfined)	505	2.39	3.00	NA ^g	NA	NA	2.52 (8.89 x 10 ⁻⁴ cm/s)
	506	2.19	2.61	NA	NA	NA	
	546	1.92	2.00	NA	NA	NA	
	547	ND ^f	ND	NA	NA	NA	
	548	3.02	3.02	NA	NA	NA	
Salt Wash aquifer (confined)	502	NA	NA	0.09	0.03	0.07	0.06 (2.12 x 10 ⁻⁵ cm/s)
	503	NA	NA	0.08	0.03	0.04	

^aBouwer, 1978.^aArithmetic mean.^bHvorslev, 1951.^fND - not determined.^cBentall, 1963.^gNA - not applicable.^dLohman, 1972.

cm/s - centimeters per second.

TABLE 3.4 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, ALLUVIUM,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

06/25/86 TO 06/25/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	0546	06/26/86	0001	AL	U	MG/L CaCO3		282.		-	-
	0546	04/10/87	0001	AL	U			407.		-	-
	0546	10/08/87	0001	AL	U			359.		-	-
	0546	07/12/89	0001	AL	U			254.		-	-
	0546	04/23/90	0001	AL	U			230.		-	-
	0546	12/05/90	0001	AL	U			238.		-	-
	0546	04/18/91	N001	AL	U			243.		-	-
	0546	07/31/91	0001	AL	U			311.		-	-
	0546	01/13/92	0001	AL	U			240.		-	-
	0546	06/24/92	0001	AL	U			248.		-	-
	0547	06/25/86	0001	AL	U			248.		-	-
	0547	04/10/87	0001	AL	U			285.		-	-
	0547	10/08/87	0001	AL	U			260.		-	-
	0547	07/17/89	0001	AL	U			211.		-	-
	0547	04/23/90	0001	AL	U			213.		-	-
	0547	12/05/90	0001	AL	U			228.		-	-
	0547	04/18/91	0001	AL	U			233.		-	-
	0547	07/31/91	0001	AL	U			242.		-	-
	0547	01/13/92	0001	AL	U			229.		-	-
	0547	06/25/92	0001	AL	U			230.		-	-
	0549	04/10/87	0001	AL	U			374.		-	-
	0549	10/08/87	0001	AL	U			296.		-	-
	0549	07/13/89	0001	AL	U			240.		-	-
	0549	04/23/90	0001	AL	U			219.		-	-
	0549	12/05/90	0001	AL	U			219.		-	-
	0549	04/18/91	0001	AL	U			236.		-	-
	0549	07/31/91	0001	AL	U			268.		-	-
	0549	01/12/92	0001	AL	U			238.		-	-
	0549	06/25/92	0001	AL	U			257.		-	-
ALUMINUM	0546	06/26/86	0001	AL	U	MG/L		0.2		0.1	-
	0546	04/10/87	0001	AL	U			0.14		0.1	-
	0546	10/08/87	0001	AL	U			0.23		0.1	-
	0546	07/12/89	0001	AL	U		<	0.1		0.1	-
	0546	04/23/90	0001	AL	U		<	0.1		0.1	-
	0546	12/05/90	0001	AL	U		<	0.1		0.1	-
	0546	04/18/91	N001	AL	U		<	0.05		0.05	-
	0546	07/31/91	0001	AL	U		<	0.05		0.05	-
	0546	01/13/92	0001	AL	U		<	0.05		0.05	-
	0546	06/24/92	0001	AL	U			0.134		0.05	-
	0547	06/25/86	0001	AL	U			0.4		0.1	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

TABLE 3.4 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, ALLUVIUM,
NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
06/25/86 TO 06/25/92
REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALUMINUM	0547	04/10/87	0001	AL	U	MG/L		0.03	J	0.1	-
	0547	10/08/87	0001	AL	U			0.19		0.1	-
	0547	07/17/89	0001	AL	U		<	0.1		0.1	-
	0547	04/23/90	0001	AL	U		<	0.1		0.1	-
	0547	12/05/90	0001	AL	U		<	0.1		0.1	-
	0547	04/18/91	0001	AL	U		<	0.05		0.05	-
	0547	07/31/91	0001	AL	U		<	0.05		0.05	-
	0547	01/13/92	0001	AL	U		<	0.05		0.05	-
	0547	06/25/92	0001	AL	U			0.083		0.05	-
	0549	04/10/87	0001	AL	U			0.10		0.1	-
	0549	10/08/87	0001	AL	U			0.21		0.1	-
	0549	07/13/89	0001	AL	U		<	0.1		0.1	-
	0549	04/23/90	0001	AL	U		<	0.1		0.1	-
	0549	12/05/90	0001	AL	U		<	0.1		0.1	-
	0549	04/18/91	0001	AL	U		<	0.05		0.05	-
	0549	07/31/91	0001	AL	U		<	0.05		0.05	-
	0549	01/12/92	0001	AL	U		<	0.05		0.05	-
	0549	06/25/92	0001	AL	U			0.132		0.05	-
AMMONIUM	0546	06/26/86	0001	AL	U	MG/L		0.1		0.1	-
	0546	04/10/87	0001	AL	U		<	0.1		0.1	-
	0546	10/08/87	0001	AL	U		<	0.1		0.1	-
	0546	07/12/89	0001	AL	U			0.1		0.1	-
	0546	04/23/90	0001	AL	U		<	0.1		0.1	-
	0546	12/05/90	0001	AL	U		<	0.1		0.1	-
	0546	04/18/91	0001	AL	U			0.10		0.01	-
	0546	07/31/91	0001	AL	U		<	0.1		0.1	-
	0546	01/13/92	0001	AL	U		<	1.0	I	1.0	-
	0546	06/24/92	0001	AL	U		<	0.1		0.1	-
	0547	04/10/87	0001	AL	U		<	0.1		0.1	-
	0547	10/08/87	0001	AL	U		<	0.1		0.1	-
	0547	07/17/89	0001	AL	U			0.1		0.1	-
	0547	04/23/90	0001	AL	U		<	0.1		0.1	-
	0547	12/05/90	0001	AL	U		<	0.1		0.1	-
	0547	04/18/91	0001	AL	U			0.09		0.01	-
	0547	07/31/91	0001	AL	U		<	0.1		0.1	-
	0547	01/13/92	0001	AL	U		<	1.0	I	1.0	-
	0547	06/25/92	0001	AL	U		<	0.1		0.1	-
	0549	04/10/87	0001	AL	U		<	0.1		0.1	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

0001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

J - ESTIMATED VALUE

TABLE 3.4 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, ALLUVIUM,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA
06/25/86 TO 06/25/92
REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
AMMONIUM	0549	10/08/87	0001	AL	U	MG/L	<	0.1		0.1	-
	0549	07/13/89	0001	AL	U			0.1		0.1	-
	0549	04/23/90	0001	AL	U		<	0.1		0.1	-
	0549	12/05/90	0001	AL	U		<	0.1		0.1	-
	0549	04/18/91	0001	AL	U			0.14		0.01	-
	0549	07/31/91	0001	AL	U		<	0.1		0.1	-
	0549	01/12/92	0001	AL	U		<	1.0	I	1.0	-
	0549	06/25/92	0001	AL	U		<	0.1		0.1	-
ANTIMONY	0546	06/26/86	0001	AL	U	MG/L	<	0.003		0.003	-
	0546	04/10/87	0001	AL	U			0.018		0.003	-
	0546	07/12/89	0001	AL	U		<	0.003		0.003	-
	0546	04/23/90	0001	AL	U		<	0.003		0.003	-
	0546	12/05/90	0001	AL	U		<	0.003		0.003	-
	0546	04/18/91	0001	AL	U		<	0.003		0.003	-
	0546	07/31/91	0001	AL	U		<	0.003		0.003	-
	0546	01/13/92	0001	AL	U		<	0.003		0.003	-
	0546	06/24/92	0001	AL	U		<	0.003		0.003	-
	0547	04/10/87	0001	AL	U		<	0.003		0.003	-
	0547	07/17/89	0001	AL	U		<	0.003		0.003	-
	0547	04/23/90	0001	AL	U		<	0.003		0.003	-
	0547	12/05/90	0001	AL	U		<	0.003		0.003	-
	0547	04/18/91	0001	AL	U		<	0.02	I	0.02	-
	0547	07/31/91	0001	AL	U		<	0.003		0.003	-
	0547	01/13/92	0001	AL	U		<	0.003		0.003	-
	0547	06/25/92	0001	AL	U		<	0.003		0.003	-
	0549	04/10/87	0001	AL	U			0.005		0.003	-
	0549	07/13/89	0001	AL	U		<	0.003		0.003	-
	0549	04/23/90	0001	AL	U		<	0.003		0.003	-
	0549	12/05/90	0001	AL	U		<	0.003		0.003	-
	0549	04/18/91	0001	AL	U		<	0.003		0.003	-
	0549	07/31/91	0001	AL	U		<	0.003		0.003	-
	0549	01/12/92	0001	AL	U		<	0.003		0.003	-
	0549	06/25/92	0001	AL	U		<	0.003		0.003	-
ARSENIC	0546	06/26/86	0001	AL	U	MG/L	<	0.01		0.01	-
	0546	04/10/87	0001	AL	U		<	0.001		0.01	-
	0546	10/08/87	0001	AL	U			0.010		0.01	-
	0546	07/12/89	0001	AL	U		<	0.01		0.01	-
	0546	04/23/90	0001	AL	U		<	0.01		0.01	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)
0001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

TABLE 3.4 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, ALLUVIUM,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA
06/25/86 TO 06/25/92
REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ARSENIC	0546	12/05/90	0001	AL	U	MG/L	<	0.01		0.01	-
	0546	04/18/91	N001	AL	U		<	0.01		0.01	-
	0546	07/31/91	0001	AL	U		<	0.01		0.01	-
	0546	01/13/92	0001	AL	U		<	0.001		0.001	-
	0546	06/24/92	0001	AL	U		<	0.005		0.005	-
	0547	06/25/86	0001	AL	U		<	0.01		0.01	-
	0547	04/10/87	0001	AL	U		<	0.001		0.01	-
	0547	10/08/87	0001	AL	U			0.005	J	0.01	-
	0547	07/17/89	0001	AL	U		<	0.01		0.01	-
	0547	04/23/90	0001	AL	U		<	0.01		0.01	-
	0547	12/05/90	0001	AL	U		<	0.01		0.01	-
	0547	04/18/91	0001	AL	U		<	0.01		0.01	-
	0547	07/31/91	0001	AL	U		<	0.01		0.01	-
	0547	01/13/92	0001	AL	U		<	0.001		0.001	-
	0547	06/25/92	0001	AL	U		<	0.005		0.005	-
	0549	04/10/87	0001	AL	U		<	0.001		0.01	-
	0549	10/08/87	0001	AL	U			0.005	J	0.01	-
	0549	07/13/89	0001	AL	U		<	0.01		0.01	-
	0549	04/23/90	0001	AL	U		<	0.01		0.01	-
	0549	12/05/90	0001	AL	U		<	0.01		0.01	-
	0549	04/18/91	0001	AL	U		<	0.01		0.01	-
	0549	07/31/91	0001	AL	U		<	0.01		0.01	-
	0549	01/12/92	0001	AL	U		<	0.001		0.001	-
	0549	06/25/92	0001	AL	U		<	0.005		0.005	-
BARIUM	0546	06/26/86	0001	AL	U	MG/L		0.4		0.1	-
	0546	10/08/87	0001	AL	U			0.04	J	0.1	-
	0546	07/12/89	0001	AL	U		<	0.1		0.1	-
	0546	04/23/90	0001	AL	U		<	0.1		0.1	-
	0546	12/05/90	0001	AL	U		<	0.1		0.1	-
	0546	04/18/91	N001	AL	U			0.03		0.01	-
	0546	07/31/91	0001	AL	U			0.03		0.01	-
	0546	01/13/92	0001	AL	U			0.02		0.01	-
	0546	06/24/92	0001	AL	U		<	0.1		0.1	-
	0547	10/08/87	0001	AL	U			0.03	J	0.1	-
	0547	07/17/89	0001	AL	U		<	0.1		0.1	-
	0547	04/23/90	0001	AL	U		<	0.1		0.1	-
	0547	12/05/90	0001	AL	U		<	0.1		0.1	-
	0547	04/18/91	0001	AL	U			0.03		0.01	-
	0547	07/31/91	0001	AL	U			0.03		0.01	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
J - ESTIMATED VALUE

FLOW RELATIONSHIP CODE:
U - UPGRADIENT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)
N001 - UNFILTERED SAMPLE

TABLE 3.4 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, ALLUVIUM,
NATURITA SITE, COLORADO

SITE: NATO1 NATURITA

06/25/86 TO 06/25/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
BARIUM	0547	01/13/92	0001	AL	U	MG/L		0.02		0.01	-
	0547	06/25/92	0001	AL	U		<	0.1		0.1	-
	0549	10/08/87	0001	AL	U			0.03	J	0.1	-
	0549	07/13/89	0001	AL	U		<	0.1		0.1	-
	0549	04/23/90	0001	AL	U		<	0.1		0.1	-
	0549	12/05/90	0001	AL	U		<	0.1		0.1	-
	0549	04/18/91	0001	AL	U			0.03		0.01	-
	0549	07/31/91	0001	AL	U			0.04		0.01	-
	0549	01/12/92	0001	AL	U			0.02		0.01	-
	0549	06/25/92	0001	AL	U		<	0.1		0.1	-
BERYLLIUM	0546	07/12/89	0001	AL	U	MG/L	<	0.005		0.005	-
	0546	04/23/90	0001	AL	U		<	0.01		0.01	-
	0546	12/05/90	0001	AL	U		<	0.01		0.01	-
	0546	04/18/91	0001	AL	U		<	0.005		0.005	-
	0546	07/31/91	0001	AL	U		<	0.005		0.005	-
	0547	07/17/89	0001	AL	U		<	0.005		0.005	-
	0547	04/23/90	0001	AL	U		<	0.01		0.01	-
	0547	12/05/90	0001	AL	U		<	0.01		0.01	-
	0547	04/18/91	0001	AL	U		<	0.005		0.005	-
	0547	07/31/91	0001	AL	U		<	0.005		0.005	-
	0549	07/13/89	0001	AL	U		<	0.005		0.005	-
	0549	04/23/90	0001	AL	U		<	0.01		0.01	-
	0549	12/05/90	0001	AL	U		<	0.01		0.01	-
	0549	04/18/91	0001	AL	U		<	0.005		0.005	-
	0549	07/31/91	0001	AL	U		<	0.005		0.005	-
BORON	0546	06/26/86	0001	AL	U	MG/L	<	0.1		0.1	-
	0546	10/08/87	0001	AL	U			0.11		0.1	-
	0546	07/12/89	0001	AL	U		<	0.1		0.1	-
	0546	04/23/90	0001	AL	U		<	0.1		0.1	-
	0547	10/08/87	0001	AL	U			0.08	J	0.1	-
	0547	07/17/89	0001	AL	U		<	0.1		0.1	-
	0547	04/23/90	0001	AL	U		<	0.1		0.1	-
	0549	10/08/87	0001	AL	U			0.10		0.1	-
	0549	07/13/89	0001	AL	U		<	0.1		0.1	-
BROMIDE	0546	07/12/89	0001	AL	U	MG/L	<	2.		2.	-
	0546	04/23/90	0001	AL	U		<	0.1		0.1	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:

J - ESTIMATED VALUE

FLOW RELATIONSHIP CODE:

U - UPGRADIENT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

TABLE 3.4 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, ALLUVIUM,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

06/25/86 TO 06/25/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
BROMIDE	0547	07/17/89	0001	AL	U	MG/L	<	2.		2.	-
	0547	04/23/90	0001	AL	U		<	0.1		0.1	-
	0549	07/13/89	0001	AL	U		<	2.		2.	-
	0549	04/23/90	0001	AL	U		<	0.1		0.1	-
CADMIUM	0546	06/26/86	0001	AL	U	MG/L	<	0.001		0.001	-
	0546	04/10/87	0001	AL	U		<	0.001		0.001	-
	0546	10/08/87	0001	AL	U		<	0.005		0.005	-
	0546	07/12/89	0001	AL	U		<	0.001		0.001	-
	0546	04/23/90	0001	AL	U		<	0.001		0.001	-
	0546	12/05/90	0001	AL	U		<	0.001		0.001	-
	0546	04/18/91	N001	AL	U		<	0.001		0.001	-
	0546	07/31/91	0001	AL	U		<	0.001		0.001	-
	0546	01/13/92	0001	AL	U		<	0.001		0.001	-
	0546	06/24/92	0001	AL	U		<	0.001		0.001	-
	0547	04/10/87	0001	AL	U		<	0.001		0.001	-
	0547	10/08/87	0001	AL	U		<	0.005		0.005	-
	0547	07/17/89	0001	AL	U		<	0.001		0.001	-
	0547	04/23/90	0001	AL	U		<	0.001		0.001	-
	0547	12/05/90	0001	AL	U		<	0.001		0.001	-
	0547	04/18/91	0001	AL	U		<	0.001		0.001	-
	0547	07/31/91	0001	AL	U		<	0.001		0.001	-
	0547	01/13/92	0001	AL	U		<	0.001		0.001	-
	0547	06/25/92	0001	AL	U		<	0.001		0.001	-
	0549	04/10/87	0001	AL	U		<	0.001		0.001	-
	0549	10/08/87	0001	AL	U		<	0.005		0.005	-
	0549	07/13/89	0001	AL	U		<	0.001		0.001	-
	0549	04/23/90	0001	AL	U		<	0.001		0.001	-
	0549	12/05/90	0001	AL	U		<	0.001		0.001	-
	0549	04/18/91	0001	AL	U		<	0.001		0.001	-
	0549	07/31/91	0001	AL	U		<	0.001		0.001	-
	0549	01/12/92	0001	AL	U		<	0.001		0.001	-
	0549	06/25/92	0001	AL	U		<	0.001		0.001	-
CALCIUM	0546	06/26/86	0001	AL	U	MG/L		142.		0.01	-
	0546	04/10/87	0001	AL	U			333.		0.01	-
	0546	10/08/87	0001	AL	U			290.		0.01	-
	0546	07/12/89	0001	AL	U			195.		0.01	-
	0546	04/23/90	0001	AL	U			156.		0.01	-
	0546	12/05/90	0001	AL	U			143.		0.01	-
	0546	04/18/91	N001	AL	U			210.		0.5	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

TABLE 3.4 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, ALLUVIUM,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

06/25/86 TO 06/25/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PARAMETER PVI VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
CALCIUM	0546	07/31/91	0001	AL	U	MG/L	252.		0.5	-
	0546	01/13/92	0001	AL	U		145		0.05	-
	0546	06/24/92	0001	AL	U		229		0.5	-
	0547	06/25/86	0001	AL	U		114.		0.01	-
	0547	04/10/87	0001	AL	U		200.		0.01	-
	0547	10/08/87	0001	AL	U		163.		0.01	-
	0547	07/17/89	0001	AL	U		98.		0.01	-
	0547	04/23/90	0001	AL	U		145.		0.01	-
	0547	12/05/90	0001	AL	U		121.		0.01	-
	0547	04/18/91	0001	AL	U		176.		0.5	-
	0547	07/31/91	0001	AL	U		157.		0.5	-
	0547	01/13/92	0001	AL	U		122		0.05	-
	0547	06/25/92	0001	AL	U		146		0.5	-
	0549	04/10/87	0001	AL	U		315.		0.01	-
	0549	10/08/87	0001	AL	U		215.		0.01	-
	0549	07/13/89	0001	AL	U		166.		0.01	-
	0549	04/23/90	0001	AL	U		155.		0.01	-
	0549	12/05/90	0001	AL	U		140.		0.01	-
	0549	04/18/91	0001	AL	U		213.		0.5	-
	0549	07/31/91	0001	AL	U		251.		0.5	-
	0549	01/12/92	0001	AL	U		139		0.05	-
	0549	06/25/92	0001	AL	U		233		0.5	-
CHLORIDE	0546	06/26/86	0001	AL	U	MG/L	17.		1.	-
	0546	04/10/87	0001	AL	U		42.6		1.	-
	0546	10/08/87	0001	AL	U		40.5		1.	-
	0546	07/12/89	0001	AL	U		16.1		1.	-
	0546	04/23/90	0001	AL	U		10.		1.	-
	0546	12/05/90	0001	AL	U		8.		1.	-
	0546	04/18/91	N001	AL	U		13.6		0.5	-
	0546	07/31/91	0001	AL	U		17.7		0.5	-
	0546	01/13/92	0001	AL	U		8		1.0	-
	0546	06/24/92	0001	AL	U		14.6		0.5	-
	0547	06/25/86	0001	AL	U		13.		1.	-
	0547	04/10/87	0001	AL	U		18.6		1.	-
	0547	10/08/87	0001	AL	U		18.9		1.	-
	0547	07/17/89	0001	AL	U		8.1		1.	-
	0547	04/23/90	0001	AL	U		7.		1.	-
	0547	12/05/90	0001	AL	U		4.		1.	-
	0547	04/18/91	0001	AL	U		8.2		0.5	-
	0547	07/31/91	0001	AL	U		8.6		0.5	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

TABLE 3.4 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, ALLUVIUM,
NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
06/25/86 TO 06/25/92
REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
CHLORIDE	0547	01/13/92	0001	AL	U	MG/L		9		1.0	-
	0547	06/25/92	0001	AL	U			10.3		0.5	-
	0549	04/10/87	0001	AL	U			37.4		1.	-
	0549	10/08/87	0001	AL	U			22.3		1.	-
	0549	07/13/89	0001	AL	U			12.1		1.	-
	0549	04/23/90	0001	AL	U			8.		1.	-
	0549	12/05/90	0001	AL	U			6.		1.	-
	0549	04/18/91	0001	AL	U			2.2		0.5	-
	0549	07/31/91	0001	AL	U			15.8		0.5	-
	0549	01/12/92	0001	AL	U			7		1.0	-
	0549	06/25/92	0001	AL	U			15.7		0.5	-
CHROMIUM	0546	06/26/86	0001	AL	U	MG/L		0.05		0.01	-
	0546	04/10/87	0001	AL	U		<	0.01		0.01	-
	0546	10/08/87	0001	AL	U		<	0.01		0.01	-
	0546	07/12/89	0001	AL	U		<	0.01		0.01	-
	0546	04/23/90	0001	AL	U		<	0.01		0.01	-
	0546	12/05/90	0001	AL	U		<	0.01		0.01	-
	0546	04/18/91	0001	AL	U		<	0.01		0.01	-
	0546	07/31/91	0001	AL	U		<	0.01		0.01	-
	0546	01/13/92	0001	AL	U		<	0.01		0.01	-
	0547	04/10/87	0001	AL	U		<	0.01		0.01	-
	0547	10/08/87	0001	AL	U		<	0.01		0.01	-
	0547	07/17/89	0001	AL	U		<	0.01		0.01	-
	0547	04/23/90	0001	AL	U		<	0.01	1	0.01	-
	0547	12/05/90	0001	AL	U		<	0.01		0.01	-
	0547	04/18/91	0001	AL	U		<	0.01		0.01	-
	0547	07/31/91	0001	AL	U		<	0.01		0.01	-
	0547	01/13/92	0001	AL	U		<	0.01		0.01	-
	0549	04/10/87	0001	AL	U		<	0.02		0.01	-
	0549	10/08/87	0001	AL	U		<	0.01		0.01	-
	0549	07/13/89	0001	AL	U		<	0.01		0.01	-
	0549	04/23/90	0001	AL	U		<	0.01		0.01	-
	0549	12/05/90	0001	AL	U		<	0.01		0.01	-
	0549	04/18/91	0001	AL	U		<	0.01		0.01	-
	0549	07/31/91	0001	AL	U		<	0.01		0.01	-
	0549	01/12/92	0001	AL	U		<	0.01		0.01	-
COBALT	0546	07/12/89	0001	AL	U	MG/L	<	0.05		0.05	-
	0546	04/23/90	0001	AL	U		<	0.05		0.05	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)
0001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
1 - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

TABLE 3.4 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, ALLUVIUM,
NATURITA SITE, COLORADO

SITE: NATO1 NATURITA

06/25/86 TO 06/25/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PARAMETER PVI VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
COBALT	0547	07/17/89	0001	AL	U	MG/L	< 0.05		0.05	-
	0547	04/23/90	0001	AL	U		< 0.05		0.05	-
	0549	07/13/89	0001	AL	U		< 0.05		0.05	-
	0549	04/23/90	0001	AL	U		< 0.05		0.05	-
COPPER	0546	06/26/86	0001	AL	U	MG/L	0.04		0.02	-
	0546	04/10/87	0001	AL	U		< 0.01		0.02	-
	0546	10/08/87	0001	AL	U		0.01	J	0.02	-
	0546	07/12/89	0001	AL	U		< 0.02		0.02	-
	0546	04/23/90	0001	AL	U		< 0.02		0.02	-
	0546	12/05/90	0001	AL	U		< 0.02		0.02	-
	0546	04/18/91	0001	AL	U		< 0.01		0.01	-
	0546	07/31/91	0001	AL	U		< 0.01		0.01	-
	0547	04/10/87	0001	AL	U		0.03		0.02	-
	0547	10/08/87	0001	AL	U		0.01	J	0.02	-
	0547	07/17/89	0001	AL	U		< 0.02		0.02	-
	0547	04/23/90	0001	AL	U		< 0.02		0.02	-
	0547	12/05/90	0001	AL	U		< 0.02		0.02	-
	0547	04/18/91	0001	AL	U		< 0.01		0.01	-
	0547	07/31/91	0001	AL	U		< 0.01		0.01	-
	0549	04/10/87	0001	AL	U		0.03		0.02	-
	0549	10/08/87	0001	AL	U		0.01	J	0.02	-
	0549	07/13/89	0001	AL	U		< 0.02		0.02	-
	0549	04/23/90	0001	AL	U		< 0.02		0.02	-
	0549	12/05/90	0001	AL	U		< 0.02		0.02	-
	0549	04/18/91	0001	AL	U		< 0.01		0.01	-
	0549	07/31/91	0001	AL	U		< 0.01		0.01	-
CYANIDE	0546	07/12/89	0001	AL	U	MG/L	< 0.02		0.02	-
	0546	04/23/90	0001	AL	U		< 0.01		0.01	-
	0546	12/05/90	0001	AL	U		< 0.01		0.01	-
	0546	04/18/91	0001	AL	U		< 0.01		0.01	-
	0546	07/31/91	0001	AL	U		< 0.01		0.01	-
	0546	01/13/92	0001	AL	U		< 0.01		0.01	-
	0546	06/24/92	0001	AL	U		< 0.01		0.01	-
	0547	07/17/89	0001	AL	U		< 0.02		0.02	-
	0547	04/23/90	0001	AL	U		< 0.01		0.01	-
	0547	12/05/90	0001	AL	U		< 0.01		0.01	-
	0547	04/18/91	0001	AL	U		< 0.01		0.01	-
	0547	07/31/91	0001	AL	U		< 0.01		0.01	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
J - ESTIMATED VALUE

FLOW RELATIONSHIP CODE:
U - UPGRADIENT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)
0001 - UNFILTERED SAMPLE

TABLE 3.4 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, ALLUVIUM,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

06/25/86 TO 06/25/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
CYANIDE	0547	01/13/92	0001	AL	U	MG/L	<	0.01		0.01	-
	0547	06/25/92	0001	AL	U		<	0.01		0.01	-
	0549	07/13/89	0001	AL	U		<	0.02		0.02	-
	0549	04/23/90	0001	AL	U		<	0.01		0.01	-
	0549	12/05/90	0001	AL	U		<	0.01		0.01	-
	0549	04/18/91	0001	AL	U		<	0.01		0.01	-
	0549	07/31/91	0001	AL	U		<	0.01		0.01	-
	0549	01/12/92	0001	AL	U		<	0.01		0.01	-
	0549	06/25/92	0001	AL	U		<	0.01		0.01	-
DISSOLVED ORGANIC CARBON	0546	04/23/90	0001	AL	U	MG/L		44.		1.	-
	0546	12/05/90	0001	AL	U			50.		1.	-
	0546	07/31/91	0001	AL	U			2.		2.	-
	0546	01/13/92	0001	AL	U			4.5		1.0	-
	0546	06/24/92	0001	AL	U			7.6	*N	1	-
	0547	04/23/90	0001	AL	U			86.		1.	-
	0547	12/05/90	0001	AL	U			56.		1.	-
	0547	07/31/91	0001	AL	U			2.		2.	-
	0547	01/13/92	0001	AL	U			3.2		1.0	-
	0547	06/25/92	0001	AL	U			8.2	*N	1	-
	0549	04/23/90	0001	AL	U			23.		1.	-
	0549	12/05/90	0001	AL	U			57.		1.	-
	0549	07/31/91	0001	AL	U			3.		2.	-
	0549	01/12/92	0001	AL	U			2.8		1.0	-
	0549	06/25/92	0001	AL	U			15.8	*N	1	-
FLUORIDE	0546	06/26/86	0001	AL	U	MG/L		0.4		0.1	-
	0546	04/10/87	0001	AL	U			0.23		0.1	-
	0546	10/08/87	0001	AL	U			0.30		0.1	-
	0546	07/12/89	0001	AL	U			0.3		0.1	-
	0546	04/23/90	0001	AL	U			0.3		0.1	-
	0546	12/05/90	0001	AL	U			0.3		0.1	-
	0546	04/18/91	0001	AL	U			0.2		0.1	-
	0546	07/31/91	0001	AL	U			0.3		0.1	-
	0546	01/13/92	0001	AL	U			0.4		0.1	-
	0546	06/24/92	0001	AL	U			0.511		0.1	-
	0547	04/10/87	0001	AL	U			0.27		0.1	-
	0547	10/08/87	0001	AL	U			0.33		0.1	-
	0547	07/17/89	0001	AL	U			0.4		0.1	-
	0547	04/23/90	0001	AL	U			0.3		0.1	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

0001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

* - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS

N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

TABLE 3.4 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, ALLUVIUM,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

06/25/86 TO 06/25/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
FLUORIDE	0547	12/05/90	0001	AL	U	MG/L		0.3		0.1	-
	0547	04/18/91	0001	AL	U			0.3		0.1	-
	0547	07/31/91	0001	AL	U			0.3		0.1	-
	0547	01/13/92	0001	AL	U			0.4		0.1	-
	0547	06/25/92	0001	AL	U			0.555		0.1	-
	0549	04/10/87	0001	AL	U			0.27		0.1	-
	0549	10/08/87	0001	AL	U			0.33		0.1	-
	0549	07/13/89	0001	AL	U			0.3		0.1	-
	0549	04/23/90	0001	AL	U			0.3		0.1	-
	0549	12/05/90	0001	AL	U			0.4		0.1	-
	0549	04/18/91	0001	AL	U			0.3		0.1	-
	0549	07/31/91	0001	AL	U			0.3		0.1	-
	0549	01/12/92	0001	AL	U			0.4		0.1	-
	0549	06/25/92	0001	AL	U			0.572		0.1	-
GROSS ALPHA	0546	07/12/89	0001	AL	U	PCI/L		4.4		0.2	6.6
	0546	04/23/90	0001	AL	U			14.		1.	7.
	0546	12/05/90	0001	AL	U			13.		1.	8.
	0546	04/18/91	0001	AL	U			12.8		1.	11.1
	0546	07/31/91	0001	AL	U			18.2		1.	10.5
	0546	01/13/92	0001	AL	U			6.7		1.	4.0
	0546	06/24/92	0001	AL	U			4.9		1.0	4.9
	0547	07/17/89	0001	AL	U			6.2		0.2	5.1
	0547	04/23/90	0001	AL	U			15.		1.	7.
	0547	12/05/90	0001	AL	U			2.9		1.	5.6
	0547	04/18/91	0001	AL	U			7.9		1.	8.4
	0547	07/31/91	0001	AL	U			7.4		1.	6.0
	0547	01/18/92	0001	AL	U			13		1.	4
	0547	06/25/92	0001	AL	U			2.1	HJN	7.7	4.9
	0549	07/13/89	0001	AL	U			0.0		0.2	60.
	0549	04/23/90	0001	AL	U			15.		1.	7.
	0549	12/05/90	0001	AL	U			5.5		1.	5.6
	0549	04/18/91	0001	AL	U			15.1		1.	10.0
	0549	07/31/91	0001	AL	U			19.6		1.	10.6
	0549	01/12/92	0001	AL	U			9.2		1.	4.8
	0549	06/25/92	0001	AL	U			3.8		1.0	9.5
GROSS BETA	0546	07/12/89	0001	AL	U	PCI/L		6.8		1.	3.8
	0546	04/23/90	0001	AL	U			7.7		0.5	3.2
	0546	12/05/90	0001	AL	U			11.		0.5	4.

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:

H - HOLD TIME EXPIRED, VALUE SUSPECT

J - ESTIMATED VALUE

N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

FLOW RELATIONSHIP CODE:

U - UPGRADIENT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

TABLE 3.4 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, ALLUVIUM,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

06/25/86 TO 06/25/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PARAMETER PVI VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
GROSS BETA	0546	04/18/91	N001	AL	U	PCI/L	9.7		0.5	6.6
	0546	07/31/91	0001	AL	U		45.1		0.5	7.6
	0546	01/13/92	0001	AL	U		3.4		0.5	2.2
	0546	06/24/92	0001	AL	U		10.5		0.5	7.9
	0547	07/17/89	0001	AL	U		3.7		1.	2.6
	0547	04/23/90	0001	AL	U		5.6		0.5	2.4
	0547	12/05/90	0001	AL	U		6.6		0.5	2.7
	0547	04/18/91	0001	AL	U		16.3		0.5	5.7
	0547	07/31/91	0001	AL	U		5.0		0.5	3.6
	0547	01/18/92	0001	AL	U		7.9		0.5	2.5
	0547	06/25/92	0001	AL	U		35.2		0.5	7.7
	0549	07/13/89	0001	AL	U		14.		1.	41.
	0549	04/23/90	0001	AL	U		8.2		0.5	3.1
	0549	12/05/90	0001	AL	U		6.4		0.5	2.9
	0549	04/18/91	0001	AL	U		10.6		0.5	6.1
	0549	07/31/91	0001	AL	U		48.2		0.5	7.8
	0549	01/12/92	0001	AL	U		10		0.5	3
	0549	06/25/92	0001	AL	U		14.4		0.5	10.2
IRON	0546	06/26/86	0001	AL	U	MG/L	0.08		0.03	-
	0546	04/10/87	0001	AL	U		0.08		0.03	-
	0546	10/08/87	0001	AL	U		< 0.01		0.03	-
	0546	07/12/89	0001	AL	U		< 0.03		0.03	-
	0546	04/23/90	0001	AL	U		0.05		0.03	-
	0547	06/25/86	0001	AL	U		0.04		0.03	-
	0547	04/10/87	0001	AL	U		0.07		0.03	-
	0547	10/08/87	0001	AL	U		< 0.01		0.03	-
	0547	07/17/89	0001	AL	U		< 0.03		0.03	-
	0547	04/23/90	0001	AL	U		0.08		0.03	-
	0549	04/10/87	0001	AL	U		0.07		0.03	-
	0549	10/08/87	0001	AL	U		< 0.01		0.03	-
	0549	07/13/89	0001	AL	U		< 0.03		0.03	-
	0549	04/23/90	0001	AL	U		0.06		0.03	-
LEAD	0546	06/26/86	0001	AL	U	MG/L	< 0.01		0.01	-
	0546	04/10/87	0001	AL	U		< 0.001		0.01	-
	0546	10/08/87	0001	AL	U		< 0.01		0.01	-
	0546	07/12/89	0001	AL	U		< 0.01		0.01	-
	0546	04/23/90	0001	AL	U		< 0.01		0.01	-
	0546	12/05/90	0001	AL	U		< 0.01 J		0.01	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

J - ESTIMATED VALUE

TABLE 3.4 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, ALLUVIUM,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

06/25/86 TO 06/25/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
LEAD	0546	04/18/91	N001	AL	U	MG/L	<	0.005		0.005	-
	0546	07/31/91	0001	AL	U		<	0.005		0.005	-
	0547	04/10/87	0001	AL	U		<	0.001		0.01	-
	0547	10/08/87	0001	AL	U		<	0.01		0.01	-
	0547	07/17/89	0001	AL	U		<	0.01		0.01	-
	0547	04/23/90	0001	AL	U		<	0.01		0.01	-
	0547	12/05/90	0001	AL	U		<	0.01	J	0.01	-
	0547	04/18/91	0001	AL	U		<	0.005		0.005	-
	0547	07/31/91	0001	AL	U		<	0.005		0.005	-
	0549	04/10/87	0001	AL	U		<	0.001		0.01	-
	0549	10/08/87	0001	AL	U		<	0.01		0.01	-
	0549	07/13/89	0001	AL	U		<	0.01		0.01	-
	0549	04/23/90	0001	AL	U		<	0.01		0.01	-
	0549	12/05/90	0001	AL	U		<	0.01	J	0.01	-
	0549	04/18/91	0001	AL	U		<	0.005		0.005	-
	0549	07/31/91	0001	AL	U		<	0.005		0.005	-
LEAD-210	0546	06/26/86	0001	AL	U	PCI/L		0.9		1.5	0.8
	0546	07/12/89	0001	AL	U			0.0		1.5	1.2
	0546	04/23/90	0001	AL	U			0.6		1.5	0.9
	0547	04/10/87	0001	AL	U			3.4		1.5	1.2
	0547	10/08/87	0001	AL	U			0.4		1.5	1.4
	0547	07/17/89	0001	AL	U			0.1		1.5	1.0
	0547	04/23/90	0001	AL	U			0.6		1.5	0.8
	0549	10/08/87	0001	AL	U			2.3		1.5	1.4
	0549	07/13/89	0001	AL	U			0.0		1.5	1.2
	0549	04/23/90	0001	AL	U			0.4		1.5	0.8
MAGNESIUM	0546	06/26/86	0001	AL	U	MG/L		32.9		0.001	-
	0546	04/10/87	0001	AL	U			70.0		0.001	-
	0546	10/08/87	0001	AL	U			53.0		0.001	-
	0546	07/12/89	0001	AL	U			40.		0.001	-
	0546	04/23/90	0001	AL	U			35.3		0.001	-
	0546	12/05/90	0001	AL	U			28.9		0.001	-
	0546	04/18/91	N001	AL	U			41.4		0.1	-
	0546	07/31/91	0001	AL	U			48.1		0.1	-
	0546	01/13/92	0001	AL	U			31		0.05	-
	0546	06/24/92	0001	AL	U			47.9		0.1	-
	0547	06/25/86	0001	AL	U			24.4		0.001	-
	0547	04/10/87	0001	AL	U			43.7		0.001	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:

J - ESTIMATED VALUE

TABLE 3.4 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, ALLUVIUM,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA
06/25/86 TO 06/25/92
REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PARAMETER PVI VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MAGNESIUM	0547	10/08/87	0001	AL	U	MG/L	27.9		0.001	-
	0547	07/17/89	0001	AL	U		24.9		0.001	-
	0547	04/23/90	0001	AL	U		31.7		0.001	-
	0547	12/05/90	0001	AL	U		24.0		0.001	-
	0547	04/18/91	0001	AL	U		33.9		0.1	-
	0547	07/31/91	0001	AL	U		29.9		0.1	-
	0547	01/13/92	0001	AL	U		26		0.05	-
	0547	06/25/92	0001	AL	U		28.7		0.1	-
	0549	04/10/87	0001	AL	U		67.8		0.001	-
	0549	10/08/87	0001	AL	U		36.8		0.001	-
	0549	07/13/89	0001	AL	U		33.		0.001	-
	0549	04/23/90	0001	AL	U		33.9		0.001	-
	0549	12/05/90	0001	AL	U		26.9		0.001	-
	0549	04/18/91	0001	AL	U		40.7		0.1	-
	0549	07/31/91	0001	AL	U		45.7		0.1	-
	0549	01/12/92	0001	AL	U		29		0.05	-
	0549	06/25/92	0001	AL	U		48.5		0.1	-
MANGANESE	0546	06/26/86	0001	AL	U	MG/L	0.92		0.01	-
	0546	04/10/87	0001	AL	U		0.68		0.01	-
	0546	10/08/87	0001	AL	U		0.54		0.01	-
	0546	07/12/89	0001	AL	U		0.23		0.01	-
	0546	04/23/90	0001	AL	U		0.07		0.01	-
	0546	12/05/90	0001	AL	U		0.04		0.01	-
	0546	04/18/91	0001	AL	U		0.06		0.01	-
	0546	07/31/91	0001	AL	U		0.15		0.01	-
	0546	01/13/92	0001	AL	U		0.02		0.01	-
	0546	06/24/92	0001	AL	U		0.097		0.01	-
	0547	06/25/86	0001	AL	U		0.07		0.01	-
	0547	04/10/87	0001	AL	U		0.09		0.01	-
	0547	10/08/87	0001	AL	U		0.04		0.01	-
	0547	07/17/89	0001	AL	U		0.02		0.01	-
	0547	04/23/90	0001	AL	U		0.05		0.01	-
	0547	12/05/90	0001	AL	U		< 0.01		0.01	-
	0547	04/18/91	0001	AL	U		0.01		0.01	-
	0547	07/31/91	0001	AL	U		0.01		0.01	-
	0547	01/13/92	0001	AL	U		< 0.01		0.01	-
	0547	06/25/92	0001	AL	U		< 0.01		0.01	-
	0549	04/10/87	0001	AL	U		0.03		0.01	-
	0549	10/08/87	0001	AL	U		0.03		0.01	-
	0549	07/13/89	0001	AL	U		0.01		0.01	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)
0001 - UNFILTERED SAMPLE

TABLE 3.4 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, ALLUVIUM,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

06/25/86 TO 06/25/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MANGANESE	0549	04/23/90	0001	AL	U	MG/L	<	0.01		0.01	-
	0549	12/05/90	0001	AL	U		<	0.01		0.01	-
	0549	04/18/91	0001	AL	U		<	0.01		0.01	-
	0549	07/31/91	0001	AL	U		<	0.01		0.01	-
	0549	01/12/92	0001	AL	U			0.01		0.01	-
	0549	06/25/92	0001	AL	U		<	0.01		0.01	-
MERCURY	0546	06/26/86	0001	AL	U	MG/L	<	0.0002		0.0002	-
	0546	04/10/87	0001	AL	U		<	0.0002		0.0002	-
	0546	10/08/87	0001	AL	U		<	0.0002		0.0002	-
	0546	07/12/89	0001	AL	U		<	0.0002		0.0002	-
	0546	04/23/90	0001	AL	U		<	0.0002		0.0002	-
	0546	12/05/90	0001	AL	U		<	0.0002		0.0002	-
	0546	04/18/91	N001	AL	U		<	0.0002		0.0002	-
	0546	07/31/91	0001	AL	U		<	0.0002		0.0002	-
	0547	04/10/87	0001	AL	U		<	0.0002		0.0002	-
	0547	10/08/87	0001	AL	U		<	0.0002		0.0002	-
	0547	07/17/89	0001	AL	U		<	0.0002		0.0002	-
	0547	04/23/90	0001	AL	U		<	0.0002		0.0002	-
	0547	12/05/90	0001	AL	U		<	0.0002		0.0002	-
	0547	04/18/91	0001	AL	U		<	0.0002		0.0002	-
	0547	07/31/91	0001	AL	U		<	0.0002		0.0002	-
	0549	04/10/87	0001	AL	U		<	0.0002		0.0002	-
	0549	10/08/87	0001	AL	U		<	0.0002		0.0002	-
	0549	07/13/89	0001	AL	U		<	0.0002		0.0002	-
	0549	04/23/90	0001	AL	U		<	0.0002		0.0002	-
	0549	12/05/90	0001	AL	U		<	0.0002		0.0002	-
	0549	04/18/91	0001	AL	U		<	0.0002		0.0002	-
	0549	07/31/91	0001	AL	U		<	0.0002		0.0002	-
MOLYBDENUM	0546	06/26/86	0001	AL	U	MG/L		0.23		0.01	-
	0546	04/10/87	0001	AL	U			0.05		0.01	-
	0546	10/08/87	0001	AL	U		<	0.01		0.01	-
	0546	07/12/89	0001	AL	U		<	0.01		0.01	-
	0546	04/23/90	0001	AL	U			0.01		0.01	-
	0546	12/05/90	0001	AL	U			0.04		0.01	-
	0546	04/18/91	N001	AL	U		<	0.01		0.01	-
	0546	07/31/91	0001	AL	U		<	0.01		0.01	-
	0546	01/13/92	0001	AL	U		<	0.01		0.01	-
	0546	06/24/92	0001	AL	U			0.014		0.01	-
	0547	06/25/86	0001	AL	U			0.24		0.01	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

TABLE 3.4 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, ALLUVIUM,
NATURITA SITE, COLORADO

SITE: NATO1 NATURITA
06/25/86 TO 06/25/92
REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MOLYBDENUM	0547	04/10/87	0001	AL	U	MG/L		0.04		0.01	-
	0547	10/08/87	0001	AL	U		<	0.01		0.01	-
	0547	07/17/89	0001	AL	U		<	0.01		0.01	-
	0547	04/23/90	0001	AL	U		<	0.01		0.01	-
	0547	12/05/90	0001	AL	U			0.03		0.01	-
	0547	04/18/91	0001	AL	U		<	0.01		0.01	-
	0547	07/31/91	0001	AL	U		<	0.01		0.01	-
	0547	01/13/92	0001	AL	U		<	0.01		0.01	-
	0547	06/25/92	0001	AL	U		<	0.01		0.01	-
	0549	04/10/87	0001	AL	U			0.05		0.01	-
	0549	10/08/87	0001	AL	U			0.02		0.01	-
	0549	07/13/89	0001	AL	U		<	0.01		0.01	-
	0549	04/23/90	0001	AL	U		<	0.01		0.01	-
	0549	12/05/90	0001	AL	U			0.03		0.01	-
	0549	04/18/91	0001	AL	U		<	0.01		0.01	-
	0549	07/31/91	0001	AL	U		<	0.01		0.01	-
	0549	01/12/92	0001	AL	U		<	0.01		0.01	-
	0549	06/25/92	0001	AL	U			0.012		0.01	-
NET GROSS ALPHA *	0546	07/12/89	0001	AL	U	PCI/L		-7.95		-	-
	0546	04/23/90	0001	AL	U			4.40		-	-
	0546	12/05/90	0001	AL	U			3.40		-	-
	0546	04/18/91	N001	AL	U			-1.61		-	-
	0546	07/31/91	0001	AL	U			12.03		-	-
	0546	01/13/92	0001	AL	U			-3.86		-	-
	0546	06/24/92	0001	AL	U			-6.08		-	-
	0547	07/17/89	0001	AL	U			-0.66		-	-
	0547	04/23/90	0001	AL	U			6.77		-	-
	0547	12/05/90	0001	AL	U			-2.73		-	-
	0547	04/18/91	0001	AL	U			-1.70		-	-
	0547	07/31/91	0001	AL	U			-7.69		-	-
	0547	01/18/92	0001	AL	U			8.06		-	-
	0547	06/25/92	0001	AL	U			0.73		-	-
	0549	07/13/89	0001	AL	U			-10.29		-	-
	0549	04/23/90	0001	AL	U			5.40		-	-
	0549	12/05/90	0001	AL	U			-3.08		-	-
	0549	04/18/91	0001	AL	U			-2.05		-	-
	0549	07/31/91	0001	AL	U			17.54		-	-
	0549	01/12/92	0001	AL	U			2.20		-	-

* NET GROSS ALPHA (GROSS ALPHA - URANIUM) WITH 1 MG URANIUM = 686 PCI

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)
N001 - UNFILTERED SAMPLE

TABLE 3.4 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, ALLUVIUM,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

06/25/86 TO 06/25/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PARAMETER PVI VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
NET GROSS ALPHA *	0549	06/25/92	0001	AL	U	PCI/L	-5.12		-	-
NICKEL	0546	06/26/86	0001	AL	U	MG/L	< 0.04		0.04	-
	0546	04/10/87	0001	AL	U		0.05		0.04	-
	0546	10/08/87	0001	AL	U		< 0.01		0.04	-
	0546	07/12/89	0001	AL	U		< 0.04		0.04	-
	0546	04/23/90	0001	AL	U		< 0.04		0.04	-
	0546	12/05/90	0001	AL	U		< 0.04		0.04	-
	0546	04/18/91	0001	AL	U		< 0.04		0.04	-
	0546	07/31/91	0001	AL	U		< 0.04		0.04	-
	0547	04/10/87	0001	AL	U		0.05		0.04	-
	0547	10/08/87	0001	AL	U		< 0.01		0.04	-
	0547	07/17/89	0001	AL	U		< 0.04		0.04	-
	0547	04/23/90	0001	AL	U		< 0.04		0.04	-
	0547	12/05/90	0001	AL	U		< 0.04		0.04	-
	0547	04/18/91	0001	AL	U		< 0.04		0.04	-
	0547	07/31/91	0001	AL	U		< 0.04		0.04	-
	0549	04/10/87	0001	AL	U		0.05		0.04	-
	0549	10/08/87	0001	AL	U		< 0.01		0.04	-
	0549	07/13/89	0001	AL	U		< 0.04		0.04	-
	0549	04/23/90	0001	AL	U		< 0.04		0.04	-
	0549	12/05/90	0001	AL	U		< 0.04		0.04	-
	0549	04/18/91	0001	AL	U		< 0.04		0.04	-
	0549	07/31/91	0001	AL	U		< 0.04		0.04	-
NITRATE	0546	06/26/86	0001	AL	U	MG/L	< 1.		1.	-
	0546	04/10/87	0001	AL	U		4.6		1.	-
	0546	10/08/87	0001	AL	U		2.2		1.	-
	0546	07/12/89	0001	AL	U		< 1.0		1.	-
	0546	04/23/90	0001	AL	U		< 0.1		1.	-
	0546	12/05/90	0001	AL	U		< 1.		1.	-
	0546	04/18/91	0001	AL	U		3.		1.	-
	0546	07/31/91	0001	AL	U		15.9		1.	-
	0546	01/13/92	0001	AL	U		12.3		0.1	-
	0546	06/24/92	0001	AL	U		3.89		1	-
	0547	06/25/86	0001	AL	U		< 0.1		1.	-
	0547	04/10/87	0001	AL	U		5.1		1.	-
	0547	10/08/87	0001	AL	U		0.9 J		1.	-

• NET GROSS ALPHA (GROSS ALPHA - URANIUM) WITH 1 MG URANIUM = 686 PCI

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:

J - ESTIMATED VALUE

FLOW RELATIONSHIP CODE:

U - UPGRADIENT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

0001 - UNFILTERED SAMPLE

TABLE 3.4 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, ALLUVIUM,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

06/25/86 TO 06/25/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
NITRATE	0547	07/17/89	0001	AL	U	MG/L	<	1.0		1.	-
	0547	04/23/90	0001	AL	U		<	0.1		1.	-
	0547	12/05/90	0001	AL	U		<	1.		1.	-
	0547	04/18/91	0001	AL	U			2.		1.	-
	0547	07/31/91	0001	AL	U			7.1		1.	-
	0547	01/13/92	0001	AL	U			12.5		0.1	-
	0547	06/25/92	0001	AL	U			3.54		1	-
	0549	04/10/87	0001	AL	U			12.0		1.	-
	0549	10/08/87	0001	AL	U			2.7		1.	-
	0549	07/13/89	0001	AL	U			7100.		1.	-
	0549	04/23/90	0001	AL	U		<	0.1		1.	-
	0549	12/05/90	0001	AL	U		<	1.		1.	-
	0549	04/18/91	0001	AL	U			3.		1.	-
	0549	07/31/91	0001	AL	U			8.4		1.	-
	0549	01/12/92	0001	AL	U			12.3		0.1	-
	0549	06/25/92	0001	AL	U			1.31		1	-
NITRITE AND NITRATE	0546	12/05/90	0001	AL	U	MG/L	<	1.		1.	-
	0546	04/18/91	N001	AL	U			0.61		0.05	-
	0546	07/31/91	0001	AL	U			3.57		0.05	-
	0546	01/13/92	0001	AL	U			2.8		0.1	-
	0547	12/05/90	0001	AL	U		<	1.		1.	-
	0547	04/18/91	0001	AL	U			0.39		0.05	-
	0547	07/31/91	0001	AL	U			1.57		0.05	-
	0547	01/13/92	0001	AL	U			2.8		0.1	-
	0549	12/05/90	0001	AL	U		<	1.		1.	-
	0549	04/18/91	0001	AL	U			0.58		0.05	-
	0549	07/31/91	0001	AL	U			0.26		0.05	-
	0549	01/12/92	0001	AL	U			2.8		0.1	-
PH	0546	06/26/86	0001	AL	U	SU		7.		-	-
	0546	04/10/87	0001	AL	U			6.91		-	-
	0546	10/08/87	0001	AL	U			6.66		-	-
	0546	07/12/89	0001	AL	U			7.10		-	-
	0546	04/23/90	0001	AL	U			7.16		-	-
	0546	12/05/90	0001	AL	U			6.83		-	-
	0546	04/18/91	N001	AL	U			6.94		-	-
	0546	07/31/91	0001	AL	U			6.93		-	-
	0546	01/13/92	0001	AL	U			7.01		-	-
	0546	06/24/92	0001	AL	U			6.77		-	-
	0547	06/25/86	0001	AL	U			6.85		-	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

TABLE 3.4 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, ALLUVIUM,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

06/25/86 TO 06/25/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PARAMETER PVI VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
PH	0547	04/10/87	0001	AL	U	SU	6.95		-	-
	0547	10/08/87	0001	AL	U		6.97		-	-
	0547	07/17/89	0001	AL	U		7.32		-	-
	0547	04/23/90	0001	AL	U		7.01		-	-
	0547	12/05/90	0001	AL	U		7.00		-	-
	0547	04/18/91	0001	AL	U		7.02		-	-
	0547	07/31/91	0001	AL	U		6.90		-	-
	0547	01/13/92	0001	AL	U		6.99		-	-
	0547	06/25/92	0001	AL	U		6.92		-	-
	0549	04/10/87	0001	AL	U		6.94		-	-
	0549	10/08/87	0001	AL	U		6.81		-	-
	0549	07/13/89	0001	AL	U		7.11		-	-
	0549	04/23/90	0001	AL	U		7.28		-	-
	0549	12/05/90	0001	AL	U		6.89		-	-
	0549	04/18/91	0001	AL	U		7.00		-	-
	0549	07/31/91	0001	AL	U		6.93		-	-
	0549	01/12/92	0001	AL	U		6.87		-	-
	0549	06/25/92	0001	AL	U		6.84		-	-
PHOSPHATE	0546	06/26/86	0001	AL	U	MG/L	< 0.1		0.1	-
	0546	04/10/87	0001	AL	U		< 0.1		0.1	-
	0546	10/08/87	0001	AL	U		< 0.1		0.1	-
	0546	07/12/89	0001	AL	U		< 0.1		0.1	-
	0546	04/23/90	0001	AL	U		< 0.1		0.1	-
	0546	12/05/90	0001	AL	U		< 0.1		0.1	-
	0546	04/18/91	N001	AL	U		0.1		0.05	-
	0546	07/31/91	0001	AL	U		0.2		0.1	-
	0546	01/13/92	0001	AL	U		< 0.1		0.1	-
	0546	06/24/92	0001	AL	U		< 0.1		0.1	-
	0547	04/10/87	0001	AL	U		< 0.1		0.1	-
	0547	10/08/87	0001	AL	U		< 0.1		0.1	-
	0547	07/17/89	0001	AL	U		0.2		0.1	-
	0547	04/23/90	0001	AL	U		< 0.1		0.1	-
	0547	12/05/90	0001	AL	U		< 0.1		0.1	-
	0547	04/18/91	0001	AL	U		0.1		0.05	-
	0547	07/31/91	0001	AL	U		0.1		0.1	-
	0547	01/13/92	0001	AL	U		< 0.1		0.1	-
	0547	06/25/92	0001	AL	U		< 0.1		0.1	-
	0549	04/10/87	0001	AL	U		< 0.1		0.1	-
	0549	10/08/87	0001	AL	U		< 0.1		0.1	-
	0549	07/13/89	0001	AL	U		< 0.1		0.1	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

TABLE 3.4 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, ALLUVIUM,
NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
06/25/86 TO 06/25/92
REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
PHOSPHATE	0549	04/23/90	0001	AL	U	MG/L	<	0.1		0.1	-
	0549	12/05/90	0001	AL	U		<	0.1		0.1	-
	0549	04/18/91	0001	AL	U			0.1		0.05	-
	0549	07/31/91	0001	AL	U		<	0.1		0.1	-
	0549	01/12/92	0001	AL	U			0.5		0.1	-
	0549	06/25/92	0001	AL	U			1		0.1	-
POLONIUM-210	0546	06/26/86	0001	AL	U	PCI/L		0.4		1.	0.7
	0546	07/12/89	0001	AL	U			0.0		1.	0.3
	0546	04/23/90	0001	AL	U			0.0		1.	0.5
	0547	04/10/87	0001	AL	U			0.0		1.	0.4
	0547	10/08/87	0001	AL	U			0.1		1.	0.5
	0547	07/17/89	0001	AL	U			0.0		1.	0.2
	0547	04/23/90	0001	AL	U			0.2		1.	0.4
	0549	10/08/87	0001	AL	U			0.4		1.	0.6
	0549	07/13/89	0001	AL	U			0.1		1.	0.2
	0549	04/23/90	0001	AL	U			0.0		1.	0.5
POTASSIUM	0546	06/26/86	0001	AL	U	MG/L		4.7		0.01	-
	0546	04/10/87	0001	AL	U			3.37		0.01	-
	0546	10/08/87	0001	AL	U			4.18		0.01	-
	0546	07/12/89	0001	AL	U			2.9		0.01	-
	0546	04/23/90	0001	AL	U			3.0		0.01	-
	0546	12/05/90	0001	AL	U			2.7		0.01	-
	0546	04/18/91	N001	AL	U			3.0		0.1	-
	0546	07/31/91	0001	AL	U			2.8		0.01	-
	0546	01/13/92	0001	AL	U			2.6		0.5	-
	0546	06/24/92	0001	AL	U			2.32		2	-
	0547	06/25/86	0001	AL	U			2.08		0.01	-
	0547	04/10/87	0001	AL	U			0.89		0.01	-
	0547	10/08/87	0001	AL	U			2.28		0.01	-
	0547	07/17/89	0001	AL	U			1.66		0.01	-
	0547	04/23/90	0001	AL	U			1.6		0.01	-
	0547	12/05/90	0001	AL	U			1.8		0.01	-
	0547	04/18/91	0001	AL	U			1.70		0.01	-
	0547	07/31/91	0001	AL	U			1.31		0.01	-
	0547	01/13/92	0001	AL	U			1.0		0.5	-
	0547	06/25/92	0001	AL	U		<	2		2	-
	0549	04/10/87	0001	AL	U			2.61		0.01	-
	0549	10/08/87	0001	AL	U			3.26		0.01	-
	0549	07/13/89	0001	AL	U			2.5		0.01	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)
N001 - UNFILTERED SAMPLE

TABLE 3.4 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, ALLUVIUM,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

06/25/86 TO 06/25/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
POTASSIUM	0549	04/23/90	0001	AL	U	MG/L		2.6		0.01	-
	0549	12/05/90	0001	AL	U			2.7		0.01	-
	0549	04/18/91	0001	AL	U			2.8		0.01	-
	0549	07/31/91	0001	AL	U			2.4		0.01	-
	0549	01/12/92	0001	AL	U			1.9		0.5	-
	0549	06/25/92	0001	AL	U		<	2		2	-
RADIUM-226	0546	06/26/86	0001	AL	U	PCI/L		0.2		1.	0.2
	0546	10/08/87	0001	AL	U			0.0		1.	0.1
	0546	07/12/89	0001	AL	U			0.1		1.	0.1
	0546	04/23/90	0001	AL	U			0.0		1.	0.1
	0546	12/05/90	0001	AL	U			0.0		1.	0.1
	0546	04/18/91	0001	AL	U			0.0		1.	0.1
	0546	07/31/91	0001	AL	U			0.1		1.	0.1
	0546	01/13/92	0001	AL	U			0.0		1.	0.1
	0546	06/24/92	0001	AL	U			0.0		1.0	0.4
	0547	04/10/87	0001	AL	U			0.0		1.	0.2
	0547	10/08/87	0001	AL	U			0.2		1.	0.2
	0547	07/17/89	0001	AL	U			0.0		1.	0.1
	0547	04/23/90	0001	AL	U			0.0		1.	0.1
	0547	12/05/90	0001	AL	U			0.0		1.	0.1
	0547	04/18/91	0001	AL	U			0.1		1.	0.1
	0547	07/31/91	0001	AL	U			0.1		1.	0.2
	0547	01/18/92	0001	AL	U			0.1		1.	0.2
	0547	06/25/92	0001	AL	U			0.1		1.0	0.4
	0549	10/08/87	0001	AL	U			0.2		1.	0.2
	0549	07/13/89	0001	AL	U			0.0		1.	0.1
	0549	04/23/90	0001	AL	U			0.6		1.	0.3
	0549	12/05/90	0001	AL	U			0.0		1.	0.1
	0549	04/18/91	0001	AL	U			0.1		1.	0.1
	0549	07/31/91	0001	AL	U			0.2		1.	0.2
	0549	01/12/92	0001	AL	U			0.2		1.	0.3
	0549	06/25/92	0001	AL	U			0.1		1.0	0.4
RADIUM-226 + RADIUM-228	0546	06/26/86	0001	AL	U	PCI/L		0.20		-	-
	0546	10/08/87	0001	AL	U			0.10		-	-
	0546	07/12/89	0001	AL	U			0.10		-	-
	0546	04/23/90	0001	AL	U			0.70		-	-
	0546	12/05/90	0001	AL	U			0.80		-	-
	0546	04/18/91	0001	AL	U			0.70		-	-
	0546	07/31/91	0001	AL	U			1.30		-	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

TABLE 3.4 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, ALLUVIUM,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

06/25/86 TO 06/25/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PARAMETER PVI VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
RADIUM-226 + RADIUM-228	0546	01/13/92	0001	AL	U	PCI/L	0.10		-	-
	0546	06/24/92	0001	AL	U		0.00		-	-
	0547	04/10/87	0001	AL	U		0.00		-	-
	0547	10/08/87	0001	AL	U		0.20		-	-
	0547	07/17/89	0001	AL	U		1.10		-	-
	0547	04/23/90	0001	AL	U		0.20		-	-
	0547	12/05/90	0001	AL	U		0.90		-	-
	0547	04/18/91	0001	AL	U		0.10		-	-
	0547	07/31/91	0001	AL	U		6.80		-	-
	0547	01/18/92	0001	AL	U		0.20		-	-
	0547	06/25/92	0001	AL	U		0.10		-	-
	0549	10/08/87	0001	AL	U		0.50		-	-
	0549	07/13/89	0001	AL	U		0.00		-	-
	0549	04/23/90	0001	AL	U		0.60		-	-
	0549	12/05/90	0001	AL	U		1.00		-	-
	0549	04/18/91	0001	AL	U		1.70		-	-
	0549	07/31/91	0001	AL	U		0.20		-	-
	0549	01/12/92	0001	AL	U		0.70		-	-
	0549	06/25/92	0001	AL	U		0.10		-	-
RADIUM-228	0546	06/26/86	0001	AL	U	PCI/L	0.		1.	1.2
	0546	10/08/87	0001	AL	U		0.1		1.	1.4
	0546	07/12/89	0001	AL	U		0.0		1.	1.6
	0546	04/23/90	0001	AL	U		0.7		1.	0.9
	0546	12/05/90	0001	AL	U		0.8		1.	0.8
	0546	04/18/91	0001	AL	U		0.7		1.	1.5
	0546	07/31/91	0001	AL	U		1.2		1.	1.4
	0546	01/13/92	0001	AL	U		0.1		1.	0.8
	0546	06/24/92	0001	AL	U		0.0		1.0	2.3
	0547	04/10/87	0001	AL	U		0.0		1.	1.2
	0547	10/08/87	0001	AL	U		0.0		1.	1.5
	0547	07/17/89	0001	AL	U		1.1		1.	1.1
	0547	04/23/90	0001	AL	U		0.2		1.	0.8
	0547	12/05/90	0001	AL	U		0.9		1.	0.7
	0547	04/18/91	0001	AL	U		0.0		1.	1.4
	0547	07/31/91	0001	AL	U		6.7		1.	1.7
	0547	01/18/92	0001	AL	U		0.1		1.	0.8
	0547	06/25/92	0001	AL	U		0.0		1.0	2.3
	0549	10/08/87	0001	AL	U		0.3		1.	0.9
	0549	07/13/89	0001	AL	U		0.0		1.	1.7
	0549	04/23/90	0001	AL	U		0.0		1.	0.7

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

0001 - UNFILTERED SAMPLE

TABLE 3.4 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, ALLUVIUM,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

06/25/86 TO 06/25/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
RADIUM-228	0549	12/05/90	0001	AL	U	PCI/L		1.0		1.	1.1
	0549	04/18/91	0001	AL	U			1.6		1.	1.6
	0549	07/31/91	0001	AL	U			0.0		1.	1.1
	0549	01/12/92	0001	AL	U			0.5		1.	1.2
	0549	06/25/92	0001	AL	U			0.0		1.0	2.4
REDOX POTENTIAL	0546	01/13/92	0001	AL	U	mVOLTS		462.7		-	-
	0547	01/13/92	0001	AL	U			459.4		-	-
	0549	01/12/92	0001	AL	U			475.7		-	-
SELENIUM	0546	06/26/86	0001	AL	U	MG/L		< 0.005		0.005	-
	0546	04/10/87	0001	AL	U			0.005		0.005	-
	0546	10/08/87	0001	AL	U			0.010		0.005	-
	0546	07/12/89	0001	AL	U			< 0.005		0.005	-
	0546	04/23/90	0001	AL	U			0.006		0.005	-
	0546	12/05/90	0001	AL	U			0.014		0.005	-
	0546	04/18/91	0001	AL	U			< 0.005		0.005	-
	0546	07/31/91	0001	AL	U			< 0.03	I	0.03	-
	0546	01/13/92	0001	AL	U			0.007		0.002	-
	0546	06/24/92	0001	AL	U			< 0.005		0.005	-
	0547	06/25/86	0001	AL	U			< 0.005		0.005	-
	0547	04/10/87	0001	AL	U			0.006		0.005	-
	0547	10/08/87	0001	AL	U			0.004	J	0.005	-
	0547	07/17/89	0001	AL	U			< 0.005		0.005	-
	0547	04/23/90	0001	AL	U			< 0.005		0.005	-
	0547	12/05/90	0001	AL	U			< 0.005		0.005	-
	0547	04/18/91	0001	AL	U			< 0.005		0.005	-
	0547	07/31/91	0001	AL	U			< 0.005		0.005	-
	0547	01/13/92	0001	AL	U			< 0.002		0.002	-
	0547	06/25/92	0001	AL	U			< 0.005		0.005	-
	0549	04/10/87	0001	AL	U			< 0.003		0.005	-
	0549	10/08/87	0001	AL	U			0.010		0.005	-
	0549	07/13/89	0001	AL	U			< 0.005		0.005	-
	0549	04/23/90	0001	AL	U			0.005		0.005	-
	0549	12/05/90	0001	AL	U			0.007		0.005	-
	0549	04/18/91	0001	AL	U			< 0.005		0.005	-
	0549	07/31/91	0001	AL	U			< 0.03	I	0.03	-
	0549	01/12/92	0001	AL	U			0.002		0.002	-
	0549	06/25/92	0001	AL	U			< 0.005		0.005	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

J - ESTIMATED VALUE

FLOW RELATIONSHIP CODE:

U - UPGRADIENT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

TABLE 3.4 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, ALLUVIUM,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

06/25/86 TO 06/25/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PARAMETER PVI VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SILICA - SiO2	0546	06/26/86	0001	AL	U	MG/L	4.0		2.	-
	0546	04/10/87	0001	AL	U		15.4		2.	-
	0546	10/08/87	0001	AL	U		13.1		2.	-
	0546	07/12/89	0001	AL	U		12.6		2.	-
	0546	04/23/90	0001	AL	U		12.		2.	-
	0547	04/10/87	0001	AL	U		15.0		2.	-
	0547	10/08/87	0001	AL	U		12.1		2.	-
	0547	07/17/89	0001	AL	U		12.8		2.	-
	0547	04/23/90	0001	AL	U		12.		2.	-
	0549	04/10/87	0001	AL	U		16.1		2.	-
	0549	10/08/87	0001	AL	U		12.0		2.	-
	0549	07/13/89	0001	AL	U		12.2		2.	-
	0549	04/23/90	0001	AL	U		12.		2.	-
SILVER	0546	06/26/86	0001	AL	U	MG/L	< 0.01		0.01	-
	0546	04/10/87	0001	AL	U		0.01		0.01	-
	0546	10/08/87	0001	AL	U		< 0.01		0.01	-
	0546	07/12/89	0001	AL	U		< 0.01		0.01	-
	0546	04/23/90	0001	AL	U		< 0.01		0.01	-
	0546	12/05/90	0001	AL	U		< 0.01		0.01	-
	0546	04/18/91	0001	AL	U		< 0.01		0.01	-
	0546	07/31/91	0001	AL	U		< 0.01		0.01	-
	0546	01/13/92	0001	AL	U		< 0.01		0.01	-
	0546	06/24/92	0001	AL	U		< 0.01		0.01	-
	0547	04/10/87	0001	AL	U		< 0.01		0.01	-
	0547	10/08/87	0001	AL	U		< 0.01		0.01	-
	0547	07/17/89	0001	AL	U		< 0.01		0.01	-
	0547	04/23/90	0001	AL	U		< 0.01		0.01	-
	0547	12/05/90	0001	AL	U		< 0.01		0.01	-
	0547	04/18/91	0001	AL	U		< 0.01		0.01	-
	0547	07/31/91	0001	AL	U		< 0.01		0.01	-
	0547	01/13/92	0001	AL	U		< 0.01		0.01	-
	0547	06/25/92	0001	AL	U		< 0.01		0.01	-
	0549	04/10/87	0001	AL	U		0.01		0.01	-
	0549	10/08/87	0001	AL	U		< 0.01		0.01	-
	0549	07/13/89	0001	AL	U		< 0.01		0.01	-
	0549	04/23/90	0001	AL	U		< 0.01		0.01	-
	0549	12/05/90	0001	AL	U		< 0.01		0.01	-
	0549	04/18/91	0001	AL	U		< 0.01		0.01	-
	0549	07/31/91	0001	AL	U		< 0.01		0.01	-
	0549	01/12/92	0001	AL	U		< 0.01		0.01	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

TABLE 3.4 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, ALLUVIUM,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

06/25/86 TO 06/25/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SILVER	0549	06/25/92	0001	AL	U	MG/L	<	0.01		0.01	-
SODIUM	0546	06/26/86	0001	AL	U	MG/L		91.6		0.002	-
	0546	04/10/87	0001	AL	U			161.		0.002	-
	0546	10/08/87	0001	AL	U			97.9		0.002	-
	0546	07/12/89	0001	AL	U			79.		0.002	-
	0546	04/23/90	0001	AL	U			56.7		0.002	-
	0546	12/05/90	0001	AL	U			51.4		0.002	-
	0546	04/18/91	N001	AL	U			61.		1.	-
	0546	07/31/91	0001	AL	U			68.		1.	-
	0546	01/13/92	0001	AL	U			59.4		0.05	-
	0546	06/24/92	0001	AL	U			70.8		1	-
	0547	06/25/86	0001	AL	U			62.6		0.002	-
	0547	04/10/87	0001	AL	U			71.7		0.002	-
	0547	10/08/87	0001	AL	U			45.1		0.002	-
	0547	07/17/89	0001	AL	U			52.		0.002	-
	0547	04/23/90	0001	AL	U			39.0		0.002	-
	0547	12/05/90	0001	AL	U			34.6		0.002	-
	0547	04/18/91	0001	AL	U			41.		1.	-
	0547	07/31/91	0001	AL	U			51.		1.	-
	0547	01/13/92	0001	AL	U			40.9		0.05	-
	0547	06/25/92	0001	AL	U			45.2		1	-
	0549	04/10/87	0001	AL	U			108.		0.002	-
	0549	10/08/87	0001	AL	U			58.0		0.002	-
	0549	07/13/89	0001	AL	U			59.		0.002	-
	0549	04/23/90	0001	AL	U			48.1		0.002	-
	0549	12/05/90	0001	AL	U			43.3		0.002	-
	0549	04/18/91	0001	AL	U			56.		1.	-
	0549	07/31/91	0001	AL	U			61.		1.	-
	0549	01/12/92	0001	AL	U			52.3		0.05	-
	0549	06/25/92	0001	AL	U			66.1		1	-
SPECIFIC CONDUCTANCE	0546	06/26/86	0001	AL	U	UMHO/CM		800.		-	-
	0546	04/10/87	0001	AL	U			1425.		-	-
	0546	10/08/87	0001	AL	U			1300.		-	-
	0546	07/12/89	0001	AL	U			4.0		-	-
	0546	04/23/90	0001	AL	U			800.		-	-
	0546	12/05/90	0001	AL	U			750.		-	-
	0546	04/18/91	N001	AL	U			1423.		-	-
	0546	07/31/91	0001	AL	U			1623.		-	-
	0546	01/13/92	0001	AL	U			761		-	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

TABLE 3.4 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, ALLUVIUM,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

06/25/86 TO 06/25/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SPECIFIC CONDUCTANCE	0546	06/24/92	0001	AL	U	UMHO/CM		975		-	-
	0547	06/25/86	0001	AL	U			680.		-	-
	0547	04/10/87	0001	AL	U			900.		-	-
	0547	10/08/87	0001	AL	U			900.		-	-
	0547	07/17/89	0001	AL	U			290.		-	-
	0547	04/23/90	0001	AL	U			700.		-	-
	0547	12/05/90	0001	AL	U			600.		-	-
	0547	04/18/91	0001	AL	U			1148.		-	-
	0547	07/31/91	0001	AL	U			1089.		-	-
	0547	01/13/92	0001	AL	U			893		-	-
	0547	06/25/92	0001	AL	U			621		-	-
	0549	04/10/87	0001	AL	U			1300.		-	-
	0549	10/08/87	0001	AL	U			800.		-	-
	0549	07/13/89	0001	AL	U			240.		-	-
	0549	04/23/90	0001	AL	U			800.		-	-
	0549	12/05/90	0001	AL	U			720.		-	-
	0549	04/18/91	0001	AL	U			962.		-	-
	0549	07/31/91	0001	AL	U			1520.		-	-
	0549	01/12/92	0001	AL	U			1040		-	-
	0549	06/25/92	0001	AL	U			257		-	-
STRONTIUM	0546	07/12/89	0001	AL	U	MG/L		1.6		0.1	-
	0546	04/23/90	0001	AL	U			1.34		0.1	-
	0546	12/05/90	0001	AL	U			1.2		0.1	-
	0546	04/18/91	N001	AL	U			1.74		0.01	-
	0546	07/31/91	0001	AL	U			2.20		0.01	-
	0546	01/13/92	0001	AL	U			1.16		0.01	-
	0546	06/24/92	0001	AL	U			2.03		0.01	-
	0547	07/17/89	0001	AL	U			1.0		0.1	-
	0547	04/23/90	0001	AL	U			1.04		0.1	-
	0547	12/05/90	0001	AL	U			0.9		0.1	-
	0547	04/18/91	0001	AL	U			1.24		0.01	-
	0547	07/31/91	0001	AL	U			1.20		0.01	-
	0547	01/13/92	0001	AL	U			0.82		0.01	-
	0547	06/25/92	0001	AL	U			1.07		0.01	-
	0549	07/13/89	0001	AL	U			1.4		0.1	-
	0549	04/23/90	0001	AL	U			1.20		0.1	-
	0549	12/05/90	0001	AL	U			1.1		0.1	-
	0549	04/18/91	0001	AL	U			1.62		0.01	-
	0549	07/31/91	0001	AL	U			1.92		0.01	-
	0549	01/12/92	0001	AL	U			1.01		0.01	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

TABLE 3.4 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, ALLUVIUM,
NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
06/25/86 TO 06/25/92
REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PARAMETER PVI VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
STRONTIUM	0549	06/25/92	0001	AL	U	MG/L	1.96		0.01	-
SULFATE	0546	06/26/86	0001	AL	U	MG/L	389.		0.1	-
	0546	04/10/87	0001	AL	U		917.		0.1	-
	0546	10/08/87	0001	AL	U		712.		0.1	-
	0546	07/12/89	0001	AL	U		516.		0.1	-
	0546	04/23/90	0001	AL	U		434.		0.1	-
	0546	12/05/90	0001	AL	U		370.		0.1	-
	0546	04/18/91	0001	AL	U		537.		10.	-
	0546	07/31/91	0001	AL	U		675.		10.	-
	0546	01/13/92	0001	AL	U		357		0.1	-
	0546	06/24/92	0001	AL	U		606		1	-
	0547	06/25/86	0001	AL	U		270.		0.1	-
	0547	04/10/87	0001	AL	U		468.		0.1	-
	0547	10/08/87	0001	AL	U		313.		0.1	-
	0547	07/17/89	0001	AL	U		256.		0.1	-
	0547	04/23/90	0001	AL	U		348.		0.1	-
	0547	12/05/90	0001	AL	U		272.		0.1	-
	0547	04/18/91	0001	AL	U		390.		10.	-
	0547	07/31/91	0001	AL	U		244.		10.	-
	0547	01/13/92	0001	AL	U		300		0.1	-
	0547	06/25/92	0001	AL	U		317		1	-
	0549	04/10/87	0001	AL	U		786.		0.1	-
	0549	10/08/87	0001	AL	U		463.		0.1	-
	0549	07/13/89	0001	AL	U		428.		0.1	-
	0549	04/23/90	0001	AL	U		434.		0.1	-
	0549	12/05/90	0001	AL	U		333.		0.1	-
	0549	04/18/91	0001	AL	U		537.		10.	-
	0549	07/31/91	0001	AL	U		564.		10.	-
	0549	01/12/92	0001	AL	U		311		0.1	-
	0549	06/25/92	0001	AL	U		605		1	-
SULFIDE	0546	06/26/86	0001	AL	U	MG/L	< 0.1		0.1	-
	0546	07/12/89	0001	AL	U		< 0.1		0.1	-
	0546	04/23/90	0001	AL	U		< 0.1		0.1	-
	0546	12/05/90	0001	AL	U		< 0.1	J	0.1	-
	0546	04/18/91	0001	AL	U		< 1.	I	1.	-
	0546	07/31/91	0001	AL	U		< 0.2		0.1	-
	0546	01/13/92	0001	AL	U		< 0.1		0.1	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)
N001 - UNFILTERED SAMPLE

OTHER PARAMETER VALUE FLAGS:
I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
J - ESTIMATED VALUE

TABLE 3.4 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, ALLUVIUM,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

06/25/86 TO 06/25/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SULFIDE	0546	06/24/92	0001	AL	U	MG/L	<	1		1	-
	0547	06/25/86	0001	AL	U		<	0.1		0.1	-
	0547	07/17/89	0001	AL	U		<	0.1		0.1	-
	0547	04/23/90	0001	AL	U		<	0.1		0.1	-
	0547	12/05/90	0001	AL	U		<	0.1	J	0.1	-
	0547	04/18/91	0001	AL	U			2.3		1.	-
	0547	07/31/91	0001	AL	U			0.4		0.1	-
	0547	01/13/92	0001	AL	U		<	0.1		0.1	-
	0547	06/25/92	0001	AL	U		<	1		1	-
	0549	07/13/89	0001	AL	U		<	0.1		0.1	-
	0549	04/23/90	0001	AL	U		<	0.1		0.1	-
	0549	12/05/90	0001	AL	U		<	0.1	J	0.1	-
	0549	04/18/91	0001	AL	U		<	1.	I	1.	-
	0549	07/31/91	0001	AL	U			0.6		0.1	-
	0549	01/12/92	0001	AL	U		<	0.1		0.1	-
	0549	06/25/92	0001	AL	U		<	1		1	-
TEMPERATURE	0546	06/26/86	0001	AL	U	C - DEGREE		13.		-	-
	0546	04/10/87	0001	AL	U			7.5		-	-
	0546	10/08/87	0001	AL	U			13.0		-	-
	0546	07/12/89	0001	AL	U			17.0		-	-
	0546	04/23/90	0001	AL	U			10.0		-	-
	0546	12/05/90	0001	AL	U			12.0		-	-
	0546	04/18/91	0001	AL	U			8.9		-	-
	0546	07/31/91	0001	AL	U			13.4		-	-
	0546	01/13/92	0001	AL	U			9.4		-	-
	0546	06/24/92	0001	AL	U			11.9		-	-
	0547	06/25/86	0001	AL	U			15.		-	-
	0547	04/10/87	0001	AL	U			8.0		-	-
	0547	10/08/87	0001	AL	U			16.5		-	-
	0547	07/17/89	0001	AL	U			16.0		-	-
	0547	04/23/90	0001	AL	U			11.0		-	-
	0547	12/05/90	0001	AL	U			11.8		-	-
	0547	04/18/91	0001	AL	U			9.1		-	-
	0547	07/31/91	0001	AL	U			15.2		-	-
	0547	01/13/92	0001	AL	U			8.2		-	-
	0547	06/25/92	0001	AL	U			14.2		-	-
	0549	04/10/87	0001	AL	U			8.5		-	-
	0549	10/08/87	0001	AL	U			16.0		-	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

J - ESTIMATED VALUE

FLOW RELATIONSHIP CODE:

U - UPGRADIENT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

TABLE 3.4 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, ALLUVIUM,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

06/25/86 TO 06/25/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
TEMPERATURE	0549	07/13/89	0001	AL	U	C - DEGREE		14.0		-	-
	0549	04/23/90	0001	AL	U			11.5		-	-
	0549	12/05/90	0001	AL	U			11.8		-	-
	0549	04/18/91	0001	AL	U			9.6		-	-
	0549	07/31/91	0001	AL	U			13.8		-	-
	0549	01/12/92	0001	AL	U			9.4		-	-
	0549	06/25/92	0001	AL	U			12.6		-	-
THALLIUM	0546	07/12/89	0001	AL	U	MG/L	<	0.1		0.1	-
	0546	04/23/90	0001	AL	U		<	0.01		0.01	-
	0546	12/05/90	0001	AL	U		<	0.01		0.01	-
	0546	04/18/91	N001	AL	U		<	0.01		0.01	-
	0546	07/31/91	0001	AL	U		<	0.01		0.01	-
	0547	07/17/89	0001	AL	U		<	0.1		0.1	-
	0547	04/23/90	0001	AL	U		<	0.01		0.01	-
	0547	12/05/90	0001	AL	U		<	0.01		0.01	-
	0547	04/18/91	0001	AL	U		<	0.03	I	0.03	-
	0547	07/31/91	0001	AL	U		<	0.01		0.01	-
	0549	07/13/89	0001	AL	U		<	0.1		0.1	-
	0549	04/23/90	0001	AL	U		<	0.01		0.01	-
	0549	12/05/90	0001	AL	U		<	0.01		0.01	-
	0549	04/18/91	0001	AL	U		<	0.01		0.01	-
	0549	07/31/91	0001	AL	U		<	0.01		0.01	-
THORIUM-230	0546	06/26/86	0001	AL	U	PCI/L		0.3		1.	0.3
	0546	07/12/89	0001	AL	U			0.0		1.	0.2
	0546	04/23/90	0001	AL	U			0.0		1.	0.4
	0547	04/10/87	0001	AL	U			0.0		1.	0.3
	0547	10/08/87	0001	AL	U			0.0		1.	0.4
	0547	07/17/89	0001	AL	U			0.3		1.	0.2
	0547	04/23/90	0001	AL	U			0.0		1.	0.3
	0549	10/08/87	0001	AL	U			0.3		1.	0.5
	0549	07/13/89	0001	AL	U			0.2		1.	0.2
	0549	04/23/90	0001	AL	U			0.0		1.	0.3
TIN	0546	06/26/86	0001	AL	U	MG/L	<	0.005		0.005	-
	0546	07/12/89	0001	AL	U		<	0.005		0.005	-
	0546	04/23/90	0001	AL	U		<	0.005		0.005	-
	0546	12/05/90	0001	AL	U		<	0.005		0.005	-
	0546	04/18/91	N001	AL	U		<	0.01	I	0.01	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

FLOW RELATIONSHIP CODE:

U - UPGRADIENT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

TABLE 3.4 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, ALLUVIUM,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

06/25/86 TO 06/25/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
TIN	0546	07/31/91	0001	AL	U	MG/L	<	0.005		0.005	-
	0546	01/13/92	0001	AL	U		<	0.005		0.005	-
	0546	06/24/92	0001	AL	U		<	0.005		0.005	-
	0547	07/17/89	0001	AL	U		<	0.005		0.005	-
	0547	04/23/90	0001	AL	U		<	0.005		0.005	-
	0547	12/05/90	0001	AL	U		<	0.005		0.005	-
	0547	04/18/91	0001	AL	U		<	0.01	I	0.01	-
	0547	07/31/91	0001	AL	U		<	0.005		0.005	-
	0547	01/13/92	0001	AL	U		<	0.005		0.005	-
	0547	06/25/92	0001	AL	U		<	0.005		0.005	-
	0549	07/13/89	0001	AL	U		<	0.005		0.005	-
	0549	04/23/90	0001	AL	U		<	0.005		0.005	-
	0549	12/05/90	0001	AL	U		<	0.005		0.005	-
	0549	04/18/91	0001	AL	U		<	0.01	I	0.01	-
	0549	07/31/91	0001	AL	U		<	0.005		0.005	-
	0549	01/12/92	0001	AL	U		<	0.005		0.005	-
	0549	06/25/92	0001	AL	U		<	0.005		0.005	-
TOTAL DISSOLVED SOLIDS	0546	06/26/86	0001	AL	U	MG/L		936.		10.	-
	0546	04/10/87	0001	AL	U			1810.		10.	-
	0546	10/08/87	0001	AL	U			1630.		10.	-
	0546	07/12/89	0001	AL	U			1020.		10.	-
	0546	04/23/90	0001	AL	U			828.		10.	-
	0546	12/05/90	0001	AL	U			724.		10.	-
	0546	04/18/91	0001	AL	U			1090.		10.	-
	0546	07/31/91	0001	AL	U			1350.		10.	-
	0546	01/13/92	0001	AL	U			854		4	-
	0546	06/24/92	0001	AL	U			1170		10	-
	0547	06/25/86	0001	AL	U			649.		10.	-
	0547	04/10/87	0001	AL	U			999.0		10.	-
	0547	10/08/87	0001	AL	U			837.		10.	-
	0547	07/17/89	0001	AL	U			640.		10.	-
	0547	04/23/90	0001	AL	U			710.		10.	-
	0547	12/05/90	0001	AL	U			568.		10.	-
	0547	04/18/91	0001	AL	U			859.		10.	-
	0547	07/31/91	0001	AL	U			814.		10.	-
	0547	01/13/92	0001	AL	U			653		4	-
	0547	06/25/92	0001	AL	U			710		10	-
	0549	04/10/87	0001	AL	U			1600.		10.	-
	0549	10/08/87	0001	AL	U			1130.		10.	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

FLOW RELATIONSHIP CODE:

U - UPGRADIENT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

TABLE 3.4 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, ALLUVIUM,
NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
06/25/86 TO 06/25/92
REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
TOTAL DISSOLVED SOLIDS	0549	07/13/89	0001	AL	U	MG/L		845.		10.	-
	0549	04/23/90	0001	AL	U			792.		10.	-
	0549	12/05/90	0001	AL	U			696.		10.	-
	0549	04/18/91	0001	AL	U			1090.		10.	-
	0549	07/31/91	0001	AL	U			1290.		10.	-
	0549	01/12/92	0001	AL	U			779		4	-
	0549	06/25/92	0001	AL	U			1170		10	-
TOTAL KJELDAHL NITROGEN	0546	01/13/92	0001	AL	U	MG/L	<	1.0		1	-
	0546	06/24/92	0001	AL	U		<	1		1	-
	0547	01/13/92	0001	AL	U		<	1.0		1	-
	0547	06/25/92	0001	AL	U		<	1		1	-
	0549	01/12/92	0001	AL	U		<	1.0		1	-
	0549	06/25/92	0001	AL	U		<	1		1	-
TOTAL ORGANIC CARBON	0546	07/12/89	0001	AL	U	MG/L		7.		1.	-
	0546	04/18/91	N001	AL	U			2.		1.	-
	0547	07/17/89	0001	AL	U			1.		1.	-
	0547	04/18/91	0001	AL	U			2.		1.	-
	0549	07/13/89	0001	AL	U			620.		1.	-
	0549	04/18/91	0001	AL	U			3.		1.	-
URANIUM	0546	06/26/86	0001	AL	U	MG/L		0.0135		0.003	-
	0546	04/10/87	0001	AL	U			0.0400		0.003	-
	0546	10/08/87	0001	AL	U			0.0322		0.003	-
	0546	07/12/89	0001	AL	U			0.018		0.003	-
	0546	04/23/90	0001	AL	U			0.014		0.003	-
	0546	12/05/90	0001	AL	U			0.0140		0.0003	-
	0546	04/18/91	N001	AL	U			0.021		0.001	-
	0546	07/31/91	0001	AL	U			0.009		0.001	-
	0546	01/13/92	0001	AL	U			0.0154		0.0003	-
	0546	06/24/92	0001	AL	U			0.016		0.001	-
	0547	06/25/86	0001	AL	U			0.0087		0.003	-
	0547	04/10/87	0001	AL	U			0.0159		0.003	-
	0547	10/08/87	0001	AL	U			0.0109		0.003	-
	0547	07/17/89	0001	AL	U			0.010		0.003	-
	0547	04/23/90	0001	AL	U			0.012		0.003	-
	0547	12/05/90	0001	AL	U			0.0082		0.0003	-
	0547	04/18/91	0001	AL	U			0.014		0.001	-
	0547	07/31/91	0001	AL	U			0.022		0.001	-
	0547	01/18/92	0001	AL	U			0.0072		0.0003	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)
N001 - UNFILTERED SAMPLE

TABLE 3.4 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, ALLUVIUM,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

06/25/86 TO 06/25/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMP. ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
URANIUM	0547	06/25/92	0001	AL	U	MG/L		0.002		0.001	-
	0549	04/10/87	0001	AL	U			0.0449		0.003	-
	0549	10/08/87	0001	AL	U			0.0252		0.003	-
	0549	07/13/89	0001	AL	U			0.015		0.003	-
	0549	04/23/90	0001	AL	U			0.014		0.003	-
	0549	12/05/90	0001	AL	U			0.0125		0.0003	-
	0549	04/18/91	0001	AL	U			0.025		0.001	-
	0549	07/31/91	0001	AL	U			0.003		0.001	-
	0549	01/12/92	0001	AL	U			0.0102		0.0003	-
	0549	06/25/92	0001	AL	U			0.013		0.001	-
VANADIUM	0546	06/26/86	0001	AL	U	MG/L		0.35		0.01	-
	0546	04/10/87	0001	AL	U			0.04		0.01	-
	0546	10/08/87	0001	AL	U			0.04		0.01	-
	0546	07/12/89	0001	AL	U		<	0.01		0.01	-
	0546	04/23/90	0001	AL	U			0.01		0.01	-
	0546	12/05/90	0001	AL	U			0.02		0.01	-
	0546	04/18/91	0001	AL	U		<	0.01		0.01	-
	0546	07/31/91	0001	AL	U		<	0.01		0.01	-
	0546	01/13/92	0001	AL	U			0.01		0.01	-
	0546	06/24/92	0001	AL	U			0.012		0.01	-
	0547	06/25/86	0001	AL	U			0.50		0.01	-
	0547	04/10/87	0001	AL	U			0.01		0.01	-
	0547	10/08/87	0001	AL	U			0.03		0.01	-
	0547	07/17/89	0001	AL	U		<	0.01		0.01	-
	0547	04/23/90	0001	AL	U			0.01		0.01	-
	0547	12/05/90	0001	AL	U			0.02		0.01	-
	0547	04/18/91	0001	AL	U		<	0.01		0.01	-
	0547	07/31/91	0001	AL	U		<	0.01		0.01	-
	0547	01/13/92	0001	AL	U		<	0.01		0.01	-
	0547	06/25/92	0001	AL	U		<	0.01		0.01	-
	0549	04/10/87	0001	AL	U			0.01		0.01	-
	0549	10/08/87	0001	AL	U			0.04		0.01	-
	0549	07/13/89	0001	AL	U		<	0.01		0.01	-
	0549	04/23/90	0001	AL	U			0.02		0.01	-
	0549	12/05/90	0001	AL	U			0.02		0.01	-
	0549	04/18/91	0001	AL	U		<	0.01		0.01	-
	0549	07/31/91	0001	AL	U		<	0.01		0.01	-
	0549	01/12/92	0001	AL	U			0.01		0.01	-
	0549	06/25/92	0001	AL	U			0.012		0.01	-
ZINC	0546	06/26/86	0001	AL	U	MG/L		0.05		0.005	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

0001 - UNFILTERED SAMPLE

TABLE 3.4 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, ALLUVIUM,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA
06/25/86 TO 06/25/92
REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ZINC	0546	04/10/87	0001	AL	U	MG/L		0.049		0.005	-
	0546	10/08/87	0001	AL	U			0.023		0.005	-
	0546	07/12/89	0001	AL	U			0.011		0.005	-
	0546	04/23/90	0001	AL	U			0.009		0.005	-
	0546	12/05/90	0001	AL	U			0.007		0.005	-
	0546	04/18/91	N001	AL	U			0.011		0.005	-
	0546	07/31/91	0001	AL	U			0.005		0.005	-
	0546	01/13/92	0001	AL	U			0.009		0.005	-
	0546	06/24/92	0001	AL	U			0.021		0.005	-
	0547	04/10/87	0001	AL	U			0.070		0.005	-
	0547	10/08/87	0001	AL	U			0.068		0.005	-
	0547	07/17/89	0001	AL	U			0.057		0.005	-
	0547	04/23/90	0001	AL	U			0.050		0.005	-
	0547	12/05/90	0001	AL	U			0.056		0.005	-
	0547	04/18/91	0001	AL	U			0.063		0.005	-
	0547	07/31/91	0001	AL	U			0.072		0.005	-
	0547	01/13/92	0001	AL	U			0.074		0.005	-
	0547	06/25/92	0001	AL	U			0.08		0.005	-
	0549	04/10/87	0001	AL	U			0.060		0.005	-
	0549	10/08/87	0001	AL	U			0.035		0.005	-
	0549	07/13/89	0001	AL	U			0.027		0.005	-
	0549	04/23/90	0001	AL	U			0.078		0.005	-
	0549	12/05/90	0001	AL	U			0.018		0.005	-
	0549	04/18/91	0001	AL	U			0.069		0.005	-
	0549	07/31/91	0001	AL	U			0.027		0.005	-
	0549	01/12/92	0001	AL	U			0.023		0.005	-
	0549	06/25/92	0001	AL	U			0.046		0.005	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

DATA FILE NAME: M:\DART\NAT01\GWQ10003.DAT

FLOW RELATIONSHIP CODE:
U - UPGRADIENT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)
N001 - UNFILTERED SAMPLE

TABLE 3.5 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, SALT WASH,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/26/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	0502	01/29/86	0001	JS	U	MG/L CACO3		1051.		-	-
	0502	06/10/86	0001	JS	U			1104.		-	-
	0502	10/08/87	0001	JS	U			1032.		-	-
	0502	07/18/89	0001	JS	U			1043.		-	-
	0502	04/23/90	0001	JS	U			1045.		-	-
	0502	12/08/90	0001	JS	U			1162.		-	-
	0502	04/19/91	0001	JS	U			1039.		-	-
	0502	08/03/91	0001	JS	U			1031.		-	-
	0502	08/05/91	0001	JS	U			1031.		-	-
	0502	01/14/92	0001	JS	U			1042		-	-
	0502	06/26/92	0001	JS	U			1033		-	-
	0503	01/29/86	0001	JS	U			1040.		-	-
	0503	06/09/86	0001	JS	U			1067.		-	-
	0503	10/08/87	0001	JS	U			1040.		-	-
	0503	07/12/89	0001	JS	U			1069.		-	-
	0503	04/20/90	0001	JS	U			1114.		-	-
	0503	12/08/90	0001	JS	U			1038.		-	-
	0503	04/18/91	0001	JS	U			1067.		-	-
	0503	08/02/91	0001	JS	U			1083.		-	-
	0503	08/05/91	0001	JS	U			1083.		-	-
	0503	06/25/92	0001	JS	U			1046		-	-
ALUMINUM	0502	06/10/86	0001	JS	U	MG/L		0.4		0.1	-
	0502	10/08/87	0001	JS	U		<	0.01		0.1	-
	0502	07/18/89	0001	JS	U		<	0.1		0.1	-
	0502	04/23/90	0001	JS	U		<	0.1		0.1	-
	0502	12/08/90	0001	JS	U		<	0.1		0.1	-
	0502	04/19/91	0001	JS	U		<	0.05		0.05	-
	0502	08/03/91	0001	JS	U		<	0.05		0.05	-
	0502	01/14/92	0001	JS	U		<	0.05		0.05	-
	0502	06/26/92	0001	JS	U			0.106		0.05	-
	0503	06/09/86	0001	JS	U			0.2		0.1	-
	0503	10/08/87	0001	JS	U		<	0.01		0.1	-
	0503	07/12/89	0001	JS	U		<	0.1		0.1	-
	0503	04/20/90	0001	JS	U		<	0.1		0.1	-
	0503	12/08/90	0001	JS	U		<	0.1		0.1	-
	0503	04/18/91	0001	JS	U		<	0.05		0.05	-
	0503	08/02/91	0001	JS	U		<	0.05		0.05	-
	0503	06/25/92	0001	JS	U			0.097		0.05	-
AMMONIUM	0502	01/29/86	0001	JS	U	MG/L		0.4		0.1	-

FORMATION OF COMPLETION CODE:
JS - JURASSIC SALT WASH FORMATION

FLOW RELATIONSHIP CODE:
U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.5 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, SALT WASH,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/26/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
AMMONIUM	0502	10/08/87	0001	JS	U	MG/L		0.5		0.1	-
	0502	07/18/89	0001	JS	U			0.9		0.1	-
	0502	04/23/90	0001	JS	U			0.6		0.1	-
	0502	12/08/90	0001	JS	U			0.8		0.1	-
	0502	04/19/91	0001	JS	U			1.00		0.01	-
	0502	08/03/91	0001	JS	U			1.0		0.1	-
	0502	01/14/92	0001	JS	U		<	1.0	I	1.0	-
	0502	06/26/92	0001	JS	U			0.64		0.1	-
	0503	01/29/86	0001	JS	U			0.3		0.1	-
	0503	06/09/86	0001	JS	U		<	0.1		0.1	-
	0503	10/08/87	0001	JS	U		<	0.1		0.1	-
	0503	07/12/89	0001	JS	U			0.7		0.1	-
	0503	04/20/90	0001	JS	U			0.4		0.1	-
	0503	12/08/90	0001	JS	U			0.6		0.1	-
	0503	04/18/91	0001	JS	U			0.95		0.01	-
	0503	08/02/91	0001	JS	U			0.9		0.1	-
	0503	06/25/92	0001	JS	U			0.62		0.1	-
ANTIMONY	0502	07/18/89	0001	JS	U	MG/L	<	0.02		0.02	-
	0502	04/23/90	0001	JS	U			0.188		0.003	-
	0502	12/08/90	0001	JS	U			0.005		0.003	-
	0502	04/19/91	0001	JS	U		<	0.02	I	0.02	-
	0502	08/03/91	0001	JS	U		<	0.02	I	0.02	-
	0502	01/14/92	0001	JS	U		<	0.03	I	0.03	-
	0502	06/26/92	0001	JS	U			0.0134		0.003	-
	0503	06/09/86	0001	JS	U		<	0.003		0.003	-
	0503	07/12/89	0001	JS	U		<	0.02		0.02	-
	0503	04/20/90	0001	JS	U			0.128		0.003	-
	0503	12/08/90	0001	JS	U			0.003		0.003	-
	0503	04/18/91	0001	JS	U			0.004		0.003	-
	0503	08/02/91	0001	JS	U		<	0.03	I	0.03	-
	0503	06/25/92	0001	JS	U			0.009		0.003	-
ARSENIC	0502	01/29/86	0001	JS	U	MG/L	<	0.01		0.01	-
	0502	06/10/86	0001	JS	U		<	0.01		0.01	-
	0502	10/08/87	0001	JS	U			0.047		0.01	-
	0502	07/18/89	0001	JS	U		<	0.05		0.05	-
	0502	04/23/90	0001	JS	U			0.16		0.01	-
	0502	12/08/90	0001	JS	U			0.021		0.01	-
	0502	04/19/91	0001	JS	U		<	0.03	I	0.03	-

FORMATION OF COMPLETION CODE:
JS - JURASSIC SALT WASH FORMATION

FLOW RELATIONSHIP CODE:
U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

TABLE 3.5 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, SALT WASH,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/26/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ARSENIC	0502	08/03/91	0001	JS	U	MG/L	<	0.05	I	0.05	-
	0502	01/14/92	0001	JS	U			0.06	I	0.01	-
	0502	06/26/92	0001	JS	U			0.052		0.005	-
	0503	01/29/86	0001	JS	U		<	0.01		0.01	-
	0503	06/09/86	0001	JS	U		<	0.01		0.01	-
	0503	10/08/87	0001	JS	U			0.038		0.01	-
	0503	07/12/89	0001	JS	U			0.05		0.01	-
	0503	04/20/90	0001	JS	U			0.03		0.01	-
	0503	12/08/90	0001	JS	U			0.023		0.01	-
	0503	04/18/91	0001	JS	U			0.04		0.01	-
	0503	08/02/91	0001	JS	U		<	0.1	I	0.1	-
	0503	06/25/92	0001	JS	U			0.05		0.005	-
BARIUM	0502	10/08/87	0001	JS	U	MG/L	<	0.01	J	0.1	-
	0502	07/18/89	0001	JS	U		<	0.1		0.1	-
	0502	04/23/90	0001	JS	U		<	0.1		0.1	-
	0502	12/08/90	0001	JS	U		<	0.1		0.1	-
	0502	04/19/91	0001	JS	U		<	0.01		0.01	-
	0502	08/03/91	0001	JS	U		<	0.01		0.01	-
	0502	01/14/92	0001	JS	U		<	0.01		0.01	-
	0502	06/26/92	0001	JS	U		<	0.1		0.1	-
	0503	06/09/86	0001	JS	U			0.3		0.1	-
	0503	10/08/87	0001	JS	U		<	0.01		0.1	-
	0503	07/12/89	0001	JS	U		<	0.1		0.1	-
	0503	04/20/90	0001	JS	U		<	0.1		0.1	-
	0503	12/08/90	0001	JS	U		<	0.1		0.1	-
	0503	04/18/91	0001	JS	U		<	0.01		0.01	-
	0503	08/02/91	0001	JS	U		<	0.01		0.01	-
	0503	06/25/92	0001	JS	U		<	0.1		0.1	-
BERYLLIUM	0502	07/18/89	0001	JS	U	MG/L	<	0.005		0.005	-
	0502	04/23/90	0001	JS	U		<	0.01		0.01	-
	0502	12/08/90	0001	JS	U		<	0.01		0.01	-
	0502	04/19/91	0001	JS	U		<	0.005		0.005	-
	0502	08/03/91	0001	JS	U		<	0.005		0.005	-
	0503	07/12/89	0001	JS	U		<	0.005		0.005	-
	0503	04/20/90	0001	JS	U		<	0.01		0.01	-
	0503	12/08/90	0001	JS	U		<	0.01		0.01	-
	0503	04/18/91	0001	JS	U		<	0.005		0.005	-

FORMATION OF COMPLETION CODE:
JS - JURASSIC SALT WASH FORMATION

FLOW RELATIONSHIP CODE:
U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
J - ESTIMATED VALUE

**TABLE 3.5 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, SALT WASH,
NATURITA SITE, COLORADO**

SITE: NAT01 NATURITA

01/29/86 TO 06/26/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
BERYLLIUM	0503	08/02/91	0001	JS	U	MG/L	<	0.005		0.005	-
BORON	0502	10/08/87	0001	JS	U	MG/L		0.61		0.1	-
	0502	07/18/89	0001	JS	U			0.6		0.1	-
	0502	04/23/90	0001	JS	U			0.7		0.1	-
	0503	06/09/86	0001	JS	U			0.1		0.1	-
	0503	10/08/87	0001	JS	U			0.63		0.1	-
	0503	07/12/89	0001	JS	U			0.6		0.1	-
	0503	04/20/90	0001	JS	U			0.7		0.1	-
BROMIDE	0502	07/18/89	0001	JS	U	MG/L		1.6		0.1	-
	0502	04/23/90	0001	JS	U			1.5		0.1	-
	0503	07/12/89	0001	JS	U		<	2.		2.	-
	0503	04/20/90	0001	JS	U			1.6		0.1	-
CADMIUM	0502	01/29/86	0001	JS	U	MG/L	<	0.001		0.001	-
	0502	10/08/87	0001	JS	U		<	0.005		0.005	-
	0502	07/18/89	0001	JS	U		<	0.001		0.001	-
	0502	04/23/90	0001	JS	U		<	0.001		0.001	-
	0502	12/08/90	0001	JS	U		<	0.001		0.001	-
	0502	04/19/91	0001	JS	U		<	0.001		0.001	-
	0502	08/03/91	0001	JS	U		<	0.001		0.001	-
	0502	01/14/92	0001	JS	U		<	0.001		0.001	-
	0502	06/26/92	0001	JS	U		<	0.001		0.001	-
	0503	01/29/86	0001	JS	U		<	0.001		0.001	-
	0503	06/09/86	0001	JS	U		<	0.001		0.001	-
	0503	10/08/87	0001	JS	U		<	0.005		0.005	-
	0503	07/12/89	0001	JS	U		<	0.001		0.001	-
	0503	04/20/90	0001	JS	U		<	0.001		0.001	-
	0503	12/08/90	0001	JS	U		<	0.001		0.001	-
	0503	04/18/91	0001	JS	U		<	0.001		0.001	-
	0503	08/02/91	0001	JS	U		<	0.001		0.001	-
	0503	06/25/92	0001	JS	U		<	0.001		0.001	-
CALCIUM	0502	01/29/86	0001	JS	U	MG/L		167.		0.01	-
	0502	06/10/86	0001	JS	U			110.		0.01	-
	0502	10/08/87	0001	JS	U			84.9		0.01	-
	0502	07/18/89	0001	JS	U			88.		0.01	-
	0502	04/23/90	0001	JS	U			83.9		0.01	-
	0502	12/08/90	0001	JS	U			81.4		0.01	-
	0502	04/19/91	0001	JS	U			82.4		0.5	-

FORMATION OF COMPLETION CODE:
JS - JURASSIC SALT WASH FORMATION

FLOW RELATIONSHIP CODE:
U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.5 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, SALT WASH,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/26/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
CALCIUM	0502	08/03/91	0001	JS	U	MG/L		88.0		0.5	-
	0502	01/14/92	0001	JS	U			74		0.05	-
	0502	06/26/92	0001	JS	U			82.6		0.5	-
	0503	01/29/86	0001	JS	U			114.		0.01	-
	0503	06/09/86	0001	JS	U			72.5		0.01	-
	0503	10/08/87	0001	JS	U			57.1		0.01	-
	0503	07/12/89	0001	JS	U			57.		0.01	-
	0503	04/20/90	0001	JS	U			52.8		0.01	-
	0503	12/08/90	0001	JS	U			54.3		0.01	-
	0503	04/18/91	0001	JS	U			51.7		0.5	-
	0503	08/02/91	0001	JS	U			58.0		0.5	-
	0503	06/25/92	0001	JS	U			56.5		0.5	-
CHLORIDE	0502	01/29/86	0001	JS	U	MG/L		630.		1.	-
	0502	06/10/86	0001	JS	U			810.		1.	-
	0502	10/08/87	0001	JS	U			620.		1.	-
	0502	07/18/89	0001	JS	U			660.		1.	-
	0502	04/23/90	0001	JS	U			685.		1.	-
	0502	12/08/90	0001	JS	U			658.		1.	-
	0502	04/19/91	0001	JS	U			635.		1.	-
	0502	08/03/91	0001	JS	U			736.		4.	-
	0502	01/14/92	0001	JS	U			611		1.0	-
	0502	06/26/92	0001	JS	U			638		0.5	-
	0503	01/29/86	0001	JS	U			520.		1.	-
	0503	06/09/86	0001	JS	U			600.		1.	-
	0503	10/08/87	0001	JS	U			560.		1.	-
	0503	07/12/89	0001	JS	U			520.		1.	-
	0503	04/20/90	0001	JS	U			541.		1.	-
	0503	12/08/90	0001	JS	U			552.		1.	-
	0503	04/18/91	0001	JS	U			550.		1.	-
	0503	08/02/91	0001	JS	U			600.		4.	-
	0503	06/25/92	0001	JS	U			517		0.5	-
CHROMIUM	0502	10/08/87	0001	JS	U	MG/L	<	0.01		0.01	-
	0502	07/18/89	0001	JS	U		<	0.01		0.01	-
	0502	04/23/90	0001	JS	U		<	0.01		0.01	-
	0502	12/08/90	0001	JS	U		<	0.01		0.01	-
	0502	04/19/91	0001	JS	U		<	0.01		0.01	-
	0502	08/03/91	0001	JS	U		<	0.01		0.01	-
	0502	01/14/92	0001	JS	U		<	0.01		0.01	-
	0503	06/09/86	0001	JS	U			0.03		0.01	-

FORMATION OF COMPLETION CODE:
JS - JURASSIC SALT WASH FORMATION

FLOW RELATIONSHIP CODE:
U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.5 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, SALT WASH,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/26/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
CHROMIUM	0503	10/08/87	0001	JS	U	MG/L	<	0.01		0.01	-
	0503	07/12/89	0001	JS	U		<	0.01		0.01	-
	0503	04/20/90	0001	JS	U		<	0.01		0.01	-
	0503	12/08/90	0001	JS	U		<	0.01		0.01	-
	0503	04/18/91	0001	JS	U		<	0.01		0.01	-
	0503	08/02/91	0001	JS	U		<	0.01		0.01	-
COBALT	0502	07/18/89	0001	JS	U	MG/L	<	0.05		0.05	-
	0502	04/23/90	0001	JS	U		<	0.05		0.05	-
	0503	07/12/89	0001	JS	U		<	0.05		0.05	-
	0503	04/20/90	0001	JS	U		<	0.05		0.05	-
COPPER	0502	10/08/87	0001	JS	U	MG/L	<	0.01		0.02	-
	0502	07/18/89	0001	JS	U		<	0.02		0.02	-
	0502	04/23/90	0001	JS	U		<	0.02		0.02	-
	0502	12/08/90	0001	JS	U		<	0.02		0.02	-
	0502	04/19/91	0001	JS	U		<	0.01		0.01	-
	0502	08/03/91	0001	JS	U		<	0.01		0.01	-
	0503	06/09/86	0001	JS	U		<	0.02		0.02	-
	0503	10/08/87	0001	JS	U		<	0.01		0.02	-
	0503	07/12/89	0001	JS	U		<	0.02		0.02	-
	0503	04/20/90	0001	JS	U		<	0.02		0.02	-
	0503	12/08/90	0001	JS	U		<	0.02		0.02	-
	0503	04/18/91	0001	JS	U		<	0.01		0.01	-
	0503	08/02/91	0001	JS	U		<	0.01		0.01	-
CYANIDE	0502	07/18/89	0001	JS	U	MG/L	<	0.02		0.02	-
	0502	04/23/90	0001	JS	U		<	0.01		0.01	-
	0502	12/08/90	0001	JS	U		<	0.01		0.01	-
	0502	04/19/91	0001	JS	U		<	0.01		0.01	-
	0502	08/03/91	0001	JS	U		<	0.01		0.01	-
	0502	01/14/92	0001	JS	U		<	0.01		0.01	-
	0502	06/26/92	0001	JS	U		<	0.01		0.01	-
	0503	07/12/89	0001	JS	U		<	0.02		0.02	-
	0503	04/20/90	0001	JS	U		<	0.01		0.01	-
	0503	12/08/90	0001	JS	U		<	0.01		0.01	-
	0503	04/18/91	0001	JS	U		<	0.01		0.01	-
	0503	08/02/91	0001	JS	U		<	0.01		0.01	-
	0503	06/25/92	0001	JS	U		<	0.01		0.01	-
DISSOLVED ORGANIC CARBON	0502	04/23/90	0001	JS	U	MG/L		175.		1.	-

FORMATION OF COMPLETION CODE:
JS - JURASSIC SALT WASH FORMATION

FLOW RELATIONSHIP CODE:
U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.5 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, SALT WASH,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/26/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
DISSOLVED ORGANIC CARBON	0502	12/08/90	0001	JS	U	MG/L		219.		1.	-
	0502	08/03/91	0001	JS	U		<	2.		2.	-
	0502	01/14/92	0001	JS	U			6.6		1.0	-
	0502	06/26/92	0001	JS	U			7.8	*N	1	-
	0503	04/20/90	0001	JS	U			115.		1.	-
	0503	12/08/90	0001	JS	U			67.		1.	-
	0503	08/02/91	0001	JS	U			2.		2.	-
	0503	06/25/92	0001	JS	U			9.1	*N	1	-
FLUORIDE	0502	10/08/87	0001	JS	U	MG/L		0.32		0.1	-
	0502	07/18/89	0001	JS	U			0.3		0.1	-
	0502	04/23/90	0001	JS	U			0.4		0.1	-
	0502	12/08/90	0001	JS	U			0.5		0.1	-
	0502	04/19/91	0001	JS	U			0.3		0.1	-
	0502	08/03/91	0001	JS	U			0.2		0.1	-
	0502	01/14/92	0001	JS	U			0.4		0.1	-
	0502	06/26/92	0001	JS	U			0.456		0.1	-
	0503	06/09/86	0001	JS	U			0.7		0.1	-
	0503	10/08/87	0001	JS	U			0.40		0.1	-
	0503	07/12/89	0001	JS	U			0.2		0.1	-
	0503	04/20/90	0001	JS	U			0.4		0.1	-
	0503	12/08/90	0001	JS	U			0.5		0.1	-
	0503	04/18/91	0001	JS	U			0.4		0.1	-
	0503	08/02/91	0001	JS	U			0.4		0.1	-
	0503	06/25/92	0001	JS	U			0.54		0.1	-
GROSS ALPHA	0502	07/18/89	0001	JS	U	PCI/L		91.		0.2	41.
	0502	04/23/90	0001	JS	U			100.		1.	60.
	0502	12/08/90	0001	JS	U			48.		1.	55.
	0502	04/19/91	0001	JS	U			68.6		1.	69.3
	0502	08/05/91	0001	JS	U			31.3		1.	60.
	0502	01/14/92	0001	JS	U			48		1.	47
	0502	06/26/92	0001	JS	U			66.1		1.0	71.7
	0503	07/12/89	0001	JS	U			85.		0.2	43.
	0503	04/20/90	0001	JS	U			110.		1.	50.
	0503	12/08/90	0001	JS	U			86.		1.	57.
	0503	04/18/91	0001	JS	U			51.7		1.	111.
	0503	08/05/91	0001	JS	U			66.1		1.	44.
	0503	06/25/92	0001	JS	U			56.7		1.0	61.5
GROSS BETA	0502	07/18/89	0001	JS	U	PCI/L		41.		1.	21.

FORMATION OF COMPLETION CODE:
JS - JURASSIC SALT WASH FORMATION

FLOW RELATIONSHIP CODE:
U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
* - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS
N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

TABLE 3.5 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, SALT WASH,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/26/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
GROSS BETA	0502	04/23/90	0001	JS	U	PCI/L		51.		0.5	32.
	0502	12/08/90	0001	JS	U			75.		0.5	35.
	0502	04/19/91	0001	JS	U			49.4		0.5	39.4
	0502	08/05/91	0001	JS	U			38.		0.5	45.
	0502	01/14/92	0001	JS	U			95		0.5	36
	0502	06/26/92	0001	JS	U			0.0		0.5	60.3
	0503	07/12/89	0001	JS	U			39.		1.	22.
	0503	04/20/90	0001	JS	U			49.		0.5	39.
	0503	12/08/90	0001	JS	U			54.		0.5	30.
	0503	04/18/91	0001	JS	U			88.4		0.5	61.6
	0503	08/05/91	0001	JS	U			16.		0.5	28.
	0503	06/25/92	0001	JS	U			0.0		0.5	58.9
IRON	0502	01/29/86	0001	JS	U	MG/L		0.12		0.03	-
	0502	06/10/86	0001	JS	U			0.3		0.03	-
	0502	10/08/87	0001	JS	U			0.92		0.03	-
	0502	07/18/89	0001	JS	U			0.54		0.03	-
	0502	04/23/90	0001	JS	U			0.81		0.03	-
	0503	01/29/86	0001	JS	U			0.15		0.03	-
	0503	06/09/86	0001	JS	U			0.18		0.03	-
	0503	10/08/87	0001	JS	U			0.15		0.03	-
	0503	07/12/89	0001	JS	U			0.16		0.03	-
	0503	04/20/90	0001	JS	U			0.22		0.03	-
LEAD	0502	10/08/87	0001	JS	U	MG/L	<	0.01		0.01	-
	0502	07/18/89	0001	JS	U		<	0.01		0.01	-
	0502	04/23/90	0001	JS	U		<	0.01		0.01	-
	0502	12/08/90	0001	JS	U		<	0.01		0.01	-
	0502	04/19/91	0001	JS	U		<	0.005		0.005	-
	0502	08/03/91	0001	JS	U		<	0.005		0.005	-
	0503	06/09/86	0001	JS	U		<	0.01		0.01	-
	0503	10/08/87	0001	JS	U		<	0.01		0.01	-
	0503	07/12/89	0001	JS	U		<	0.01		0.01	-
	0503	04/20/90	0001	JS	U		<	0.01		0.01	-
	0503	12/08/90	0001	JS	U		<	0.01		0.01	-
	0503	04/18/91	0001	JS	U		<	0.005		0.005	-
	0503	08/02/91	0001	JS	U		<	0.005		0.005	-
	0503	08/02/91	0001	JS	U		<	0.005		0.005	-
LEAD-210	0502	07/18/89	0001	JS	U	PCI/L		0.4		1.5	1.1
	0502	04/23/90	0001	JS	U			0.4		1.5	0.7
	0503	06/09/86	0001	JS	U			2.6		1.5	0.8

FORMATION OF COMPLETION CODE:
JS - JURASSIC SALT WASH FORMATION

FLOW RELATIONSHIP CODE:
U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.5 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, SALT WASH,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/26/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
LEAD-210	0503	07/12/89	0001	JS	U	PCI/L		0.0		1.5	1.0
	0503	04/20/90	0001	JS	U			1.0		1.5	0.8
MAGNESIUM	0502	01/29/86	0001	JS	U	MG/L		37.6		0.001	-
	0502	06/10/86	0001	JS	U			32.8		0.001	-
	0502	10/08/87	0001	JS	U			28.2		0.001	-
	0502	07/18/89	0001	JS	U			32.		0.001	-
	0502	04/23/90	0001	JS	U			32.0		0.001	-
	0502	12/08/90	0001	JS	U			31.7		0.001	-
	0502	04/19/91	0001	JS	U			31.3		0.1	-
	0502	08/03/91	0001	JS	U			32.7		0.1	-
	0502	01/14/92	0001	JS	U			27		0.05	-
	0502	06/26/92	0001	JS	U			30.8		0.1	-
	0503	01/29/86	0001	JS	U			27.8		0.001	-
	0503	06/09/86	0001	JS	U			22.7		0.001	-
	0503	10/08/87	0001	JS	U			20.6		0.001	-
	0503	07/12/89	0001	JS	U			22.0		0.001	-
	0503	04/20/90	0001	JS	U			21.9		0.001	-
	0503	12/08/90	0001	JS	U			22.6		0.001	-
	0503	04/18/91	0001	JS	U			21.8		0.1	-
	0503	08/02/91	0001	JS	U			23.5		0.1	-
	0503	06/25/92	0001	JS	U			20.8		0.1	-
MANGANESE	0502	01/29/86	0001	JS	U	MG/L		0.04		0.01	-
	0502	06/10/86	0001	JS	U			0.09		0.01	-
	0502	10/08/87	0001	JS	U			0.09		0.01	-
	0502	07/18/89	0001	JS	U			0.03		0.01	-
	0502	04/23/90	0001	JS	U			0.03		0.01	-
	0502	12/08/90	0001	JS	U			0.03		0.01	-
	0502	04/19/91	0001	JS	U		<	0.01		0.01	-
	0502	08/03/91	0001	JS	U			0.01		0.01	-
	0502	01/14/92	0001	JS	U			0.01		0.01	-
	0502	06/26/92	0001	JS	U			0.016		0.01	-
	0503	01/29/86	0001	JS	U			0.02		0.01	-
	0503	06/09/86	0001	JS	U			0.04		0.01	-
	0503	10/08/87	0001	JS	U		<	0.01		0.01	-
	0503	07/12/89	0001	JS	U		<	0.01		0.01	-
	0503	04/20/90	0001	JS	U		<	0.01		0.01	-
	0503	12/08/90	0001	JS	U		<	0.01		0.01	-
	0503	04/18/91	0001	JS	U		<	0.01		0.01	-
	0503	08/02/91	0001	JS	U		<	0.01		0.01	-

FORMATION OF COMPLETION CODE:
JS - JURASSIC SALT WASH FORMATION

FLOW RELATIONSHIP CODE:
U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.5 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, SALT WASH,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/26/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MANGANESE	0503	06/25/92	0001	JS	U	MG/L	<	0.01		0.01	-
MERCURY	0502	10/08/87	0001	JS	U	MG/L	<	0.0002		0.0002	-
	0502	07/18/89	0001	JS	U		<	0.0002		0.0002	-
	0502	04/23/90	0001	JS	U		<	0.0002		0.0002	-
	0502	12/08/90	0001	JS	U		<	0.0002		0.0002	-
	0502	04/19/91	0001	JS	U		<	0.0002		0.0002	-
	0502	08/03/91	0001	JS	U		<	0.0002		0.0002	-
	0503	06/09/86	0001	JS	U		<	0.0002		0.0002	-
	0503	10/08/87	0001	JS	U		<	0.0002		0.0002	-
	0503	07/12/89	0001	JS	U		<	0.0002		0.0002	-
	0503	04/20/90	0001	JS	U		<	0.0002		0.0002	-
	0503	12/08/90	0001	JS	U		<	0.0002		0.0002	-
	0503	04/18/91	0001	JS	U		<	0.0002		0.0002	-
	0503	08/02/91	0001	JS	U		<	0.0002		0.0002	-
MOLYBDENUM	0502	01/29/86	0001	JS	U	MG/L		0.11		0.01	-
	0502	06/10/86	0001	JS	U			0.24		0.01	-
	0502	10/08/87	0001	JS	U		<	0.01		0.01	-
	0502	07/18/89	0001	JS	U		<	0.01		0.01	-
	0502	04/23/90	0001	JS	U		<	0.01		0.01	-
	0502	12/08/90	0001	JS	U			0.01		0.01	-
	0502	04/19/91	0001	JS	U		<	0.01		0.01	-
	0502	08/03/91	0001	JS	U		<	0.01		0.01	-
	0502	01/14/92	0001	JS	U			0.02		0.01	-
	0502	06/26/92	0001	JS	U		<	0.01		0.01	-
	0503	01/29/86	0001	JS	U			0.1		0.01	-
	0503	06/09/86	0001	JS	U			0.2		0.01	-
	0503	10/08/87	0001	JS	U		<	0.01		0.01	-
	0503	07/12/89	0001	JS	U		<	0.01		0.01	-
	0503	04/20/90	0001	JS	U			0.01		0.01	-
	0503	12/08/90	0001	JS	U		<	0.01		0.01	-
	0503	04/18/91	0001	JS	U		<	0.01		0.01	-
	0503	08/02/91	0001	JS	U		<	0.01		0.01	-
	0503	06/25/92	0001	JS	U		<	0.01		0.01	-
NET GROSS ALPHA *	0502	07/18/89	0001	JS	U	PCI/L		59.44		-	-
	0502	04/23/90	0001	JS	U			83.54		-	-
	0502	12/08/90	0001	JS	U			19.46		-	-

* NET GROSS ALPHA (GROSS ALPHA - URANIUM) WITH 1 MG URANIUM = 686 PCI

FORMATION OF COMPLETION CODE:
JS - JURASSIC SALT WASH FORMATION

FLOW RELATIONSHIP CODE:
U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.5 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, SALT WASH,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/26/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
NET GROSS ALPHA *	0502	04/19/91	0001	JS	U	PCI/L		37.73		-	-
	0502	08/05/91	0001	JS	U			9.35		-	-
	0502	01/14/92	0001	JS	U			21.31		-	-
	0502	06/26/92	0001	JS	U			39.35		-	-
	0503	07/12/89	0001	JS	U			54.82		-	-
	0503	04/20/90	0001	JS	U			83.93		-	-
	0503	12/08/90	0001	JS	U			60.34		-	-
	0503	04/18/91	0001	JS	U			21.52		-	-
	0503	08/05/91	0001	JS	U			44.83		-	-
	0503	06/25/92	0001	JS	U			34.06		-	-
NICKEL	0502	10/08/87	0001	JS	U	MG/L	<	0.01		0.04	-
	0502	07/18/89	0001	JS	U		<	0.04		0.04	-
	0502	04/23/90	0001	JS	U		<	0.04		0.04	-
	0502	12/08/90	0001	JS	U		<	0.04		0.04	-
	0502	04/19/91	0001	JS	U		<	0.04		0.04	-
	0502	08/03/91	0001	JS	U		<	0.04		0.04	-
	0503	06/09/86	0001	JS	U			0.09		0.04	-
	0503	10/08/87	0001	JS	U		<	0.01		0.04	-
	0503	07/12/89	0001	JS	U		<	0.04		0.04	-
	0503	04/20/90	0001	JS	U		<	0.04		0.04	-
	0503	12/08/90	0001	JS	U		<	0.04		0.04	-
	0503	04/18/91	0001	JS	U		<	0.04		0.04	-
	0503	08/02/91	0001	JS	U		<	0.04		0.04	-
NITRATE	0502	01/29/86	0001	JS	U	MG/L	<	1.		1.	-
	0502	06/10/86	0001	JS	U		<	1.		1.	-
	0502	10/08/87	0001	JS	U		<	0.1		1.	-
	0502	07/18/89	0001	JS	U		<	1.0		1.	-
	0502	04/23/90	0001	JS	U		<	0.1		1.	-
	0502	12/08/90	0001	JS	U		<	1.		1.	-
	0502	04/19/91	0001	JS	U			2.		1.	-
	0502	08/03/91	0001	JS	U			2.2		1.	-
	0502	01/14/92	0001	JS	U			12.5		0.1	-
	0502	06/26/92	0001	JS	U		<	1		1	-
	0503	01/29/86	0001	JS	U		<	1.		1.	-
	0503	06/09/86	0001	JS	U		<	1.		1.	-
	0503	10/08/87	0001	JS	U			0.4	J	1.	-

* NET GROSS ALPHA (GROSS ALPHA - URANIUM) WITH 1 MG URANIUM = 686 PCI

FORMATION OF COMPLETION CODE:
JS - JURASSIC SALT WASH FORMATION

FLOW RELATIONSHIP CODE:
U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
J - ESTIMATED VALUE

TABLE 3.5 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, SALT WASH,
NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
01/29/86 TO 06/26/92
REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
NITRATE	0503	07/12/89	0001	JS	U	MG/L	<	1.0		1.	-
	0503	04/20/90	0001	JS	U		<	0.1		1.	-
	0503	12/08/90	0001	JS	U		<	1.		1.	-
	0503	04/18/91	0001	JS	U		<	1.		1.	-
	0503	08/02/91	0001	JS	U			1.8		1.	-
	0503	06/25/92	0001	JS	U		<	1		1	-
NITRITE AND NITRATE	0502	12/08/90	0001	JS	U	MG/L	<	1.		1.	-
	0502	04/19/91	0001	JS	U			0.39		0.05	-
	0502	08/03/91	0001	JS	U			0.47		0.05	-
	0502	01/14/92	0001	JS	U			2.8		0.1	-
	0503	12/08/90	0001	JS	U		<	1.		1.	-
	0503	04/18/91	0001	JS	U			0.10		0.05	-
PH	0503	08/02/91	0001	JS	U			0.47		0.05	-
	0502	01/29/86	0001	JS	U	SU		7.11		-	-
	0502	06/10/86	0001	JS	U			7.2		-	-
	0502	10/08/87	0001	JS	U			7.03		-	-
	0502	07/18/89	0001	JS	U			7.20		-	-
	0502	04/23/90	0001	JS	U			7.16		-	-
	0502	12/08/90	0001	JS	U			7.08		-	-
	0502	04/19/91	0001	JS	U			7.01		-	-
	0502	08/03/91	0001	JS	U			7.02		-	-
	0502	08/05/91	0001	JS	U			7.02		-	-
	0502	01/14/92	0001	JS	U			7.11		-	-
	0502	06/26/92	0001	JS	U			6.99		-	-
	0503	01/29/86	0001	JS	U			7.22		-	-
	0503	06/09/86	0001	JS	U			7.42		-	-
	0503	10/08/87	0001	JS	U			7.26		-	-
	0503	07/12/89	0001	JS	U			7.26		-	-
	0503	04/20/90	0001	JS	U			7.21		-	-
	0503	12/08/90	0001	JS	U			7.14		-	-
	0503	04/18/91	0001	JS	U			7.24		-	-
	0503	08/02/91	0001	JS	U			7.11		-	-
	0503	08/05/91	0001	JS	U			7.11		-	-
	0503	06/25/92	0001	JS	U			7.09		-	-
PHOSPHATE	0502	10/08/87	0001	JS	U	MG/L		0.27		0.1	-
	0502	07/18/89	0001	JS	U			0.2		0.1	-
	0502	04/23/90	0001	JS	U		<	0.1		0.1	-
	0502	12/08/90	0001	JS	U		<	0.1		0.1	-

FORMATION OF COMPLETION CODE:
JS - JURASSIC SALT WASH FORMATION

FLOW RELATIONSHIP CODE:
U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.5 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, SALT WASH,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/26/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
PHOSPHATE	0502	04/19/91	0001	JS	U	MG/L		0.1		0.05	-
	0502	08/03/91	0001	JS	U			0.1		0.1	-
	0502	01/14/92	0001	JS	U			0.1		0.1	-
	0502	06/26/92	0001	JS	U			0.13		0.1	-
	0503	06/09/86	0001	JS	U			0.1		0.1	-
	0503	10/08/87	0001	JS	U			0.36		0.1	-
	0503	07/12/89	0001	JS	U			0.1		0.1	-
	0503	04/20/90	0001	JS	U			0.1		0.1	-
	0503	12/08/90	0001	JS	U			0.1		0.1	-
	0503	04/18/91	0001	JS	U			0.1		0.05	-
	0503	08/02/91	0001	JS	U			0.2		0.1	-
	0503	06/25/92	0001	JS	U			0.17		0.1	-
POLONIUM-210	0502	07/18/89	0001	JS	U	PCI/L		0.4		1.	0.3
	0502	04/23/90	0001	JS	U			0.0		1.	0.3
	0503	06/09/86	0001	JS	U			0.		1.	0.5
	0503	07/12/89	0001	JS	U			0.1		1.	0.2
	0503	04/20/90	0001	JS	U			0.0		1.	0.4
POTASSIUM	0502	01/29/86	0001	JS	U	MG/L		29.3		0.01	-
	0502	06/10/86	0001	JS	U			26.8		0.01	-
	0502	10/08/87	0001	JS	U			23.0		0.01	-
	0502	07/18/89	0001	JS	U			23.		0.01	-
	0502	04/23/90	0001	JS	U			29.3		0.01	-
	0502	12/08/90	0001	JS	U			26.1		0.01	-
	0502	04/19/91	0001	JS	U			19.		5.	-
	0502	08/03/91	0001	JS	U			21.		5.	-
	0502	01/14/92	0001	JS	U			23		0.5	-
	0502	06/26/92	0001	JS	U			33.1		2	-
	0503	01/29/86	0001	JS	U			23.2		0.01	-
	0503	06/09/86	0001	JS	U			20.2		0.01	-
	0503	10/08/87	0001	JS	U			19.0		0.01	-
	0503	07/12/89	0001	JS	U			19.1		0.01	-
	0503	04/20/90	0001	JS	U			21.6		0.01	-
	0503	12/08/90	0001	JS	U			20.6		0.01	-
	0503	04/18/91	0001	JS	U			14.		5.	-
	0503	08/02/91	0001	JS	U			18.		5.	-
	0503	06/25/92	0001	JS	U			23		2	-
RADIUM-226	0502	10/08/87	0001	JS	U	PCI/L		2.6		1.	0.6
	0502	07/18/89	0001	JS	U			4.0		1.	0.7

FORMATION OF COMPLETION CODE:
JS - JURASSIC SALT WASH FORMATION

FLOW RELATIONSHIP CODE:
U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.5 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, SALT WASH,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/26/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
RADIUM-226	0502	04/23/90	0001	JS	U	PCI/L		2.2		1.	0.5
	0502	12/08/90	0001	JS	U			3.1		1.	0.6
	0502	04/19/91	0001	JS	U			5.3		1.	0.8
	0502	08/05/91	0001	JS	U			4.7		1.	0.7
	0502	01/14/92	0001	JS	U			3.3		1.	0.6
	0502	06/26/92	0001	JS	U			6.3		1.0	1.3
	0503	06/09/86	0001	JS	U			1.2		1.	0.4
	0503	10/08/87	0001	JS	U			0.8		1.	0.3
	0503	07/12/89	0001	JS	U			1.0		1.	0.4
	0503	04/20/90	0001	JS	U			1.1		1.	0.4
	0503	12/08/90	0001	JS	U			0.9		1.	0.3
	0503	04/18/91	0001	JS	U			1.1		1.	0.4
	0503	08/05/91	0001	JS	U			1.3		1.	0.4
	0503	06/25/92	0001	JS	U			2.0		1.0	0.8
RADIUM-226 + RADIUM-228	0502	10/08/87	0001	JS	U	PCI/L		4.40		-	-
	0502	07/18/89	0001	JS	U			6.20		-	-
	0502	04/23/90	0001	JS	U			10.50		-	-
	0502	12/08/90	0001	JS	U			6.40		-	-
	0502	04/19/91	0001	JS	U			6.30		-	-
	0502	08/05/91	0001	JS	U			7.80		-	-
	0502	01/14/92	0001	JS	U			6.20		-	-
	0502	06/26/92	0001	JS	U			7.60		-	-
	0503	06/09/86	0001	JS	U			3.50		-	-
	0503	10/08/87	0001	JS	U			2.90		-	-
	0503	07/12/89	0001	JS	U			3.80		-	-
	0503	04/20/90	0001	JS	U			3.90		-	-
	0503	12/08/90	0001	JS	U			4.10		-	-
	0503	04/18/91	0001	JS	U			2.40		-	-
	0503	08/05/91	0001	JS	U			5.80		-	-
	0503	06/25/92	0001	JS	U			2.00		-	-
RADIUM-228	0502	10/08/87	0001	JS	U	PCI/L		1.8		1.	1.5
	0502	07/18/89	0001	JS	U			2.2		1.	1.2
	0502	04/23/90	0001	JS	U			8.3		1.	0.9
	0502	12/08/90	0001	JS	U			3.3		1.	0.9
	0502	04/19/91	0001	JS	U			1.0		1.	1.5
	0502	08/05/91	0001	JS	U			3.1		1.	1.6
	0502	01/14/92	0001	JS	U			2.9		1.	1.6
	0502	06/26/92	0001	JS	U			1.3		1.0	2.0
	0503	06/09/86	0001	JS	U			2.3		1.	1.

FORMATION OF COMPLETION CODE:
JS - JURASSIC SALT WASH FORMATION

FLOW RELATIONSHIP CODE:
U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.5 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, SALT WASH,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/26/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
RADIUM-228	0503	10/08/87	0001	JS	U	PCI/L		2.1		1.	1.5
	0503	07/12/89	0001	JS	U			2.8		1.	1.6
	0503	04/20/90	0001	JS	U			2.8		1.	1.0
	0503	12/08/90	0001	JS	U			3.2		1.	1.0
	0503	04/18/91	0001	JS	U			1.3		1.	1.5
	0503	08/05/91	0001	JS	U			4.5		1.	1.7
	0503	06/25/92	0001	JS	U			0.0		1.0	1.9
REDOX POTENTIAL	0502	01/14/92	0001	JS	U	mVOLTS		190.7		-	-
SELENIUM	0502	01/29/86	0001	JS	U	MG/L	<	0.005		0.005	-
	0502	06/10/86	0001	JS	U		<	0.005		0.005	-
	0502	10/08/87	0001	JS	U			0.321		0.005	-
	0502	07/18/89	0001	JS	U		<	0.03		0.03	-
	0502	04/23/90	0001	JS	U			0.061		0.005	-
	0502	12/08/90	0001	JS	U		<	0.005		0.005	-
	0502	04/19/91	0001	JS	U		<	0.03	I	0.03	-
	0502	08/03/91	0001	JS	U		<	0.03	I	0.03	-
	0502	01/14/92	0001	JS	U		<	0.02	I	0.02	-
	0502	06/26/92	0001	JS	U		<	0.005		0.005	-
	0503	01/29/86	0001	JS	U		<	0.005		0.005	-
	0503	06/09/86	0001	JS	U		<	0.005		0.005	-
	0503	10/08/87	0001	JS	U			0.236		0.005	-
	0503	07/12/89	0001	JS	U		<	0.03		0.03	-
	0503	04/20/90	0001	JS	U		<	0.005		0.005	-
	0503	12/08/90	0001	JS	U		<	0.005		0.005	-
	0503	04/18/91	0001	JS	U		<	0.03	I	0.03	-
	0503	08/02/91	0001	JS	U		<	0.05	I	0.05	-
	0503	06/25/92	0001	JS	U		<	0.005		0.005	-
SILICA - SiO2	0502	10/08/87	0001	JS	U	MG/L		8.17		2.	-
	0502	07/18/89	0001	JS	U			8.1		2.	-
	0502	04/23/90	0001	JS	U			9.		2.	-
	0503	06/09/86	0001	JS	U			3.		2.	-
	0503	10/08/87	0001	JS	U			10.9		2.	-
	0503	07/12/89	0001	JS	U			7.3		2.	-
	0503	04/20/90	0001	JS	U			8.		2.	-
SILVER	0502	10/08/87	0001	JS	U	MG/L	<	0.01		0.01	-
	0502	07/18/89	0001	JS	U		<	0.01		0.01	-

FORMATION OF COMPLETION CODE:
JS - JURASSIC SALT WASH FORMATION

FLOW RELATIONSHIP CODE:
U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

TABLE 3.5 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, SALT WASH,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/26/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SILVER	0502	04/23/90	0001	JS	U	MG/L	<	0.01		0.01	-
	0502	12/08/90	0001	JS	U		<	0.01		0.01	-
	0502	04/19/91	0001	JS	U		<	0.01		0.01	-
	0502	08/03/91	0001	JS	U		<	0.01		0.01	-
	0502	01/14/92	0001	JS	U		<	0.01		0.01	-
	0502	06/26/92	0001	JS	U			0.011		0.01	-
	0503	06/09/86	0001	JS	U		<	0.01		0.01	-
	0503	10/08/87	0001	JS	U		<	0.01		0.01	-
	0503	07/12/89	0001	JS	U		<	0.01		0.01	-
	0503	04/20/90	0001	JS	U		<	0.01		0.01	-
	0503	12/08/90	0001	JS	U		<	0.01		0.01	-
	0503	04/18/91	0001	JS	U		<	0.01		0.01	-
	0503	08/02/91	0001	JS	U		<	0.01		0.01	-
	0503	06/25/92	0001	JS	U		<	0.01		0.01	-
SODIUM	0502	01/29/86	0001	JS	U	MG/L		1910.		0.002	-
	0502	06/10/86	0001	JS	U			2150.		0.002	-
	0502	10/08/87	0001	JS	U			2080.		0.002	-
	0502	07/18/89	0001	JS	U			2050.		0.002	-
	0502	04/23/90	0001	JS	U			1810.		0.002	-
	0502	12/08/90	0001	JS	U			2190.		0.002	-
	0502	04/19/91	0001	JS	U			2140.		50.	-
	0502	08/03/91	0001	JS	U			2150.		20.	-
	0502	01/14/92	0001	JS	U			1940		0.05	-
	0502	06/26/92	0001	JS	U			2140		1	-
	0503	01/29/86	0001	JS	U			1700.		0.002	-
	0503	06/09/86	0001	JS	U			1790.		0.002	-
	0503	10/08/87	0001	JS	U			1820.		0.002	-
	0503	07/12/89	0001	JS	U			1780.		0.002	-
	0503	04/20/90	0001	JS	U			1720.		0.002	-
	0503	12/08/90	0001	JS	U			1890.		0.002	-
	0503	04/18/91	0001	JS	U			1860.		50.	-
	0503	08/02/91	0001	JS	U			1850.		20.	-
	0503	06/25/92	0001	JS	U			1840		1	-
SPECIFIC CONDUCTANCE	0502	01/29/86	0001	JS	U	UMHO/CM		5500.		-	-
	0502	06/10/86	0001	JS	U			5000.		-	-
	0502	10/08/87	0001	JS	U			3420.		-	-
	0502	07/18/89	0001	JS	U			2150.		-	-
	0502	04/23/90	0001	JS	U			6100.		-	-
	0502	12/08/90	0001	JS	U			6200.		-	-

FORMATION OF COMPLETION CODE:
JS - JURASSIC SALT WASH FORMATION

FLOW RELATIONSHIP CODE:
U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.5 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, SALT WASH,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/26/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SPECIFIC CONDUCTANCE	0502	04/19/91	0001	JS	U	UMHO/CM		6950.		-	-
	0502	08/03/91	0001	JS	U			8020.		-	-
	0502	08/05/91	0001	JS	U			8020.		-	-
	0502	01/14/92	0001	JS	U			6370		-	-
	0502	06/26/92	0001	JS	U			6620		-	-
	0503	01/29/86	0001	JS	U			4900.		-	-
	0503	06/09/86	0001	JS	U			4800.		-	-
	0503	10/08/87	0001	JS	U			3300.		-	-
	0503	07/12/89	0001	JS	U			1200.		-	-
	0503	04/20/90	0001	JS	U			5000.		-	-
	0503	12/08/90	0001	JS	U			5000.		-	-
	0503	04/18/91	0001	JS	U			6960.		-	-
	0503	08/02/91	0001	JS	U			6840.		-	-
	0503	08/05/91	0001	JS	U			6840.		-	-
	0503	06/25/92	0001	JS	U			5440		-	-
STRONTIUM	0502	07/18/89	0001	JS	U	MG/L		3.0		0.1	-
	0502	04/23/90	0001	JS	U			2.80		0.1	-
	0502	12/08/90	0001	JS	U			2.9		0.1	-
	0502	04/19/91	0001	JS	U			2.87		0.01	-
	0502	08/03/91	0001	JS	U			3.01		0.01	-
	0502	01/14/92	0001	JS	U			2.42		0.01	-
	0502	06/26/92	0001	JS	U			2.85		0.01	-
	0503	07/12/89	0001	JS	U			2.0		0.1	-
	0503	04/20/90	0001	JS	U			1.91		0.1	-
	0503	12/08/90	0001	JS	U			2.1		0.1	-
	0503	04/18/91	0001	JS	U			2.02		0.01	-
	0503	08/02/91	0001	JS	U			2.14		0.01	-
	0503	06/25/92	0001	JS	U			1.94		0.01	-
SULFATE	0502	01/29/86	0001	JS	U	MG/L		2720.		0.1	-
	0502	06/10/86	0001	JS	U			2870.		0.1	-
	0502	10/08/87	0001	JS	U			2800.		0.1	-
	0502	07/18/89	0001	JS	U			2380.		0.1	-
	0502	04/23/90	0001	JS	U			2850.		0.1	-
	0502	12/08/90	0001	JS	U			2950.		0.1	-
	0502	04/19/91	0001	JS	U			2840.		10.	-
	0502	08/03/91	0001	JS	U			2760.		10.	-
	0502	01/14/92	0001	JS	U			2840		0.1	-
	0502	06/26/92	0001	JS	U			2750		1	-
	0503	01/29/86	0001	JS	U			2260.		0.1	-

FORMATION OF COMPLETION CODE:
JS - JURASSIC SALT WASH FORMATION

FLOW RELATIONSHIP CODE:
U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.5 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, SALT WASH,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA
01/29/86 TO 06/26/92
REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SULFATE	0503	06/09/86	0001	JS	U	MG/L		2260.		0.1	-
	0503	10/08/87	0001	JS	U			2270.		0.1	-
	0503	07/12/89	0001	JS	U			2300.		0.1	-
	0503	04/20/90	0001	JS	U			2280.		0.1	-
	0503	12/08/90	0001	JS	U			2380.		0.1	-
	0503	04/18/91	0001	JS	U			2230.		10.	-
	0503	08/02/91	0001	JS	U			2270.		10.	-
	0503	06/25/92	0001	JS	U			2230		1	-
SULFIDE	0502	06/10/86	0001	JS	U	MG/L	<	0.1		0.1	-
	0502	07/18/89	0001	JS	U			0.3		0.1	-
	0502	04/23/90	0001	JS	U		<	0.1		0.1	-
	0502	04/19/91	0001	JS	U			1.0		1.	-
	0502	08/03/91	0001	JS	U			2.1		0.1	-
	0502	01/14/92	0001	JS	U		<	0.1		0.1	-
	0502	06/26/92	0001	JS	U			1.08		1	-
	0503	06/09/86	0001	JS	U		<	0.1		0.1	-
	0503	07/12/89	0001	JS	U		<	0.1		0.1	-
	0503	04/20/90	0001	JS	U		<	0.1		0.1	-
	0503	12/08/90	0001	JS	U		<	0.1		0.1	-
	0503	04/18/91	0001	JS	U		<	1.	I	1.	-
	0503	08/02/91	0001	JS	U			0.4		0.1	-
	0503	06/25/92	0001	JS	U		<	1		1	-
TEMPERATURE	0502	01/29/86	0001	JS	U	C - DEGREE		14.		-	-
	0502	06/10/86	0001	JS	U			14.		-	-
	0502	10/08/87	0001	JS	U			17.0		-	-
	0502	07/18/89	0001	JS	U			15.0		-	-
	0502	04/23/90	0001	JS	U			14.5		-	-
	0502	12/08/90	0001	JS	U			14.0		-	-
	0502	04/19/91	0001	JS	U			14.2		-	-
	0502	08/03/91	0001	JS	U			16.2		-	-
	0502	08/05/91	0001	JS	U			16.2		-	-
	0502	01/14/92	0001	JS	U			12.9		-	-
	0502	06/26/92	0001	JS	U			14.4		-	-
	0503	01/29/86	0001	JS	U			12.		-	-
	0503	06/09/86	0001	JS	U			12.		-	-
	0503	10/08/87	0001	JS	U			11.0		-	-
	0503	07/12/89	0001	JS	U			13.0		-	-
	0503	04/20/90	0001	JS	U			12.0		-	-

FORMATION OF COMPLETION CODE:
JS - JURASSIC SALT WASH FORMATION

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

FLOW RELATIONSHIP CODE:
U - UPGRADIENT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.5 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, SALT WASH,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/26/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
TEMPERATURE	0503	12/08/90	0001	JS	U	C - DEGREE		12.2		-	-
	0503	04/18/91	0001	JS	U			12.0		-	-
	0503	08/02/91	0001	JS	U			12.7		-	-
	0503	08/05/91	0001	JS	U			12.7		-	-
	0503	06/25/92	0001	JS	U			12.3		-	-
THALLIUM	0502	07/18/89	0001	JS	U	MG/L	<	0.1		0.1	-
	0502	04/23/90	0001	JS	U		<	0.01		0.01	-
	0502	12/08/90	0001	JS	U		<	0.01		0.01	-
	0502	04/19/91	0001	JS	U		<	0.03	I	0.03	-
	0502	08/03/91	0001	JS	U		<	0.05	I	0.05	-
	0503	07/12/89	0001	JS	U		<	0.1		0.1	-
	0503	04/20/90	0001	JS	U		<	0.01		0.01	-
	0503	12/08/90	0001	JS	U		<	0.01		0.01	-
	0503	04/18/91	0001	JS	U		<	0.01		0.01	-
	0503	08/02/91	0001	JS	U		<	0.1	I	0.1	-
THORIUM-230	0502	07/18/89	0001	JS	U	PCI/L		0.5		1.	0.3
	0502	04/23/90	0001	JS	U			0.0		1.	0.3
	0503	06/09/86	0001	JS	U			1.		1.	0.6
	0503	07/12/89	0001	JS	U			0.1		1.	0.2
	0503	04/20/90	0001	JS	U			0.0		1.	0.3
TIN	0502	07/18/89	0001	JS	U	MG/L		0.040		0.005	-
	0502	04/23/90	0001	JS	U			0.411		0.005	-
	0502	12/08/90	0001	JS	U		<	0.005		0.005	-
	0502	04/19/91	0001	JS	U		<	0.03	I	0.03	-
	0502	08/03/91	0001	JS	U		<	0.05	I	0.05	-
	0502	01/14/92	0001	JS	U		<	0.05	I	0.05	-
	0502	06/26/92	0001	JS	U		<	0.005		0.005	-
	0503	06/09/86	0001	JS	U		<	0.005		0.005	-
	0503	07/12/89	0001	JS	U			0.060		0.005	-
	0503	04/20/90	0001	JS	U			0.315		0.005	-
	0503	12/08/90	0001	JS	U		<	0.005		0.005	-
	0503	04/18/91	0001	JS	U		<	0.03	I	0.03	-
	0503	08/02/91	0001	JS	U		<	0.05	I	0.05	-
	0503	06/25/92	0001	JS	U		<	0.005		0.005	-
TOTAL DISSOLVED SOLIDS	0502	01/29/86	0001	JS	U	MG/L		6180.		10.	-
	0502	06/10/86	0001	JS	U			6160.		10.	-

FORMATION OF COMPLETION CODE:
JS - JURASSIC SALT WASH FORMATION

FLOW RELATIONSHIP CODE:
U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

**TABLE 3.5 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, SALT WASH,
NATURITA SITE, COLORADO**

SITE: NAT01 NATURITA

01/29/86 TO 06/26/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
TOTAL DISSOLVED SOLIDS	0502	10/08/87	0001	JS	U	MG/L		6140.		10.	-
	0502	07/18/89	0001	JS	U			6100.		10.	-
	0502	04/23/90	0001	JS	U			6220.		10.	-
	0502	12/08/90	0001	JS	U			5850.		10.	-
	0502	04/19/91	0001	JS	U			6160.		10.	-
	0502	08/03/91	0001	JS	U			6160.		10.	-
	0502	01/14/92	0001	JS	U			6010		4	-
	0502	06/26/92	0001	JS	U			6060		10	-
	0503	01/29/86	0001	JS	U			5180.		10.	-
	0503	06/09/86	0001	JS	U			5250.		10.	-
	0503	10/08/87	0001	JS	U			5220.		10.	-
	0503	07/12/89	0001	JS	U			5240.		10.	-
	0503	04/20/90	0001	JS	U			5110.		10.	-
	0503	12/08/90	0001	JS	U			4950.		10.	-
	0503	04/18/91	0001	JS	U			5220.		10.	-
	0503	08/02/91	0001	JS	U			5250.		10.	-
	0503	06/25/92	0001	JS	U			5130		10	-
TOTAL KJELDAHL NITROGEN	0502	01/14/92	0001	JS	U	MG/L	<	1.0		1	-
	0502	06/26/92	0001	JS	U		<	1		1	-
	0503	06/25/92	0001	JS	U		<	1		1	-
TOTAL ORGANIC CARBON	0502	07/18/89	0001	JS	U	MG/L		1.		1.	-
	0502	04/19/91	0001	JS	U			4.		1.	-
	0503	07/12/89	0001	JS	U			3.		1.	-
	0503	04/18/91	0001	JS	U			3.		1.	-
URANIUM	0502	01/29/86	0001	JS	U	MG/L		0.0394		0.003	-
	0502	06/10/86	0001	JS	U			0.0252		0.003	-
	0502	10/08/87	0001	JS	U			0.0320		0.003	-
	0502	07/18/89	0001	JS	U			0.046		0.003	-
	0502	04/23/90	0001	JS	U			0.024		0.003	-
	0502	12/08/90	0001	JS	U			0.0416		0.0003	-
	0502	04/19/91	0001	JS	U			0.045		0.001	-
	0502	08/05/91	0001	JS	U			0.032		0.001	-
	0502	01/14/92	0001	JS	U			0.0389		0.0003	-
	0502	06/26/92	0001	JS	U			0.039		0.001	-
	0503	01/29/86	0001	JS	U			0.0373		0.003	-
	0503	06/09/86	0001	JS	U			0.0233		0.003	-
	0503	10/08/87	0001	JS	U			0.0326		0.003	-
	0503	07/12/89	0001	JS	U			0.044		0.003	-

FORMATION OF COMPLETION CODE:
JS - JURASSIC SALT WASH FORMATION

FLOW RELATIONSHIP CODE:
U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.5 BACKGROUND GROUNDWATER QUALITY DATA BY PARAMETER, SALT WASH,
NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/26/92

REPORT DATE: 06/08/93

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
URANIUM	0503	04/20/90	0001	JS	U	MG/L		0.038		0.003	-
	0503	12/08/90	0001	JS	U			0.0374		0.0003	-
	0503	04/18/91	0001	JS	U			0.044		0.001	-
	0503	08/05/91	0001	JS	U			0.031		0.001	-
	0503	06/25/92	0001	JS	U			0.033		0.001	-
VANADIUM	0502	06/10/86	0001	JS	U	MG/L		0.32		0.01	-
	0502	10/08/87	0001	JS	U			0.01		0.01	-
	0502	07/18/89	0001	JS	U		<	0.01		0.01	-
	0502	04/23/90	0001	JS	U			0.01		0.01	-
	0502	12/08/90	0001	JS	U		<	0.01		0.01	-
	0502	04/19/91	0001	JS	U		<	0.01		0.01	-
	0502	08/03/91	0001	JS	U		<	0.01		0.01	-
	0502	01/14/92	0001	JS	U		<	0.01		0.01	-
	0502	06/26/92	0001	JS	U			0.013		0.01	-
	0503	06/09/86	0001	JS	U			0.20		0.01	-
	0503	10/08/87	0001	JS	U		<	0.01		0.01	-
	0503	07/12/89	0001	JS	U		<	0.01		0.01	-
	0503	04/20/90	0001	JS	U		<	0.01		0.01	-
	0503	12/08/90	0001	JS	U		<	0.01		0.01	-
	0503	04/18/91	0001	JS	U		<	0.01		0.01	-
	0503	08/02/91	0001	JS	U		<	0.01		0.01	-
	0503	06/25/92	0001	JS	U		<	0.01		0.01	-
ZINC	0502	10/08/87	0001	JS	U	MG/L	<	0.005		0.005	-
	0502	07/18/89	0001	JS	U		<	0.005		0.005	-
	0502	04/23/90	0001	JS	U			0.008		0.005	-
	0502	12/08/90	0001	JS	U		<	0.005		0.005	-
	0502	04/19/91	0001	JS	U		<	0.005		0.005	-
	0502	08/03/91	0001	JS	U		<	0.005		0.005	-
	0502	01/14/92	0001	JS	U			0.015		0.005	-
	0502	06/26/92	0001	JS	U			0.014		0.005	-
	0503	06/09/86	0001	JS	U			0.012		0.005	-
	0503	10/08/87	0001	JS	U		<	0.005		0.005	-
	0503	07/12/89	0001	JS	U		<	0.005		0.005	-
	0503	04/20/90	0001	JS	U			0.066		0.005	-
	0503	12/08/90	0001	JS	U			0.011		0.005	-
	0503	04/18/91	0001	JS	U			0.023		0.005	-
	0503	08/02/91	0001	JS	U		<	0.005		0.005	-
	0503	06/25/92	0001	JS	U			0.012		0.005	-

FORMATION OF COMPLETION CODE:
JS - JURASSIC SALT WASH FORMATION

FLOW RELATIONSHIP CODE:
U - UPGRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

DATA FILE NAME: M:\DART\NAT01\GWQ10004.DAT

TABLE 3.6 BACKGROUND GROUNDWATER QUALITY STATISTICS BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

06/25/86 TO 06/25/92

REPORT DATE: 06/08/93

PARAMETER NAME					UNITS								
# OF SAMP	MINIMUM	MAXIMUM	MEDIAN	MEAN		STANDARD DEVIATION	COEFF. OF VARIATION	% OF NON DETECTS	STATISTICAL RANGE 98% CONFIDENCE INTERVAL		DISTRIBUTION TYPE	FOOT NOTE	
									MINIMUM	MAXIMUM *			
ALKALINITY					MG/L CaCO3								
29	211.0000	407.0000	242.0000	259.9310		48.2745	0.1857	0.0	237.8160	282.0461	NORMAL		
ALUMINUM					MG/L								
29	** 0.0500	0.4000	0.0500	NA		NA	NA	62.1	** 0.0500	0.1320	NONPARAMETRIC	2	
AMMONIUM					MG/L								
28	0.0500	0.5000	+ 0.0500	NA		NA	NA	75.0	0.0500	0.1000	NONPARAMETRIC	2	
ANTIMONY					MG/L								
25	** 0.0030	0.0180	** 0.0030	NA		NA	NA	92.0	** 0.0030	** 0.0030	NONPARAMETRIC	2	
ARSENIC					MG/L								
29	** 0.0010	0.0100	0.0050	NA		NA	NA	89.7	0.0050	0.0050	NONPARAMETRIC	2	
BARIUM					MG/L								
25	0.0200	0.4000	0.0500	NA		NA	NA	48.0	0.0300	0.0500	NONPARAMETRIC	2	
BERYLLIUM					MG/L								
15	** 0.0050	0.0050	** 0.0050	NA		NA	NA	100.0	** 0.0050	0.0050	NONPARAMETRIC	2	
BORON					MG/L								
10	** 0.1000	0.1100	** 0.1000	NA		NA	NA	70.0	** 0.1000	0.1000	NONPARAMETRIC	2	
BROMIDE					MG/L								
6	** 0.1000	1.0000	+ 0.5250	NA		NA	NA	100.0	** 0.1000	1.0000	NONPARAMETRIC	2,6	
CADMIUM					MG/L								
28	** 0.0010	0.0025	** 0.0010	NA		NA	NA	96.4	** 0.0010	** 0.0010	NONPARAMETRIC	2	

** The reported value is the minimum detection limit of the data set

+ The sample size is even, so the median value is the arithmetic average of the two middle values

* The statistical maximum is the 99 percent one sided confidence interval, $\alpha = 0.01$

2) The nonparametric distribution was used because the nondetected values comprise more than 15% of the samples.

6) The stat. range is the 96.9% confidence interval due to a sample size of 6. The maximum is the 98.5% one sided confidence int.

TABLE 3.6 BACKGROUND GROUNDWATER QUALITY STATISTICS BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO
SITE: NATO1 NATURITA
06/25/86 TO 06/25/92
REPORT DATE: 06/08/93

PARAMETER NAME				UNITS	MEAN	STANDARD DEVIATION	COEFF. OF VARIATION	% OF NON DETECTS	STATISTICAL RANGE 98% CONFIDENCE INTERVAL		DISTRIBUTION TYPE	FOOT NOTE
# OF SAMP	MINIMUM	MAXIMUM	MEDIAN						MINIMUM	MAXIMUM *		
CALCIUM				MG/L								
29	98.0000	333.0000	163.0000		184.9655	60.4001	0.3265	0.0	157.2956	212.6355	NORMAL	
CHLORIDE				MG/L								
29	2.2000	42.6000	12.1000		14.4931	10.1325	0.6991	0.0	9.8513	19.1349	NORMAL	
CHROMIUM				MG/L								
25	** 0.0100	0.0500	** 0.0100		NA	NA	NA	88.0	** 0.0100	** 0.0100	NONPARAMETRIC	2
COBALT				MG/L								
6	** 0.0500	** 0.0500	** 0.0500		NA	NA	NA	100.0	** 0.0500	** 0.0500	NONPARAMETRIC	2,6
COPPER				MG/L								
22	** 0.0100	0.0400	+ 0.0100		NA	NA	NA	72.7	** 0.0100	0.0100	NONPARAMETRIC	2
CYANIDE				MG/L								
21	** 0.0100	0.0100	** 0.0100		NA	NA	NA	100.0	** 0.0100	** 0.0100	NONPARAMETRIC	2
DISSOLVED ORGANIC CARBON				MG/L								
15	2.0000	86.0000	8.2000		11.3426	3.9458	NA	0.0	4.4753	28.7479	LOGNORMAL	7,8
FLUORIDE				MG/L								
28	0.2000	0.5720	+ 0.3000		0.3417	0.0889	0.2601	0.0	0.3002	0.3833	NORMAL	
GROSS ALPHA				PCI/L								
21	** 0.2000	19.6000	7.9000		NA	NA	NA	0.0	4.4000	15.0000	NONPARAMETRIC	9

** The reported value is the minimum detection limit of the data set

+ The sample size is even, so the median value is the arithmetic average of the two middle values

* The statistical maximum is the 99 percent one sided confidence interval, $\alpha = 0.01$

2) The nonparametric distribution was used because the nondetected values comprise more than 15% of the samples.

6) The stat. range is the 96.9% confidence interval due to a sample size of 6. The maximum is the 98.5% one sided confidence int.

7) The lognormal distribution was used because the data failed the normal distribution test.

8) The mean is geometric. The standard deviation is the value to divide or multiply with the geometric mean.

9) The nonparametric distribution was used because the data failed the normal distribution test and includes values ≤ 0 .

TABLE 3.6 BACKGROUND GROUNDWATER QUALITY STATISTICS BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

06/25/86 TO 06/25/92

REPORT DATE: 06/08/93

PARAMETER NAME					UNITS					STATISTICAL RANGE 98% CONFIDENCE INTERVAL		DISTRIBUTION	FOOT
# OF SAMP	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION	COEFF. OF VARIATION	% OF NON DETECTS	MINIMUM	MAXIMUM *	TYPE	NOTE		
GROSS BETA				PCI/L									
21	3.4000	48.2000	9.7000	13.6333	12.8474	0.9424	0.0	6.5460	20.7207	NORMAL			
IRON				MG/L									
14	** 0.0300	0.0800	+ 0.0450	NA	NA	NA	42.9	** 0.0300	0.0800	NONPARAMETRIC	2		
LEAD				MG/L									
22	** 0.0050	0.0050	+ 0.0050	NA	NA	NA	100.0	** 0.0050	0.0050	NONPARAMETRIC	2		
LEAD-210				PCI/L									
10	** 1.5000	3.4000	** 1.5000	NA	NA	NA	0.0	** 1.5000	2.3000	NONPARAMETRIC	9		
MAGNESIUM				MG/L									
29	24.0000	70.0000	33.9000	37.4448	11.9115	0.3181	0.0	31.9880	42.9016	NORMAL			
MANGANESE				MG/L									
29	** 0.0100	0.9200	0.0300	NA	NA	NA	27.6	** 0.0100	0.0700	NONPARAMETRIC	2		
MERCURY				MG/L									
22	** 0.0002	** 0.0002	** 0.0002	NA	NA	NA	100.0	** 0.0002	** 0.0002	NONPARAMETRIC	2		
MOLYBDENUM				MG/L									
29	** 0.0100	0.2400	** 0.0100	NA	NA	NA	58.6	** 0.0100	0.0300	NONPARAMETRIC	2		
NET GROSS ALPHA ***				PCI/L									
21	-10.2900	17.5400	-1.6100	NA	NA	NA	0.0	-5.1200	5.4000	NONPARAMETRIC	9		

*** NET GROSS ALPHA (GROSS ALPHA - URANIUM) WITH 1 MG URANIUM = 686 PCI

** The reported value is the minimum detection limit of the data set

+ The sample size is even, so the median value is the arithmetic average of the two middle values

* The statistical maximum is the 99 percent one sided confidence interval, $\alpha = 0.01$

2) The nonparametric distribution was used because the nondetected values comprise more than 15% of the samples.

9) The nonparametric distribution was used because the data failed the normal distribution test and includes values ≤ 0 .

TABLE 3.6 BACKGROUND GROUNDWATER QUALITY STATISTICS BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
06/25/86 TO 06/25/92
REPORT DATE: 06/08/93

PARAMETER NAME				UNITS	MEAN	STANDARD DEVIATION	COEFF. OF VARIATION	% OF NON DETECTS	STATISTICAL RANGE 98% CONFIDENCE INTERVAL		DISTRIBUTION TYPE	FOOT NOTE
# OF SAMP	MINIMUM	MAXIMUM	MEDIAN						MINIMUM	MAXIMUM *		
NICKEL				MG/L								
22	** 0.0400	0.0500	** 0.0400		NA	NA	NA	86.4	** 0.0400	** 0.0400	NONPARAMETRIC	2
NITRATE				MG/L								
29	0.5000	7100.0000	2.7000		NA	NA	NA	34.5	0.5000	7.1000	NONPARAMETRIC	2
NITRITE AND NITRATE				MG/L								
12	0.2600	3.5700	+ 0.5950		NA	NA	NA	25.0	0.3900	2.8000	NONPARAMETRIC	2
PH				SU								
29	6.6600	7.3200	6.9400		NA	NA	NA	0.0	NA	NA	UNKNOWN	
PHOSPHATE				MG/L								
28	0.0500	1.0000	+ 0.0500		NA	NA	NA	71.4	0.0500	0.1000	NONPARAMETRIC	2
POLONIUM-210				PCI/L								
10	** 1.0000	** 1.0000	** 1.0000		NA	NA	NA	0.0	** 1.0000	** 1.0000	NONPARAMETRIC	9
POTASSIUM				MG/L								
29	0.8900	4.7000	2.5000		2.3676	0.9156	0.3867	6.9	1.9482	2.7870	NORMAL	
RADIUM-226				PCI/L								
26	** 1.0000	** 1.0000	** 1.0000		NA	NA	NA	0.0	** 1.0000	** 1.0000	NONPARAMETRIC	9
RADIUM-226 + RADIUM-228				PCI/L								
26	0.0000	6.8000	+ 0.2000		NA	NA	NA	0.0	0.1000	0.8000	NONPARAMETRIC	9
RADIUM-228				PCI/L								
26	** 1.0000	6.7000	** 1.0000		NA	NA	NA	0.0	** 1.0000	** 1.0000	NONPARAMETRIC	9

** The reported value is the minimum detection limit of the data set

+ The sample size is even, so the median value is the arithmetic average of the two middle values

* The statistical maximum is the 99 percent one sided confidence interval, $\alpha = 0.01$

1) A minimum of 4 samples must be available for the statistical analysis.

2) The nonparametric distribution was used because the nondetected values comprise more than 15% of the samples.

9) The nonparametric distribution was used because the data failed the normal distribution test and includes values ≤ 0 .

TABLE 3.6 BACKGROUND GROUNDWATER QUALITY STATISTICS BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

06/25/86 TO 06/25/92

REPORT DATE: 06/08/93

PARAMETER NAME				UNITS		STANDARD DEVIATION	COEFF. OF VARIATION	% OF NON DETECTS	STATISTICAL RANGE 98% CONFIDENCE INTERVAL		DISTRIBUTION TYPE	FOOT NOTE
# OF SAMP	MINIMUM	MAXIMUM	MEDIAN	MEAN					MINIMUM	MAXIMUM *		
REDOX POTENTIAL				mVOLTS								
3	459.4000	475.7000	462.7000	NA		NA	NA	0.0	NA	NA	UNKNOWN	1
SELENIUM				MG/L								
29	** 0.0020	0.0150	0.0025	NA		NA	NA	62.1	0.0025	0.0060	NONPARAMETRIC	2
SILICA - SIO2				MG/L								
13	4.0000	16.1000	12.2000	12.4077		2.9079	0.2344	0.0	10.2455	14.5699	NORMAL	
SILVER				MG/L								
28	** 0.0100	0.0100	** 0.0100	NA		NA	NA	92.9	** 0.0100	** 0.0100	NONPARAMETRIC	2
SODIUM				MG/L								
29	34.6000	161.0000	58.0000	63.1621		25.6059	0.4054	0.0	51.4317	74.8924	NORMAL	
SPECIFIC CONDUCTANCE				UMHO/CM								
29	4.0000	1623.0000	800.0000	873.1379		390.7926	0.4476	0.0	694.1118	1052.1641	NORMAL	
STRONTIUM				MG/L								
21	0.8200	2.2000	1.2000	1.3690		0.4024	0.2939	0.0	1.1471	1.5910	NORMAL	
SULFATE				MG/L								
29	244.0000	917.0000	428.0000	453.5172		169.1505	0.3730	0.0	376.0276	531.0069	NORMAL	
SULFIDE				MG/L								
23	** 0.1000	2.3000	** 0.1000	NA		NA	NA	82.6	** 0.1000	0.5000	NONPARAMETRIC	2
TEMPERATURE				C - DEGREE								
29	7.5000	17.0000	11.9000	12.0103		2.7933	0.2326	0.0	10.7307	13.2900	NORMAL	

** The reported value is the minimum detection limit of the data set

* The statistical maximum is the 99 percent one sided confidence interval, $\alpha = 0.01$

1) A minimum of 4 samples must be available for the statistical analysis.

2) The nonparametric distribution was used because the nondetected values comprise more than 15% of the samples.

TABLE 3.6 BACKGROUND GROUNDWATER QUALITY STATISTICS BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
06/25/86 TO 06/25/92
REPORT DATE: 06/08/93

PARAMETER NAME					UNITS		STANDARD DEVIATION	COEFF. OF VARIATION	% OF NON DETECTS	STATISTICAL RANGE 98% CONFIDENCE INTERVAL MINIMUM MAXIMUM *		DISTRIBUTION TYPE	FOOT NOTE			
# OF SAMP	MINIMUM		MAXIMUM		MEDIAN	MEAN										
THALLIUM					MG/L											
15	**	0.0100	0.0500	**	0.0100	NA	NA	NA	100.0	**	0.0100	0.0500	NONPARAMETRIC	2		
THORIUM-230					PCI/L											
10	**	1.0000	**	1.0000	**	1.0000	NA	NA	NA	0.0	**	1.0000	**	1.0000	NONPARAMETRIC	9
TIN					MG/L											
22	**	0.0050	0.0050	**	0.0050	NA	NA	NA	100.0	**	0.0050	**	0.0050	NONPARAMETRIC	2	
TOTAL DISSOLVED SOLIDS					MG/L											
29	568.0000		1810.0000		854.0000		973.8966	318.4751	0.3270	0.0	827.9998	1119.7933	NORMAL			
TOTAL KJELDAHL NITROGEN					MG/L											
6	**	1.0000	**	1.0000	**	1.0000	NA	NA	NA	100.0	**	1.0000	**	1.0000	NONPARAMETRIC	2,6
TOTAL ORGANIC CARBON					MG/L											
6	1.0000		620.0000		+	2.5000	6.1110	10.4966	NA	0.0	**	1.0000	154.4479	LOGNORMAL	7,8	
URANIUM					MG/L											
29	0.0020		0.0449		0.0140		0.0161	0.0098	0.6062	0.0	0.0116	0.0206	NORMAL			
VANADIUM					MG/L											
29	**	0.0100	0.5000		0.0100		NA	NA	NA	37.9	**	0.0100	0.0200	NONPARAMETRIC	2	
ZINC					MG/L											
28	**	0.0050	0.0800		+	0.0475	0.0416	0.0254	0.6090	3.6	0.0298	0.0535	NORMAL			

** The reported value is the minimum detection limit of the data set

+ The sample size is even, so the median value is the arithmetic average of the two middle values

* The statistical maximum is the 99 percent one sided confidence interval, $\alpha = 0.01$

2) The nonparametric distribution was used because the nondetected values comprise more than 15% of the samples.

6) The stat. range is the 96.9% confidence interval due to a sample size of 6. The maximum is the 98.5% one sided confidence int.

7) The lognormal distribution was used because the data failed the normal distribution test.

8) The mean is geometric. The standard deviation is the value to divide or multiply with the geometric mean.

9) The nonparametric distribution was used because the data failed the normal distribution test and includes values ≤ 0 .

TABLE 3.6 BACKGROUND GROUNDWATER QUALITY STATISTICS BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NATO1 NATURITA

06/25/86 TO 06/25/92

REPORT DATE: 06/08/93

PARAMETER NAME				UNITS	MEAN	STANDARD DEVIATION	COEFF. OF VARIATION	% OF NON DETECTS	STATISTICAL RANGE 98% CONFIDENCE INTERVAL		DISTRIBUTION TYPE	FOOT NOTE
# OF SAMP	MINIMUM	MAXIMUM	MEDIAN						MINIMUM	MAXIMUM *		

* The statistical maximum is the 99 percent one sided confidence interval, $\alpha = 0.01$

INPUT DATA FILENAME: M:\DART\NATO1\GWQ10003.DAT

TABLE 3.7 BACKGROUND GROUNDWATER QUALITY STATISTICS BY PARAMETER,
SALT WASH, NATURITA SITE, COLORADO
SITE: NATO1 NATURITA
01/29/86 TO 06/26/92
REPORT DATE: 06/08/93

PARAMETER NAME				UNITS		STANDARD DEVIATION	COEFF. OF VARIATION	% OF NON DETECTS	STATISTICAL RANGE 98% CONFIDENCE INTERVAL MINIMUM MAXIMUM *		DISTRIBUTION TYPE	FOOT NOTE
# OF SAMP	MINIMUM	MAXIMUM	MEDIAN	MEAN								
ALKALINITY				MG/L CaCO3								
21	1031.0000	1162.0000	1045.0000	1060.0000		33.5619	0.0317	0.0	1041.4854	1078.5146	NORMAL	
ALUMINUM				MG/L								
17	** 0.0500	0.4000	0.0500	NA		NA	NA	76.5	** 0.0500	0.0970	NONPARAMETRIC	2
AMMONIUM				MG/L								
18	0.0500	1.0000	+ 0.6100	NA		NA	NA	16.7	0.4000	0.9000	NONPARAMETRIC	2
ANTIMONY				MG/L								
14	** 0.0030	0.1880	+ 0.0100	NA		NA	NA	50.0	0.0040	0.0150	NONPARAMETRIC	2
ARSENIC				MG/L								
19	0.0050	0.1600	0.0300	NA		NA	NA	42.1	0.0050	0.0500	NONPARAMETRIC	2
BARIUM				MG/L								
16	** 0.0100	0.3000	+ 0.0500	NA		NA	NA	87.5	** 0.0100	0.0500	NONPARAMETRIC	2
BERYLLIUM				MG/L								
10	** 0.0050	0.0050	** 0.0050	NA		NA	NA	100.0	** 0.0050	0.0050	NONPARAMETRIC	2
BORON				MG/L								
7	0.1000	0.7000	0.6100	0.5629		0.2087	0.3708	0.0	0.3149	0.8108	NORMAL	
BROMIDE				MG/L								
4	1.0000	1.6000	+ 1.5500	NA		NA	NA	25.0	1.0000	1.6000	NONPARAMETRIC	2,4
CADMIUM				MG/L								
18	** 0.0010	0.0025	** 0.0010	NA		NA	NA	100.0	** 0.0010	** 0.0010	NONPARAMETRIC	2

** The reported value is the minimum detection limit of the data set

+ The sample size is even, so the median value is the arithmetic average of the two middle values

* The statistical maximum is the 99 percent one sided confidence interval, $\alpha = 0.01$

2) The nonparametric distribution was used because the nondetected values comprise more than 15% of the samples.

4) The stat. range is the 87.5% confidence interval due to a sample size of 4. The maximum is the 93.8% one sided confidence int.

TABLE 3.7 BACKGROUND GROUNDWATER QUALITY STATISTICS BY PARAMETER,
SALT WASH, NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
01/29/86 TO 06/26/92
REPORT DATE: 06/08/93

PARAMETER NAME				UNITS					STATISTICAL RANGE			
# OF SAMP	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION	COEFF. OF VARIATION	% OF NON DETECTS	98% CONFIDENCE INTERVAL	MINIMUM	MAXIMUM *	DISTRIBUTION TYPE	FOOT NOTE
CALCIUM				MG/L								
19	51.7000	167.0000	81.4000	79.7947	28.0763	0.3519	0.0	63.3569	96.2325		NORMAL	
CHLORIDE				MG/L								
19	517.0000	810.0000	611.0000	612.7895	77.2230	0.1260	0.0	567.5778	658.0012		NORMAL	
CHROMIUM				MG/L								
14	** 0.0100	0.0300	** 0.0100	NA	NA	NA	92.9	** 0.0100	** 0.0100		NONPARAMETRIC	2
COBALT				MG/L								
4	** 0.0500	** 0.0500	** 0.0500	NA	NA	NA	100.0	** 0.0500	** 0.0500		NONPARAMETRIC	2,4
COPPER				MG/L								
13	** 0.0100	0.0200	0.0100	NA	NA	NA	92.3	** 0.0100	0.0100		NONPARAMETRIC	2
CYANIDE				MG/L								
13	** 0.0100	0.0100	** 0.0100	NA	NA	NA	100.0	** 0.0100	0.0100		NONPARAMETRIC	2
DISSOLVED ORGANIC CARBON				MG/L								
9	1.0000	219.0000	9.1000	18.6780	7.3716	NA	11.1	2.7155	128.4736		LOGNORMAL	7,8
FLUORIDE				MG/L								
16	0.2000	0.7000	+ 0.4000	0.4010	0.1263	0.3149	0.0	0.3189	0.4831		NORMAL	
GROSS ALPHA				PCI/L								
13	31.3000	110.0000	66.1000	69.8846	23.1511	0.3313	0.0	52.6700	87.0992		NORMAL	

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2) The nonparametric distribution was used because the nondetected values comprise more than 15% of the samples.

4) The stat. range is the 87.5% confidence interval due to a sample size of 4. The maximum is the 93.8% one sided confidence int.

7) The lognormal distribution was used because the data failed the normal distribution test.

8) The mean is geometric. The standard deviation is the value to divide or multiply with the geometric mean.

TABLE 3.7 BACKGROUND GROUNDWATER QUALITY STATISTICS BY PARAMETER,
SALT WASH, NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
01/29/86 TO 06/26/92
REPORT DATE: 06/08/93

PARAMETER NAME					UNITS		STANDARD DEVIATION	COEFF. OF VARIATION	% OF NON DETECTS	STATISTICAL RANGE 95% CONFIDENCE INTERVAL MINIMUM MAXIMUM *		DISTRIBUTION TYPE	FOOT NOTE
# OF SAMP	MINIMUM	MAXIMUM	MEDIAN	MEAN									
GROSS BETA					PCI/L								
13	** 0.5000	95.0000	49.0000	NA		NA	NA	0.0	** 0.5000	88.4000	NONPARAMETRIC	9	
IRON					MG/L								
10	0.1200	0.9200	+ 0.2000	0.3550		0.2962	0.8344	0.0	0.0908	0.6192	NORMAL		
LEAD					MG/L								
13	** 0.0050	0.0050	0.0050	NA		NA	NA	100.0	** 0.0050	0.0050	NONPARAMETRIC	2	
LEAD-210					PCI/L								
5	** 1.5000	2.6000	** 1.5000	NA		NA	NA	0.0	** 1.5000	2.6000	NONPARAMETRIC	9,5	
MAGNESIUM					MG/L								
19	20.6000	37.6000	27.8000	27.3579		5.2213	0.1908	0.0	24.3010	30.4148	NORMAL		
MANGANESE					MG/L								
19	** 0.0100	0.0900	0.0100	NA		NA	NA	42.1	** 0.0100	0.0400	NONPARAMETRIC	2	
MERCURY					MG/L								
13	** 0.0002	** 0.0002	** 0.0002	NA		NA	NA	100.0	** 0.0002	** 0.0002	NONPARAMETRIC	2	
MOLYBDENUM					MG/L								
19	** 0.0100	0.2400	** 0.0100	NA		NA	NA	63.2	** 0.0100	0.1000	NONPARAMETRIC	2	
NET GROSS ALPHA ***					PCI/L								
13	9.3500	83.9300	39.3500	43.8215		23.7405	0.5418	0.0	26.1687	61.4744	NORMAL		

*** NET GROSS ALPHA (GROSS ALPHA - URANIUM) WITH 1 MG URANIUM = 686 PCI

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+ The sample size is even, so the median value is the arithmetic average of the two middle values

* The statistical maximum is the 99 percent one sided confidence interval, $\alpha = 0.01$

2) The nonparametric distribution was used because the nondetected values comprise more than 15% of the samples.

5) The stat. range is the 93.8% confidence interval due to a sample size of 5. The maximum is the 96.9% one sided confidence int.

9) The nonparametric distribution was used because the data failed the normal distribution test and includes values ≤ 0 .

TABLE 3.7 BACKGROUND GROUNDWATER QUALITY STATISTICS BY PARAMETER,
SALT WASH, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/26/92

REPORT DATE: 06/08/93

PARAMETER NAME				UNITS						STATISTICAL RANGE 98% CONFIDENCE INTERVAL	DISTRIBUTION TYPE	FOOT NOTE
# OF SAMP	MINIMUM	MAXIMUM	MEDIAN	MEAN	STANDARD DEVIATION	COEFF. OF VARIATION	% OF NON DETECTS	MINIMUM MAXIMUM *				
NICKEL				MG/L								
13	** 0.0400	0.0900	** 0.0400	NA	NA	NA	92.3	** 0.0400	** 0.0400	NONPARAMETRIC	2	
NITRATE				MG/L								
19	0.4000	12.5000	0.5000	NA	NA	NA	73.7	0.5000	1.8000	NONPARAMETRIC	2	
NITRITE AND NITRATE				MG/L								
7	0.1000	2.8000	0.4700	NA	NA	NA	28.6	0.1000	2.8000	NONPARAMETRIC	2	
PH				SU								
21	6.9900	7.4200	7.1100	NA	NA	NA	0.0	NA	NA	UNKNOWN		
PHOSPHATE				MG/L								
16	0.0500	0.3600	+ 0.1000	NA	NA	NA	43.8	0.0500	0.2000	NONPARAMETRIC	2	
POLONIUM-210				PCI/L								
5	** 1.0000	** 1.0000	** 1.0000	NA	NA	NA	0.0	** 1.0000	** 1.0000	NONPARAMETRIC	9,5	
POTASSIUM				MG/L								
19	14.0000	33.1000	23.0000	22.7526	4.5770	0.2012	0.0	20.0729	25.4323	NORMAL		
RADIUM-226				PCI/L								
16	** 1.0000	6.3000	+ 2.1000	2.5562	1.7401	0.6807	0.0	1.4243	3.6882	NORMAL		
RADIUM-226 + RADIUM-228				PCI/L								
16	2.0000	10.5000	+ 5.1000	5.2375	2.2709	0.4336	0.0	3.7603	6.7147	NORMAL		

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* The statistical maximum is the 99 percent one sided confidence interval, $\alpha = 0.01$

1) A minimum of 4 samples must be available for the statistical analysis.

2) The nonparametric distribution was used because the nondetected values comprise more than 15% of the samples.

5) The stat. range is the 93.8% confidence interval due to a sample size of 5. The maximum is the 96.9% one sided confidence int.

9) The nonparametric distribution was used because the data failed the normal distribution test and includes values ≤ 0 .

TABLE 3.7 BACKGROUND GROUNDWATER QUALITY STATISTICS BY PARAMETER,
SALT WASH, NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
01/29/86 TO 06/26/92
REPORT DATE: 06/08/93

PARAMETER NAME				UNITS	MEAN	STANDARD DEVIATION	COEFF. OF VARIATION	% OF NON DETECTS	STATISTICAL RANGE 98% CONFIDENCE INTERVAL		DISTRIBUTION TYPE	FOOT NOTE
# OF SAMP	MINIMUM	MAXIMUM	MEDIAN						MINIMUM	MAXIMUM *		
RADIUM-228				PCI/L								
16	** 1.0000	8.3000	+ 2.5500		NA	NA	NA	0.0	1.3000	3.3000	NONPARAMETRIC	9
REDOX POTENTIAL				mVOLTS								
1	190.7000	190.7000	190.7000		NA	NA	NA	0.0	NA	NA	UNKNOWN	1
SELENIUM				MG/L								
19	** 0.0050	0.3210	0.0100		NA	NA	NA	84.2	** 0.0050	0.0250	NONPARAMETRIC	2
SILICA - SiO2				MG/L								
7	3.0000	10.9000	8.1000		7.7814	2.4015	0.3086	0.0	4.9285	10.6343	NORMAL	
SILVER				MG/L								
16	** 0.0100	0.0110	** 0.0100		NA	NA	NA	93.8	** 0.0100	** 0.0100	NONPARAMETRIC	2
SODIUM				MG/L								
19	1700.0000	2190.0000	1890.0000		1937.3684	162.5437	0.0839	0.0	1842.2041	2032.5327	NORMAL	
SPECIFIC CONDUCTANCE				UMHO/CM								
21	1200.0000	8020.0000	5500.0000		5458.5714	1786.5310	0.3273	0.0	4473.0230	6444.1198	NORMAL	
STRONTIUM				MG/L								
13	1.9100	3.0100	2.4200		2.4585	0.4505	0.1832	0.0	2.1235	2.7934	NORMAL	
SULFATE				MG/L								
19	2230.0000	2950.0000	2380.0000		2538.9474	280.5529	0.1105	0.0	2374.6924	2703.2024	NORMAL	
SULFIDE				MG/L								
14	** 0.1000	2.1000	+ 0.1750		NA	NA	NA	64.3	** 0.1000	1.0000	NONPARAMETRIC	2

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+ The sample size is even, so the median value is the arithmetic average of the two middle values

* The statistical maximum is the 99 percent one sided confidence interval, $\alpha = 0.01$

1) A minimum of 4 samples must be available for the statistical analysis.

2) The nonparametric distribution was used because the nondetected values comprise more than 15% of the samples.

9) The nonparametric distribution was used because the data failed the normal distribution test and includes values ≤ 0 .

TABLE 3.7 BACKGROUND GROUNDWATER QUALITY STATISTICS BY PARAMETER,
SALT WASH, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/26/92

REPORT DATE: 06/08/93

PARAMETER NAME					UNITS								
# OF SAMP	MINIMUM	MAXIMUM	MEDIAN	MEAN		STANDARD DEVIATION	COEFF. OF VARIATION	% OF NON DETECTS	STATISTICAL RANGE 98% CONFIDENCE INTERVAL		DISTRIBUTION TYPE	FOOT NOTE	
									MINIMUM	MAXIMUM *			
TEMPERATURE					C - DEGREE								
21	11.0000	17.0000	13.0000	13.5381		1.6182	0.1195	0.0	12.6454	14.4308	NORMAL		
THALLIUM					MG/L								
10	** 0.0100	0.0500	+ 0.0100	NA		NA	NA	100.0	** 0.0100	0.0500	NONPARAMETRIC	2	
THORIUM-230					PCI/L								
5	** 1.0000	1.0000	** 1.0000	NA		NA	NA	0.0	** 1.0000	1.0000	NONPARAMETRIC	9,5	
TIN					MG/L								
14	** 0.0050	0.4110	+ 0.0200	NA		NA	NA	71.4	** 0.0050	0.0600	NONPARAMETRIC	2	
TOTAL DISSOLVED SOLIDS					MG/L								
19	4950.0000	6220.0000	5850.0000	5662.6316		488.4311	0.0863	0.0	5376.6704	5948.5928	NORMAL		
TOTAL KJELDAHL NITROGEN					MG/L								
3	** 1.0000	** 1.0000	** 1.0000	NA		NA	NA	100.0	NA	NA	UNKNOWN	1	
TOTAL ORGANIC CARBON					MG/L								
4	1.0000	4.0000	+ 3.0000	2.7500		1.2583	0.4576	0.0	** 1.0000	5.6070	NORMAL		
URANIUM					MG/L								
19	0.0233	0.0460	0.0374	0.0360		0.0070	0.1939	0.0	0.0319	0.0401	NORMAL		
VANADIUM					MG/L								
17	** 0.0100	0.3200	** 0.0100	NA		NA	NA	70.6	** 0.0100	0.0100	NONPARAMETRIC	2	

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+ The sample size is even, so the median value is the arithmetic average of the two middle values

* The statistical maximum is the 99 percent one sided confidence interval, $\alpha = 0.01$

1) A minimum of 4 samples must be available for the statistical analysis.

2) The nonparametric distribution was used because the nondetected values comprise more than 15% of the samples.

5) The stat. range is the 93.8% confidence interval due to a sample size of 5. The maximum is the 96.9% one sided confidence int.

9) The nonparametric distribution was used because the data failed the normal distribution test and includes values ≤ 0 .

TABLE 3.7 BACKGROUND GROUNDWATER QUALITY STATISTICS BY PARAMETER,
SALT WASH, NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
01/29/86 TO 06/26/92
REPORT DATE: 06/08/93

PARAMETER NAME					UNITS		STANDARD DEVIATION	COEFF. OF VARIATION	% OF NON DETECTS	STATISTICAL RANGE 98% CONFIDENCE INTERVAL		DISTRIBUTION TYPE	FOOT NOTE
# OF SAMP	MINIMUM	MAXIMUM	MEDIAN	MEAN	MINIMUM					MAXIMUM *			
ZINC					MG/L								
16	** 0.0050	0.0660	+ 0.0053	NA		NA	NA	50.0	** 0.0050	0.0150	NONPARAMETRIC	2	

** The reported value is the minimum detection limit of the data set

+ The sample size is even, so the median value is the arithmetic average of the two middle values

* The statistical maximum is the 99 percent one sided confidence interval, $\alpha = 0.01$

2) The nonparametric distribution was used because the nondetected values comprise more than 15% of the samples.

INPUT DATA FILENAME: M:\DART\NAT01\GWQ10004.DAT

Table 3.8 Hazardous constituents that exceed analytical detection limits, and average and statistical maximum value, for background water quality in the alluvium at the Naturita site, Colorado^a

Hazardous constituent	Detection limit	MCL	Average	Statistical maximum
Aluminum	0.1	--	0.05	0.13
Antimony	0.003	--	0.003	0.003
Arsenic	0.01	0.05	0.005	0.005
Barium	0.1	1.00	0.05	0.05
Beryllium	0.01	--	0.005	0.005
Cadmium	0.001	0.01	0.001	0.001
Chromium	0.01	0.05	0.01	0.01
Copper	0.02	--	0.01	0.01
Cyanide	0.01	--	0.01	0.01
Fluoride	0.1	--	0.30	0.38
Gross alpha	1.0 pCi/L	15 pCi/L	7.9 pCi/L	15.0 pCi/L
Lead	0.01	0.05	0.005	0.005
Mercury	0.0002	0.0002	0.0002	0.0002
Molybdenum	0.01	0.10	0.01	0.03
Nickel	0.04	--	0.04	0.04
Nitrate	1.0	44	2.7	7.1
Radium-226, -228	1.0 pCi/L	5 pCi/L	0.2 pCi/L	0.8 pCi/L
Selenium	0.005	0.01	0.003	0.006
Silver	0.01	0.05	0.01	0.01
Strontium	0.1	--	1.20	1.59
Thallium	0.01	--	0.01	0.05
Tin	0.005	--	0.005	0.005
Uranium	0.003	0.044	0.014	0.021
Vanadium	0.01	--	0.01	0.02
Zinc	0.005	--	0.048	0.054

^aIn milligrams per liter except where noted.
pCi/L - picocuries per liter

Table 3.9 Hazardous constituents that exceed analytical detection limits, and average and statistical maximum value, for background water quality in the Salt Wash at the Naturita site, Colorado*

Hazardous constituent	Detection limit	MCL	Average	Statistical maximum
Aluminum	0.1	--	0.05	0.10
Antimony	0.003	--	0.010	0.015
Arsenic	0.01	0.01	0.030	0.050
Barium	0.1	1.00	0.05	0.05
Beryllium	0.01	--	0.0005	0.005
Cadmium	0.001	0.01	0.001	0.001
Chromium	0.01	0.05	0.01	0.01
Copper	0.02	--	0.01	0.01
Cyanide	0.01	--	0.01	0.01
Fluoride	0.1	--	0.40	0.48
Gross alpha	1.0 pCi/L	15 pCi/L	66.1	87.1
Lead	0.01	0.05	0.005	0.005
Mercury	0.0002	0.0002	0.0002	0.0002
Molybdenum	0.01	0.10	0.01	0.10
Nickel	0.04	--	0.04	0.04
Nitrate	1.0	44	0.5	1.8
Radium -226, -228	1.0 pCi/L	5 pCi/L	5.1 pCi/L	6.7 pCi/L
Selenium	0.005	0.01	0.010	0.025
Silver	0.01	0.05	0.005	0.01
Strontium	0.1	--	2.4	2.8
Thallium	0.01	--	0.01	0.05
Tin	0.005	--	0.02	0.06
Uranium	0.003	0.044	0.037	0.040
Vanadium	0.01	--	0.010	0.010
Zinc	0.005	--	0.005	0.015

*In milligrams per liter except where noted.
pCi/L - picocuries per liter

TABLE 3.10 BACKGROUND GROUNDWATER QUALITY MEASUREMENTS EXCEEDING MAXIMUM
CONCENTRATION LIMITS, ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

06/25/86 TO 06/25/92

REPORT DATE: 06/08/93

PARAMETER NAME	TOTAL # OF SAMP.	UNITS OF MEASURE	MAXIMUM CONC. LIMIT	LOC. ID	LOG DATE	SAMP ID	FORM OF COMP	HYDR FLOW REL.	RESULT EXCEEDING MAX. CONCENTRATION LIMIT VALUE FLAGS	DETECTION LIMIT	PARAMETER UNCERT.
ARSENIC	29	MG/L	0.0500	-	-	-	-	-	-	-	-
ARSENIC (TOTAL)	0	MG/L	0.0500	-	-	-	-	-	-	-	-
BARIUM	25	MG/L	1.0000	-	-	-	-	-	-	-	-
BARIUM (TOTAL)	0	MG/L	1.0000	-	-	-	-	-	-	-	-
CADMIUM	28	MG/L	0.0100	-	-	-	-	-	-	-	-
CADMIUM (TOTAL)	0	MG/L	0.0100	-	-	-	-	-	-	-	-
CHROMIUM	25	MG/L	0.0500	0546	06/26/86	0001	AL	U	0.05	0.01	-
CHROMIUM (TOTAL)	0	MG/L	0.0500	-	-	-	-	-	-	-	-
GROSS ALPHA	21	PCI/L	15.0000	0546	07/31/91	0001	AL	U	18.2	1.	10.5
				0547	04/23/90	0001	AL	U	15.	1.	7.
				0549	04/23/90	0001	AL	U	15.	1.	7.
				0549	04/18/91	0001	AL	U	15.1	1.	10.0
				0549	07/31/91	0001	AL	U	19.6	1.	10.6
GROSS ALPHA (TOTAL)	0	PCI/L	15.0000	-	-	-	-	-	-	-	-
LEAD	22	MG/L	0.0500	-	-	-	-	-	-	-	-
LEAD (TOTAL)	0	MG/L	0.0500	-	-	-	-	-	-	-	-
MERCURY	22	MG/L	0.0020	-	-	-	-	-	-	-	-
MERCURY (TOTAL)	0	MG/L	0.0020	-	-	-	-	-	-	-	-
MOLYBDENUM	29	MG/L	0.1000	0546	06/26/86	0001	AL	U	0.23	0.01	-
				0547	06/25/86	0001	AL	U	0.24	0.01	-
MOLYBDENUM (TOTAL)	0	MG/L	0.1000	-	-	-	-	-	-	-	-
NET GROSS ALPHA *	21	PCI/L	15.0000	0549	07/31/91	0001	AL	U	17.5	-	-

* NET GROSS ALPHA (GROSS ALPHA - URANIUM) WITH 1 MG URANIUM = 686 PCI

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

U - UPGRADIENT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.10 BACKGROUND GROUNDWATER QUALITY MEASUREMENTS EXCEEDING MAXIMUM
CONCENTRATION LIMITS, ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA
06/25/86 TO 06/25/92
REPORT DATE: 06/08/93

PARAMETER NAME	TOTAL # OF SAMP.	UNITS OF MEASURE	MAXIMUM CONC. LIMIT	LOC. ID	LOG DATE	SAMP ID	FORM OF COMP	HYDR FLOW REL.	RESULT EXCEEDING MAX. CONCENTRATION LIMIT VALUE FLAGS	DETECTION LIMIT	PARAMETER UNCERT.
NET GROSS ALPHA (TOTAL) **	0	PCI/L	15.0000	-	-	-	-	-	-	-	-
NITRATE	29	MG/L	44.0000	0549	07/13/89	0001	AL	U	7100.	1.	-
NITRATE (TOTAL)	0	MG/L	44.0000	-	-	-	-	-	-	-	-
RA-226 & RA-228	26	PCI/L	5.0000	0547	07/31/91	0001	AL	U	6.8	-	-
RA-226 & RA-228 (TOTAL)	0	PCI/L	5.0000	-	-	-	-	-	-	-	-
SELENIUM	29	MG/L	0.0100	0546	10/08/87	0001	AL	U	0.010	0.005	-
				0546	12/05/90	0001	AL	U	0.014	0.005	-
				0546	07/31/91	0001	AL	U	< 0.03 I	0.03	-
				0549	10/08/87	0001	AL	U	0.010	0.005	-
				0549	07/31/91	0001	AL	U	< 0.03 I	0.03	-
SELENIUM (TOTAL)	0	MG/L	0.0100	-	-	-	-	-	-	-	-
SILVER	28	MG/L	0.0500	-	-	-	-	-	-	-	-
SILVER (TOTAL)	0	MG/L	0.0500	-	-	-	-	-	-	-	-
URANIUM	29	MG/L	0.0440	0549	04/10/87	0001	AL	U	0.0449	0.003	-
URANIUM (TOTAL)	0	MG/L	0.0440	-	-	-	-	-	-	-	-

* NET GROSS ALPHA (GROSS ALPHA - URANIUM) WITH 1 MG URANIUM = 686 PCI

** TOTAL NET GROSS ALPHA (TOTAL GROSS ALPHA - TOTAL URANIUM)

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

U - UPGRADIENT

OTHER PARAMETER VALUE FLAGS:

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

DATA FILE NAME: M:\DART\NAT01\GWQ10003.DAT

TABLE 3.11 BACKGROUND GROUNDWATER QUALITY MEASUREMENTS EXCEEDING MAXIMUM
CONCENTRATION LIMITS, SALT WASH, NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
01/29/86 TO 06/26/92
REPORT DATE: 06/08/93

PARAMETER NAME	TOTAL # OF SAMP.	UNITS OF MEASURE	MAXIMUM CONC. LIMIT	LOC. ID	LOG DATE	SAMP ID	FORM OF COMP	HYDR FLOW REL.	RESULT EXCEEDING MAX. CONCENTRATION LIMIT VALUE FLAGS	DETECTION LIMIT	PARAMETER UNCERT.
ARSENIC	19	MG/L	0.0500	0502	07/18/89	0001	JS	U	< 0.05	0.05	-
				0502	04/23/90	0001	JS	U	0.16	0.01	-
				0502	08/03/91	0001	JS	U	< 0.05 I	0.05	-
				0502	01/14/92	0001	JS	U	0.06 I	0.01	-
				0502	06/26/92	0001	JS	U	0.052	0.005	-
				0503	07/12/89	0001	JS	U	0.05	0.01	-
				0503	08/02/91	0001	JS	U	< 0.1 I	0.1	-
				0503	06/25/92	0001	JS	U	0.05	0.005	-
ARSENIC (TOTAL)	0	MG/L	0.0500	-	-	-	-	-	-	-	-
BARIUM	16	MG/L	1.0000	-	-	-	-	-	-	-	-
BARIUM (TOTAL)	0	MG/L	1.0000	-	-	-	-	-	-	-	-
CADMIUM	18	MG/L	0.0100	-	-	-	-	-	-	-	-
CADMIUM (TOTAL)	0	MG/L	0.0100	-	-	-	-	-	-	-	-
CHROMIUM	14	MG/L	0.0500	-	-	-	-	-	-	-	-
CHROMIUM (TOTAL)	0	MG/L	0.0500	-	-	-	-	-	-	-	-
GROSS ALPHA	13	PCI/L	15.0000	0502	07/18/89	0001	JS	U	91.	0.2	41.
				0502	04/23/90	0001	JS	U	100.	1.	60.
				0502	12/08/90	0001	JS	U	48.	1.	55.
				0502	04/19/91	0001	JS	U	68.6	1.	69.3
				0502	08/05/91	0001	JS	U	31.3	1.	60.
				0502	01/14/92	0001	JS	U	48.	1.	47
				0502	06/26/92	0001	JS	U	66.1	1.0	71.7
				0503	07/12/89	0001	JS	U	85.	0.2	43.
				0503	04/20/90	0001	JS	U	110.	1.	50.
				0503	12/08/90	0001	JS	U	86.	1.	57.
				0503	04/18/91	0001	JS	U	51.7	1.	111.
				0503	08/05/91	0001	JS	U	66.1	1.	44.
				0503	06/25/92	0001	JS	U	56.7	1.0	61.5
GROSS ALPHA (TOTAL)	0	PCI/L	15.0000	-	-	-	-	-	-	-	-

< - THE DATA IS FLAGGED AS A NON-DETECT, SO THE RESULT IS AN ESTIMATED VALUE OR THE DETECTION LIMIT

FORMATION OF COMPLETION CODE:
JS - JURASSIC SALT WASH FORMATION

FLOW RELATIONSHIP CODE:
U - UPGRADIENT

OTHER PARAMETER VALUE FLAGS:
I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.11 BACKGROUND GROUNDWATER QUALITY MEASUREMENTS EXCEEDING MAXIMUM
CONCENTRATION LIMITS, SALT WASH, NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
01/29/86 TO 06/26/92
REPORT DATE: 06/08/93

PARAMETER NAME	TOTAL # OF SAMP.	UNITS OF MEASURE	MAXIMUM CONC. LIMIT	LOC. ID	LOG DATE	SAMP ID	FORM OF COMP	HYDR FLOW REL.	RESULT EXCEEDING MAX. CONCENTRATION LIMIT VALUE FLAGS	DETECTION LIMIT	PARAMETER UNCERT.
LEAD	13	MG/L	0.0500	-	-	-	-	-	-	-	-
LEAD (TOTAL)	0	MG/L	0.0500	-	-	-	-	-	-	-	-
MERCURY	13	MG/L	0.0020	-	-	-	-	-	-	-	-
MERCURY (TOTAL)	0	MG/L	0.0020	-	-	-	-	-	-	-	-
MOLYBDENUM	19	MG/L	0.1000	0502	01/29/86	0001	JS	U	0.11	0.01	-
				0502	06/10/86	0001	JS	U	0.24	0.01	-
				0503	01/29/86	0001	JS	U	0.1	0.01	-
				0503	06/09/86	0001	JS	U	0.2	0.01	-
MOLYBDENUM (TOTAL)	0	MG/L	0.1000	-	-	-	-	-	-	-	-
NET GROSS ALPHA *	13	PCI/L	15.0000	0502	07/18/89	0001	JS	U	59.4	-	-
				0502	04/23/90	0001	JS	U	83.5	-	-
				0502	12/08/90	0001	JS	U	19.5	-	-
				0502	04/19/91	0001	JS	U	37.7	-	-
				0502	01/14/92	0001	JS	U	21.3	-	-
				0502	06/26/92	0001	JS	U	39.3	-	-
				0503	07/12/89	0001	JS	U	54.8	-	-
				0503	04/20/90	0001	JS	U	83.9	-	-
				0503	12/08/90	0001	JS	U	60.3	-	-
				0503	04/18/91	0001	JS	U	21.5	-	-
				0503	08/05/91	0001	JS	U	44.8	-	-
				0503	06/25/92	0001	JS	U	34.1	-	-
NET GROSS ALPHA (TOTAL) **	0	PCI/L	15.0000	-	-	-	-	-	-	-	-
NITRATE	19	MG/L	44.0000	-	-	-	-	-	-	-	-
NITRATE (TOTAL)	0	MG/L	44.0000	-	-	-	-	-	-	-	-
RA-226 & RA-228	16	PCI/L	5.0000	0502	07/18/89	0001	JS	U	6.2	-	-

* NET GROSS ALPHA (GROSS ALPHA - URANIUM) WITH 1 MG URANIUM = 686 PCI
** TOTAL NET GROSS ALPHA (TOTAL GROSS ALPHA - TOTAL URANIUM)

FORMATION OF COMPLETION CODE:
JS - JURASSIC SALT WASH FORMATION

FLOW RELATIONSHIP CODE:
U - UPGRADIENT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.11 BACKGROUND GROUNDWATER QUALITY MEASUREMENTS EXCEEDING MAXIMUM
CONCENTRATION LIMITS, SALT WASH, NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
01/29/86 TO 06/26/92
REPORT DATE: 06/08/93

PARAMETER NAME	TOTAL # OF SAMP.	UNITS OF MEASURE	MAXIMUM CONC. LIMIT	LOC. ID	LOG DATE	SAMP ID	FORM OF COMP	HYDR FLOW REL.	RESULT EXCEEDING MAX. CONCENTRATION LIMIT VALUE FLAGS	DETECTION LIMIT	PARAMETER UNCERT.
RA-226 & RA-228	16	PCI/L	5.0000	0502	04/23/90	0001	JS	U	10.5	-	-
				0502	12/08/90	0001	JS	U	6.4	-	-
				0502	04/19/91	0001	JS	U	6.3	-	-
				0502	08/05/91	0001	JS	U	7.8	-	-
				0502	01/14/92	0001	JS	U	6.2	-	-
				0502	06/26/92	0001	JS	U	7.6	-	-
				0503	08/05/91	0001	JS	U	5.8	-	-
RA-226 & RA-228 (TOTAL)	0	PCI/L	5.0000	-	-	-	-	-	-	-	-
SELENIUM	19	MG/L	0.0100	0502	10/08/87	0001	JS	U	0.321	0.005	-
				0502	07/18/89	0001	JS	U	< 0.03	0.03	-
				0502	04/23/90	0001	JS	U	0.061	0.005	-
				0502	04/19/91	0001	JS	U	< 0.03 I	0.03	-
				0502	08/03/91	0001	JS	U	< 0.03 I	0.03	-
				0502	01/14/92	0001	JS	U	< 0.02 I	0.02	-
				0503	10/08/87	0001	JS	U	0.236	0.005	-
				0503	07/12/89	0001	JS	U	< 0.03	0.03	-
				0503	04/18/91	0001	JS	U	< 0.03 I	0.03	-
				0503	08/02/91	0001	JS	U	< 0.05 I	0.05	-
SELENIUM (TOTAL)	0	MG/L	0.0100	-	-	-	-	-	-	-	-
SILVER	16	MG/L	0.0500	-	-	-	-	-	-	-	-
SILVER (TOTAL)	0	MG/L	0.0500	-	-	-	-	-	-	-	-
URANIUM	19	MG/L	0.0440	0502	07/18/89	0001	JS	U	0.046	0.003	-
				0502	04/19/91	0001	JS	U	0.045	0.001	-
				0503	07/12/89	0001	JS	U	0.044	0.003	-
				0503	04/18/91	0001	JS	U	0.044	0.001	-
URANIUM (TOTAL)	0	MG/L	0.0440	-	-	-	-	-	-	-	-

FORMATION OF COMPLETION CODE:
JS - JURASSIC SALT WASH FORMATION

FLOW RELATIONSHIP CODE:
U - UPGRADIENT

OTHER PARAMETER VALUE FLAGS:
I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

DATA FILE NAME: M:\DART\NAT01\GWQ10004.DAT

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
01/29/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	0505	01/29/86	0001	AL	O	MG/L CaCO3		382.		-	-
	0505	06/10/86	0001	AL	O			406.		-	-
	0505	04/10/87	0001	AL	O			476.		-	-
	0505	10/08/87	0001	AL	O			459.		-	-
	0505	07/13/89	0001	AL	O			370.		-	-
	0505	04/20/90	0001	AL	O			345.		-	-
	0505	12/08/90	0001	AL	O			338.		-	-
	0505	04/18/91	0001	AL	O			321.		-	-
	0505	08/01/91	0001	AL	O			350.		-	-
	0505	01/13/92	0001	AL	O			355		-	-
	0505	06/24/92	0001	AL	O			342		-	-
	0506	01/30/86	0001	AL	O			531.		-	-
	0506	06/09/86	0001	AL	O			605.		-	-
	0506	04/10/87	0001	AL	O			583.		-	-
	0506	10/08/87	0001	AL	O			542.		-	-
	0506	07/13/89	0001	AL	O			491.		-	-
	0506	04/20/90	0001	AL	O			460.		-	-
	0506	12/08/90	0001	AL	O			468.		-	-
	0506	04/18/91	0001	AL	O			463.		-	-
	0506	08/01/91	0001	AL	O			467.		-	-
	0506	01/13/92	0001	AL	O			475		-	-
	0506	06/24/92	0001	AL	O			457		-	-
	0548	06/25/86	0001	AL	D			901.		-	-
	0548	04/10/87	0001	AL	D			717.		-	-
	0548	10/08/87	0001	AL	D			338.		-	-
	0548	07/17/89	0001	AL	D			168.		-	-
	0548	04/23/90	0001	AL	D			239.		-	-
	0548	12/05/90	0001	AL	D			316.		-	-
	0548	04/19/91	0001	AL	D			264.		-	-
	0548	08/02/91	0001	AL	D			168.		-	-
	0548	08/05/91	0001	AL	D			168.		-	-
	0548	01/14/92	0001	AL	D			200		-	-
	0548	06/25/92	0001	AL	D			174		-	-
	0616	07/14/89	0001	AL	O			842.		-	-
	0616	04/23/90	0001	AL	O			750.		-	-
	0616	12/05/90	0001	AL	O			637.		-	-
	0616	04/18/91	0001	AL	O			509.		-	-
	0616	01/09/92	0001	AL	O			534		-	-
	0616	06/26/92	0001	AL	O			567		-	-
	0619	07/16/89	0001	AL	O			219.		-	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
O - ON-SITE
D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PARAMETER PVI VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	0619	04/23/90	0001	AL	0	MG/L CaCO3	186.		-	-
	0619	12/08/90	0001	AL	0		198.		-	-
	0619	04/19/91	0001	AL	0		251.		-	-
	0619	08/04/91	0001	AL	0		158.		-	-
	0619	08/05/91	0001	AL	0		158.		-	-
	0619	01/11/92	0001	AL	0		266		-	-
	0619	06/27/92	0001	AL	0		182		-	-
	0630	07/14/89	0001	AL	0		165.		-	-
	0630	04/23/90	0001	AL	0		130.		-	-
	0630	12/05/90	0001	AL	0		166.		-	-
	0630	04/19/91	0001	AL	0		151.		-	-
	0630	08/03/91	0001	AL	0		161.		-	-
	0630	08/05/91	0001	AL	0		161.		-	-
	0630	06/28/92	0001	AL	0		156		-	-
	0632	07/16/89	0001	AL	0		590.		-	-
	0632	04/23/90	0001	AL	0		540.		-	-
	0632	12/05/90	0001	AL	0		532.		-	-
	0632	04/18/91	0001	AL	0		510.		-	-
	0632	08/02/91	0001	AL	0		465.		-	-
	0632	08/05/91	0001	AL	0		465.		-	-
	0632	01/10/92	0001	AL	0		498		-	-
	0632	06/27/92	0001	AL	0		544		-	-
	0637	07/16/89	0001	AL	0		497.		-	-
	0637	04/23/90	0001	AL	0		344.		-	-
	0637	12/05/90	0001	AL	0		322.		-	-
	0637	04/19/91	0001	AL	0		362.		-	-
	0637	08/04/91	0001	AL	0		351.		-	-
	0637	08/05/91	0001	AL	0		351.		-	-
	0637	01/11/92	0001	AL	0		352		-	-
	0637	06/27/92	0001	AL	0		324		-	-
	0656	04/23/90	0001	AL	0		1152.		-	-
	0656	12/08/90	0001	AL	0		1002.		-	-
	0656	04/18/91	0001	AL	0		1038.		-	-
	0656	08/04/91	0001	AL	0		1028.		-	-
	0656	08/05/91	0001	AL	0		1028.		-	-
	0656	06/27/92	0001	AL	0		2380		-	-
ALUMINUM	0505	06/10/86	0001	AL	0	MG/L	0.3		0.1	-
	0505	04/10/87	0001	AL	0		0.23		0.1	-
	0505	10/08/87	0001	AL	0		0.29		0.1	-
	0505	07/13/89	0001	AL	0		< 0.1		0.1	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

0 - ON-SITE

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
01/29/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PARAMETER PVI VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALUMINUM	0505	04/20/90	0001	AL	O	MG/L	< 0.1		0.1	-
	0505	12/08/90	0001	AL	O		< 0.1		0.1	-
	0505	04/18/91	0001	AL	O		< 0.05		0.05	-
	0505	08/01/91	0001	AL	O		< 0.05		0.05	-
	0505	01/13/92	0001	AL	O		0.08		0.05	-
	0505	06/24/92	0001	AL	O		0.072		0.05	-
	0506	06/09/86	0001	AL	O		0.3		0.1	-
	0506	04/10/87	0001	AL	O		0.33		0.1	-
	0506	10/08/87	0001	AL	O		0.38		0.1	-
	0506	07/13/89	0001	AL	O		< 0.1		0.1	-
	0506	04/20/90	0001	AL	O		< 0.1		0.1	-
	0506	12/08/90	0001	AL	O		< 0.1		0.1	-
	0506	04/18/91	0001	AL	O		< 0.05		0.05	-
	0506	08/01/91	0001	AL	O		< 0.05		0.05	-
	0506	01/13/92	0001	AL	O		0.17		0.05	-
	0506	06/24/92	0001	AL	O		0.082		0.05	-
	0548	06/25/86	0001	AL	D		0.2		0.1	-
	0548	04/10/87	0001	AL	D		0.28		0.1	-
	0548	10/08/87	0001	AL	D		0.15		0.1	-
	0548	07/17/89	0001	AL	D		< 0.1		0.1	-
	0548	04/23/90	0001	AL	D		< 0.1		0.1	-
	0548	12/05/90	0001	AL	D		< 0.1		0.1	-
	0548	04/19/91	0001	AL	D		< 0.05		0.05	-
	0548	08/02/91	0001	AL	D		< 0.05		0.05	-
	0548	01/14/92	0001	AL	D		< 0.05		0.05	-
	0548	06/25/92	0001	AL	D		0.152		0.05	-
	0616	07/14/89	0001	AL	O		0.1		0.1	-
	0616	04/23/90	0001	AL	O		< 0.1		0.1	-
	0616	12/05/90	0001	AL	O		< 0.1		0.1	-
	0616	04/18/91	0001	AL	O		< 0.05		0.05	-
	0616	01/09/92	0001	AL	O		0.28		0.05	-
	0616	06/26/92	0001	AL	O		0.201		0.05	-
	0619	07/16/89	0001	AL	O		< 0.1		0.1	-
	0619	04/23/90	0001	AL	O		< 0.1		0.1	-
	0619	12/08/90	0001	AL	O		< 0.1		0.1	-
	0619	04/19/91	0001	AL	O		< 0.05		0.05	-
	0619	08/04/91	0001	AL	O		< 0.05		0.05	-
	0619	01/11/92	0001	AL	O		< 0.05		0.05	-
	0619	06/27/92	0001	AL	O		0.198		0.05	-
	0630	07/14/89	0001	AL	O		< 0.1		0.1	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
O - ON-SITE
D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALUMINUM	0630	04/23/90	0001	AL	0	MG/L	<	0.1		0.1	-
	0630	12/05/90	0001	AL	0			0.1		0.1	-
	0630	04/19/91	0001	AL	0		<	0.05		0.05	-
	0630	08/03/91	0001	AL	0		<	0.05		0.05	-
	0630	01/10/92	0001	AL	0		<	0.05		0.05	-
	0630	06/28/92	0001	AL	0			0.165		0.05	-
	0632	07/16/89	0001	AL	0		<	0.1		0.1	-
	0632	04/23/90	0001	AL	0		<	0.1		0.1	-
	0632	12/05/90	0001	AL	0		<	0.1		0.1	-
	0632	04/18/91	0001	AL	0		<	0.05		0.05	-
	0632	08/02/91	0001	AL	0			0.05		0.05	-
	0632	01/10/92	0001	AL	0			0.26		0.05	-
	0632	06/27/92	0001	AL	0			0.203		0.05	-
	0637	07/16/89	0001	AL	0		<	0.1		0.1	-
	0637	04/23/90	0001	AL	0		<	0.1		0.1	-
	0637	12/05/90	0001	AL	0		<	0.1		0.1	-
	0637	04/19/91	0001	AL	0			0.05		0.05	-
	0637	08/04/91	0001	AL	0			0.05		0.05	-
	0637	01/11/92	0001	AL	0			0.14		0.05	-
	0637	06/27/92	0001	AL	0			0.167		0.05	-
	0656	04/23/90	0001	AL	0		<	0.1		0.1	-
	0656	12/08/90	0001	AL	0		<	0.1		0.1	-
	0656	04/18/91	0001	AL	0			0.05		0.05	-
	0656	08/04/91	0001	AL	0		<	0.05		0.05	-
	0656	01/09/92	0001	AL	0			0.08		0.05	-
	0656	06/27/92	0001	AL	0			0.185		0.05	-
AMMONIUM	0505	01/29/86	0001	AL	0	MG/L		0.1		0.1	-
	0505	06/10/86	0001	AL	0			0.1		0.1	-
	0505	04/10/87	0001	AL	0		<	0.1		0.1	-
	0505	07/13/89	0001	AL	0			0.4		0.1	-
	0505	04/20/90	0001	AL	0		<	0.1		0.1	-
	0505	12/08/90	0001	AL	0		<	0.1		0.1	-
	0505	04/18/91	0001	AL	0			0.33		0.01	-
	0505	08/01/91	0001	AL	0			0.2		0.1	-
	0505	01/13/92	0001	AL	0		<	1.0	I	1.0	-
	0505	06/24/92	0001	AL	0			0.82		0.1	-
	0506	01/30/86	0001	AL	0			0.4		0.1	-
	0506	04/10/87	0001	AL	0			0.5		0.1	-
	0506	07/13/89	0001	AL	0			1.2		0.1	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

0 - ON-SITE

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
AMMONIUM	0506	04/20/90	0001	AL	O	MG/L	0.4		0.1	-
	0506	12/08/90	0001	AL	O		0.6		0.1	-
	0506	04/18/91	0001	AL	O		0.63		0.01	-
	0506	08/01/91	0001	AL	O		0.8		0.1	-
	0506	01/13/92	0001	AL	O		1.0	I	1.0	-
	0506	06/24/92	0001	AL	O		0.56		0.1	-
	0548	06/25/86	0001	AL	D		0.1		0.1	-
	0548	04/10/87	0001	AL	D		0.1		0.1	-
	0548	07/17/89	0001	AL	D		0.3		0.1	-
	0548	04/23/90	0001	AL	D		0.1		0.1	-
	0548	12/05/90	0001	AL	D		0.1		0.1	-
	0548	04/19/91	0001	AL	D		0.31		0.01	-
	0548	08/02/91	0001	AL	D		0.1		0.1	-
	0548	01/14/92	0001	AL	D		1.0	I	1.0	-
	0548	06/25/92	0001	AL	D		0.1		0.1	-
	0616	07/14/89	0001	AL	O		0.9		0.1	-
	0616	04/23/90	0001	AL	O		0.3		0.1	-
	0616	12/05/90	0001	AL	O		0.1		0.1	-
	0616	04/18/91	0001	AL	O		0.52		0.01	-
	0616	01/09/92	0001	AL	O		1.0	I	1.0	-
	0616	06/26/92	0001	AL	O		0.1		0.1	-
	0619	07/16/89	0001	AL	O		0.3		0.1	-
	0619	04/23/90	0001	AL	O		0.1		0.1	-
	0619	12/08/90	0001	AL	O		0.1		0.1	-
	0619	01/11/92	0001	AL	O		1.0	I	1.0	-
	0619	06/27/92	0001	AL	O		0.1		0.1	-
	0630	07/14/89	0001	AL	O		0.2		0.1	-
	0630	04/23/90	0001	AL	O		0.1		0.1	-
	0630	12/05/90	0001	AL	O		0.1		0.1	-
	0630	04/19/91	0001	AL	O		0.14		0.01	-
	0630	08/03/91	0001	AL	O		0.1		0.1	-
	0630	01/10/92	0001	AL	O		1.0	I	1.0	-
	0630	06/28/92	0001	AL	O		0.1		0.1	-
	0632	07/16/89	0001	AL	O		0.3		0.1	-
	0632	04/23/90	0001	AL	O		1.4		0.1	-
	0632	12/05/90	0001	AL	O		0.1		0.1	-
	0632	04/18/91	0001	AL	O		0.26		0.01	-
	0632	08/02/91	0001	AL	O		0.2		0.1	-
	0632	01/10/92	0001	AL	O		1.0	I	1.0	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

O - ON-SITE

D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
AMMONIUM	0632	06/27/92	0001	AL	O	MG/L	<	0.1		0.1	-
	0637	07/16/89	0001	AL	O			0.5		0.1	-
	0637	04/23/90	0001	AL	O		<	0.1		0.1	-
	0637	12/05/90	0001	AL	O		<	0.1		0.1	-
	0637	04/19/91	0001	AL	O			0.67		0.01	-
	0637	01/11/92	0001	AL	O		<	1.0	I	1.0	-
	0637	06/27/92	0001	AL	O			0.29		0.1	-
	0656	04/23/90	0001	AL	O			0.6		0.1	-
	0656	12/08/90	0001	AL	O			1.2		0.1	-
	0656	01/09/92	0001	AL	O		<	1.0	I	1.0	-
ANTIMONY	0505	06/10/86	0001	AL	O	MG/L	<	0.003		0.003	-
	0505	04/10/87	0001	AL	O			0.016		0.003	-
	0505	07/13/89	0001	AL	O		<	0.003		0.003	-
	0505	04/20/90	0001	AL	O			0.003		0.003	-
	0505	12/08/90	0001	AL	O		<	0.003		0.003	-
	0505	04/18/91	0001	AL	O		<	0.003		0.003	-
	0505	08/01/91	0001	AL	O		<	0.003		0.003	-
	0505	01/13/92	0001	AL	O		<	0.003		0.003	-
	0505	06/24/92	0001	AL	O		<	0.003		0.003	-
	0506	04/10/87	0001	AL	O			0.025		0.003	-
	0506	07/13/89	0001	AL	O		<	0.003		0.003	-
	0506	04/20/90	0001	AL	O			0.012		0.003	-
	0506	12/08/90	0001	AL	O		<	0.003		0.003	-
	0506	04/18/91	0001	AL	O		<	0.003		0.003	-
	0506	08/01/91	0001	AL	O		<	0.003		0.003	-
	0506	01/13/92	0001	AL	O		<	0.03	I	0.03	-
	0506	06/24/92	0001	AL	O		<	0.003		0.003	-
	0548	06/25/86	0001	AL	D		<	0.003		0.003	-
	0548	04/10/87	0001	AL	D			0.056		0.003	-
	0548	07/17/89	0001	AL	D		<	0.003		0.003	-
	0548	04/23/90	0001	AL	D		<	0.003		0.003	-
	0548	12/05/90	0001	AL	D		<	0.003		0.003	-
	0548	04/19/91	0001	AL	D			0.004		0.003	-
	0548	08/02/91	0001	AL	D		<	0.003		0.003	-
	0548	01/14/92	0001	AL	D		<	0.003		0.003	-
	0548	06/25/92	0001	AL	D		<	0.003		0.003	-
	0616	07/14/89	0001	AL	O		<	0.003		0.003	-
	0616	04/23/90	0001	AL	O			0.043		0.003	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

O - ON-SITE

D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ANTIMONY	0616	12/05/90	0001	AL	O	MG/L	<	0.003		0.003	-
	0616	04/18/91	0001	AL	O		<	0.003		0.003	-
	0616	01/09/92	0001	AL	O		<	0.03	I	0.03	-
	0616	06/26/92	0001	AL	O			0.006		0.003	-
	0619	07/16/89	0001	AL	O		<	0.003		0.003	-
	0619	04/23/90	0001	AL	O		<	0.003		0.003	-
	0619	12/08/90	0001	AL	O		<	0.003		0.003	-
	0619	04/19/91	0001	AL	O			0.004		0.003	-
	0619	08/04/91	0001	AL	O			0.005		0.003	-
	0619	01/11/92	0001	AL	O			0.003		0.003	-
	0619	06/27/92	0001	AL	O			0.003		0.003	-
	0630	07/14/89	0001	AL	O		<	0.003		0.003	-
	0630	04/23/90	0001	AL	O		<	0.003		0.003	-
	0630	12/05/90	0001	AL	O		<	0.003		0.003	-
	0630	04/19/91	0001	AL	O			0.006		0.003	-
	0630	08/03/91	0001	AL	O			0.005		0.003	-
	0630	01/10/92	0001	AL	O		<	0.003		0.003	-
	0630	06/28/92	0001	AL	O		<	0.003		0.003	-
	0632	07/16/89	0001	AL	O		<	0.003		0.003	-
	0632	04/23/90	0001	AL	O			0.017		0.003	-
	0632	12/05/90	0001	AL	O		<	0.003		0.003	-
	0632	04/18/91	0001	AL	O		<	0.003		0.003	-
	0632	08/02/91	0001	AL	O			0.009		0.003	-
	0632	01/10/92	0001	AL	O		<	0.003		0.003	-
	0632	06/27/92	0001	AL	O			0.005		0.003	-
	0637	07/16/89	0001	AL	O		<	0.003		0.003	-
	0637	04/23/90	0001	AL	O		<	0.003		0.003	-
	0637	12/05/90	0001	AL	O		<	0.003		0.003	-
	0637	04/19/91	0001	AL	O			0.004		0.003	-
	0637	08/04/91	0001	AL	O			0.015		0.003	-
	0637	01/11/92	0001	AL	O			0.004		0.003	-
	0637	06/27/92	0001	AL	O		<	0.003		0.003	-
	0656	04/23/90	0001	AL	O		<	0.003		0.003	-
	0656	12/08/90	0001	AL	O		<	0.003		0.003	-
	0656	04/18/91	0001	AL	O			0.005		0.003	-
	0656	08/04/91	0001	AL	O		<	0.003		0.003	-
	0656	01/09/92	0001	AL	O			0.003		0.003	-
	0656	06/27/92	0001	AL	O			0.0038		0.003	-
ARSENIC	0505	01/29/86	0001	AL	O	MG/L		0.02		0.01	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

O - ON-SITE

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ARSENIC	0505	06/10/86	0001	AL	O	MG/L	<	0.01		0.01	-
	0505	04/10/87	0001	AL	O			0.019		0.01	-
	0505	10/08/87	0001	AL	O			0.029		0.01	-
	0505	07/13/89	0001	AL	O			0.02		0.01	-
	0505	04/20/90	0001	AL	O			0.02		0.01	-
	0505	12/08/90	0001	AL	O			0.010		0.01	-
	0505	04/18/91	0001	AL	O		<	0.01		0.01	-
	0505	08/01/91	0001	AL	O		<	0.05	I	0.05	-
	0505	01/13/92	0001	AL	O			0.019		0.001	-
	0505	06/24/92	0001	AL	O			0.012		0.005	-
	0506	01/30/86	0001	AL	O			0.07		0.01	-
	0506	06/09/86	0001	AL	O			0.04		0.01	-
	0506	04/10/87	0001	AL	O			0.043		0.01	-
	0506	10/08/87	0001	AL	O			0.038		0.01	-
	0506	07/13/89	0001	AL	O			0.03		0.01	-
	0506	04/20/90	0001	AL	O			0.02		0.01	-
	0506	12/08/90	0001	AL	O			0.035		0.01	-
	0506	04/18/91	0001	AL	O			0.03		0.01	-
	0506	08/01/91	0001	AL	O		<	0.1	I	0.1	-
	0506	01/13/92	0001	AL	O			0.036		0.001	-
	0506	06/24/92	0001	AL	O			0.032		0.005	-
	0548	06/25/86	0001	AL	D		<	0.01		0.01	-
	0548	04/10/87	0001	AL	D			0.011		0.01	-
	0548	10/08/87	0001	AL	D			0.009	J	0.01	-
	0548	07/17/89	0001	AL	D			0.01		0.01	-
	0548	04/23/90	0001	AL	D		<	0.01		0.01	-
	0548	12/05/90	0001	AL	D		<	0.01		0.01	-
	0548	04/19/91	0001	AL	D		<	0.01		0.01	-
	0548	08/02/91	0001	AL	D		<	0.05	I	0.05	-
	0548	01/14/92	0001	AL	D			0.011		0.001	-
	0548	06/25/92	0001	AL	D			0.008		0.005	-
	0616	07/14/89	0001	AL	O			0.01		0.01	-
	0616	04/23/90	0001	AL	O		<	0.01		0.01	-
	0616	12/05/90	0001	AL	O			0.053		0.01	-
	0616	04/18/91	0001	AL	O			0.06		0.01	-
	0616	01/09/92	0001	AL	O			0.08	I	0.01	-
	0616	06/26/92	0001	AL	O			0.007		0.005	-
	0619	07/16/89	0001	AL	O			0.01		0.01	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

O - ON-SITE

D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

J - ESTIMATED VALUE

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ARSENIC	0619	04/23/90	0001	AL	0	MG/L		0.01		0.01	-
	0619	12/08/90	0001	AL	0			0.012		0.01	-
	0619	04/19/91	0001	AL	0			0.01		0.01	-
	0619	08/04/91	0001	AL	0		<	0.01		0.01	-
	0619	01/11/92	0001	AL	0			0.032		0.001	-
	0619	06/27/92	0001	AL	0			0.026		0.005	-
	0630	07/14/89	0001	AL	0		<	0.01		0.01	-
	0630	04/23/90	0001	AL	0		<	0.01		0.01	-
	0630	12/05/90	0001	AL	0		<	0.01		0.01	-
	0630	04/19/91	0001	AL	0		<	0.01		0.01	-
	0630	08/03/91	0001	AL	0		<	0.01		0.01	-
	0630	01/10/92	0001	AL	0			0.004		0.001	-
	0630	06/28/92	0001	AL	0		<	0.005		0.005	-
	0632	07/16/89	0001	AL	0			0.04		0.01	-
	0632	04/23/90	0001	AL	0			0.03		0.01	-
	0632	12/05/90	0001	AL	0			0.029		0.01	-
	0632	04/18/91	0001	AL	0			0.02		0.01	-
	0632	08/02/91	0001	AL	0		<	0.01		0.01	-
	0632	01/10/92	0001	AL	0			0.044		0.001	-
	0632	06/27/92	0001	AL	0			0.038		0.005	-
	0637	07/16/89	0001	AL	0			0.03		0.01	-
	0637	04/23/90	0001	AL	0			0.02		0.01	-
	0637	12/05/90	0001	AL	0			0.016		0.01	-
	0637	04/19/91	0001	AL	0			0.02		0.01	-
	0637	08/04/91	0001	AL	0		<	0.01		0.01	-
	0637	01/11/92	0001	AL	0			0.028		0.001	-
	0637	06/27/92	0001	AL	0			0.027		0.005	-
	0656	04/23/90	0001	AL	0		<	0.01		0.01	-
	0656	12/08/90	0001	AL	0		<	0.01		0.01	-
	0656	04/18/91	0001	AL	0		<	0.01		0.01	-
	0656	08/04/91	0001	AL	0		<	0.01		0.01	-
	0656	01/09/92	0001	AL	0			0.003		0.001	-
	0656	06/27/92	0001	AL	0		<	0.005		0.005	-
BARIUM	0505	06/10/86	0001	AL	0	MG/L		0.3		0.1	-
	0505	10/08/87	0001	AL	0			0.04	J	0.1	-
	0505	07/13/89	0001	AL	0		<	0.1		0.1	-
	0505	04/20/90	0001	AL	0		<	0.1		0.1	-
	0505	12/08/90	0001	AL	0		<	0.1		0.1	-
	0505	04/18/91	0001	AL	0			0.03		0.01	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
0 - ON-SITE

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
J - ESTIMATED VALUE

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA
01/29/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
BARIUM	0505	08/01/91	0001	AL	O	MG/L		0.03		0.01	-
	0505	01/13/92	0001	AL	O			0.02		0.01	-
	0505	06/24/92	0001	AL	O		<	0.1		0.1	-
	0506	10/08/87	0001	AL	O			0.05	J	0.1	-
	0506	07/13/89	0001	AL	O		<	0.1		0.1	-
	0506	04/20/90	0001	AL	O		<	0.1		0.1	-
	0506	12/08/90	0001	AL	O		<	0.1		0.1	-
	0506	04/18/91	0001	AL	O			0.03		0.01	-
	0506	08/01/91	0001	AL	O			0.03		0.01	-
	0506	01/13/92	0001	AL	O			0.03		0.01	-
	0506	06/24/92	0001	AL	O		<	0.1		0.1	-
	0548	06/25/86	0001	AL	D			0.3		0.1	-
	0548	10/08/87	0001	AL	D			0.04	J	0.1	-
	0548	07/17/89	0001	AL	D		<	0.1		0.1	-
	0548	04/23/90	0001	AL	D		<	0.1		0.1	-
	0548	12/05/90	0001	AL	D		<	0.1		0.1	-
	0548	04/19/91	0001	AL	D			0.05		0.01	-
	0548	08/02/91	0001	AL	D			0.03		0.01	-
	0548	01/14/92	0001	AL	D			0.03		0.01	-
	0548	06/25/92	0001	AL	D		<	0.1		0.1	-
	0616	07/14/89	0001	AL	O			0.2		0.1	-
	0616	04/23/90	0001	AL	O			0.1		0.1	-
	0616	12/05/90	0001	AL	O		<	0.1		0.1	-
	0616	04/18/91	0001	AL	O			0.05		0.01	-
	0616	01/09/92	0001	AL	O			0.04		0.01	-
	0616	06/26/92	0001	AL	O		<	0.1		0.1	-
	0619	07/16/89	0001	AL	O		<	0.1		0.1	-
	0619	04/23/90	0001	AL	O		<	0.1		0.1	-
	0619	12/08/90	0001	AL	O		<	0.1		0.1	-
	0619	04/19/91	0001	AL	O			0.03		0.01	-
	0619	08/04/91	0001	AL	O			0.04		0.01	-
	0619	01/11/92	0001	AL	O			0.02		0.01	-
	0619	06/27/92	0001	AL	O		<	0.1		0.1	-
	0630	07/14/89	0001	AL	O		<	0.1		0.1	-
	0630	04/23/90	0001	AL	O		<	0.1		0.1	-
	0630	12/05/90	0001	AL	O		<	0.1		0.1	-
	0630	04/19/91	0001	AL	O			0.04		0.01	-
	0630	08/03/91	0001	AL	O			0.03		0.01	-
	0630	01/10/92	0001	AL	O			0.03		0.01	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
O - ON-SITE
D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
J - ESTIMATED VALUE

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
BARIUM	0630	06/28/92	0001	AL	O	MG/L	<	0.1		0.1	-
	0632	07/16/89	0001	AL	O		<	0.1		0.1	-
	0632	04/23/90	0001	AL	O		<	0.1		0.1	-
	0632	12/05/90	0001	AL	O		<	0.1		0.1	-
	0632	04/18/91	0001	AL	O			0.05		0.01	-
	0632	08/02/91	0001	AL	O			0.08		0.01	-
	0632	01/10/92	0001	AL	O			0.06		0.01	-
	0632	06/27/92	0001	AL	O		<	0.1		0.1	-
	0637	07/16/89	0001	AL	O		<	0.1		0.1	-
	0637	04/23/90	0001	AL	O		<	0.1		0.1	-
	0637	12/05/90	0001	AL	O		<	0.1		0.1	-
	0637	04/19/91	0001	AL	O			0.05		0.01	-
	0637	08/04/91	0001	AL	O			0.05		0.01	-
	0637	01/11/92	0001	AL	O			0.04		0.01	-
	0637	06/27/92	0001	AL	O		<	0.1		0.1	-
	0656	04/23/90	0001	AL	O		<	0.1		0.1	-
	0656	12/08/90	0001	AL	O		<	0.1		0.1	-
	0656	04/18/91	0001	AL	O			0.06		0.01	-
	0656	08/04/91	0001	AL	O			0.08		0.01	-
	0656	01/09/92	0001	AL	O			0.04		0.01	-
	0656	06/27/92	0001	AL	O		<	0.1		0.1	-
BERYLLIUM	0505	07/13/89	0001	AL	O	MG/L	<	0.005		0.005	-
	0505	04/20/90	0001	AL	O		<	0.01		0.01	-
	0505	12/08/90	0001	AL	O		<	0.01		0.01	-
	0505	04/18/91	0001	AL	O		<	0.005		0.005	-
	0505	08/01/91	0001	AL	O		<	0.005		0.005	-
	0506	07/13/89	0001	AL	O		<	0.005		0.005	-
	0506	04/20/90	0001	AL	O		<	0.01		0.01	-
	0506	12/08/90	0001	AL	O		<	0.01		0.01	-
	0506	04/18/91	0001	AL	O		<	0.005		0.005	-
	0506	08/01/91	0001	AL	O		<	0.005		0.005	-
	0548	07/17/89	0001	AL	D		<	0.005		0.005	-
	0548	04/23/90	0001	AL	D		<	0.01		0.01	-
	0548	12/05/90	0001	AL	D		<	0.01		0.01	-
	0548	04/19/91	0001	AL	D		<	0.005		0.005	-
	0548	08/02/91	0001	AL	D		<	0.005		0.005	-
	0616	07/14/89	0001	AL	O		<	0.005		0.005	-
	0616	04/23/90	0001	AL	O		<	0.01		0.01	-
	0616	12/05/90	0001	AL	O		<	0.01		0.01	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

O - ON-SITE

D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
UM	0616	04/18/91	0001	AL	O	MG/L	<	0.005		0.005	-
	0619	07/16/89	0001	AL	O		<	0.005		0.005	-
	0619	04/23/90	0001	AL	O		<	0.01		0.01	-
	0619	12/08/90	0001	AL	O		<	0.01		0.01	-
	0619	04/19/91	0001	AL	O		<	0.005		0.005	-
	0619	08/04/91	0001	AL	O		<	0.005		0.005	-
	0630	07/14/89	0001	AL	O		<	0.005		0.005	-
	0630	04/23/90	0001	AL	O		<	0.01		0.01	-
	0630	12/05/90	0001	AL	O		<	0.01		0.01	-
	0630	04/19/91	0001	AL	O		<	0.005		0.005	-
	0630	08/03/91	0001	AL	O		<	0.005		0.005	-
	0632	07/16/89	0001	AL	O		<	0.005		0.005	-
	0632	04/23/90	0001	AL	O		<	0.01		0.01	-
	0632	12/05/90	0001	AL	O		<	0.01		0.01	-
	0632	04/18/91	0001	AL	O		<	0.005		0.005	-
	0632	08/02/91	0001	AL	O		<	0.005		0.005	-
	0637	07/16/89	0001	AL	O		<	0.005		0.005	-
	0637	04/23/90	0001	AL	O		<	0.01		0.01	-
	0637	12/05/90	0001	AL	O		<	0.01		0.01	-
	0637	04/19/91	0001	AL	O		<	0.005		0.005	-
	0637	08/04/91	0001	AL	O		<	0.005		0.005	-
	0656	04/23/90	0001	AL	O		<	0.01		0.01	-
	0656	12/08/90	0001	AL	O		<	0.01		0.01	-
	0656	04/18/91	0001	AL	O		<	0.005		0.005	-
	0656	08/04/91	0001	AL	O		<	0.005		0.005	-
BORON	0505	06/10/86	0001	AL	O	MG/L	<	0.1		0.1	-
	0505	10/08/87	0001	AL	O			0.17		0.1	-
	0505	07/13/89	0001	AL	O			0.1		0.1	-
	0505	04/20/90	0001	AL	O		<	0.1		0.1	-
	0506	10/08/87	0001	AL	O			0.25		0.1	-
	0506	07/13/89	0001	AL	O			0.2		0.1	-
	0506	04/20/90	0001	AL	O			0.2		0.1	-
	0548	06/25/86	0001	AL	O		<	0.1		0.1	-
	0548	10/08/87	0001	AL	D			0.14		0.1	-
	0548	07/17/89	0001	AL	D		<	0.1		0.1	-
	0548	04/23/90	0001	AL	D		<	0.1		0.1	-
	0616	07/14/89	0001	AL	O			0.2		0.1	-
	0616	04/23/90	0001	AL	O			0.2		0.1	-
	0619	07/16/89	0001	AL	O		<	0.1		0.1	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

O - ON-SITE

D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
BORON	0619	04/23/90	0001	AL	O	MG/L	<	0.1		0.1	-
	0630	07/14/89	0001	AL	O		<	0.1		0.1	-
	0630	04/23/90	0001	AL	O		<	0.1		0.1	-
	0632	07/16/89	0001	AL	O			0.3		0.1	-
	0632	04/23/90	0001	AL	O			0.2		0.1	-
	0637	07/16/89	0001	AL	O		<	0.1		0.1	-
	0637	04/23/90	0001	AL	O		<	0.1		0.1	-
	0656	04/23/90	0001	AL	O			0.3		0.1	-
BROMIDE	0505	07/13/89	0001	AL	O	MG/L		0.2		0.1	-
	0505	04/20/90	0001	AL	O		<	0.1		0.1	-
	0506	07/13/89	0001	AL	O			0.3		0.1	-
	0506	04/20/90	0001	AL	O		<	0.1		0.1	-
	0548	07/17/89	0001	AL	D		<	0.1		0.1	-
	0548	04/23/90	0001	AL	D		<	0.1		0.1	-
	0616	07/14/89	0001	AL	O			0.6		0.1	-
	0616	04/23/90	0001	AL	O			0.3		0.1	-
	0619	07/16/89	0001	AL	O			0.2		0.1	-
	0619	04/23/90	0001	AL	O		<	0.1		0.1	-
	0630	07/14/89	0001	AL	O			0.2		0.1	-
	0630	04/23/90	0001	AL	O		<	0.1		0.1	-
	0632	07/16/89	0001	AL	O			0.4		0.1	-
	0632	04/23/90	0001	AL	O		<	0.1		0.1	-
	0637	07/16/89	0001	AL	O			0.1		0.1	-
	0637	04/23/90	0001	AL	O		<	0.1		0.1	-
	0656	04/23/90	0001	AL	O			0.2		0.1	-
CADMIUM	0505	01/29/86	0001	AL	O	MG/L	<	0.001		0.001	-
	0505	06/10/86	0001	AL	O		<	0.001		0.001	-
	0505	04/10/87	0001	AL	O			0.001		0.001	-
	0505	10/08/87	0001	AL	O		<	0.005		0.005	-
	0505	07/13/89	0001	AL	O			0.001		0.001	-
	0505	04/20/90	0001	AL	O		<	0.001		0.001	-
	0505	12/08/90	0001	AL	O			0.001		0.001	-
	0505	04/18/91	0001	AL	O			0.002		0.001	-
	0505	08/01/91	0001	AL	O		<	0.005	I	0.005	-
	0505	01/13/92	0001	AL	O			0.003		0.001	-
	0505	06/24/92	0001	AL	O			0.00325		0.001	-
	0506	01/30/86	0001	AL	O		<	0.001		0.001	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
O - ON-SITE
D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
CADMIUM	0506	04/10/87	0001	AL	O	MG/L	<	0.001		0.001	-
	0506	10/08/87	0001	AL	O		<	0.005		0.005	-
	0506	07/13/89	0001	AL	O		<	0.001		0.001	-
	0506	04/20/90	0001	AL	O		<	0.001		0.001	-
	0506	12/08/90	0001	AL	O		<	0.001		0.001	-
	0506	04/18/91	0001	AL	O		<	0.001		0.001	-
	0506	08/01/91	0001	AL	O		<	0.001		0.001	-
	0506	01/13/92	0001	AL	O		<	0.001		0.001	-
	0506	06/24/92	0001	AL	O		<	0.001		0.001	-
	0548	06/25/86	0001	AL	D		<	0.001		0.001	-
	0548	04/10/87	0001	AL	D		<	0.001		0.001	-
	0548	10/08/87	0001	AL	D		<	0.005		0.005	-
	0548	07/17/89	0001	AL	D		<	0.001		0.001	-
	0548	04/23/90	0001	AL	D		<	0.001		0.001	-
	0548	12/05/90	0001	AL	D		<	0.001		0.001	-
	0548	04/19/91	0001	AL	D		<	0.001		0.001	-
	0548	08/02/91	0001	AL	D		<	0.001		0.001	-
	0548	01/14/92	0001	AL	D		<	0.001		0.001	-
	0548	06/25/92	0001	AL	D		<	0.001		0.001	-
	0616	07/14/89	0001	AL	O		<	0.001		0.001	-
	0616	04/23/90	0001	AL	O		<	0.001		0.001	-
	0616	12/05/90	0001	AL	O		<	0.001		0.001	-
	0616	04/18/91	0001	AL	O		<	0.001		0.001	-
	0616	01/09/92	0001	AL	O		<	0.001		0.001	-
	0616	06/26/92	0001	AL	O			0.00275		0.001	-
	0619	07/16/89	0001	AL	O			0.001		0.001	-
	0619	04/23/90	0001	AL	O		<	0.001		0.001	-
	0619	12/08/90	0001	AL	O		<	0.001		0.001	-
	0619	04/19/91	0001	AL	O			0.002		0.001	-
	0619	08/04/91	0001	AL	O		<	0.001		0.001	-
	0619	01/11/92	0001	AL	O		<	0.01	I	0.01	-
	0619	06/27/92	0001	AL	O			0.00114		0.001	-
	0630	07/14/89	0001	AL	O			0.014		0.001	-
	0630	04/23/90	0001	AL	O			0.007		0.001	-
	0630	12/05/90	0001	AL	O		<	0.001		0.001	-
	0630	04/19/91	0001	AL	O			0.004		0.001	-
	0630	08/03/91	0001	AL	O		<	0.005	I	0.005	-
	0630	01/10/92	0001	AL	O		<	0.01		0.01	-
	0630	06/28/92	0001	AL	O			0.00324		0.001	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

O - ON-SITE

D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

TABLE 3.12: ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
CADMIUM	0632	07/16/89	0001	AL	O	MG/L	<	0.001		0.001	-
	0632	04/23/90	0001	AL	O		<	0.001		0.001	-
	0632	12/05/90	0001	AL	O		<	0.001		0.001	-
	0632	04/18/91	0001	AL	O		<	0.001		0.001	-
	0632	08/02/91	0001	AL	O			0.001		0.001	-
	0632	01/10/92	0001	AL	O			0.001		0.001	-
	0632	06/27/92	0001	AL	O		<	0.001		0.001	-
	0637	07/16/89	0001	AL	O		<	0.001		0.001	-
	0637	04/23/90	0001	AL	O		<	0.001		0.001	-
	0637	12/05/90	0001	AL	O		<	0.001		0.001	-
	0637	04/19/91	0001	AL	O		<	0.001		0.001	-
	0637	08/04/91	0001	AL	O		<	0.001		0.001	-
	0637	01/11/92	0001	AL	O		<	0.001		0.001	-
	0637	06/27/92	0001	AL	O		<	0.001		0.001	-
	0656	04/23/90	0001	AL	O			0.001		0.001	-
	0656	12/08/90	0001	AL	O		<	0.001		0.001	-
	0656	04/18/91	0001	AL	O		<	0.001		0.001	-
	0656	08/04/91	0001	AL	O		<	0.001		0.001	-
	0656	01/09/92	0001	AL	O		<	0.01	I	0.01	-
	0656	06/27/92	0001	AL	O			0.0077		0.001	-
CALCIUM	0505	01/29/86	0001	AL	O	MG/L		280.		0.01	-
	0505	06/10/86	0001	AL	O			174.		0.01	-
	0505	04/10/87	0001	AL	O			271.		0.01	-
	0505	10/08/87	0001	AL	O			207.		0.01	-
	0505	07/13/89	0001	AL	O			174.		0.01	-
	0505	04/20/90	0001	AL	O			150.		0.01	-
	0505	12/08/90	0001	AL	O			161.		0.01	-
	0505	04/18/91	0001	AL	O			212.		0.5	-
	0505	08/01/91	0001	AL	O			224.		0.5	-
	0505	01/13/92	0001	AL	O			150		0.05	-
	0505	06/24/92	0001	AL	O			210		0.5	-
	0506	01/30/86	0001	AL	O			376.		0.01	-
	0506	06/09/86	0001	AL	O			247.		0.01	-
	0506	04/10/87	0001	AL	O			280.		0.01	-
	0506	10/08/87	0001	AL	O			245.		0.01	-
	0506	07/13/89	0001	AL	O			307.		0.01	-
	0506	04/20/90	0001	AL	O			257.		0.01	-
	0506	12/08/90	0001	AL	O			228.		0.01	-
	0506	04/18/91	0001	AL	O			232.		0.5	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

O - ON-SITE

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
CALCIUM	0506	08/01/91	0001	AL	O	MG/L		226.		0.5	-
	0506	01/13/92	0001	AL	O			198		0.05	-
	0506	06/24/92	0001	AL	O			242		0.5	-
	0548	06/25/86	0001	AL	D			128.		0.01	-
	0548	04/10/87	0001	AL	D			297.		0.01	-
	0548	10/08/87	0001	AL	D			114.		0.01	-
	0548	07/17/89	0001	AL	D			67.		0.01	-
	0548	04/23/90	0001	AL	D			115.		0.01	-
	0548	12/05/90	0001	AL	D			145.		0.01	-
	0548	04/19/91	0001	AL	D			145.		0.5	-
	0548	08/02/91	0001	AL	D			74.9		0.5	-
	0548	01/14/92	0001	AL	D			88		0.05	-
	0548	06/25/92	0001	AL	D			92.1		0.5	-
	0616	07/14/89	0001	AL	O			215.		0.01	-
	0616	04/23/90	0001	AL	O			208.		0.01	-
	0616	12/05/90	0001	AL	O			135.		0.01	-
	0616	04/18/91	0001	AL	O			104.		0.5	-
	0616	01/09/92	0001	AL	O			119		0.05	-
	0616	06/26/92	0001	AL	O			118		0.5	-
	0619	07/16/89	0001	AL	O			124.		0.01	-
	0619	04/23/90	0001	AL	O			123.		0.01	-
	0619	12/08/90	0001	AL	O			124.		0.01	-
	0619	04/19/91	0001	AL	O			140.		0.5	-
	0619	08/04/91	0001	AL	O			129.		0.5	-
	0619	01/11/92	0001	AL	O			104		0.05	-
	0619	06/27/92	0001	AL	O			115		0.5	-
	0630	07/14/89	0001	AL	O			104.		0.01	-
	0630	04/23/90	0001	AL	O			113.		0.01	-
	0630	12/05/90	0001	AL	O			108.		0.01	-
	0630	04/19/91	0001	AL	O			121.		0.5	-
	0630	08/03/91	0001	AL	O			79.9		0.5	-
	0630	01/10/92	0001	AL	O			76		0.05	-
	0630	06/28/92	0001	AL	O			84.7		0.5	-
	0632	07/16/89	0001	AL	O			281.		0.01	-
	0632	04/23/90	0001	AL	O			243.		0.01	-
	0632	12/05/90	0001	AL	O			243.		0.01	-
	0632	04/18/91	0001	AL	O			261.		0.5	-
	0632	08/02/91	0001	AL	O			226.		0.5	-
	0632	01/10/92	0001	AL	O			218		0.05	-
	0632	06/27/92	0001	AL	O			210		0.5	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

O - ON-SITE

D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
01/29/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
CALCIUM	0637	07/16/89	0001	AL	O	MG/L		139.		0.01	-
	0637	04/23/90	0001	AL	O			131.		0.01	-
	0637	12/05/90	0001	AL	O			159.		0.01	-
	0637	04/19/91	0001	AL	O			175.		0.5	-
	0637	08/04/91	0001	AL	O			136.		0.5	-
	0637	01/11/92	0001	AL	O			176		0.05	-
	0637	06/27/92	0001	AL	O			149		0.5	-
	0656	04/23/90	0001	AL	O			300.		0.01	-
	0656	12/08/90	0001	AL	O			224.		0.01	-
	0656	04/18/91	0001	AL	O			256.		0.5	-
	0656	08/04/91	0001	AL	O			229.		0.5	-
	0656	01/09/92	0001	AL	O			186		0.05	-
	0656	06/27/92	0001	AL	O			175		0.5	-
CHLORIDE	0505	01/29/86	0001	AL	O	MG/L		66.		1.	-
	0505	06/10/86	0001	AL	O			42.		1.	-
	0505	04/10/87	0001	AL	O			64.2		1.	-
	0505	10/08/87	0001	AL	O			83.2		1.	-
	0505	07/13/89	0001	AL	O			37.		1.	-
	0505	04/20/90	0001	AL	O			21.		1.	-
	0505	12/08/90	0001	AL	O			19.		1.	-
	0505	04/18/91	0001	AL	O			856.		1.	-
	0505	08/01/91	0001	AL	O			24.		1.	-
	0505	01/13/92	0001	AL	O			19		1.0	-
	0505	06/24/92	0001	AL	O			23		0.5	-
	0506	01/30/86	0001	AL	O			120.		1.	-
	0506	06/09/86	0001	AL	O			110.		1.	-
	0506	04/10/87	0001	AL	O			179.		1.	-
	0506	10/08/87	0001	AL	O			155.		1.	-
	0506	07/13/89	0001	AL	O			111.		1.	-
	0506	04/20/90	0001	AL	O			80.		1.	-
	0506	12/08/90	0001	AL	O			82.		1.	-
	0506	04/18/91	0001	AL	O			88.		1.	-
	0506	08/01/91	0001	AL	O			488.		4.	-
	0506	01/13/92	0001	AL	O			68		1.0	-
	0506	06/24/92	0001	AL	O			106		0.5	-
	0548	06/25/86	0001	AL	D			34.		1.	-
	0548	04/10/87	0001	AL	D			275.		1.	-
	0548	10/08/87	0001	AL	D			77.5		1.	-
	0548	07/17/89	0001	AL	D			8.2		1.	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
O - ON-SITE
D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA
01/29/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
CHLORIDE	0548	04/23/90	0001	AL	D	MG/L		19.		1.	-
	0548	12/05/90	0001	AL	D			19.		1.	-
	0548	04/19/91	0001	AL	D			24.		1.	-
	0548	08/02/91	0001	AL	D			6.5		0.5	-
	0548	01/14/92	0001	AL	D			7		1.0	-
	0548	06/25/92	0001	AL	D			8.2		0.5	-
	0616	07/14/89	0001	AL	O			830.		1.	-
	0616	04/23/90	0001	AL	O			856.		1.	-
	0616	12/05/90	0001	AL	O			592.		1.	-
	0616	04/18/91	0001	AL	O			419.		1.	-
	0616	01/09/92	0001	AL	O			500		1.0	-
	0616	06/26/92	0001	AL	O			469		0.5	-
	0619	07/16/89	0001	AL	O			9.9		1.	-
	0619	04/23/90	0001	AL	O			7.		1.	-
	0619	12/08/90	0001	AL	O			5.		1.	-
	0619	04/19/91	0001	AL	O			8.9		0.5	-
	0619	08/04/91	0001	AL	O			9.5		0.5	-
	0619	01/11/92	0001	AL	O			11		1.0	-
	0619	06/27/92	0001	AL	O			10.6		0.5	-
	0630	07/14/89	0001	AL	O			6.3		1.	-
	0630	04/23/90	0001	AL	O			7.		1.	-
	0630	12/05/90	0001	AL	O			4.		1.	-
	0630	04/19/91	0001	AL	O			7.8		0.5	-
	0630	08/03/91	0001	AL	O			2.9		0.5	-
	0630	01/10/92	0001	AL	O			8		1.0	-
	0630	06/28/92	0001	AL	O			4.21		0.5	-
	0632	07/16/89	0001	AL	O			177.		1.	-
	0632	04/23/90	0001	AL	O			120.		1.	-
	0632	12/05/90	0001	AL	O			130.		1.	-
	0632	04/18/91	0001	AL	O			115.		1.	-
	0632	08/02/91	0001	AL	O			100.		1.	-
	0632	01/10/92	0001	AL	O			112		1.0	-
	0632	06/27/92	0001	AL	O			81.2		0.5	-
	0637	07/16/89	0001	AL	O			15.7		1.	-
	0637	04/23/90	0001	AL	O			14.		1.	-
	0637	12/05/90	0001	AL	O			17.		1.	-
	0637	04/19/91	0001	AL	O			16.4		0.5	-
	0637	08/04/91	0001	AL	O			14.1		0.5	-
	0637	01/11/92	0001	AL	O			20		1.0	-
	0637	06/27/92	0001	AL	O			13		0.5	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
D - DOWN GRADIENT
O - ON-SITE

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
01/29/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
CHLORIDE	0656	04/23/90	0001	AL	O	MG/L		258.		1.	-
	0656	12/08/90	0001	AL	O			194.		1.	-
	0656	04/18/91	0001	AL	O			1824.		1.	-
	0656	01/09/92	0001	AL	O			149		1.0	-
	0656	06/27/92	0001	AL	O			123		0.5	-
CHROMIUM	0505	06/10/86	0001	AL	O	MG/L		0.04		0.01	-
	0505	04/10/87	0001	AL	O			0.01		0.01	-
	0505	10/08/87	0001	AL	O		<	0.01		0.01	-
	0505	07/13/89	0001	AL	O		<	0.01		0.01	-
	0505	04/20/90	0001	AL	O		<	0.01		0.01	-
	0505	12/08/90	0001	AL	O		<	0.01		0.01	-
	0505	04/18/91	0001	AL	O		<	0.01		0.01	-
	0505	08/01/91	0001	AL	O		<	0.01		0.01	-
	0505	01/13/92	0001	AL	O		<	0.01		0.01	-
	0506	04/10/87	0001	AL	O		<	0.01		0.01	-
	0506	10/08/87	0001	AL	O		<	0.01		0.01	-
	0506	07/13/89	0001	AL	O		<	0.01		0.01	-
	0506	04/20/90	0001	AL	O		<	0.01		0.01	-
	0506	12/08/90	0001	AL	O		<	0.01		0.01	-
	0506	04/18/91	0001	AL	O		<	0.01		0.01	-
	0506	08/01/91	0001	AL	O		<	0.01		0.01	-
	0506	01/13/92	0001	AL	O		<	0.01		0.01	-
	0548	06/25/86	0001	AL	D			0.05		0.01	-
	0548	04/10/87	0001	AL	D			0.01		0.01	-
	0548	10/08/87	0001	AL	D		<	0.01		0.01	-
	0548	07/17/89	0001	AL	D		<	0.01		0.01	-
	0548	04/23/90	0001	AL	D		<	0.01		0.01	-
	0548	12/05/90	0001	AL	D		<	0.01		0.01	-
	0548	04/19/91	0001	AL	D		<	0.01		0.01	-
	0548	08/02/91	0001	AL	D		<	0.01		0.01	-
	0548	01/14/92	0001	AL	D		<	0.01		0.01	-
	0616	07/14/89	0001	AL	O		<	0.01		0.01	-
	0616	04/23/90	0001	AL	O		<	0.01		0.01	-
	0616	12/05/90	0001	AL	O		<	0.01		0.01	-
	0616	04/18/91	0001	AL	O		<	0.01		0.01	-
	0616	01/09/92	0001	AL	O		<	0.01		0.01	-
	0619	07/16/89	0001	AL	O		<	0.01		0.01	-
	0619	04/23/90	0001	AL	O		<	0.01		0.01	-
	0619	12/08/90	0001	AL	O		<	0.01		0.01	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
O - ON-SITE
D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA
01/29/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
CHROMIUM	0619	04/19/91	0001	AL	O	MG/L	<	0.01		0.01	-
	0619	08/04/91	0001	AL	O		<	0.01		0.01	-
	0619	01/11/92	0001	AL	O		<	0.01		0.01	-
	0630	07/14/89	0001	AL	O		<	0.01		0.01	-
	0630	04/23/90	0001	AL	O		<	0.01		0.01	-
	0630	12/05/90	0001	AL	O		<	0.01		0.01	-
	0630	04/19/91	0001	AL	O		<	0.01		0.01	-
	0630	08/03/91	0001	AL	O		<	0.01		0.01	-
	0630	01/10/92	0001	AL	O		<	0.01		0.01	-
	0632	07/16/89	0001	AL	O		<	0.01		0.01	-
	0632	04/23/90	0001	AL	O		<	0.01		0.01	-
	0632	12/05/90	0001	AL	O		<	0.01		0.01	-
	0632	04/18/91	0001	AL	O		<	0.01		0.01	-
	0632	08/02/91	0001	AL	O		<	0.01		0.01	-
	0632	01/10/92	0001	AL	O		<	0.01		0.01	-
	0637	07/16/89	0001	AL	O		<	0.01		0.01	-
	0637	04/23/90	0001	AL	O		<	0.01		0.01	-
	0637	12/05/90	0001	AL	O		<	0.01		0.01	-
	0637	04/19/91	0001	AL	O		<	0.01		0.01	-
	0637	08/04/91	0001	AL	O		<	0.01		0.01	-
	0637	01/11/92	0001	AL	O		<	0.01		0.01	-
	0656	04/23/90	0001	AL	O		<	0.01		0.01	-
	0656	12/08/90	0001	AL	O		<	0.01		0.01	-
	0656	04/18/91	0001	AL	O		<	0.01		0.01	-
	0656	08/04/91	0001	AL	O		<	0.01		0.01	-
	0656	01/09/92	0001	AL	O		<	0.01		0.01	-
COBALT	0505	07/13/89	0001	AL	O	MG/L	<	0.05		0.05	-
	0505	04/20/90	0001	AL	O		<	0.05		0.05	-
	0506	07/13/89	0001	AL	O		<	0.05		0.05	-
	0506	04/20/90	0001	AL	O		<	0.05		0.05	-
	0548	07/17/89	0001	AL	D		<	0.05		0.05	-
	0548	04/23/90	0001	AL	D		<	0.05		0.05	-
	0616	07/14/89	0001	AL	O		<	0.05		0.05	-
	0616	04/23/90	0001	AL	O		<	0.05		0.05	-
	0619	07/16/89	0001	AL	O		<	0.05		0.05	-
	0619	04/23/90	0001	AL	O		<	0.05		0.05	-
	0630	07/14/89	0001	AL	O		<	0.05		0.05	-
	0630	04/23/90	0001	AL	O		<	0.05		0.05	-
	0632	07/16/89	0001	AL	O		<	0.05		0.05	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
O - ON-SITE
D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
01/29/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
COBALT	0632	04/23/90	0001	AL	O	MG/L	<	0.05		0.05	-
	0637	07/16/89	0001	AL	O		<	0.05		0.05	-
	0637	04/23/90	0001	AL	O		<	0.05		0.05	-
	0656	04/23/90	0001	AL	O		<	0.05		0.05	-
COPPER	0505	06/10/86	0001	AL	O	MG/L		0.03		0.02	-
	0505	04/10/87	0001	AL	O		<	0.01		0.02	-
	0505	10/08/87	0001	AL	O			0.01	J	0.02	-
	0505	07/13/89	0001	AL	O		<	0.02		0.02	-
	0505	04/20/90	0001	AL	O		<	0.02		0.02	-
	0505	12/08/90	0001	AL	O		<	0.02		0.02	-
	0505	04/18/91	0001	AL	O		<	0.01		0.01	-
	0505	08/01/91	0001	AL	O		<	0.01		0.01	-
	0506	04/10/87	0001	AL	O		<	0.01		0.02	-
	0506	10/08/87	0001	AL	O			0.02		0.02	-
	0506	07/13/89	0001	AL	O		<	0.02		0.02	-
	0506	04/20/90	0001	AL	O		<	0.02		0.02	-
	0506	12/08/90	0001	AL	O		<	0.02		0.02	-
	0506	04/18/91	0001	AL	O		<	0.01		0.01	-
	0506	08/01/91	0001	AL	O		<	0.01		0.01	-
	0548	06/25/86	0001	AL	D			0.03		0.02	-
	0548	04/10/87	0001	AL	D		<	0.01		0.02	-
	0548	10/08/87	0001	AL	D		<	0.01		0.02	-
	0548	07/17/89	0001	AL	D		<	0.02		0.02	-
	0548	04/23/90	0001	AL	D		<	0.02		0.02	-
	0548	12/05/90	0001	AL	D		<	0.02		0.02	-
	0548	04/19/91	0001	AL	D		<	0.01		0.01	-
	0548	08/02/91	0001	AL	D		<	0.01		0.01	-
	0616	07/14/89	0001	AL	O		<	0.02		0.02	-
	0616	04/23/90	0001	AL	O		<	0.02		0.02	-
	0616	12/05/90	0001	AL	O		<	0.02		0.02	-
	0616	04/18/91	0001	AL	O		<	0.01		0.01	-
	0619	07/16/89	0001	AL	O		<	0.02		0.02	-
	0619	04/23/90	0001	AL	O		<	0.02		0.02	-
	0619	12/08/90	0001	AL	O		<	0.02		0.02	-
	0619	04/19/91	0001	AL	O		<	0.01		0.01	-
	0619	08/04/91	0001	AL	O		<	0.01		0.01	-
	0630	07/14/89	0001	AL	O		<	0.02		0.02	-
	0630	04/23/90	0001	AL	O		<	0.02		0.02	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
O - ON-SITE
D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
J - ESTIMATED VALUE

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA
01/29/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
COPPER	0630	12/05/90	0001	AL	O	MG/L	<	0.02		0.02	-
	0630	04/19/91	0001	AL	O		<	0.01		0.01	-
	0630	08/03/91	0001	AL	O		<	0.01		0.01	-
	0632	07/16/89	0001	AL	O		<	0.02		0.02	-
	0632	04/23/90	0001	AL	O		<	0.02		0.02	-
	0632	12/05/90	0001	AL	O		<	0.02		0.02	-
	0632	04/18/91	0001	AL	O		<	0.01		0.01	-
	0632	08/02/91	0001	AL	O		<	0.01		0.01	-
	0637	07/16/89	0001	AL	O		<	0.02		0.02	-
	0637	04/23/90	0001	AL	O		<	0.02		0.02	-
	0637	12/05/90	0001	AL	O		<	0.02		0.02	-
	0637	04/19/91	0001	AL	O		<	0.01		0.01	-
	0637	08/04/91	0001	AL	O		<	0.01		0.01	-
	0656	04/23/90	0001	AL	O		<	0.02		0.02	-
	0656	12/08/90	0001	AL	O		<	0.02		0.02	-
	0656	04/18/91	0001	AL	O		<	0.01		0.01	-
	0656	08/04/91	0001	AL	O		<	0.01		0.01	-
CYANIDE	0505	07/13/89	0001	AL	O	MG/L	<	0.02		0.02	-
	0505	04/20/90	0001	AL	O		<	0.01		0.01	-
	0505	12/08/90	0001	AL	O		<	0.01		0.01	-
	0505	04/18/91	0001	AL	O		<	0.01		0.01	-
	0505	08/01/91	0001	AL	O		<	0.01		0.01	-
	0505	01/13/92	0001	AL	O		<	0.01		0.01	-
	0505	06/24/92	0001	AL	O		<	0.01		0.01	-
	0506	07/13/89	0001	AL	O		<	0.02		0.02	-
	0506	04/20/90	0001	AL	O		<	0.01		0.01	-
	0506	12/08/90	0001	AL	O		<	0.01		0.01	-
	0506	04/18/91	0001	AL	O		<	0.01		0.01	-
	0506	08/01/91	0001	AL	O		<	0.01		0.01	-
	0506	01/13/92	0001	AL	O		<	0.01		0.01	-
	0506	06/24/92	0001	AL	O		<	0.01		0.01	-
	0548	07/17/89	0001	AL	D		<	0.02		0.02	-
	0548	04/23/90	0001	AL	D		<	0.01		0.01	-
	0548	12/05/90	0001	AL	D		<	0.01		0.01	-
	0548	04/19/91	0001	AL	D		<	0.01		0.01	-
	0548	08/02/91	0001	AL	D		<	0.01		0.01	-
	0548	01/14/92	0001	AL	D		<	0.01		0.01	-
	0548	06/25/92	0001	AL	D		<	0.01		0.01	-
	0616	07/14/89	0001	AL	O		<	0.02		0.02	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
O - ON-SITE
D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
01/29/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
CYANIDE	0616	04/23/90	0001	AL	O	MG/L	<	0.01		0.01	-
	0616	12/05/90	0001	AL	O		<	0.01		0.01	-
	0616	04/18/91	0001	AL	O		<	0.01		0.01	-
	0616	01/09/92	0001	AL	O		<	0.01		0.01	-
	0616	06/26/92	0001	AL	O		<	0.01		0.01	-
	0619	07/16/89	0001	AL	O		<	0.02		0.02	-
	0619	04/23/90	0001	AL	O		<	0.01		0.01	-
	0619	12/08/90	0001	AL	O		<	0.01		0.01	-
	0619	04/19/91	0001	AL	O		<	0.01		0.01	-
	0619	01/11/92	0001	AL	O		-		J	-	-
	0619	06/27/92	0001	AL	O		<	0.01		0.01	-
	0630	07/14/89	0001	AL	O		<	0.02		0.02	-
	0630	04/23/90	0001	AL	O		<	0.01		0.01	-
	0630	12/05/90	0001	AL	O		<	0.01		0.01	-
	0630	04/19/91	0001	AL	O		<	0.01		0.01	-
	0630	08/03/91	0001	AL	O		<	0.01		0.01	-
	0630	01/10/92	0001	AL	O		-		J	-	-
	0630	06/28/92	0001	AL	O		<	0.01		0.01	-
	0632	07/16/89	0001	AL	O		<	0.02		0.02	-
	0632	04/23/90	0001	AL	O		<	0.01		0.01	-
	0632	12/05/90	0001	AL	O		<	0.01		0.01	-
	0632	04/18/91	0001	AL	O		<	0.01		0.01	-
	0632	08/02/91	0001	AL	O		<	0.01		0.01	-
	0632	01/10/92	0001	AL	O		<	0.01		0.01	-
	0632	06/27/92	0001	AL	O		<	0.01		0.01	-
	0637	07/16/89	0001	AL	O		<	0.02		0.02	-
	0637	04/23/90	0001	AL	O		<	0.01		0.01	-
	0637	12/05/90	0001	AL	O		<	0.01		0.01	-
	0637	04/19/91	0001	AL	O		<	0.01		0.01	-
	0637	01/11/92	0001	AL	O		-	0.02		0.01	-
	0637	06/27/92	0001	AL	O		<	0.01		0.01	-
	0656	04/23/90	0001	AL	O		<	0.01		0.01	-
	0656	12/08/90	0001	AL	O		<	0.01		0.01	-
	0656	01/09/92	0001	AL	O		-		J	-	-
DISSOLVED ORGANIC CARBON	0505	04/20/90	0001	AL	O	MG/L		96.		1.	-
	0505	12/08/90	0001	AL	O			113.		1.	-
	0505	08/01/91	0001	AL	O			3.		2.	-
	0505	01/13/92	0001	AL	O			6.3		1.0	-
	0505	06/24/92	0001	AL	O			11.2	*N	1	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
O - ON-SITE

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
• - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS
J - ESTIMATED VALUE
N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
DISSOLVED ORGANIC CARBON	0506	04/20/90	0001	AL	O	MG/L		75.		1.	-
	0506	12/08/90	0001	AL	O			99.		1.	-
	0506	08/01/91	0001	AL	O			3.		2.	-
	0506	01/13/92	0001	AL	O			4.4		1.0	-
	0506	06/24/92	0001	AL	O			11.9	*N	1	-
	0548	04/23/90	0001	AL	D			39.		1.	-
	0548	12/05/90	0001	AL	D			72.		1.	-
	0548	08/02/91	0001	AL	D			3.		2.	-
	0548	01/14/92	0001	AL	D			5.5		1.0	-
	0548	06/25/92	0001	AL	D			5.5	*N	1	-
	0616	04/23/90	0001	AL	O			124.		1.	-
	0616	12/05/90	0001	AL	O			142.		1.	-
	0616	01/09/92	0001	AL	O			9.7		1.0	-
	0616	06/26/92	0001	AL	O			10.6	*N	1	-
	0619	04/23/90	0001	AL	O			21.		1.	-
	0619	12/08/90	0001	AL	O			36.		1.	-
	0619	01/11/92	0001	AL	O			5.8		1.0	-
	0619	06/27/92	0001	AL	O			5.6	*N	1	-
	0630	04/23/90	0001	AL	O			6.		1.	-
	0630	12/05/90	0001	AL	O			38.		1.	-
	0630	01/10/92	0001	AL	O			3.8		1.0	-
	0630	06/28/92	0001	AL	O			3.4	*N	1	-
	0632	04/23/90	0001	AL	O			108.		1.	-
	0632	12/05/90	0001	AL	O			124.		1.	-
	0632	08/02/91	0001	AL	O			6.		2.	-
	0632	01/10/92	0001	AL	O			8.0		1.0	-
	0632	06/27/92	0001	AL	O			16.4	*N	1	-
	0637	04/23/90	0001	AL	O			59.		1.	-
	0637	12/05/90	0001	AL	O			66.		1.	-
	0637	01/11/92	0001	AL	O			8.6		1.0	-
	0637	06/27/92	0001	AL	O			6.4	*N	1	-
	0656	12/08/90	0001	AL	O			224.		1.	-
	0656	01/09/92	0001	AL	O			20		1.0	-
FLUORIDE	0505	06/10/86	0001	AL	O	MG/L		0.5		0.1	-
	0505	04/10/87	0001	AL	O			0.26		0.1	-
	0505	10/08/87	0001	AL	O			0.44		0.1	-
	0505	07/13/89	0001	AL	O			0.2		0.1	-
	0505	04/20/90	0001	AL	O			0.3		0.1	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

O - ON-SITE

D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:

* - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS

N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
FLUORIDE	0505	12/08/90	0001	AL	O	MG/L		0.3		0.1	-
	0505	04/18/91	0001	AL	O			0.3		0.1	-
	0505	08/01/91	0001	AL	O			0.4		0.1	-
	0505	01/13/92	0001	AL	O			0.4		0.1	-
	0505	06/24/92	0001	AL	O			0.523		0.1	-
	0506	04/10/87	0001	AL	O			0.34		0.1	-
	0506	10/08/87	0001	AL	O			0.43		0.1	-
	0506	07/13/89	0001	AL	O			0.3		0.1	-
	0506	04/20/90	0001	AL	O			0.3		0.1	-
	0506	12/08/90	0001	AL	O			0.4		0.1	-
	0506	04/18/91	0001	AL	O			0.4		0.1	-
	0506	08/01/91	0001	AL	O			0.4		0.1	-
	0506	01/13/92	0001	AL	O			0.5		0.1	-
	0506	06/24/92	0001	AL	O			0.435		0.1	-
	0548	06/25/86	0001	AL	D			0.8		0.1	-
	0548	04/10/87	0001	AL	D			0.59		0.1	-
	0548	10/08/87	0001	AL	D			0.75		0.1	-
	0548	07/17/89	0001	AL	D			0.8		0.1	-
	0548	04/23/90	0001	AL	D			0.7		0.1	-
	0548	12/05/90	0001	AL	D			0.7		0.1	-
	0548	04/19/91	0001	AL	D			0.6		0.1	-
	0548	08/02/91	0001	AL	D			0.9		0.1	-
	0548	01/14/92	0001	AL	D			0.8		0.1	-
	0548	06/25/92	0001	AL	D			0.94		0.1	-
	0616	07/14/89	0001	AL	O			1.6		0.1	-
	0616	04/23/90	0001	AL	O			1.0		0.1	-
	0616	12/05/90	0001	AL	O			1.3		0.1	-
	0616	04/18/91	0001	AL	O			1.6		0.1	-
	0616	01/09/92	0001	AL	O			1.3		0.1	-
	0616	06/26/92	0001	AL	O			1.51		0.1	-
	0619	07/16/89	0001	AL	O			1.3		0.1	-
	0619	04/23/90	0001	AL	O			1.0		0.1	-
	0619	12/08/90	0001	AL	O			1.1		0.1	-
	0619	04/19/91	0001	AL	O			1.0		0.1	-
	0619	08/04/91	0001	AL	O			1.2		0.1	-
	0619	01/11/92	0001	AL	O			-	J	-	-
	0619	06/27/92	0001	AL	O			1.27		0.1	-
	0630	07/14/89	0001	AL	O			1.0		0.1	-
	0630	04/23/90	0001	AL	O			0.7		0.1	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

O - ON-SITE

D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:

J - ESTIMATED VALUE

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
FLUORIDE	0630	12/05/90	0001	AL	O	MG/L		0.8		0.1	-
	0630	04/19/91	0001	AL	O			0.7		0.1	-
	0630	08/03/91	0001	AL	O			0.9		0.1	-
	0630	01/10/92	0001	AL	O			-	J	-	-
	0630	06/28/92	0001	AL	O			0.92		0.1	-
	0632	07/16/89	0001	AL	O			0.5		0.1	-
	0632	04/23/90	0001	AL	O			0.4		0.1	-
	0632	12/05/90	0001	AL	O			0.5		0.1	-
	0632	04/18/91	0001	AL	O			0.5		0.1	-
	0632	08/02/91	0001	AL	O			0.6		0.1	-
	0632	01/10/92	0001	AL	O			0.5		0.1	-
	0632	06/27/92	0001	AL	O			0.81		0.1	-
	0637	07/16/89	0001	AL	O			0.4		0.1	-
	0637	04/23/90	0001	AL	O			0.4		0.1	-
	0637	12/05/90	0001	AL	O			0.4		0.1	-
	0637	04/19/91	0001	AL	O			0.4		0.1	-
	0637	08/04/91	0001	AL	O			0.4		0.1	-
	0637	01/11/92	0001	AL	O			0.3		0.1	-
	0637	06/27/92	0001	AL	O			0.61		0.1	-
	0656	04/23/90	0001	AL	O			0.2		0.1	-
	0656	12/08/90	0001	AL	O			0.5		0.1	-
	0656	04/18/91	0001	AL	O			0.6		0.1	-
	0656	01/09/92	0001	AL	O			-	J	-	-
	0656	06/27/92	0001	AL	O			0.92		0.1	-
GROSS ALPHA	0505	07/13/89	0001	AL	O	PCI/L		358.		0.2	31.
	0505	04/20/90	0001	AL	O			560.		1.	30.
	0505	12/08/90	0001	AL	O			430.		1.	30.
	0505	04/18/91	0001	AL	O			416.		1.	35.8
	0505	08/01/91	0001	AL	O			383.9		1.	36.1
	0505	01/14/92	0001	AL	O			320		1.	20
	0505	06/24/92	0001	AL	O			364.		1.0	35.7
	0506	07/13/89	0001	AL	O			1125.		0.2	76.
	0506	04/20/90	0001	AL	O			1500.		1.	100.
	0506	12/08/90	0001	AL	O			870.		1.	50.
	0506	04/18/91	0001	AL	O			1277.		1.	75.2
	0506	08/01/91	0001	AL	O			1011.2		1.	67.7
	0506	01/13/92	0001	AL	O			710		1.	40
	0506	06/24/92	0001	AL	O			1050.		1.0	68.8
	0548	07/17/89	0001	AL	D			116.		0.2	12.

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

O - ON-SITE

D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:

J - ESTIMATED VALUE

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
GROSS ALPHA	0548	04/23/90	0001	AL	D	PCI/L		290.		1.	20.
	0548	12/05/90	0001	AL	D			370.		1.	30.
	0548	04/19/91	0001	AL	D			286.		1.	24.6
	0548	08/05/91	0001	AL	D			115.		1.	12.
	0548	01/14/92	0001	AL	D			140.		1.	10
	0548	06/25/92	0001	AL	D			138.		1.0	15.2
	0616	07/14/89	0001	AL	O			4161.		0.2	219.
	0616	04/23/90	0001	AL	O			3200.		1.	200.
	0616	12/05/90	0001	AL	O			1600.		1.	100.
	0616	04/18/91	0001	AL	O			1957.		1.	118.
	0616	01/09/92	0001	AL	O			880.		1.	80
	0616	06/26/92	0001	AL	O			1310.		1.0	140.
	0619	07/16/89	0001	AL	O			95.		0.2	13.
	0619	04/23/90	0001	AL	O			78.		1.	10.
	0619	12/08/90	0001	AL	O			130.		1.	10.
	0619	08/05/91	0001	AL	O			93.7		1.	13.
	0619	01/12/92	0001	AL	O			120.		1.	10
	0619	06/27/92	0001	AL	O			77.7		1.0	12.1
	0630	07/14/89	0001	AL	O			54.		0.2	8.1
	0630	04/23/90	0001	AL	O			99.		1.	10.
	0630	12/05/90	0001	AL	O			100.		1.	10.
	0630	04/19/91	0001	AL	O			61.0		1.	8.0
	0630	08/05/91	0001	AL	O			18.0		1.	3.
	0630	01/10/92	0001	AL	O			59.		1.	6
	0630	06/28/92	0001	AL	O			68.6		1.0	10.2
	0632	07/16/89	0001	AL	O			1080.		0.2	79.
	0632	04/23/90	0001	AL	O			1500.		1.	100.
	0632	12/05/90	0001	AL	O			530.		1.	40.
	0632	04/18/91	0001	AL	O			1235.		1.	80.7
	0632	08/05/91	0001	AL	O			973.		1.	67.
	0632	01/10/92	0001	AL	O			1500.		1.	100
	0632	06/27/92	0001	AL	O			1090.		1.0	72.7
	0637	07/16/89	0001	AL	O			1018.		0.2	52.
	0637	04/23/90	0001	AL	O			1100.		1.	100.
	0637	12/05/90	0001	AL	O			470.		1.	30.
	0637	04/19/91	0001	AL	O			468.		1.	36.3
	0637	08/05/91	0001	AL	O			265.		1.	25.
	0637	01/11/92	0001	AL	O			480.		1.	30
	0637	06/27/92	0001	AL	O			375.		1.0	33.5
	0656	12/08/90	0001	AL	O			1100.		1.	100.

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
D - DOWN GRADIENT
O - ON-SITE

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PARAMETER PVI VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
GROSS ALPHA	0656	04/18/91	0001	AL	0	PCI/L	746.		1.	69.3
	0656	08/05/91	0001	AL	0		640.		1.	64.
	0656	01/09/92	0001	AL	0		240		1.	30
	0656	06/27/92	0001	AL	0		591.		1.0	61.4
GROSS BETA	0505	07/13/89	0001	AL	0	PCI/L	301.		1.	15.
	0505	04/20/90	0001	AL	0		230.		0.5	10.
	0505	12/08/90	0001	AL	0		190.		0.5	10.
	0505	04/18/91	0001	AL	0		213.		0.5	13.5
	0505	08/01/91	0001	AL	0		180.6		0.5	13.3
	0505	01/14/92	0001	AL	0		150		0.5	10
	0505	06/24/92	0001	AL	0		237.		0.5	18.2
	0506	07/13/89	0001	AL	0		637.		1.	28.
	0506	04/20/90	0001	AL	0		690.		0.5	20.
	0506	12/08/90	0001	AL	0		420.		0.5	20.
	0506	04/18/91	0001	AL	0		539.		0.5	25.2
	0506	08/01/91	0001	AL	0		455.3		0.5	23.4
	0506	01/13/92	0001	AL	0		320		0.5	20
	0506	06/24/92	0001	AL	0		777.		0.5	37.3
	0548	07/17/89	0001	AL	D		66.		1.	5.
	0548	04/23/90	0001	AL	D		130.		0.5	10.
	0548	12/05/90	0001	AL	D		140.		0.5	10.
	0548	04/19/91	0001	AL	D		125.		0.5	8.9
	0548	08/05/91	0001	AL	D		51.		0.5	4.2
	0548	01/14/92	0001	AL	D		68		0.5	5
	0548	06/25/92	0001	AL	D		95.2		0.5	8.1
	0616	07/14/89	0001	AL	0		12930.		1.	74.
	0616	04/23/90	0001	AL	0		1500.		0.5	100.
	0616	12/05/90	0001	AL	0		780.		0.5	40.
	0616	04/18/91	0001	AL	0		663.		0.5	35.6
	0616	01/09/92	0001	AL	0		420		0.5	30
	0616	06/26/92	0001	AL	0		688.		0.5	64.1
	0619	07/16/89	0001	AL	0		42.		1.	4.
	0619	04/23/90	0001	AL	0		41.		0.5	3.
	0619	12/08/90	0001	AL	0		44.		0.5	4.
	0619	08/05/91	0001	AL	0		34.		0.5	4.6
	0619	01/12/92	0001	AL	0		46		0.5	4
	0619	06/27/92	0001	AL	0		61.0		0.5	7.5
	0630	07/14/89	0001	AL	0		38.		1.	3.
	0630	04/23/90	0001	AL	0		41.		0.5	3.

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

0 - ON-SITE

D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PARAMETER PVI VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
GROSS BETA	0630	12/05/90	0001	AL	0	PCI/L	40.		0.5	3.
	0630	04/19/91	0001	AL	0		138.		0.5	3.3
	0630	08/05/91	0001	AL	0		19.		0.5	2.9
	0630	01/10/92	0001	AL	0		32		0.5	2
	0630	06/28/92	0001	AL	0		39.2		0.5	5.7
	0632	07/16/89	0001	AL	0		532.		1.	28.
	0632	04/23/90	0001	AL	0		700.		0.5	20.
	0632	12/05/90	0001	AL	0		280.		0.5	20.
	0632	04/18/91	0001	AL	0		523.		0.5	26.8
	0632	08/05/91	0001	AL	0		468.		0.5	26.
	0632	01/10/92	0001	AL	0		540		0.5	20
	0632	06/27/92	0001	AL	0		671.		0.5	36.2
	0637	07/16/89	0001	AL	0		549.		1.	19.
	0637	04/23/90	0001	AL	0		360.		0.5	10.
	0637	12/05/90	0001	AL	0		230.		0.5	10.
	0637	04/19/91	0001	AL	0		332.		0.5	16.9
	0637	08/05/91	0001	AL	0		156.		0.5	11.
	0637	01/11/92	0001	AL	0		230		0.5	10
	0637	06/27/92	0001	AL	0		236.		0.5	15.7
	0656	12/08/90	0001	AL	0		430.		0.5	20.
	0656	04/18/91	0001	AL	0		285.		0.5	23.1
	0656	08/05/91	0001	AL	0		262.		0.5	23.
	0656	01/09/92	0001	AL	0		140		0.5	20
	0656	06/27/92	0001	AL	0		300.		0.5	29.6
IRON	0505	01/29/86	0001	AL	0	MG/L	0.09		0.03	-
	0505	06/10/86	0001	AL	0		0.06		0.03	-
	0505	04/10/87	0001	AL	0		0.08		0.03	-
	0505	10/08/87	0001	AL	0		< 0.01		0.03	-
	0505	07/13/89	0001	AL	0		< 0.03		0.03	-
	0505	04/20/90	0001	AL	0		0.05		0.03	-
	0506	01/30/86	0001	AL	0		0.21		0.03	-
	0506	06/09/86	0001	AL	0		0.98		0.03	-
	0506	04/10/87	0001	AL	0		0.36		0.03	-
	0506	10/08/87	0001	AL	0		0.62		0.03	-
	0506	07/13/89	0001	AL	0		2.83		0.03	-
	0506	04/20/90	0001	AL	0		2.12		0.03	-
	0548	06/25/86	0001	AL	D		0.62		0.03	-
	0548	04/10/87	0001	AL	D		0.99		0.03	-
	0548	10/08/87	0001	AL	D		0.60		0.03	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

0 - ON-SITE

D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
01/29/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
IRON	0548	07/17/89	0001	AL	D	MG/L		0.15		0.03	-
	0548	04/23/90	0001	AL	D			0.44		0.03	-
	0616	07/14/89	0001	AL	O		<	0.03		0.03	-
	0616	04/23/90	0001	AL	O			0.09		0.03	-
	0619	07/16/89	0001	AL	O			0.05		0.03	-
	0619	04/23/90	0001	AL	O			0.08		0.03	-
	0630	07/14/89	0001	AL	O		<	0.03		0.03	-
	0630	04/23/90	0001	AL	O			0.04		0.03	-
	0632	07/16/89	0001	AL	O		<	0.03		0.03	-
	0632	04/23/90	0001	AL	O			0.07		0.03	-
	0637	07/16/89	0001	AL	O			0.13		0.03	-
	0637	04/23/90	0001	AL	O			0.33		0.03	-
	0656	04/23/90	0001	AL	O			0.22		0.03	-
LEAD	0505	06/10/86	0001	AL	O	MG/L	<	0.01		0.01	-
	0505	04/10/87	0001	AL	O			0.002	J	0.01	-
	0505	10/08/87	0001	AL	O			0.02		0.01	-
	0505	07/13/89	0001	AL	O		<	0.01		0.01	-
	0505	04/20/90	0001	AL	O		<	0.01		0.01	-
	0505	12/08/90	0001	AL	O		<	0.01		0.01	-
	0505	04/18/91	0001	AL	O		<	0.005		0.005	-
	0505	08/01/91	0001	AL	O		<	0.005		0.005	-
	0506	04/10/87	0001	AL	O			0.001	J	0.01	-
	0506	10/08/87	0001	AL	O			0.02		0.01	-
	0506	07/13/89	0001	AL	O		<	0.01		0.01	-
	0506	04/20/90	0001	AL	O		<	0.01		0.01	-
	0506	12/08/90	0001	AL	O		<	0.01		0.01	-
	0506	04/18/91	0001	AL	O		<	0.005		0.005	-
	0506	08/01/91	0001	AL	O		<	0.005		0.005	-
	0548	06/25/86	0001	AL	D		<	0.01		0.01	-
	0548	04/10/87	0001	AL	D		<	0.001		0.01	-
	0548	10/08/87	0001	AL	D		<	0.01		0.01	-
	0548	07/17/89	0001	AL	D		<	0.01		0.01	-
	0548	04/23/90	0001	AL	D		<	0.01		0.01	-
	0548	12/05/90	0001	AL	D		<	0.01	J	0.01	-
	0548	04/19/91	0001	AL	D		<	0.005		0.005	-
	0548	08/02/91	0001	AL	D		<	0.005		0.005	-
	0616	07/14/89	0001	AL	O		<	0.01		0.01	-
	0616	04/23/90	0001	AL	O		<	0.01		0.01	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
D - DOWN GRADIENT
O - ON-SITE

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
J - ESTIMATED VALUE

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
LEAD	0616	12/05/90	0001	AL	O	MG/L	<	0.01		0.01	-
	0616	04/18/91	0001	AL	O		<	0.005		0.005	-
	0619	07/16/89	0001	AL	O		<	0.01		0.01	-
	0619	04/23/90	0001	AL	O		<	0.01		0.01	-
	0619	12/08/90	0001	AL	O		<	0.01	J	0.01	-
	0619	04/19/91	0001	AL	O		<	0.005		0.005	-
	0619	08/04/91	0001	AL	O		<	0.005		0.005	-
	0630	07/14/89	0001	AL	O		<	0.01		0.01	-
	0630	04/23/90	0001	AL	O		<	0.01		0.01	-
	0630	12/05/90	0001	AL	O		<	0.01	J	0.01	-
	0630	04/19/91	0001	AL	O		<	0.005		0.005	-
	0630	08/03/91	0001	AL	O		<	0.005		0.005	-
	0632	07/16/89	0001	AL	O		<	0.01		0.01	-
	0632	04/23/90	0001	AL	O		<	0.01		0.01	-
	0632	12/05/90	0001	AL	O		<	0.01		0.01	-
	0632	04/18/91	0001	AL	O		<	0.005		0.005	-
	0632	08/02/91	0001	AL	O		<	0.005		0.005	-
	0637	07/16/89	0001	AL	O		<	0.01		0.01	-
	0637	04/23/90	0001	AL	O		<	0.01		0.01	-
	0637	12/05/90	0001	AL	O		<	0.01		0.01	-
	0637	04/19/91	0001	AL	O		<	0.005		0.005	-
	0637	08/04/91	0001	AL	O		<	0.005		0.005	-
	0656	04/23/90	0001	AL	O		<	0.01		0.01	-
	0656	12/08/90	0001	AL	O		<	0.01	J	0.01	-
	0656	04/18/91	0001	AL	O		<	0.005		0.005	-
	0656	08/04/91	0001	AL	O		<	0.005		0.005	-
LEAD-210	0505	06/10/86	0001	AL	O	PCI/L		7.		1.5	0.9
	0505	10/08/87	0001	AL	O			1.5		1.5	1.3
	0505	07/13/89	0001	AL	O			1.0		1.5	1.2
	0505	04/20/90	0001	AL	O			2.1		1.5	0.9
	0506	04/10/87	0001	AL	O			11.		1.5	1.
	0506	10/08/87	0001	AL	O			0.0		1.5	1.6
	0506	07/13/89	0001	AL	O			5.0		1.5	1.4
	0506	04/20/90	0001	AL	O			0.0		1.5	0.8
	0548	06/25/86	0001	AL	D			4.5		1.5	0.8
	0548	04/10/87	0001	AL	D			5.9		1.5	1.1
	0548	10/08/87	0001	AL	D			0.2		1.5	1.3
	0548	07/17/89	0001	AL	D			1.5		1.5	1.0

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
O - ON-SITE
D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
J - ESTIMATED VALUE

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
LEAD-210	0548	04/23/90	0001	AL	D	PCI/L		0.3		1.5	0.9
	0616	07/14/89	0001	AL	O			13.5		1.5	1.4
	0616	04/23/90	0001	AL	O			3.4		1.5	0.8
	0619	07/16/89	0001	AL	O			1.5		1.5	1.0
	0619	04/23/90	0001	AL	O			0.9		1.5	0.9
	0630	07/14/89	0001	AL	O			0.0		1.5	1.2
	0630	04/23/90	0001	AL	O			0.6		1.5	0.8
	0632	07/16/89	0001	AL	O			6.7		1.5	1.2
	0632	04/23/90	0001	AL	O			3.7		1.5	0.9
	0637	07/16/89	0001	AL	O			8.4		1.5	1.3
	0637	04/23/90	0001	AL	O			4.0		1.5	0.9
MAGNESIUM	0505	01/29/86	0001	AL	O	MG/L		44.5		0.001	-
	0505	06/10/86	0001	AL	O			43.6		0.001	-
	0505	04/10/87	0001	AL	O			61.4		0.001	-
	0505	10/08/87	0001	AL	O			51.6		0.001	-
	0505	07/13/89	0001	AL	O			39.		0.001	-
	0505	04/20/90	0001	AL	O			36.7		0.001	-
	0505	12/08/90	0001	AL	O			40.6		0.001	-
	0505	04/18/91	0001	AL	O			48.6		0.1	-
	0505	08/01/91	0001	AL	O			55.8		0.5	-
	0505	01/13/92	0001	AL	O			37		0.05	-
	0505	06/24/92	0001	AL	O			50.7		0.1	-
	0506	01/30/86	0001	AL	O			86.		0.001	-
	0506	06/09/86	0001	AL	O			77.4		0.001	-
	0506	04/10/87	0001	AL	O			84.6		0.001	-
	0506	10/08/87	0001	AL	O			83.7		0.001	-
	0506	07/13/89	0001	AL	O			92.		0.001	-
	0506	04/20/90	0001	AL	O			78.0		0.001	-
	0506	12/08/90	0001	AL	O			69.0		0.001	-
	0506	04/18/91	0001	AL	O			68.6		0.5	-
	0506	08/01/91	0001	AL	O			66.9		0.5	-
	0506	01/13/92	0001	AL	O			59		0.05	-
	0506	06/24/92	0001	AL	O			63.2		0.1	-
	0548	06/25/86	0001	AL	D			35.6		0.001	-
	0548	04/10/87	0001	AL	D			78.4		0.001	-
	0548	10/08/87	0001	AL	D			30.6		0.001	-
	0548	07/17/89	0001	AL	D			16.5		0.001	-
	0548	04/23/90	0001	AL	D			30.8		0.001	-
	0548	12/05/90	0001	AL	D			33.7		0.001	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

D - DOWN GRADIENT

O - ON-SITE

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA
01/29/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MAGNESIUM	0548	04/19/91	0001	AL	D	MG/L		33.6		0.1	-
	0548	08/02/91	0001	AL	D			18.1		0.1	-
	0548	01/14/92	0001	AL	D			21		0.05	-
	0548	06/25/92	0001	AL	D			21.5		0.1	-
	0616	07/14/89	0001	AL	O			77.		0.001	-
	0616	04/23/90	0001	AL	O			84.7		0.001	-
	0616	12/05/90	0001	AL	O			63.6		0.001	-
	0616	04/18/91	0001	AL	O			48.9		0.1	-
	0616	01/09/92	0001	AL	O			63		0.05	-
	0616	06/26/92	0001	AL	O			59.9		0.1	-
	0619	07/16/89	0001	AL	O			19.8		0.001	-
	0619	04/23/90	0001	AL	O			19.9		0.001	-
	0619	12/08/90	0001	AL	O			17.9		0.001	-
	0619	04/19/91	0001	AL	O			20.7		0.1	-
	0619	08/04/91	0001	AL	O			20.4		0.1	-
	0619	01/11/92	0001	AL	O			17		0.05	-
	0619	06/27/92	0001	AL	O			17.7		0.1	-
	0630	07/14/89	0001	AL	O			14.7		0.001	-
	0630	04/23/90	0001	AL	O			20.5		0.001	-
	0630	12/05/90	0001	AL	O			17.7		0.001	-
	0630	04/19/91	0001	AL	O			21.1		0.1	-
	0630	08/03/91	0001	AL	O			14.5		0.1	-
	0630	01/10/92	0001	AL	O			15		0.05	-
	0630	06/28/92	0001	AL	O			15.8		0.1	-
	0632	07/16/89	0001	AL	O			97.		0.001	-
	0632	04/23/90	0001	AL	O			89.6		0.001	-
	0632	12/05/90	0001	AL	O			89.4		0.001	-
	0632	04/18/91	0001	AL	O			91.2		0.5	-
	0632	08/02/91	0001	AL	O			82.3		0.5	-
	0632	01/10/92	0001	AL	O			76		0.05	-
	0632	06/27/92	0001	AL	O			70.3		0.1	-
	0637	07/16/89	0001	AL	O			41.		0.001	-
	0637	04/23/90	0001	AL	O			40.3		0.001	-
	0637	12/05/90	0001	AL	O			47.0		0.001	-
	0637	04/19/91	0001	AL	O			45.3		0.1	-
	0637	08/04/91	0001	AL	O			40.4		0.1	-
	0637	01/11/92	0001	AL	O			50		0.05	-
	0637	06/27/92	0001	AL	O			39.1		0.1	-
	0656	04/23/90	0001	AL	O			119.		0.001	-
	0656	12/08/90	0001	AL	O			87.1		0.001	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
D - DOWN GRADIENT
O - ON-SITE

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MAGNESIUM	0656	04/18/91	0001	AL	O	MG/L		96.4		0.5	-
	0656	08/04/91	0001	AL	O			97.9		0.5	-
	0656	01/09/92	0001	AL	O			74		0.05	-
	0656	06/27/92	0001	AL	O			72.4		0.1	-
MANGANESE	0505	01/29/86	0001	AL	O	MG/L		0.47		0.01	-
	0505	06/10/86	0001	AL	O			0.41		0.01	-
	0505	04/10/87	0001	AL	O			0.98		0.01	-
	0505	10/08/87	0001	AL	O			1.18		0.01	-
	0505	07/13/89	0001	AL	O			0.58		0.01	-
	0505	04/20/90	0001	AL	O			0.39		0.01	-
	0505	12/08/90	0001	AL	O			0.49		0.01	-
	0505	04/18/91	0001	AL	O			0.19		0.01	-
	0505	08/01/91	0001	AL	O			0.98		0.01	-
	0505	01/13/92	0001	AL	O			0.55		0.01	-
	0505	06/24/92	0001	AL	O			0.766		0.01	-
	0506	01/30/86	0001	AL	O			2.44		0.01	-
	0506	06/09/86	0001	AL	O			3.26		0.01	-
	0506	04/10/87	0001	AL	O			3.42		0.01	-
	0506	10/08/87	0001	AL	O			3.31		0.01	-
	0506	07/13/89	0001	AL	O			3.37		0.01	-
	0506	04/20/90	0001	AL	O			3.09		0.01	-
	0506	12/08/90	0001	AL	O			2.59		0.01	-
	0506	04/18/91	0001	AL	O			2.20		0.01	-
	0506	08/01/91	0001	AL	O			2.39		0.01	-
	0506	01/13/92	0001	AL	O			2.13		0.01	-
	0506	06/24/92	0001	AL	O			2.25		0.01	-
	0548	06/25/86	0001	AL	D			2.01		0.01	-
	0548	04/10/87	0001	AL	D			4.61		0.01	-
	0548	10/08/87	0001	AL	D			2.27		0.01	-
	0548	07/17/89	0001	AL	D			1.00		0.01	-
	0548	04/23/90	0001	AL	D			1.88		0.01	-
	0548	12/05/90	0001	AL	D			2.25		0.01	-
	0548	04/19/91	0001	AL	D			1.94		0.01	-
	0548	08/02/91	0001	AL	D			0.97		0.01	-
	0548	01/14/92	0001	AL	D			1.21		0.01	-
	0548	06/25/92	0001	AL	D			1.19		0.01	-
	0616	07/14/89	0001	AL	O			3.97		0.01	-
	0616	04/23/90	0001	AL	O			4.19		0.01	-
	0616	12/05/90	0001	AL	O			0.82		0.01	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

O - ON-SITE

D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MANGANESE	0616	04/18/91	0001	AL	0	MG/L		0.02		0.01	-
	0616	01/09/92	0001	AL	0			0.12		0.01	-
	0616	06/26/92	0001	AL	0			0.274		0.01	-
	0619	07/16/89	0001	AL	0			2.35		0.01	-
	0619	04/23/90	0001	AL	0			2.12		0.01	-
	0619	12/08/90	0001	AL	0			2.25		0.01	-
	0619	04/19/91	0001	AL	0			0.63		0.01	-
	0619	08/04/91	0001	AL	0			2.19		0.01	-
	0619	01/11/92	0001	AL	0			0.13		0.01	-
	0619	06/27/92	0001	AL	0			1.15		0.01	-
	0630	07/14/89	0001	AL	0			0.73		0.01	-
	0630	04/23/90	0001	AL	0			0.58		0.01	-
	0630	12/05/90	0001	AL	0			0.17		0.01	-
	0630	04/19/91	0001	AL	0			0.16		0.01	-
	0630	08/03/91	0001	AL	0			0.17		0.01	-
	0630	01/10/92	0001	AL	0			0.04		0.01	-
	0630	06/28/92	0001	AL	0			0.206		0.01	-
	0632	07/16/89	0001	AL	0			0.76		0.01	-
	0632	04/23/90	0001	AL	0			0.60		0.01	-
	0632	12/05/90	0001	AL	0			0.80		0.01	-
	0632	04/18/91	0001	AL	0			0.17		0.01	-
	0632	08/02/91	0001	AL	0			0.61		0.01	-
	0632	01/10/92	0001	AL	0			0.26		0.01	-
	0632	06/27/92	0001	AL	0			0.415		0.01	-
	0637	07/16/89	0001	AL	0			1.27		0.01	-
	0637	04/23/90	0001	AL	0			1.17		0.01	-
	0637	12/05/90	0001	AL	0			0.95		0.01	-
	0637	04/19/91	0001	AL	0			0.70		0.01	-
	0637	08/04/91	0001	AL	0			1.75		0.01	-
	0637	01/11/92	0001	AL	0			0.56		0.01	-
	0637	06/27/92	0001	AL	0			0.54		0.01	-
	0656	04/23/90	0001	AL	0			7.48		0.01	-
	0656	12/08/90	0001	AL	0			4.95		0.01	-
	0656	04/18/91	0001	AL	0			5.24		0.01	-
	0656	08/04/91	0001	AL	0			5.77		0.01	-
	0656	01/09/92	0001	AL	0			1.88		0.01	-
	0656	06/27/92	0001	AL	0			4.13		0.01	-
MERCURY	0505	06/10/86	0001	AL	0	MG/L	<	0.0002		0.0002	-
	0505	04/10/87	0001	AL	0		<	0.0002		0.0002	-
	0505	10/08/87	0001	AL	0			0.0002		0.0002	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

0 - ON-SITE

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MERCURY	0505	07/13/89	0001	AL	O	MG/L	<	0.0002		0.0002	-
	0505	04/20/90	0001	AL	O		<	0.0002		0.0002	-
	0505	12/08/90	0001	AL	O		<	0.0002		0.0002	-
	0505	04/18/91	0001	AL	O		<	0.0002		0.0002	-
	0505	08/01/91	0001	AL	O		<	0.0002		0.0002	-
	0506	04/10/87	0001	AL	O		<	0.0002		0.0002	-
	0506	10/08/87	0001	AL	O		<	0.0002		0.0002	-
	0506	07/13/89	0001	AL	O		<	0.0002		0.0002	-
	0506	04/20/90	0001	AL	O		<	0.0002		0.0002	-
	0506	12/08/90	0001	AL	O		<	0.0002		0.0002	-
	0506	04/18/91	0001	AL	O		<	0.0002		0.0002	-
	0506	08/01/91	0001	AL	O		<	0.0002		0.0002	-
	0548	06/25/86	0001	AL	D		<	0.0002		0.0002	-
	0548	04/10/87	0001	AL	D		<	0.0002		0.0002	-
	0548	10/08/87	0001	AL	D		<	0.0002		0.0002	-
	0548	07/17/89	0001	AL	D		<	0.0002		0.0002	-
	0548	04/23/90	0001	AL	D		<	0.0002		0.0002	-
	0548	12/05/90	0001	AL	D		<	0.0002		0.0002	-
	0548	04/19/91	0001	AL	D		<	0.0002		0.0002	-
	0548	08/02/91	0001	AL	D		<	0.0002		0.0002	-
	0616	07/14/89	0001	AL	O		<	0.0002		0.0002	-
	0616	04/23/90	0001	AL	O		<	0.0002		0.0002	-
	0616	12/05/90	0001	AL	O		<	0.0002		0.0002	-
	0616	04/18/91	0001	AL	O		<	0.0002		0.0002	-
	0619	07/16/89	0001	AL	O		<	0.0002		0.0002	-
	0619	04/23/90	0001	AL	O		<	0.0002		0.0002	-
	0619	12/08/90	0001	AL	O		<	0.0002		0.0002	-
	0619	04/19/91	0001	AL	O		<	0.0002		0.0002	-
	0619	08/04/91	0001	AL	O		<	0.0002		0.0002	-
	0630	07/14/89	0001	AL	O		<	0.0002		0.0002	-
	0630	04/23/90	0001	AL	O		<	0.0002		0.0002	-
	0630	12/05/90	0001	AL	O		<	0.0002		0.0002	-
	0630	04/19/91	0001	AL	O		<	0.0002		0.0002	-
	0630	08/03/91	0001	AL	O		<	0.0002		0.0002	-
	0632	07/16/89	0001	AL	O		<	0.0002		0.0002	-
	0632	04/23/90	0001	AL	O		<	0.0002		0.0002	-
	0632	12/05/90	0001	AL	O		<	0.0002		0.0002	-
	0632	04/18/91	0001	AL	O		<	0.0002		0.0002	-
	0632	08/02/91	0001	AL	O		<	0.0002		0.0002	-
	0637	07/16/89	0001	AL	O		<	0.0002		0.0002	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
O - ON-SITE
D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MERCURY	0637	04/23/90	0001	AL	0	MG/L	<	0.0002		0.0002	-
	0637	12/05/90	0001	AL	0		<	0.0002		0.0002	-
	0637	04/19/91	0001	AL	0		<	0.0002		0.0002	-
	0637	08/04/91	0001	AL	0		<	0.0002		0.0002	-
	0656	04/23/90	0001	AL	0		<	0.0002		0.0002	-
	0656	12/08/90	0001	AL	0		<	0.0002		0.0002	-
	0656	04/18/91	0001	AL	0		<	0.0002		0.0002	-
	0656	08/04/91	0001	AL	0		<	0.0002		0.0002	-
MOLYBDENUM	0505	01/29/86	0001	AL	0	MG/L		0.15		0.01	-
	0505	06/10/86	0001	AL	0			0.22		0.01	-
	0505	04/10/87	0001	AL	0			0.08		0.01	-
	0505	10/08/87	0001	AL	0			0.07		0.01	-
	0505	07/13/89	0001	AL	0		<	0.01		0.01	-
	0505	04/20/90	0001	AL	0			0.04		0.01	-
	0505	12/08/90	0001	AL	0		<	0.01		0.01	-
	0505	04/18/91	0001	AL	0			0.02		0.01	-
	0505	08/01/91	0001	AL	0			0.03		0.01	-
	0505	01/13/92	0001	AL	0			0.02		0.01	-
	0505	06/24/92	0001	AL	0			0.019		0.01	-
	0506	01/30/86	0001	AL	0			0.19		0.01	-
	0506	06/09/86	0001	AL	0			0.2		0.01	-
	0506	04/10/87	0001	AL	0			0.11		0.01	-
	0506	10/08/87	0001	AL	0			0.07		0.01	-
	0506	07/13/89	0001	AL	0		<	0.01		0.01	-
	0506	04/20/90	0001	AL	0			0.05		0.01	-
	0506	12/08/90	0001	AL	0			0.05		0.01	-
	0506	04/18/91	0001	AL	0			0.04		0.01	-
	0506	08/01/91	0001	AL	0			0.04		0.01	-
	0506	01/13/92	0001	AL	0			0.04		0.01	-
	0506	06/24/92	0001	AL	0			0.054		0.01	-
	0548	06/25/86	0001	AL	D			0.25		0.01	-
	0548	04/10/87	0001	AL	D			0.18		0.01	-
	0548	10/08/87	0001	AL	D			0.10		0.01	-
	0548	07/17/89	0001	AL	D			0.07		0.01	-
	0548	04/23/90	0001	AL	D			0.08		0.01	-
	0548	12/05/90	0001	AL	D			0.08		0.01	-
	0548	04/19/91	0001	AL	D			0.07		0.01	-
	0548	08/02/91	0001	AL	D			0.07		0.01	-
	0548	01/14/92	0001	AL	D			0.04		0.01	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

0 - ON-SITE

D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
01/29/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PARAMETER PVI VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MOLYBDENUM	0548	06/25/92	0001	AL	D	MG/L	0.063		0.01	-
	0616	07/14/89	0001	AL	O		0.38		0.01	-
	0616	04/23/90	0001	AL	O		0.31		0.01	-
	0616	12/05/90	0001	AL	O		0.30		0.01	-
	0616	04/18/91	0001	AL	O		0.25		0.01	-
	0616	01/09/92	0001	AL	O		0.25		0.01	-
	0616	06/26/92	0001	AL	O		0.277		0.01	-
	0619	07/16/89	0001	AL	O		0.06		0.01	-
	0619	04/23/90	0001	AL	O		0.04		0.01	-
	0619	12/08/90	0001	AL	O		0.07		0.01	-
	0619	04/19/91	0001	AL	O		0.04		0.01	-
	0619	08/04/91	0001	AL	O		0.06		0.01	-
	0619	01/11/92	0001	AL	O		0.03		0.01	-
	0619	06/27/92	0001	AL	O		0.054		0.01	-
	0630	07/14/89	0001	AL	O		0.01		0.01	-
	0630	04/23/90	0001	AL	O		0.03		0.01	-
	0630	12/05/90	0001	AL	O		0.07		0.01	-
	0630	04/19/91	0001	AL	O		0.04		0.01	-
	0630	08/03/91	0001	AL	O		0.04		0.01	-
	0630	01/10/92	0001	AL	O		0.02		0.01	-
	0630	06/28/92	0001	AL	O		0.038		0.01	-
	0632	07/16/89	0001	AL	O		0.07		0.01	-
	0632	04/23/90	0001	AL	O		0.07		0.01	-
	0632	12/05/90	0001	AL	O		0.09		0.01	-
	0632	04/18/91	0001	AL	O		0.09		0.01	-
	0632	08/02/91	0001	AL	O		0.08		0.01	-
	0632	01/10/92	0001	AL	O		0.08		0.01	-
	0632	06/27/92	0001	AL	O		0.096		0.01	-
	0637	07/16/89	0001	AL	O		0.05		0.01	-
	0637	04/23/90	0001	AL	O		0.04		0.01	-
	0637	12/05/90	0001	AL	O		0.06		0.01	-
	0637	04/19/91	0001	AL	O		0.07		0.01	-
	0637	08/04/91	0001	AL	O		0.03		0.01	-
	0637	01/11/92	0001	AL	O		0.05		0.01	-
	0637	06/27/92	0001	AL	O		0.049		0.01	-
	0656	04/23/90	0001	AL	O		0.09		0.01	-
	0656	12/08/90	0001	AL	O		0.11		0.01	-
	0656	04/18/91	0001	AL	O		0.05		0.01	-
	0656	08/04/91	0001	AL	O		0.05		0.01	-
	0656	01/09/92	0001	AL	O		0.06		0.01	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
D - DOWN GRADIENT
O - ON-SITE

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
01/29/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MOLYBDENUM	0656	06/27/92	0001	AL	O	MG/L		0.056		0.01	-
NET GROSS ALPHA *	0505	07/13/89	0001	AL	O	PCI/L		-110.54		-	-
	0505	04/20/90	0001	AL	O			25.61		-	-
	0505	12/08/90	0001	AL	O			-163.39		-	-
	0505	04/18/91	0001	AL	O			-165.73		-	-
	0505	08/01/91	0001	AL	O			368.81		-	-
	0505	01/14/92	0001	AL	O			-183.52		-	-
	0505	06/24/92	0001	AL	O			-138.84		-	-
	0506	07/13/89	0001	AL	O			-391.06		-	-
	0506	04/20/90	0001	AL	O			169.16		-	-
	0506	12/08/90	0001	AL	O			-515.72		-	-
	0506	04/18/91	0001	AL	O			-293.94		-	-
	0506	08/01/91	0001	AL	O			431.53		-	-
	0506	01/13/92	0001	AL	O			-902.10		-	-
	0506	06/24/92	0001	AL	O			-205.38		-	-
	0548	07/17/89	0001	AL	D			-12.97		-	-
	0548	04/23/90	0001	AL	D			-13.21		-	-
	0548	12/05/90	0001	AL	D			-33.37		-	-
	0548	04/19/91	0001	AL	D			-80.32		-	-
	0548	08/05/91	0001	AL	D			33.30		-	-
	0548	01/14/92	0001	AL	D			0.74		-	-
	0548	06/25/92	0001	AL	D			-18.41		-	-
	0616	07/14/89	0001	AL	O			593.80		-	-
	0616	04/23/90	0001	AL	O			-291.74		-	-
	0616	12/05/90	0001	AL	O			-53.26		-	-
	0616	04/18/91	0001	AL	O			8.76		-	-
	0616	01/09/92	0001	AL	O			-636.06		-	-
	0616	06/26/92	0001	AL	O			-82.58		-	-
	0619	07/16/89	0001	AL	O			85.40		-	-
	0619	04/23/90	0001	AL	O			-0.20		-	-
	0619	12/08/90	0001	AL	O			9.26		-	-
	0619	08/05/91	0001	AL	O			40.88		-	-
	0619	01/12/92	0001	AL	O			3.38		-	-
	0619	06/27/92	0001	AL	O			0.87		-	-
	0630	07/14/89	0001	AL	O			14.21		-	-
	0630	04/23/90	0001	AL	O			4.33		-	-
	0630	12/05/90	0001	AL	O			7.39		-	-

* NET GROSS ALPHA (GROSS ALPHA - URANIUM) WITH 1 MG URANIUM = 686 PCI

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
O - ON-SITE
D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
NET GROSS ALPHA *	0630	04/19/91	0001	AL	O	PCI/L		-37.78		-	-
	0630	08/05/91	0001	AL	O			-12.87		-	-
	0630	01/10/92	0001	AL	O			-19.20		-	-
	0630	06/28/92	0001	AL	O			2.06		-	-
	0632	07/16/89	0001	AL	O			-65.62		-	-
	0632	04/23/90	0001	AL	O			-16.06		-	-
	0632	12/05/90	0001	AL	O			-986.06		-	-
	0632	04/18/91	0001	AL	O			-164.44		-	-
	0632	08/05/91	0001	AL	O			284.94		-	-
	0632	01/10/92	0001	AL	O			-475.68		-	-
	0632	06/27/92	0001	AL	O			-83.06		-	-
	0637	07/16/89	0001	AL	O			-24.72		-	-
	0637	04/23/90	0001	AL	O			187.62		-	-
	0637	12/05/90	0001	AL	O			-229.72		-	-
	0637	04/19/91	0001	AL	O			-231.72		-	-
	0637	08/05/91	0001	AL	O			23.53		-	-
	0637	01/11/92	0001	AL	O			-142.89		-	-
	0637	06/27/92	0001	AL	O			-61.30		-	-
	0656	12/08/90	0001	AL	O			43.56		-	-
	0656	04/18/91	0001	AL	O			-331.02		-	-
	0656	08/05/91	0001	AL	O			133.05		-	-
	0656	01/09/92	0001	AL	O			-366.42		-	-
NICKEL	0505	06/10/86	0001	AL	O	MG/L		0.05		0.04	-
	0505	04/10/87	0001	AL	O			0.01	J	0.04	-
	0505	10/08/87	0001	AL	O			0.01	J	0.04	-
	0505	07/13/89	0001	AL	O		<	0.04		0.04	-
	0505	04/20/90	0001	AL	O		<	0.04		0.04	-
	0505	12/08/90	0001	AL	O		<	0.04		0.04	-
	0505	04/18/91	0001	AL	O		<	0.04		0.04	-
	0505	08/01/91	0001	AL	O		<	0.04		0.04	-
	0506	04/10/87	0001	AL	O			0.02	J	0.04	-
	0506	10/08/87	0001	AL	O		<	0.01		0.04	-
	0506	07/13/89	0001	AL	O		<	0.04		0.04	-
	0506	04/20/90	0001	AL	O		<	0.04		0.04	-
	0506	12/08/90	0001	AL	O		<	0.04		0.04	-
	0506	04/18/91	0001	AL	O		<	0.04		0.04	-
	0506	08/01/91	0001	AL	O		<	0.04		0.04	-

* NET GROSS ALPHA (GROSS ALPHA - URANIUM) WITH 1 MG URANIUM = 686 PCI

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
O - ON-SITE

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
J - ESTIMATED VALUE

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NATO1 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
NICKEL	0548	06/25/86	0001	AL	D	MG/L		0.06		0.04	-
	0548	04/10/87	0001	AL	D			0.06		0.04	-
	0548	10/08/87	0001	AL	D		<	0.01		0.04	-
	0548	07/17/89	0001	AL	D		<	0.04		0.04	-
	0548	04/23/90	0001	AL	D		<	0.04		0.04	-
	0548	12/05/90	0001	AL	D		<	0.04		0.04	-
	0548	04/19/91	0001	AL	D		<	0.04		0.04	-
	0548	08/02/91	0001	AL	D		<	0.04		0.04	-
	0616	07/14/89	0001	AL	O		<	0.04		0.04	-
	0616	04/23/90	0001	AL	O		<	0.04		0.04	-
	0616	12/05/90	0001	AL	O		<	0.04		0.04	-
	0616	04/18/91	0001	AL	O		<	0.04		0.04	-
	0619	07/16/89	0001	AL	O		<	0.04		0.04	-
	0619	04/23/90	0001	AL	O		<	0.04		0.04	-
	0619	12/08/90	0001	AL	O		<	0.04		0.04	-
	0619	04/19/91	0001	AL	O		<	0.04		0.04	-
	0619	08/04/91	0001	AL	O		<	0.04		0.04	-
	0630	07/14/89	0001	AL	O		<	0.04		0.04	-
	0630	04/23/90	0001	AL	O		<	0.04		0.04	-
	0630	12/05/90	0001	AL	O		<	0.04		0.04	-
	0630	04/19/91	0001	AL	O		<	0.04		0.04	-
	0630	08/03/91	0001	AL	O		<	0.04		0.04	-
	0632	07/16/89	0001	AL	O		<	0.04		0.04	-
	0632	04/23/90	0001	AL	O		<	0.04		0.04	-
	0632	12/05/90	0001	AL	O		<	0.04		0.04	-
	0632	04/18/91	0001	AL	O		<	0.04		0.04	-
	0632	08/02/91	0001	AL	O		<	0.04		0.04	-
	0637	07/16/89	0001	AL	O		<	0.04		0.04	-
	0637	04/23/90	0001	AL	O		<	0.04		0.04	-
	0637	12/05/90	0001	AL	O		<	0.04		0.04	-
	0637	04/19/91	0001	AL	O		<	0.04		0.04	-
	0637	08/04/91	0001	AL	O		<	0.04		0.04	-
	0656	04/23/90	0001	AL	O		<	0.04		0.04	-
	0656	12/08/90	0001	AL	O		<	0.04		0.04	-
	0656	04/18/91	0001	AL	O		<	0.04		0.04	-
	0656	08/04/91	0001	AL	O		<	0.04		0.04	-
NITRATE	0505	01/29/86	0001	AL	O	MG/L	<	1.		1.	-
	0505	06/10/86	0001	AL	O		<	1.		1.	-
	0505	04/10/87	0001	AL	O			20.4		1.	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
D - DOWN GRADIENT
O - ON-SITE

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
NITRATE	0505	10/08/87	0001	AL	O	MG/L		3.5		1.	-
	0505	07/13/89	0001	AL	O		<	1.0		1.	-
	0505	04/20/90	0001	AL	O		<	0.1		1.	-
	0505	12/08/90	0001	AL	O		<	1.		1.	-
	0505	04/18/91	0001	AL	O		<	1.		1.	-
	0505	08/01/91	0001	AL	O			1.8		1.	-
	0505	01/13/92	0001	AL	O			12.7		0.1	-
	0505	06/24/92	0001	AL	O			3.58		1	-
	0506	01/30/86	0001	AL	O		<	1.		1.	-
	0506	06/09/86	0001	AL	O		<	1.		1.	-
	0506	04/10/87	0001	AL	O			3.1		1.	-
	0506	10/08/87	0001	AL	O		<	0.1		1.	-
	0506	07/13/89	0001	AL	O		<	1.0		1.	-
	0506	04/20/90	0001	AL	O		<	0.1		1.	-
	0506	12/08/90	0001	AL	O		<	1.		1.	-
	0506	04/18/91	0001	AL	O			2.		1.	-
	0506	08/01/91	0001	AL	O			1.8		1.	-
	0506	01/13/92	0001	AL	O			12.1		0.1	-
	0506	06/24/92	0001	AL	O			3.41		1	-
	0548	06/25/86	0001	AL	D		<	1.		1.	-
	0548	04/10/87	0001	AL	D			0.9	J	1.	-
	0548	10/08/87	0001	AL	D		<	0.1		1.	-
	0548	07/17/89	0001	AL	D		<	1.0		1.	-
	0548	04/23/90	0001	AL	D		<	0.1		1.	-
	0548	12/05/90	0001	AL	D		<	1.		1.	-
	0548	04/19/91	0001	AL	D			1.		1.	-
	0548	08/02/91	0001	AL	D			1.8		1.	-
	0548	01/14/92	0001	AL	D			12.4		0.1	-
	0548	06/25/92	0001	AL	D		<	1		1	-
	0616	07/14/89	0001	AL	O		<	1.0		1.	-
	0616	04/23/90	0001	AL	O			1.0		1.	-
	0616	12/05/90	0001	AL	O			6.		1.	-
	0616	04/18/91	0001	AL	O			45.		1.	-
	0616	01/09/92	0001	AL	O			22.0		0.1	-
	0616	06/26/92	0001	AL	O			15.2		1	-
	0619	07/16/89	0001	AL	O		<	1.0		1.	-
	0619	04/23/90	0001	AL	O		<	0.1		1.	-
	0619	12/08/90	0001	AL	O		<	1.		1.	-
	0619	01/11/92	0001	AL	O			44.4		0.1	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
O - ON-SITE
D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
J - ESTIMATED VALUE

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
01/29/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
NITRATE	0619	06/27/92	0001	AL	0	MG/L	<	1		1	-
	0630	07/14/89	0001	AL	0		<	1.0		1.	-
	0630	04/23/90	0001	AL	0		<	0.1		1.	-
	0630	12/05/90	0001	AL	0		<	1.		1.	-
	0630	04/19/91	0001	AL	0		<	1.		1.	-
	0630	08/03/91	0001	AL	0			3.5		1.	-
	0630	01/10/92	0001	AL	0			50.4		0.1	-
	0630	06/28/92	0001	AL	0		<	1		1	-
	0632	07/16/89	0001	AL	0			1.0		1.	-
	0632	04/23/90	0001	AL	0		<	0.1		1.	-
	0632	12/05/90	0001	AL	0		<	1.		1.	-
	0632	04/18/91	0001	AL	0			5.		1.	-
	0632	08/02/91	0001	AL	0			2.7		1.	-
	0632	01/10/92	0001	AL	0			13.0		0.1	-
	0632	06/27/92	0001	AL	0			1.43		1	-
	0637	07/16/89	0001	AL	0		<	1.0		1.	-
	0637	04/23/90	0001	AL	0		<	0.1		1.	-
	0637	12/05/90	0001	AL	0		<	1.		1.	-
	0637	04/19/91	0001	AL	0		<	1.		1.	-
	0637	01/11/92	0001	AL	0			13.1		0.1	-
	0637	06/27/92	0001	AL	0		<	1		1	-
	0656	04/23/90	0001	AL	0		<	0.1		1.	-
	0656	12/08/90	0001	AL	0		<	1.		1.	-
	0656	01/09/92	0001	AL	0			13.9		0.1	-
NITRITE AND NITRATE	0505	12/08/90	0001	AL	0	MG/L	<	1.		1.	-
	0505	04/18/91	0001	AL	0			0.11		0.05	-
	0505	08/01/91	0001	AL	0			0.36		0.05	-
	0505	01/13/92	0001	AL	0			2.9		0.1	-
	0506	12/08/90	0001	AL	0		<	1.		1.	-
	0506	04/18/91	0001	AL	0			0.39		0.05	-
	0506	08/01/91	0001	AL	0			0.37		0.05	-
	0506	01/13/92	0001	AL	0			2.7		0.1	-
	0548	12/05/90	0001	AL	D		<	1.		1.	-
	0548	04/19/91	0001	AL	D			0.28		0.05	-
	0548	08/02/91	0001	AL	D			0.47		0.05	-
	0548	01/14/92	0001	AL	D			2.8		0.1	-
	0616	12/05/90	0001	AL	0			1.		1.	-
	0616	04/18/91	0001	AL	0			10.1		0.05	-
	0616	01/09/92	0001	AL	0			5.0		0.1	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
0 - ON-SITE
D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
NITRITE AND NITRATE	0619	12/08/90	0001	AL	O	MG/L	<	1.		1.	-
	0619	01/11/92	0001	AL	O			10.0		0.1	-
	0630	12/05/90	0001	AL	O		<	1.		1.	-
	0630	04/19/91	0001	AL	O			0.11		0.05	-
	0630	08/03/91	0001	AL	O			0.81		0.05	-
	0630	01/10/92	0001	AL	O			11.4		0.1	-
	0632	12/05/90	0001	AL	O		<	1.		1.	-
	0632	04/18/91	0001	AL	O			2.27		0.05	-
	0632	08/02/91	0001	AL	O			0.69		0.05	-
	0632	01/10/92	0001	AL	O			2.9		0.1	-
	0637	12/05/90	0001	AL	O		<	1.		1.	-
	0637	04/19/91	0001	AL	O		<	0.05		0.05	-
	0637	01/11/92	0001	AL	O			3.0		0.1	-
	0656	12/08/90	0001	AL	O		<	1.		1.	-
	0656	01/09/92	0001	AL	O			3.1		0.1	-
PH	0505	01/29/86	0001	AL	O	SU		6.82		-	-
	0505	06/10/86	0001	AL	O			7.		-	-
	0505	04/10/87	0001	AL	O			6.96		-	-
	0505	10/08/87	0001	AL	O			6.94		-	-
	0505	07/13/89	0001	AL	O			7.12		-	-
	0505	04/20/90	0001	AL	O			6.83		-	-
	0505	12/08/90	0001	AL	O			6.87		-	-
	0505	04/18/91	0001	AL	O			6.93		-	-
	0505	08/01/91	0001	AL	O			6.86		-	-
	0505	01/13/92	0001	AL	O			6.84		-	-
	0505	06/24/92	0001	AL	O			6.64		-	-
	0506	01/30/86	0001	AL	O			7.01		-	-
	0506	06/09/86	0001	AL	O			6.75		-	-
	0506	04/10/87	0001	AL	O			6.85		-	-
	0506	10/08/87	0001	AL	O			6.78		-	-
	0506	07/13/89	0001	AL	O			6.86		-	-
	0506	04/20/90	0001	AL	O			6.77		-	-
	0506	12/08/90	0001	AL	O			6.77		-	-
	0506	04/18/91	0001	AL	O			6.81		-	-
	0506	08/01/91	0001	AL	O			6.78		-	-
	0506	01/13/92	0001	AL	O			6.82		-	-
	0506	06/24/92	0001	AL	O			6.67		-	-
	0548	06/25/86	0001	AL	D			7.		-	-
	0548	04/10/87	0001	AL	D			6.92		-	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

O - ON-SITE

D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
01/29/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
PH	0548	10/08/87	0001	AL	D	SU		6.72		-	-
	0548	07/17/89	0001	AL	D			7.43		-	-
	0548	04/23/90	0001	AL	D			7.32		-	-
	0548	12/05/90	0001	AL	D			6.84		-	-
	0548	04/19/91	0001	AL	D			7.02		-	-
	0548	08/02/91	0001	AL	D			7.07		-	-
	0548	08/05/91	0001	AL	D			7.07		-	-
	0548	01/14/92	0001	AL	D			7.31		-	-
	0548	06/25/92	0001	AL	D			7.05		-	-
	0616	07/14/89	0001	AL	O			7.55		-	-
	0616	04/23/90	0001	AL	O			7.54		-	-
	0616	12/05/90	0001	AL	O			7.66		-	-
	0616	04/18/91	0001	AL	O			7.64		-	-
	0616	08/01/91	0001	AL	O			7.38		-	-
	0616	01/09/92	0001	AL	O			7.50		-	-
	0616	06/26/92	0001	AL	O			7.31		-	-
	0619	07/16/89	0001	AL	O			7.59		-	-
	0619	04/23/90	0001	AL	O			7.12		-	-
	0619	12/08/90	0001	AL	O			7.18		-	-
	0619	04/19/91	0001	AL	O			7.20		-	-
	0619	08/04/91	0001	AL	O			6.98		-	-
	0619	08/05/91	0001	AL	O			6.98		-	-
	0619	01/11/92	0001	AL	O			6.97		-	-
	0619	06/27/92	0001	AL	O			7.07		-	-
	0630	07/14/89	0001	AL	O			7.63		-	-
	0630	04/23/90	0001	AL	O			7.71		-	-
	0630	12/05/90	0001	AL	O			7.09		-	-
	0630	04/19/91	0001	AL	O			7.63		-	-
	0630	08/03/91	0001	AL	O			7.32		-	-
	0630	08/05/91	0001	AL	O			7.32		-	-
	0630	01/10/92	0001	AL	O			7.27		-	-
	0630	06/28/92	0001	AL	O			7.18		-	-
	0632	07/16/89	0001	AL	O			6.89		-	-
	0632	04/23/90	0001	AL	O			7.07		-	-
	0632	12/05/90	0001	AL	O			6.80		-	-
	0632	04/18/91	0001	AL	O			6.98		-	-
	0632	08/02/91	0001	AL	O			6.94		-	-
	0632	08/05/91	0001	AL	O			6.94		-	-
	0632	01/10/92	0001	AL	O			7.09		-	-
	0632	06/27/92	0001	AL	O			6.85		-	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
D - DOWN GRADIENT
O - ON-SITE

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
PH	0637	07/16/89	0001	AL	O	SU		7.34		-	-
	0637	04/23/90	0001	AL	O			7.16		-	-
	0637	12/05/90	0001	AL	O			7.07		-	-
	0637	04/19/91	0001	AL	O			7.19		-	-
	0637	08/04/91	0001	AL	O			7.08		-	-
	0637	08/05/91	0001	AL	O			7.08		-	-
	0637	01/11/92	0001	AL	O			7.01		-	-
	0637	06/27/92	0001	AL	O			7.03		-	-
	0656	04/23/90	0001	AL	O			7.26		-	-
	0656	12/08/90	0001	AL	O			7.30		-	-
	0656	04/18/91	0001	AL	O			7.05		-	-
	0656	08/04/91	0001	AL	O			7.01		-	-
	0656	08/05/91	0001	AL	O			7.01		-	-
	0656	01/09/92	0001	AL	O			7.14		-	-
	0656	06/27/92	0001	AL	O			7.07		-	-
PHOSPHATE	0505	06/10/86	0001	AL	O	MG/L	<	0.1		0.1	-
	0505	04/10/87	0001	AL	O		<	0.1		0.1	-
	0505	10/08/87	0001	AL	O		<	0.1		0.1	-
	0505	07/13/89	0001	AL	O			0.1		0.1	-
	0505	04/20/90	0001	AL	O		<	0.1		0.1	-
	0505	12/08/90	0001	AL	O		<	0.1		0.1	-
	0505	04/18/91	0001	AL	O			0.1		0.05	-
	0505	08/01/91	0001	AL	O			0.2		0.1	-
	0505	01/13/92	0001	AL	O			0.1		0.1	-
	0505	06/24/92	0001	AL	O			0.1		0.1	-
	0506	04/10/87	0001	AL	O		<	0.1		0.1	-
	0506	10/08/87	0001	AL	O			0.33		0.1	-
	0506	07/13/89	0001	AL	O			0.2		0.1	-
	0506	04/20/90	0001	AL	O		<	0.1		0.1	-
	0506	12/08/90	0001	AL	O		<	0.1		0.1	-
	0506	04/18/91	0001	AL	O			0.2		0.05	-
	0506	08/01/91	0001	AL	O			0.2		0.1	-
	0506	01/13/92	0001	AL	O			0.2		0.1	-
	0506	06/24/92	0001	AL	O			0.19		0.1	-
	0548	06/25/86	0001	AL	D		<	0.1		0.1	-
	0548	04/10/87	0001	AL	D		<	0.1		0.1	-
	0548	10/08/87	0001	AL	D		<	0.1		0.1	-
	0548	07/17/89	0001	AL	D		<	0.1		0.1	-
	0548	04/23/90	0001	AL	D		<	0.1		0.1	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
O - ON-SITE
D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
01/29/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
PHOSPHATE	0548	12/05/90	0001	AL	D	MG/L	<	0.1		0.1	-
	0548	04/19/91	0001	AL	D			0.2		0.05	-
	0548	08/02/91	0001	AL	D			0.1		0.1	-
	0548	01/14/92	0001	AL	D		<	0.1		0.1	-
	0548	06/25/92	0001	AL	D		<	0.1		0.1	-
	0616	07/14/89	0001	AL	O			0.6		0.1	-
	0616	04/23/90	0001	AL	O		<	0.1		0.1	-
	0616	12/05/90	0001	AL	O			0.4		0.1	-
	0616	04/18/91	0001	AL	O			0.6		0.05	-
	0616	01/09/92	0001	AL	O			0.3		0.1	-
	0616	06/26/92	0001	AL	O			0.63		0.1	-
	0619	07/16/89	0001	AL	O			0.1		0.1	-
	0619	04/23/90	0001	AL	O		<	0.1		0.1	-
	0619	12/08/90	0001	AL	O		<	0.1		0.1	-
	0619	04/19/91	0001	AL	O			0.2		0.05	-
	0619	08/04/91	0001	AL	O			0.2		0.1	-
	0619	01/11/92	0001	AL	O			0.5		0.1	-
	0619	06/27/92	0001	AL	O			0.19		0.1	-
	0630	07/14/89	0001	AL	O			0.1		0.1	-
	0630	04/23/90	0001	AL	O		<	0.1		0.1	-
	0630	12/05/90	0001	AL	O		<	0.1		0.1	-
	0630	04/19/91	0001	AL	O			0.1		0.05	-
	0630	08/03/91	0001	AL	O			0.2		0.1	-
	0630	01/10/92	0001	AL	O			1.0		0.1	-
	0630	06/28/92	0001	AL	O		<	0.1		0.1	-
	0632	07/16/89	0001	AL	O			0.2		0.1	-
	0632	12/05/90	0001	AL	O		<	0.1		0.1	-
	0632	04/18/91	0001	AL	O			0.4		0.05	-
	0632	08/02/91	0001	AL	O			0.4		0.1	-
	0632	01/10/92	0001	AL	O			0.3		0.1	-
	0632	06/27/92	0001	AL	O			0.34		0.1	-
	0637	07/16/89	0001	AL	O			0.3		0.1	-
	0637	04/23/90	0001	AL	O		<	0.1		0.1	-
	0637	12/05/90	0001	AL	O		<	0.1		0.1	-
	0637	04/19/91	0001	AL	O			0.2		0.05	-
	0637	08/04/91	0001	AL	O			0.3		0.1	-
	0637	01/11/92	0001	AL	O			0.3		0.1	-
	0637	06/27/92	0001	AL	O			0.45		0.1	-
	0656	04/23/90	0001	AL	O		<	0.1		0.1	-
	0656	12/08/90	0001	AL	O		<	0.1		0.1	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
D - DOWN GRADIENT
O - ON-SITE

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
PHOSPHATE	0656	04/18/91	0001	AL	O	MG/L		0.1		0.05	-
	0656	01/09/92	0001	AL	O		<	0.1		0.1	-
POLONIUM-210	0505	06/10/86	0001	AL	O	PCI/L		1.3		1.	0.7
	0505	10/08/87	0001	AL	O			0.5		1.	0.6
	0505	07/13/89	0001	AL	O			0.2		1.	0.2
	0505	04/20/90	0001	AL	O			0.8		1.	0.4
	0506	04/10/87	0001	AL	O			0.7		1.	0.6
	0506	10/08/87	0001	AL	O			2.0		1.	0.9
	0506	07/13/89	0001	AL	O			0.1		1.	0.1
	0506	04/20/90	0001	AL	O			0.2		1.	0.4
	0548	06/25/86	0001	AL	D			0.1		1.	0.6
	0548	04/10/87	0001	AL	D			2.3		1.	0.8
	0548	10/08/87	0001	AL	D			1.2		1.	0.7
	0548	07/17/89	0001	AL	D			0.0		1.	0.2
	0548	04/23/90	0001	AL	D			0.3		1.	0.5
	0616	07/14/89	0001	AL	O			0.8		1.	0.4
	0616	04/23/90	0001	AL	O			4.5		1.	0.8
	0619	07/16/89	0001	AL	O			0.3		1.	0.2
	0619	04/23/90	0001	AL	O			0.3		1.	0.3
	0630	07/14/89	0001	AL	O			0.2		1.	0.3
	0630	04/23/90	0001	AL	O			0.4		1.	0.5
	0632	07/16/89	0001	AL	O			0.5		1.	0.3
	0632	04/23/90	0001	AL	O			1.0		1.	0.5
	0637	07/16/89	0001	AL	O			0.6		1.	0.3
	0637	04/23/90	0001	AL	O			0.8		1.	0.4
POTASSIUM	0505	01/29/86	0001	AL	O	MG/L		8.45		0.01	-
	0505	06/10/86	0001	AL	O			6.62		0.01	-
	0505	04/10/87	0001	AL	O			7.48		0.01	-
	0505	10/08/87	0001	AL	O			8.44		0.01	-
	0505	07/13/89	0001	AL	O			6.1		0.01	-
	0505	04/20/90	0001	AL	O			6.0		0.01	-
	0505	12/08/90	0001	AL	O			6.6		0.01	-
	0505	04/18/91	0001	AL	O			4.8		0.01	-
	0505	08/01/91	0001	AL	O			4.7		0.01	-
	0505	01/13/92	0001	AL	O			4.9		0.5	-
	0505	06/24/92	0001	AL	O			2.83		2	-
	0506	01/30/86	0001	AL	O			3.22		0.01	-
	0506	06/09/86	0001	AL	O			20.8		0.01	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

O - ON-SITE

D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
PO/ASSIUM	0506	04/10/87	0001	AL	0	MG/L		20.2		0.01	-
	0506	10/08/87	0001	AL	0			21.3		0.01	-
	0506	07/13/89	0001	AL	0			16.6		0.01	-
	0506	04/20/90	0001	AL	0			17.0		0.01	-
	0506	12/08/90	0001	AL	0			17.2		0.01	-
	0506	04/18/91	0001	AL	0			12.		5.	-
	0506	08/01/91	0001	AL	0			14.		5.	-
	0506	01/13/92	0001	AL	0			14.1		0.5	-
	0506	06/24/92	0001	AL	0			17.2		2	-
	0548	06/25/86	0001	AL	D			8.36		0.01	-
	0548	04/10/87	0001	AL	D			14.5		0.01	-
	0548	10/08/87	0001	AL	D			7.73		0.01	-
	0548	07/17/89	0001	AL	D			4.7		0.01	-
	0548	04/23/90	0001	AL	D			7.2		0.01	-
	0548	12/05/90	0001	AL	D			8.3		0.01	-
	0548	04/19/91	0001	AL	D			6.9		0.01	-
	0548	08/02/91	0001	AL	D			3.9		0.01	-
	0548	01/14/92	0001	AL	D			5.5		0.5	-
	0548	06/25/92	0001	AL	D			4.47		2	-
	0616	07/14/89	0001	AL	0			9.6		0.01	-
	0616	04/23/90	0001	AL	0			10.5		0.01	-
	0616	12/05/90	0001	AL	0			10.1		0.01	-
	0616	04/18/91	0001	AL	0			8.6		0.01	-
	0616	01/09/92	0001	AL	0			13.6		0.5	-
	0616	06/26/92	0001	AL	0			11.3		2	-
	0619	07/16/89	0001	AL	0			5.9		0.01	-
	0619	04/23/90	0001	AL	0			6.8		0.01	-
	0619	12/08/90	0001	AL	0			7.2		0.01	-
	0619	04/19/91	0001	AL	0			6.8		0.01	-
	0619	08/04/91	0001	AL	0			4.9		0.01	-
	0619	01/11/92	0001	AL	0			7.1		0.5	-
	0619	06/27/92	0001	AL	0			6.26		2	-
	0630	07/14/89	0001	AL	0			3.9		0.01	-
	0630	04/23/90	0001	AL	0			4.0		0.01	-
	0630	12/05/90	0001	AL	0			3.9		0.01	-
	0630	04/19/91	0001	AL	0			3.9		0.01	-
	0630	08/03/91	0001	AL	0			2.6		0.01	-
	0630	01/10/92	0001	AL	0			4.4		0.5	-
	0630	06/28/92	0001	AL	0			4.25		2	-
	0632	07/16/89	0001	AL	0			48.		0.01	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
0 - ON-SITE
D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI) < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
01/29/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
POTASSIUM	0632	04/23/90	0001	AL	O	MG/L		41.4		0.01	-
	0632	12/05/90	0001	AL	O			37.3		0.01	-
	0632	04/18/91	0001	AL	O			31.		5.	-
	0632	08/02/91	0001	AL	O			41.		5.	-
	0632	01/10/92	0001	AL	O			32		0.5	-
	0632	06/27/92	0001	AL	O			43.1		2	-
	0637	07/16/89	0001	AL	O			13.0		0.01	-
	0637	04/23/90	0001	AL	O			9.7		0.01	-
	0637	12/05/90	0001	AL	O			8.7		0.01	-
	0637	04/19/91	0001	AL	O			8.4		0.01	-
	0637	08/04/91	0001	AL	O			8.6		0.01	-
	0637	01/11/92	0001	AL	O			7.1		0.5	-
	0637	06/27/92	0001	AL	O			10		2	-
	0656	04/23/90	0001	AL	O			11.9		0.01	-
	0656	12/08/90	0001	AL	O			9.6		0.01	-
	0656	04/18/91	0001	AL	O			8.6		0.01	-
	0656	08/04/91	0001	AL	O			8.9		0.01	-
	0656	01/09/92	0001	AL	O			12.7		0.5	-
	0656	06/27/92	0001	AL	O			9.36		2	-
RADIUM-226	0505	06/10/86	0001	AL	O	PCI/L		0.5		1.	0.3
	0505	10/08/87	0001	AL	O			0.6		1.	0.3
	0505	07/13/89	0001	AL	O			0.2		1.	0.2
	0505	04/20/90	0001	AL	O			0.2		1.	0.2
	0505	12/08/90	0001	AL	O			0.5		1.	0.3
	0505	04/18/91	0001	AL	O			0.4		1.	0.2
	0505	08/01/91	0001	AL	O			0.4		1.	0.2
	0505	01/14/92	0001	AL	O			0.3		1.	0.2
	0505	06/24/92	0001	AL	O			0.3		1.0	0.5
	0506	04/10/87	0001	AL	O			0.0		1.	0.2
	0506	10/08/87	0001	AL	O			0.0		1.	0.2
	0506	07/13/89	0001	AL	O			0.2		1.	0.2
	0506	04/20/90	0001	AL	O			0.1		1.	0.2
	0506	12/08/90	0001	AL	O			0.2		1.	0.1
	0506	04/18/91	0001	AL	O			0.1		1.	0.1
	0506	08/01/91	0001	AL	O			0.2		1.	0.2
	0506	01/13/92	0001	AL	O			0.1		1.	0.2
	0506	06/24/92	0001	AL	O			0.3		1.0	0.5
	0548	06/25/86	0001	AL	D			0.2		1.	0.1
	0548	04/10/87	0001	AL	D			0.3		1.	0.2

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
O - ON-SITE
D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
01/29/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
RADIUM-226	0548	10/08/87	0001	AL	D	PCI/L		0.0		1.	0.2
	0548	07/17/89	0001	AL	D			0.0		1.	0.1
	0548	04/23/90	0001	AL	D			0.1		1.	0.1
	0548	12/05/90	0001	AL	D			0.4		1.	0.2
	0548	04/19/91	0001	AL	D			0.0		1.	0.1
	0548	08/05/91	0001	AL	D			0.1		1.	0.2
	0548	01/14/92	0001	AL	D			0.3		1.	0.4
	0548	06/25/92	0001	AL	D			0.0		1.0	0.4
	0616	07/14/89	0001	AL	O			28.6		1.	1.8
	0616	04/23/90	0001	AL	O			11.		1.	1.
	0616	12/05/90	0001	AL	O			4.9		1.	0.7
	0616	04/18/91	0001	AL	O			3.7		1.	0.6
	0616	01/09/92	0001	AL	O			3.4		1.	0.8
	0616	06/26/92	0001	AL	O			9.1		1.0	1.6
	0619	07/16/89	0001	AL	O			1.7		1.	0.4
	0619	04/23/90	0001	AL	O			2.1		1.	0.5
	0619	12/08/90	0001	AL	O			0.8		1.	0.4
	0619	04/19/91	0001	AL	O			0.4		1.	0.2
	0619	08/05/91	0001	AL	O			0.5		1.	0.3
	0619	01/12/92	0001	AL	O			0.7		1.	0.6
	0619	06/27/92	0001	AL	O			0.1		1.0	0.5
	0630	07/14/89	0001	AL	O			0.3		1.	0.2
	0630	04/23/90	0001	AL	O			0.4		1.	0.2
	0630	12/05/90	0001	AL	O			0.4		1.	0.3
	0630	04/19/91	0001	AL	O			0.2		1.	0.2
	0630	08/05/91	0001	AL	O			0.1		1.	0.2
	0630	01/10/92	0001	AL	O			0.4		1.	0.3
	0630	06/28/92	0001	AL	O			0.0		1.0	0.5
	0632	07/16/89	0001	AL	O			5.4		1.	0.8
	0632	04/23/90	0001	AL	O			3.4		1.	0.6
	0632	12/05/90	0001	AL	O			3.2		1.	0.6
	0632	04/18/91	0001	AL	O			4.3		1.	0.7
	0632	08/05/91	0001	AL	O			7.5		1.	0.9
	0632	01/10/92	0001	AL	O			3.2		1.	0.7
	0632	06/27/92	0001	AL	O			5.6		1.0	1.2
	0637	07/16/89	0001	AL	O			12.4		1.	1.2
	0637	04/23/90	0001	AL	O			11.		1.	1.
	0637	12/05/90	0001	AL	O			9.7		1.	1.1
	0637	04/19/91	0001	AL	O			12.0		1.	1.2
	0637	08/05/91	0001	AL	O			12.2		1.	1.1

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
D - DOWN GRADIENT
O - ON-SITE

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
01/29/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
RADIUM-226	0637	01/11/92	0001	AL	O	PCI/L		8.0		1.	1.2
	0637	06/27/92	0001	AL	O			8.4		1.0	1.5
	0656	12/08/90	0001	AL	O			5.7		1.	0.9
	0656	08/05/91	0001	AL	O			16.5		1.	1.3
	0656	01/09/92	0001	AL	O			4.3		1.	0.8
RADIUM-226 + RADIUM-228	0505	06/10/86	0001	AL	O	PCI/L		0.50		-	-
	0505	10/08/87	0001	AL	O			1.60		-	-
	0505	07/13/89	0001	AL	O			0.20		-	-
	0505	04/20/90	0001	AL	O			1.20		-	-
	0505	12/08/90	0001	AL	O			1.60		-	-
	0505	04/18/91	0001	AL	O			1.00		-	-
	0505	08/01/91	0001	AL	O			0.40		-	-
	0505	01/14/92	0001	AL	O			0.30		-	-
	0505	06/24/92	0001	AL	O			0.30		-	-
	0506	04/10/87	0001	AL	O			0.00		-	-
	0506	10/08/87	0001	AL	O			0.60		-	-
	0506	07/13/89	0001	AL	O			0.20		-	-
	0506	04/20/90	0001	AL	O			0.50		-	-
	0506	12/08/90	0001	AL	O			1.50		-	-
	0506	04/18/91	0001	AL	O			7.00		-	-
	0506	08/01/91	0001	AL	O			0.20		-	-
	0506	01/13/92	0001	AL	O			0.10		-	-
	0506	06/24/92	0001	AL	O			0.30		-	-
	0548	06/25/86	0001	AL	D			0.60		-	-
	0548	04/10/87	0001	AL	D			0.30		-	-
	0548	10/08/87	0001	AL	D			0.00		-	-
	0548	07/17/89	0001	AL	D			0.60		-	-
	0548	04/23/90	0001	AL	D			0.30		-	-
	0548	12/05/90	0001	AL	D			1.40		-	-
	0548	04/19/91	0001	AL	D			9.00		-	-
	0548	08/05/91	0001	AL	D			4.00		-	-
	0548	01/14/92	0001	AL	D			0.60		-	-
	0548	06/25/92	0001	AL	D			0.00		-	-
	0616	07/14/89	0001	AL	O			29.70		-	-
	0616	04/23/90	0001	AL	O			11.90		-	-
	0616	12/05/90	0001	AL	O			6.00		-	-
	0616	04/18/91	0001	AL	O			6.90		-	-
	0616	01/09/92	0001	AL	O			3.90		-	-
	0616	06/26/92	0001	AL	O			9.10		-	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
O - ON-SITE
D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PARAMETER PVI VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
RADIUM-226 + RADIUM-228	0619	07/16/89	0001	AL	0	PCI/L	3.50		-	-
	0619	04/23/90	0001	AL	0		2.70		-	-
	0619	12/08/90	0001	AL	0		1.20		-	-
	0619	04/19/91	0001	AL	0		4.40		-	-
	0619	08/05/91	0001	AL	0		1.30		-	-
	0619	01/12/92	0001	AL	0		0.70		-	-
	0619	06/27/92	0001	AL	0		0.10		-	-
	0630	07/14/89	0001	AL	0		1.90		-	-
	0630	04/23/90	0001	AL	0		0.60		-	-
	0630	12/05/90	0001	AL	0		0.80		-	-
	0630	04/19/91	0001	AL	0		3.10		-	-
	0630	08/05/91	0001	AL	0		1.20		-	-
	0630	01/10/92	0001	AL	0		0.40		-	-
	0630	06/28/92	0001	AL	0		0.40		-	-
	0632	07/16/89	0001	AL	0		5.80		-	-
	0632	04/23/90	0001	AL	0		3.80		-	-
	0632	12/05/90	0001	AL	0		4.30		-	-
	0632	04/18/91	0001	AL	0		7.70		-	-
	0632	08/05/91	0001	AL	0		8.70		-	-
	0632	01/10/92	0001	AL	0		3.30		-	-
	0632	06/27/92	0001	AL	0		7.30		-	-
	0637	07/16/89	0001	AL	0		12.60		-	-
	0637	04/23/90	0001	AL	0		11.10		-	-
	0637	12/05/90	0001	AL	0		11.70		-	-
	0637	04/19/91	0001	AL	0		12.50		-	-
	0637	08/05/91	0001	AL	0		12.90		-	-
	0637	01/11/92	0001	AL	0		8.20		-	-
	0637	06/27/92	0001	AL	0		8.40		-	-
	0656	12/08/90	0001	AL	0		7.60		-	-
	0656	08/05/91	0001	AL	0		17.40		-	-
	0656	01/09/92	0001	AL	0		5.20		-	-
RADIUM-228	0505	06/10/86	0001	AL	0	PCI/L	0.		1.	1.
	0505	10/08/87	0001	AL	0		1.0		1.	1.2
	0505	07/13/89	0001	AL	0		0.0		1.	1.4
	0505	04/20/90	0001	AL	0		1.0		1.	0.8
	0505	12/08/90	0001	AL	0		1.1		1.	0.9
	0505	04/18/91	0001	AL	0		0.6		1.	1.5
	0505	08/01/91	0001	AL	0		0.0		1.	1.3
	0505	01/14/92	0001	AL	0		0.0		1.	0.8
	0505	06/24/92	0001	AL	0		0.0		1.0	2.4

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

0 - ON-SITE

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PARAMETER PVI VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
RADIUM-228	0506	04/10/87	0001	AL	0	PCI/L	0.0		1.	1.1
	0506	10/08/87	0001	AL	0		0.6		1.	1.1
	0506	07/13/89	0001	AL	0		0.0		1.	1.5
	0506	04/20/90	0001	AL	0		0.4		1.	0.8
	0506	12/08/90	0001	AL	0		1.3		1.	0.8
	0506	04/18/91	0001	AL	0		6.9		1.	1.6
	0506	08/01/91	0001	AL	0		0.0		1.	1.2
	0506	01/13/92	0001	AL	0		0.0		1.	0.8
	0506	06/24/92	0001	AL	0		0.0		1.0	2.4
	0548	06/25/86	0001	AL	D		0.4		1.	0.8
	0548	04/10/87	0001	AL	D		0.0		1.	1.4
	0548	10/08/87	0001	AL	D		0.0		1.	0.9
	0548	07/17/89	0001	AL	D		0.6		1.	1.1
	0548	04/23/90	0001	AL	D		0.2		1.	0.8
	0548	12/05/90	0001	AL	D		1.0		1.	0.8
	0548	04/19/91	0001	AL	D		9.0		1.	1.8
	0548	08/05/91	0001	AL	D		3.9		1.	1.7
	0548	01/14/92	0001	AL	D		0.3		1.	1.2
	0548	06/25/92	0001	AL	D		0.0		1.0	2.5
	0616	07/14/89	0001	AL	0		1.1		1.	1.3
	0616	04/23/90	0001	AL	0		0.9		1.	0.8
	0616	12/05/90	0001	AL	0		1.1		1.	0.8
	0616	04/18/91	0001	AL	0		3.2		1.	1.4
	0616	01/09/92	0001	AL	0		0.5		1.	0.9
	0616	06/26/92	0001	AL	0		0.0		1.0	1.9
	0619	07/16/89	0001	AL	0		1.8		1.	1.4
	0619	04/23/90	0001	AL	0		0.6		1.	0.8
	0619	12/08/90	0001	AL	0		0.4		1.	0.7
	0619	04/19/91	0001	AL	0		4.0		1.	1.5
	0619	08/05/91	0001	AL	0		0.8		1.	1.5
	0619	01/12/92	0001	AL	0		0.0		1.	1.3
	0619	06/27/92	0001	AL	0		0.0		1.0	1.8
	0630	07/14/89	0001	AL	0		1.6		1.	1.1
	0630	04/23/90	0001	AL	0		0.2		1.	0.8
	0630	12/05/90	0001	AL	0		0.4		1.	0.7
	0630	04/19/91	0001	AL	0		2.9		1.	1.6
	0630	08/05/91	0001	AL	0		1.1		1.	1.7
	0630	01/10/92	0001	AL	0		0.0		1.	1.4
	0630	06/28/92	0001	AL	0		0.4		1.0	1.9
	0632	07/16/89	0001	AL	0		0.4		1.	1.3

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

0 - ON-SITE

D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA
 ALLUVIUM, NATURITA SITE, COLORADO
 SITE: NAT01 NATURITA
 01/29/86 TO 06/28/92
 REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
RADIUM-228	0632	04/23/90	0001	AL	O	PC1/L		0.4		1.	0.7
	0632	12/05/90	0001	AL	O			1.1		1.	0.8
	0632	04/18/91	0001	AL	O			3.4		1.	1.5
	0632	08/05/91	0001	AL	O			1.2		1.	1.7
	0632	01/10/92	0001	AL	O			0.1		1.	1.2
	0632	06/27/92	0001	AL	O			1.7		1.0	1.9
	0637	07/16/89	0001	AL	O			0.2		1.	1.3
	0637	04/23/90	0001	AL	O			0.1		1.	0.7
	0637	12/05/90	0001	AL	O			2.0		1.	0.8
	0637	04/19/91	0001	AL	O			0.5		1.	1.5
	0637	08/05/91	0001	AL	O			0.7		1.	1.6
	0637	01/11/92	0001	AL	O			0.2		1.	1.3
	0637	06/27/92	0001	AL	O			0.0		1.0	1.8
	0656	12/08/90	0001	AL	O			1.9		1.	1.2
	0656	04/18/91	0001	AL	O			0.2		1.	1.4
	0656	08/05/91	0001	AL	O			0.9		1.	1.6
	0656	01/09/92	0001	AL	O			0.9		1.	1.2
REDOX POTENTIAL	0505	01/13/92	0001	AL	O	mVOLTS		468.5		-	-
	0506	01/13/92	0001	AL	O			438.9		-	-
	0548	01/14/92	0001	AL	D			472.9		-	-
	0619	01/11/92	0001	AL	O			456.9		-	-
	0630	01/10/92	0001	AL	O			447		-	-
	0632	01/10/92	0001	AL	O			449.9		-	-
	0637	01/11/92	0001	AL	O			467.4		-	-
	0656	01/09/92	0001	AL	O			468.2		-	-
SELENIUM	0505	01/29/86	0001	AL	O	MG/L	<	0.005		0.005	-
	0505	06/10/86	0001	AL	O		<	0.005		0.005	-
	0505	04/10/87	0001	AL	O		<	0.003		0.005	-
	0505	10/08/87	0001	AL	O			0.010		0.005	-
	0505	07/13/89	0001	AL	O		<	0.005		0.005	-
	0505	04/20/90	0001	AL	O		<	0.005		0.005	-
	0505	12/08/90	0001	AL	O		<	0.005		0.005	-
	0505	04/18/91	0001	AL	O		<	0.005		0.005	-
	0505	08/01/91	0001	AL	O		<	0.03	I	0.03	-
	0505	01/13/92	0001	AL	O		<	0.002		0.002	-
	0505	06/24/92	0001	AL	O		<	0.005		0.005	-
	0506	01/30/86	0001	AL	O		<	0.005		0.005	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

O - ON-SITE

D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SELENIUM	0506	06/09/86	0001	AL	O	MG/L	<	0.005		0.005	-
	0506	04/10/87	0001	AL	O		<	0.003		0.005	-
	0506	10/08/87	0001	AL	O			0.010		0.005	-
	0506	07/13/89	0001	AL	O		<	0.005		0.005	-
	0506	04/20/90	0001	AL	O		<	0.005		0.005	-
	0506	12/08/90	0001	AL	O		<	0.005		0.005	-
	0506	04/18/91	0001	AL	O		<	0.005		0.005	-
	0506	08/01/91	0001	AL	O		<	0.05	1	0.05	-
	0506	01/13/92	0001	AL	O		<	0.002		0.002	-
	0506	06/24/92	0001	AL	O			0.00815		0.005	-
	0548	06/25/86	0001	AL	D		<	0.005		0.005	-
	0548	04/10/87	0001	AL	D		<	0.003		0.005	-
	0548	10/08/87	0001	AL	D			0.007		0.005	-
	0548	07/17/89	0001	AL	D		<	0.005		0.005	-
	0548	04/23/90	0001	AL	D		<	0.005		0.005	-
	0548	12/05/90	0001	AL	D		<	0.005		0.005	-
	0548	04/19/91	0001	AL	D		<	0.005		0.005	-
	0548	08/02/91	0001	AL	D		<	0.005		0.005	-
	0548	01/14/92	0001	AL	D		<	0.002		0.002	-
	0548	06/25/92	0001	AL	D		<	0.005		0.005	-
	0616	07/14/89	0001	AL	O		<	0.005		0.005	-
	0616	04/23/90	0001	AL	O			0.014		0.005	-
	0616	12/05/90	0001	AL	O			0.026		0.005	-
	0616	04/18/91	0001	AL	O			0.040		0.005	-
	0616	01/09/92	0001	AL	O			0.005		0.002	-
	0616	06/26/92	0001	AL	O			0.0078		0.005	-
	0619	07/16/89	0001	AL	O		<	0.005		0.005	-
	0619	04/23/90	0001	AL	O		<	0.005		0.005	-
	0619	12/08/90	0001	AL	O		<	0.005		0.005	-
	0619	04/19/91	0001	AL	O		<	0.005		0.005	-
	0619	08/04/91	0001	AL	O		<	0.005		0.005	-
	0619	01/11/92	0001	AL	O		<	0.002		0.002	-
	0619	06/27/92	0001	AL	O		<	0.005		0.005	-
	0630	07/14/89	0001	AL	O		<	0.005		0.005	-
	0630	04/23/90	0001	AL	O		<	0.005		0.005	-
	0630	12/05/90	0001	AL	O		<	0.005		0.005	-
	0630	04/19/91	0001	AL	O		<	0.005		0.005	-
	0630	08/03/91	0001	AL	O		<	0.005		0.005	-
	0630	01/10/92	0001	AL	O		<	0.002		0.002	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

O - ON-SITE

D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:

1 - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
01/29/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SELENIUM	0630	06/28/92	0001	AL	0	MG/L	<	0.005		0.005	-
	0632	07/16/89	0001	AL	0			0.006		0.005	-
	0632	04/23/90	0001	AL	0			0.007		0.005	-
	0632	12/05/90	0001	AL	0			0.010		0.005	-
	0632	04/18/91	0001	AL	0			0.045		0.005	-
	0632	08/02/91	0001	AL	0		<	0.005		0.005	-
	0632	01/10/92	0001	AL	0			0.08	I	0.02	-
	0632	06/27/92	0001	AL	0			0.0378		0.005	-
	0637	07/16/89	0001	AL	0		<	0.005		0.005	-
	0637	04/23/90	0001	AL	0		<	0.005		0.005	-
	0637	12/05/90	0001	AL	0			0.012		0.005	-
	0637	04/19/91	0001	AL	0		<	0.005		0.005	-
	0637	08/04/91	0001	AL	0		<	0.005		0.005	-
	0637	01/11/92	0001	AL	0			0.043		0.002	-
	0637	06/27/92	0001	AL	0		<	0.005		0.005	-
	0656	04/23/90	0001	AL	0		<	0.005		0.005	-
	0656	12/08/90	0001	AL	0		<	0.005		0.005	-
	0656	04/18/91	0001	AL	0		<	0.03	I	0.03	-
	0656	08/04/91	0001	AL	0		<	0.005		0.005	-
	0656	01/09/92	0001	AL	0		<	0.002		0.002	-
	0656	06/27/92	0001	AL	0		<	0.005		0.005	-
SILICA - SiO2	0505	06/10/86	0001	AL	0	MG/L		3.		2.	-
	0505	04/10/87	0001	AL	0			17.2		2.	-
	0505	10/08/87	0001	AL	0			14.3		2.	-
	0505	07/13/89	0001	AL	0			13.9		2.	-
	0505	04/20/90	0001	AL	0			14.		2.	-
	0506	04/10/87	0001	AL	0			22.0		2.	-
	0506	10/08/87	0001	AL	0			19.2		2.	-
	0506	07/13/89	0001	AL	0			17.1		2.	-
	0506	04/20/90	0001	AL	0			19.		2.	-
	0548	06/25/86	0001	AL	D			6.0		2.	-
	0548	04/10/87	0001	AL	D			10.9		2.	-
	0548	10/08/87	0001	AL	D			16.7		2.	-
	0548	07/17/89	0001	AL	D			13.5		2.	-
	0548	04/23/90	0001	AL	D			14.		2.	-
	0616	07/14/89	0001	AL	0			16.5		2.	-
	0616	04/23/90	0001	AL	0			16.		2.	-
	0619	07/16/89	0001	AL	0			13.7		2.	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
0 - ON-SITE
D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SILICA - SiO2	0619	04/23/90	0001	AL	O	MG/L		15.		2.	-
	0630	07/14/89	0001	AL	O			4.9		2.	-
	0630	04/23/90	0001	AL	O			5.		2.	-
	0632	07/16/89	0001	AL	O			23.6		2.	-
	0632	04/23/90	0001	AL	O			20.		2.	-
	0637	07/16/89	0001	AL	O			16.9		2.	-
	0637	04/23/90	0001	AL	O			16.		2.	-
	0656	04/23/90	0001	AL	O			19.		2.	-
SILVER	0505	06/10/86	0001	AL	O	MG/L	<	0.01		0.01	-
	0505	04/10/87	0001	AL	O			0.02		0.01	-
	0505	10/08/87	0001	AL	O			0.02		0.01	-
	0505	07/13/89	0001	AL	O		<	0.01		0.01	-
	0505	04/20/90	0001	AL	O		<	0.01		0.01	-
	0505	12/08/90	0001	AL	O			0.01		0.01	-
	0505	04/18/91	0001	AL	O		<	0.01		0.01	-
	0505	08/01/91	0001	AL	O		<	0.01		0.01	-
	0505	01/13/92	0001	AL	O		<	0.01		0.01	-
	0505	06/24/92	0001	AL	O		<	0.01		0.01	-
	0506	04/10/87	0001	AL	O			0.02		0.01	-
	0506	10/08/87	0001	AL	O			0.03		0.01	-
	0506	07/13/89	0001	AL	O		<	0.01		0.01	-
	0506	04/20/90	0001	AL	O		<	0.01		0.01	-
	0506	12/08/90	0001	AL	O			0.01		0.01	-
	0506	04/18/91	0001	AL	O		<	0.01		0.01	-
	0506	08/01/91	0001	AL	O		<	0.01		0.01	-
	0506	01/13/92	0001	AL	O			0.01		0.01	-
	0506	06/24/92	0001	AL	O			0.018		0.01	-
	0548	06/25/86	0001	AL	D		<	0.01		0.01	-
	0548	04/10/87	0001	AL	D			0.01		0.01	-
	0548	10/08/87	0001	AL	D		<	0.01		0.01	-
	0548	07/17/89	0001	AL	D		<	0.01		0.01	-
	0548	04/23/90	0001	AL	D		<	0.01		0.01	-
	0548	12/05/90	0001	AL	D		<	0.01		0.01	-
	0548	04/19/91	0001	AL	D		<	0.01		0.01	-
	0548	08/02/91	0001	AL	D		<	0.01		0.01	-
	0548	01/14/92	0001	AL	D		<	0.01		0.01	-
	0548	06/25/92	0001	AL	D		<	0.01		0.01	-
	0616	07/14/89	0001	AL	O		<	0.01		0.01	-
	0616	04/23/90	0001	AL	O		<	0.01		0.01	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
O - ON-SITE
D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SILVER	0616	12/05/90	0001	AL	O	MG/L	<	0.01		0.01	-
	0616	04/18/91	0001	AL	O		<	0.01		0.01	-
	0616	01/09/92	0001	AL	O			0.03		0.01	-
	0616	06/26/92	0001	AL	O		<	0.01		0.01	-
	0619	07/16/89	0001	AL	O		<	0.01		0.01	-
	0619	04/23/90	0001	AL	O		<	0.01		0.01	-
	0619	12/08/90	0001	AL	O		<	0.01		0.01	-
	0619	04/19/91	0001	AL	O		<	0.01		0.01	-
	0619	08/04/91	0001	AL	O		<	0.01		0.01	-
	0619	01/11/92	0001	AL	O		<	0.01		0.01	-
	0619	06/27/92	0001	AL	O			0.014		0.01	-
	0630	07/14/89	0001	AL	O		<	0.01		0.01	-
	0630	04/23/90	0001	AL	O		<	0.01		0.01	-
	0630	12/05/90	0001	AL	O		<	0.01		0.01	-
	0630	04/19/91	0001	AL	O		<	0.01		0.01	-
	0630	08/03/91	0001	AL	O		<	0.01		0.01	-
	0630	01/10/92	0001	AL	O		<	0.01		0.01	-
	0630	06/28/92	0001	AL	O			0.016		0.01	-
	0632	07/16/89	0001	AL	O		<	0.01		0.01	-
	0632	04/23/90	0001	AL	O		<	0.01		0.01	-
	0632	12/05/90	0001	AL	O			0.01		0.01	-
	0632	04/18/91	0001	AL	O		<	0.01		0.01	-
	0632	08/02/91	0001	AL	O		<	0.01		0.01	-
	0632	01/10/92	0001	AL	O			0.02		0.01	-
	0632	06/27/92	0001	AL	O			0.027		0.01	-
	0637	07/16/89	0001	AL	O		<	0.01		0.01	-
	0637	04/23/90	0001	AL	O		<	0.01		0.01	-
	0637	12/05/90	0001	AL	O		<	0.01		0.01	-
	0637	04/19/91	0001	AL	O		<	0.01		0.01	-
	0637	08/04/91	0001	AL	O		<	0.01		0.01	-
	0637	01/11/92	0001	AL	O		<	0.01		0.01	-
	0637	06/27/92	0001	AL	O			0.02		0.01	-
	0656	04/23/90	0001	AL	O		<	0.01		0.01	-
	0656	12/08/90	0001	AL	O		<	0.01		0.01	-
	0656	04/18/91	0001	AL	O		<	0.01		0.01	-
	0656	08/04/91	0001	AL	O		<	0.01		0.01	-
	0656	01/09/92	0001	AL	O		<	0.01		0.01	-
	0656	06/27/92	0001	AL	O			0.021		0.01	-
SODIUM	0505	01/29/86	0001	AL	O	MG/L		152.		0.002	-
	0505	06/10/86	0001	AL	O			200.		0.002	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

O - ON-SITE

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SODIUM	0505	04/10/87	0001	AL	O	MG/L		256.		0.002	-
	0505	10/08/87	0001	AL	O			312.		0.002	-
	0505	07/13/89	0001	AL	O			199.		0.002	-
	0505	04/20/90	0001	AL	O			136.		0.002	-
	0505	12/08/90	0001	AL	O			150.		0.002	-
	0505	04/18/91	0001	AL	O			126.		5.	-
	0505	08/01/91	0001	AL	O			162.		5.	-
	0505	01/13/92	0001	AL	O			142		0.05	-
	0505	06/24/92	0001	AL	O			133		1	-
	0506	01/30/86	0001	AL	O			159.		0.002	-
	0506	06/09/86	0001	AL	O			326.		0.002	-
	0506	04/10/87	0001	AL	O			314.		0.002	-
	0506	10/08/87	0001	AL	O			363.		0.002	-
	0506	07/13/89	0001	AL	O			308.		0.002	-
	0506	04/20/90	0001	AL	O			249.		0.002	-
	0506	12/08/90	0001	AL	O			283.		0.002	-
	0506	04/18/91	0001	AL	O			274.		5.	-
	0506	08/01/91	0001	AL	O			278.		5.	-
	0506	01/13/92	0001	AL	O			259		0.05	-
	0506	06/24/92	0001	AL	O			261		1	-
	0548	06/25/86	0001	AL	D			400.		0.002	-
	0548	04/10/87	0001	AL	D			495.		0.002	-
	0548	10/08/87	0001	AL	D			134.		0.002	-
	0548	07/17/89	0001	AL	D			61.		0.002	-
	0548	04/23/90	0001	AL	D			84.9		0.002	-
	0548	12/05/90	0001	AL	D			82.6		0.002	-
	0548	04/19/91	0001	AL	D			88.		1.	-
	0548	08/02/91	0001	AL	D			53.		1.	-
	0548	01/14/92	0001	AL	D			59.2		0.05	-
	0548	06/25/92	0001	AL	D			50.8		1	-
	0616	07/14/89	0001	AL	O			1080.		0.002	-
	0616	04/23/90	0001	AL	O			1040.		0.002	-
	0616	12/05/90	0001	AL	O			1040.		0.002	-
	0616	04/18/91	0001	AL	O			801.		5.	-
	0616	01/09/92	0001	AL	O			917		0.05	-
	0616	06/26/92	0001	AL	O			954		1	-
	0619	07/16/89	0001	AL	O			54.		0.002	-
	0619	04/23/90	0001	AL	O			38.3		0.002	-
	0619	12/08/90	0001	AL	O			39.0		0.002	-
	0619	04/19/91	0001	AL	O			45.		1.	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
O - ON-SITE
D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SODIUM	0619	08/04/91	0001	AL	0	MG/L		47.		1.	-
	0619	01/11/92	0001	AL	0			49.4		0.05	-
	0619	06/27/92	0001	AL	0			47.9		1	-
	0630	07/14/89	0001	AL	0			33.		0.002	-
	0630	04/23/90	0001	AL	0			29.8		0.002	-
	0630	12/05/90	0001	AL	0			30.7		0.002	-
	0630	04/19/91	0001	AL	0			32.		1.	-
	0630	08/03/91	0001	AL	0			28.		1.	-
	0630	01/10/92	0001	AL	0			28.8		0.05	-
	0630	06/28/92	0001	AL	0			28.4		1	-
	0632	07/16/89	0001	AL	0			462.		0.002	-
	0632	04/23/90	0001	AL	0			347.		0.002	-
	0632	12/05/90	0001	AL	0			389.		0.002	-
	0632	04/18/91	0001	AL	0			354.		5.	-
	0632	08/02/91	0001	AL	0			354.		5.	-
	0632	01/10/92	0001	AL	0			350		0.05	-
	0632	06/27/92	0001	AL	0			320		1	-
	0637	07/16/89	0001	AL	0			154.		0.002	-
	0637	04/23/90	0001	AL	0			102.		0.002	-
	0637	12/05/90	0001	AL	0			116.		0.002	-
	0637	04/19/91	0001	AL	0			129.		5.	-
	0637	08/04/91	0001	AL	0			99.		1.	-
	0637	01/11/92	0001	AL	0			128		0.05	-
	0637	06/27/92	0001	AL	0			100		1	-
	0656	04/23/90	0001	AL	0			530.		0.002	-
	0656	12/08/90	0001	AL	0			434.		0.002	-
	0656	04/18/91	0001	AL	0			444.		5.	-
	0656	08/04/91	0001	AL	0			461.		5.	-
	0656	01/09/92	0001	AL	0			462		0.05	-
	0656	06/27/92	0001	AL	0			388		1	-
SPECIFIC CONDUCTANCE	0505	01/29/86	0001	AL	0	UMHO/CM		1400.		-	-
	0505	06/10/86	0001	AL	0			1020.		-	-
	0505	04/10/87	0001	AL	0			1500.		-	-
	0505	10/08/87	0001	AL	0			1400.		-	-
	0505	07/13/89	0001	AL	0			650.		-	-
	0505	04/20/90	0001	AL	0			110.		-	-
	0505	12/08/90	0001	AL	0			1150.		-	-
	0505	04/18/91	0001	AL	0			1435.		-	-
	0505	08/01/91	0001	AL	0			1856.		-	-
	0505	01/13/92	0001	AL	0			1030		-	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

0 - ON-SITE

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PARAMETER PVI VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SPECIFIC CONDUCTANCE	0505	06/24/92	0001	AL	O	UMHO/CM	1340		-	-
	0506	01/30/86	0001	AL	O		1950.		-	-
	0506	06/09/86	0001	AL	O		1800.		-	-
	0506	04/10/87	0001	AL	O		1975.		-	-
	0506	10/08/87	0001	AL	O		1700.		-	-
	0506	07/13/89	0001	AL	O		780.		-	-
	0506	04/20/90	0001	AL	O		180.		-	-
	0506	12/08/90	0001	AL	O		1900.		-	-
	0506	04/18/91	0001	AL	O		2640.		-	-
	0506	08/01/91	0001	AL	O		2500.		-	-
	0506	01/13/92	0001	AL	O		1886		-	-
	0506	06/24/92	0001	AL	O		1960		-	-
	0548	06/25/86	0001	AL	D		1000.		-	-
	0548	04/10/87	0001	AL	D		2000.		-	-
	0548	10/08/87	0001	AL	D		900.		-	-
	0548	07/17/89	0001	AL	D		186.		-	-
	0548	04/23/90	0001	AL	D		720.		-	-
	0548	12/05/90	0001	AL	D		890.		-	-
	0548	04/19/91	0001	AL	D		1228.		-	-
	0548	08/02/91	0001	AL	D		698.		-	-
	0548	08/05/91	0001	AL	D		698.		-	-
	0548	01/14/92	0001	AL	D		569		-	-
	0548	06/25/92	0001	AL	D		571		-	-
	0616	07/14/89	0001	AL	O		1420.		-	-
	0616	04/23/90	0001	AL	O		3170.		-	-
	0616	12/05/90	0001	AL	O		2250.		-	-
	0616	04/18/91	0001	AL	O		3980.		-	-
	0616	01/09/92	0001	AL	O		4670		-	-
	0616	06/26/92	0001	AL	O		4113		-	-
	0619	07/16/89	0001	AL	O		290.		-	-
	0619	04/23/90	0001	AL	O		650.		-	-
	0619	12/08/90	0001	AL	O		510.		-	-
	0619	04/19/91	0001	AL	O		996.		-	-
	0619	08/04/91	0001	AL	O		889.		-	-
	0619	08/05/91	0001	AL	O		889.		-	-
	0619	01/11/92	0001	AL	O		880		-	-
	0619	06/27/92	0001	AL	O		640		-	-
	0630	07/14/89	0001	AL	O		280.		-	-
	0630	04/23/90	0001	AL	O		570.		-	-
	0630	12/05/90	0001	AL	O		478.		-	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

O - ON-SITE

D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
01/29/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SPECIFIC CONDUCTANCE	0630	04/19/91	0001	AL	0	UMHO/CM		832.		.	.
	0630	08/03/91	0001	AL	0			584.		.	.
	0630	08/05/91	0001	AL	0			584.		.	.
	0630	01/10/92	0001	AL	0			700		.	.
	0630	06/28/92	0001	AL	0			528		.	.
	0632	07/16/89	0001	AL	0			780.		.	.
	0632	04/23/90	0001	AL	0			2300.		.	.
	0632	12/05/90	0001	AL	0			1950.		.	.
	0632	04/18/91	0001	AL	0			2930.		.	.
	0632	08/02/91	0001	AL	0			2620.		.	.
	0632	08/05/91	0001	AL	0			2620.		.	.
	0632	01/10/92	0001	AL	0			2900		.	.
	0632	06/27/92	0001	AL	0			2460		.	.
	0637	07/16/89	0001	AL	0			320.		.	.
	0637	04/23/90	0001	AL	0			858.		.	.
	0637	12/05/90	0001	AL	0			820.		.	.
	0637	04/19/91	0001	AL	0			1505.		.	.
	0637	08/04/91	0001	AL	0			1351.		.	.
	0637	08/05/91	0001	AL	0			1351.		.	.
	0637	01/11/92	0001	AL	0			1655		.	.
	0637	06/27/92	0001	AL	0			1250		.	.
	0656	04/23/90	0001	AL	0			2500.		.	.
	0656	12/08/90	0001	AL	0			2200.		.	.
	0656	04/18/91	0001	AL	0			3290.		.	.
	0656	08/04/91	0001	AL	0			3180.		.	.
	0656	08/05/91	0001	AL	0			3180.		.	.
	0656	01/09/92	0001	AL	0			3110		.	.
	0656	06/27/92	0001	AL	0			2380		.	.
STRONTIUM	0505	07/13/89	0001	AL	0	MG/L		1.6		0.1	.
	0505	04/20/90	0001	AL	0			1.32		0.1	.
	0505	12/08/90	0001	AL	0			1.5		0.1	.
	0505	04/18/91	0001	AL	0			1.82		0.01	.
	0505	08/01/91	0001	AL	0			2.14		0.01	.
	0505	01/13/92	0001	AL	0			1.26		0.01	.
	0505	06/24/92	0001	AL	0			1.91		0.01	.
	0506	07/13/89	0001	AL	0			3.5		0.1	.
	0506	04/20/90	0001	AL	0			2.83		0.1	.
	0506	12/08/90	0001	AL	0			2.8		0.1	.
	0506	04/18/91	0001	AL	0			2.57		0.01	.
	0506	08/01/91	0001	AL	0			2.84		0.01	.

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
0 - ON-SITE

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PARAMETER PVI VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
STRONTIUM	0506	01/13/92	0001	AL	O	MG/L	2.13		0.01	-
	0506	06/24/92	0001	AL	O		2.56		0.01	-
	0548	07/17/89	0001	AL	D		0.7		0.1	-
	0548	04/23/90	0001	AL	D		1.11		0.1	-
	0548	12/05/90	0001	AL	D		1.4		0.1	-
	0548	04/19/91	0001	AL	D		1.35		0.01	-
	0548	08/02/91	0001	AL	D		0.71		0.01	-
	0548	01/14/92	0001	AL	D		0.79		0.01	-
	0548	06/25/92	0001	AL	D		0.886		0.01	-
	0616	07/14/89	0001	AL	O		4.1		0.1	-
	0616	04/23/90	0001	AL	O		4.01		0.1	-
	0616	12/05/90	0001	AL	O		2.9		0.1	-
	0616	04/18/91	0001	AL	O		2.11		0.01	-
	0616	01/09/92	0001	AL	O		2.33		0.01	-
	0616	06/26/92	0001	AL	O		2.6		0.01	-
	0619	07/16/89	0001	AL	O		0.9		0.1	-
	0619	04/23/90	0001	AL	O		0.77		0.1	-
	0619	12/08/90	0001	AL	O		0.7		0.1	-
	0619	04/19/91	0001	AL	O		0.83		0.01	-
	0619	08/04/91	0001	AL	O		0.80		0.01	-
	0619	01/11/92	0001	AL	O		0.57		0.01	-
	0619	06/27/92	0001	AL	O		0.709		0.01	-
	0630	07/14/89	0001	AL	O		0.6		0.1	-
	0630	04/23/90	0001	AL	O		0.71		0.1	-
	0630	12/05/90	0001	AL	O		0.6		0.1	-
	0630	04/19/91	0001	AL	O		0.76		0.01	-
	0630	08/03/91	0001	AL	O		0.54		0.01	-
	0630	01/10/92	0001	AL	O		0.46		0.01	-
	0630	06/28/92	0001	AL	O		0.602		0.01	-
	0632	07/16/89	0001	AL	O		3.7		0.1	-
	0632	04/23/90	0001	AL	O		3.13		0.1	-
	0632	12/05/90	0001	AL	O		3.4		0.1	-
	0632	04/18/91	0001	AL	O		3.21		0.01	-
	0632	08/02/91	0001	AL	O		3.07		0.01	-
	0632	01/10/92	0001	AL	O		2.62		0.01	-
	0632	06/27/92	0001	AL	O		2.81		0.01	-
	0637	07/16/89	0001	AL	O		1.3		0.1	-
	0637	04/23/90	0001	AL	O		1.17		0.1	-
	0637	12/05/90	0001	AL	O		1.5		0.1	-
	0637	04/19/91	0001	AL	O		1.52		0.01	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

O - ON-SITE

D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
STRONTIUM	0637	08/04/91	0001	AL	O	MG/L		1.33		0.01	-
	0637	01/11/92	0001	AL	O			1.42		0.01	-
	0637	06/27/92	0001	AL	O			1.4		0.01	-
	0656	04/23/90	0001	AL	O			7.16		0.1	-
	0656	12/08/90	0001	AL	O			5.5		0.1	-
	0656	04/18/91	0001	AL	O			5.87		0.01	-
	0656	08/04/91	0001	AL	O			5.53		0.01	-
	0656	01/09/92	0001	AL	O			4.23		0.01	-
	0656	06/27/92	0001	AL	O			4.13		0.01	-
SULFATE	0505	01/29/86	0001	AL	O	MG/L		716.		0.1	-
	0505	06/10/86	0001	AL	O			619.		0.1	-
	0505	04/10/87	0001	AL	O			866.		0.1	-
	0505	10/08/87	0001	AL	O			849.		0.1	-
	0505	07/13/89	0001	AL	O			604.		0.1	-
	0505	04/20/90	0001	AL	O			458.		0.1	-
	0505	12/08/90	0001	AL	O			489.		0.1	-
	0505	04/18/91	0001	AL	O			606.		10.	-
	0505	08/01/91	0001	AL	O			671.		10.	-
	0505	01/13/92	0001	AL	O			445.		0.1	-
	0505	06/24/92	0001	AL	O			594.		1	-
	0506	01/30/86	0001	AL	O			912.		0.1	-
	0506	06/09/86	0001	AL	O			978.		0.1	-
	0506	04/10/87	0001	AL	O			892.		0.1	-
	0506	10/08/87	0001	AL	O			1050.		0.1	-
	0506	07/13/89	0001	AL	O			1075.		0.1	-
	0506	04/20/90	0001	AL	O			965.		0.1	-
	0506	12/08/90	0001	AL	O			889.		0.1	-
	0506	04/18/91	0001	AL	O			818.		10.	-
	0506	08/01/91	0001	AL	O			1200.		10.	-
	0506	01/13/92	0001	AL	O			798.		0.1	-
	0506	06/24/92	0001	AL	O			833.		1	-
	0548	06/25/86	0001	AL	D			430.		0.1	-
	0548	04/10/87	0001	AL	D			932.		0.1	-
	0548	10/08/87	0001	AL	D			306.		0.1	-
	0548	07/17/89	0001	AL	D			171.		0.1	-
	0548	04/23/90	0001	AL	D			350.		0.1	-
	0548	12/05/90	0001	AL	D			386.		0.1	-
	0548	04/19/91	0001	AL	D			378.		10.	-
	0548	08/02/91	0001	AL	D			160.		10.	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

O - ON-SITE

D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODE:

0001 - FILTERED SAMPLE (<.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA
01/29/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SULFATE	0548	01/14/92	0001	AL	D	MG/L		220		0.1	-
	0548	06/25/92	0001	AL	D			223		1	-
	0616	07/14/89	0001	AL	O			1240.		0.1	-
	0616	04/23/90	0001	AL	O			1450.		0.1	-
	0616	12/05/90	0001	AL	O			1250.		0.1	-
	0616	04/18/91	0001	AL	O			1030.		10.	-
	0616	01/09/92	0001	AL	O			1160		0.1	-
	0616	06/26/92	0001	AL	O			1120		1	-
	0619	07/16/89	0001	AL	O			242.		0.1	-
	0619	04/23/90	0001	AL	O			290.		0.1	-
	0619	12/08/90	0001	AL	O			262.		0.1	-
	0619	04/19/91	0001	AL	O			274.		10.	-
	0619	08/04/91	0001	AL	O			286.		10.	-
	0619	01/11/92	0001	AL	O			253		0.1	-
	0619	06/27/92	0001	AL	O			272		1	-
	0630	07/14/89	0001	AL	O			205.		0.1	-
	0630	04/23/90	0001	AL	O			295.		0.1	-
	0630	12/05/90	0001	AL	O			243.		0.1	-
	0630	04/19/91	0001	AL	O			307.		10.	-
	0630	08/03/91	0001	AL	O			148.		10.	-
	0630	01/10/92	0001	AL	O			193		0.1	-
	0630	06/28/92	0001	AL	O			160		1	-
	0632	07/16/89	0001	AL	O			1230.		0.1	-
	0632	04/23/90	0001	AL	O			1130.		0.1	-
	0632	12/05/90	0001	AL	O			1100.		0.1	-
	0632	04/18/91	0001	AL	O			1090.		10.	-
	0632	08/02/91	0001	AL	O			889.		10.	-
	0632	01/10/92	0001	AL	O			929		0.1	-
	0632	06/27/92	0001	AL	O			892		1	-
	0637	07/16/89	0001	AL	O			340.		0.1	-
	0637	04/23/90	0001	AL	O			379.		0.1	-
	0637	12/05/90	0001	AL	O			466.		0.1	-
	0637	04/19/91	0001	AL	O			556.		10.	-
	0637	08/04/91	0001	AL	O			448.		10.	-
	0637	01/11/92	0001	AL	O			546		0.1	-
	0637	06/27/92	0001	AL	O			400		1	-
	0656	04/23/90	0001	AL	O			1090.		0.1	-
	0656	12/08/90	0001	AL	O			817.		0.1	-
	0656	04/18/91	0001	AL	O			757.		10.	-
	0656	01/09/92	0001	AL	O			600		0.1	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
D - DOWN GRADIENT
O - ON-SITE

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
01/29/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SULFATE	0656	06/27/92	0001	AL	O	MG/L		496		1	-
SULFIDE	0505	06/10/86	0001	AL	O	MG/L	<	0.1		0.1	-
	0505	07/13/89	0001	AL	O			0.1		0.1	-
	0505	04/20/90	0001	AL	O		<	0.1		0.1	-
	0505	12/08/90	0001	AL	O		<	0.1		0.1	-
	0505	04/18/91	0001	AL	O			3.9		1.	-
	0505	08/01/91	0001	AL	O			0.8		0.1	-
	0505	01/13/92	0001	AL	O		<	0.1		0.1	-
	0505	06/24/92	0001	AL	O		<	1		1	-
	0506	06/09/86	0001	AL	O		<	0.1		0.1	-
	0506	07/13/89	0001	AL	O		<	0.1		0.1	-
	0506	04/20/90	0001	AL	O		<	0.1		0.1	-
	0506	12/08/90	0001	AL	O		<	0.1		0.1	-
	0506	04/18/91	0001	AL	O		<	1.	I	1.	-
	0506	08/01/91	0001	AL	O		<	0.1		0.1	-
	0506	01/13/92	0001	AL	O		<	0.1		0.1	-
	0506	06/24/92	0001	AL	O		<	1		1	-
	0548	06/25/86	0001	AL	D		<	0.1		0.1	-
	0548	07/17/89	0001	AL	D		<	0.1		0.1	-
	0548	04/23/90	0001	AL	D		<	0.01		0.1	-
	0548	12/05/90	0001	AL	D		<	0.1	J	0.1	-
	0548	04/19/91	0001	AL	D		<	1.	I	1.	-
	0548	08/02/91	0001	AL	D		<	0.1		0.1	-
	0548	01/14/92	0001	AL	D		<	0.1		0.1	-
	0548	06/25/92	0001	AL	D		<	1		1	-
	0616	07/14/89	0001	AL	O		<	0.1		0.1	-
	0616	04/23/90	0001	AL	O		<	0.1		0.1	-
	0616	12/05/90	0001	AL	O		<	0.1		0.1	-
	0616	04/18/91	0001	AL	O			2.3		1.	-
	0616	01/09/92	0001	AL	O		<	0.1		0.1	-
	0616	06/26/92	0001	AL	O			1.26		1	-
	0619	07/16/89	0001	AL	O		<	0.1		0.1	-
	0619	04/23/90	0001	AL	O		<	0.1		0.1	-
	0619	12/08/90	0001	AL	O		<	0.1	J	0.1	-
	0619	01/11/92	0001	AL	O			-	J	-	-
	0619	06/27/92	0001	AL	O			1.16		1	-
	0630	07/14/89	0001	AL	O		<	0.1		0.1	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
O - ON-SITE
D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION
J - ESTIMATED VALUE

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SULFIDE	0630	04/23/90	0001	AL	0	MG/L	<	0.1		0.1	-
	0630	12/05/90	0001	AL	0		<	0.1	J	0.1	-
	0630	04/19/91	0001	AL	0		<	1.	I	1.	-
	0630	08/03/91	0001	AL	0		<	0.4		0.4	-
	0630	01/10/92	0001	AL	0			-	J	-	-
	0630	06/28/92	0001	AL	0		<	1		1	-
	0632	07/16/89	0001	AL	0		<	0.1		0.1	-
	0632	04/23/90	0001	AL	0		<	0.1		0.1	-
	0632	12/05/90	0001	AL	0		<	0.1		0.1	-
	0632	04/18/91	0001	AL	0		<	1.	I	1.	-
	0632	08/02/91	0001	AL	0			0.3		0.2	-
	0632	01/10/92	0001	AL	0		<	0.1		0.1	-
	0632	06/27/92	0001	AL	0		<	1		1	-
	0637	07/16/89	0001	AL	0		<	0.1		0.1	-
	0637	04/23/90	0001	AL	0		<	0.1		0.1	-
	0637	12/05/90	0001	AL	0		<	0.1		0.1	-
	0637	04/19/91	0001	AL	0		<	0.4	I	0.4	-
	0637	01/11/92	0001	AL	0		<	0.1		0.1	-
	0637	06/27/92	0001	AL	0		<	1		1	-
	0656	04/23/90	0001	AL	0		<	0.1		0.1	-
	0656	12/08/90	0001	AL	0		<	0.1	J	0.1	-
	0656	01/09/92	0001	AL	0			-	J	-	-
TEMPERATURE	0505	01/29/86	0001	AL	0	C - DEGREE		13.		-	-
	0505	06/10/86	0001	AL	0			12.5		-	-
	0505	04/10/87	0001	AL	0			10.0		-	-
	0505	10/08/87	0001	AL	0			18.5		-	-
	0505	07/13/89	0001	AL	0			13.9		-	-
	0505	04/20/90	0001	AL	0			13.0		-	-
	0505	12/08/90	0001	AL	0			14.0		-	-
	0505	04/18/91	0001	AL	0			11.7		-	-
	0505	08/01/91	0001	AL	0			14.4		-	-
	0505	01/13/92	0001	AL	0			11.6		-	-
	0505	06/24/92	0001	AL	0			14.1		-	-
	0506	01/30/86	0001	AL	0			14.		-	-
	0506	06/09/86	0001	AL	0			13.		-	-
	0506	04/10/87	0001	AL	0			11.0		-	-
	0506	10/08/87	0001	AL	0			19.0		-	-
	0506	07/13/89	0001	AL	0			18.0		-	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

0 - ON-SITE

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

J - ESTIMATED VALUE

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PARAMETER PVI VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
TEMPERATURE	0506	04/20/90	0001	AL	O	C - DEGREE	13.		-	-
	0506	12/08/90	0001	AL	O		17.0		-	-
	0506	04/18/91	0001	AL	O		12.8		-	-
	0506	08/01/91	0001	AL	O		14.4		-	-
	0506	01/13/92	0001	AL	O		14.4		-	-
	0506	06/24/92	0001	AL	O		14.0		-	-
	0548	06/25/86	0001	AL	D		12.		-	-
	0548	04/10/87	0001	AL	D		8.0		-	-
	0548	10/08/87	0001	AL	D		14.0		-	-
	0548	07/17/89	0001	AL	D		12.9		-	-
	0548	04/23/90	0001	AL	D		10.5		-	-
	0548	12/05/90	0001	AL	D		11.8		-	-
	0548	04/19/91	0001	AL	D		8.4		-	-
	0548	08/02/91	0001	AL	D		10.8		-	-
	0548	08/05/91	0001	AL	D		10.8		-	-
	0548	01/14/92	0001	AL	D		8.9		-	-
	0548	06/25/92	0001	AL	D		10.5		-	-
	0616	07/14/89	0001	AL	O		23.2		-	-
	0616	04/23/90	0001	AL	O		11.5		-	-
	0616	12/05/90	0001	AL	O		7.0		-	-
	0616	04/18/91	0001	AL	O		10.2		-	-
	0616	08/01/91	0001	AL	O		21.5		-	-
	0616	01/09/92	0001	AL	O		5.9		-	-
	0616	06/26/92	0001	AL	O		20.6		-	-
	0619	07/16/89	0001	AL	O		19.5		-	-
	0619	04/23/90	0001	AL	O		10.5		-	-
	0619	12/08/90	0001	AL	O		7.9		-	-
	0619	04/19/91	0001	AL	O		11.8		-	-
	0619	08/04/91	0001	AL	O		14.9		-	-
	0619	08/05/91	0001	AL	O		14.9		-	-
	0619	01/11/92	0001	AL	O		7.3		-	-
	0619	06/27/92	0001	AL	O		16.6		-	-
	0630	07/14/89	0001	AL	O		24.0		-	-
	0630	04/23/90	0001	AL	O		12.0		-	-
	0630	12/05/90	0001	AL	O		9.2		-	-
	0630	04/19/91	0001	AL	O		11.4		-	-
	0630	08/03/91	0001	AL	O		16.8		-	-
	0630	08/05/91	0001	AL	O		16.8		-	-
	0630	01/10/92	0001	AL	O		7.0		-	-
	0630	06/28/92	0001	AL	O		15.7		-	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

O - ON-SITE

D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
TEMPERATURE	0632	07/16/89	0001	AL	O	C - DEGREE		22.0		-	-
	0632	04/23/90	0001	AL	O			13.5		-	-
	0632	12/05/90	0001	AL	O			9.7		-	-
	0632	04/18/91	0001	AL	O			12.0		-	-
	0632	08/02/91	0001	AL	O			23.2		-	-
	0632	08/05/91	0001	AL	O			23.2		-	-
	0632	01/10/92	0001	AL	O			5.3		-	-
	0632	06/27/92	0001	AL	O			20.6		-	-
	0637	07/16/89	0001	AL	O			25.0		-	-
	0637	04/23/90	0001	AL	O			13.5		-	-
	0637	12/05/90	0001	AL	O			7.8		-	-
	0637	04/19/91	0001	AL	O			12.4		-	-
	0637	08/04/91	0001	AL	O			23.0		-	-
	0637	08/05/91	0001	AL	O			23.0		-	-
	0637	01/11/92	0001	AL	O			3.7		-	-
	0637	06/27/92	0001	AL	O			20.4		-	-
	0656	04/23/90	0001	AL	O			12.0		-	-
	0656	12/08/90	0001	AL	O			11.0		-	-
	0656	04/18/91	0001	AL	O			11.0		-	-
	0656	08/04/91	0001	AL	O			16.8		-	-
	0656	08/05/91	0001	AL	O			16.8		-	-
	0656	01/09/92	0001	AL	O			8.5		-	-
	0656	06/27/92	0001	AL	O			16.4		-	-
THALLIUM	0505	07/13/89	0001	AL	O	MG/L		< 0.1		0.1	-
	0505	04/20/90	0001	AL	O			< 0.01		0.01	-
	0505	12/08/90	0001	AL	O			< 0.01		0.01	-
	0505	04/18/91	0001	AL	O			< 0.01		0.01	-
	0505	08/01/91	0001	AL	O			< 0.01		0.01	-
	0506	07/13/89	0001	AL	O			< 0.1		0.1	-
	0506	04/20/90	0001	AL	O			< 0.01		0.01	-
	0506	12/08/90	0001	AL	O			< 0.01		0.01	-
	0506	04/18/91	0001	AL	O			< 0.01		0.01	-
	0506	08/01/91	0001	AL	O			< 0.01		0.01	-
	0548	07/17/89	0001	AL	D			< 0.1		0.1	-
	0548	04/23/90	0001	AL	D			< 0.01		0.01	-
	0548	12/05/90	0001	AL	D			< 0.01		0.01	-
	0548	04/19/91	0001	AL	D			< 0.01		0.01	-
	0548	08/02/91	0001	AL	D			< 0.01		0.01	-
	0616	07/14/89	0001	AL	O			< 0.1		0.1	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

O - ON-SITE

D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
01/29/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
THALLIUM	0616	04/23/90	0001	AL	O	MG/L	<	0.01		0.01	-
	0616	12/05/90	0001	AL	O		<	0.01		0.01	-
	0616	04/18/91	0001	AL	O		<	0.01		0.01	-
	0619	07/16/89	0001	AL	O		<	0.1		0.1	-
	0619	04/23/90	0001	AL	O		<	0.01		0.01	-
	0619	12/08/90	0001	AL	O		<	0.01		0.01	-
	0619	04/19/91	0001	AL	O		<	0.01		0.01	-
	0619	08/04/91	0001	AL	O		<	0.01		0.01	-
	0630	07/14/89	0001	AL	O		<	0.1		0.1	-
	0630	04/23/90	0001	AL	O		<	0.01		0.01	-
	0630	12/05/90	0001	AL	O		<	0.01		0.01	-
	0630	04/19/91	0001	AL	O		<	0.01		0.01	-
	0630	08/03/91	0001	AL	O		<	0.01		0.01	-
	0632	07/16/89	0001	AL	O		<	0.1		0.1	-
	0632	04/23/90	0001	AL	O		<	0.01		0.01	-
	0632	12/05/90	0001	AL	O		<	0.01		0.01	-
	0632	04/18/91	0001	AL	O		<	0.01		0.01	-
	0632	08/02/91	0001	AL	O		<	0.01		0.01	-
	0637	07/16/89	0001	AL	O		<	0.1		0.1	-
	0637	04/23/90	0001	AL	O		<	0.01		0.01	-
	0637	12/05/90	0001	AL	O		<	0.01		0.01	-
	0637	04/19/91	0001	AL	O		<	0.01		0.01	-
	0637	08/04/91	0001	AL	O		<	0.01		0.01	-
	0656	04/23/90	0001	AL	O		<	0.01		0.01	-
	0656	12/08/90	0001	AL	O		<	0.01		0.01	-
	0656	04/18/91	0001	AL	O		<	0.01		0.01	-
	0656	08/04/91	0001	AL	O		<	0.01		0.01	-
THORIUM-230	0505	06/10/86	0001	AL	O	PCI/L		0.1		1.	0.2
	0505	10/08/87	0001	AL	O			0.0		1.	0.5
	0505	07/13/89	0001	AL	O			0.4		1.	0.2
	0505	04/20/90	0001	AL	O			0.0		1.	0.3
	0506	04/10/87	0001	AL	O			0.1		1.	0.3
	0506	10/08/87	0001	AL	O			0.3		1.	0.5
	0506	07/13/89	0001	AL	O			0.1		1.	0.2
	0506	04/20/90	0001	AL	O			0.0		1.	0.4
	0548	06/25/86	0001	AL	D			0.7		1.	0.5
	0548	04/10/87	0001	AL	D			0.2		1.	0.5
	0548	10/08/87	0001	AL	D			0.3		1.	0.5
	0548	07/17/89	0001	AL	D			0.4		1.	0.3

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
O - ON-SITE
D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
THORIUM-230	0548	04/23/90	0001	AL	D	PCI/L		0.0		1.	0.3
	0616	07/14/89	0001	AL	O			0.9		1.	0.3
	0616	04/23/90	0001	AL	O			0.2		1.	0.4
	0619	07/16/89	0001	AL	O			0.2		1.	0.2
	0619	04/23/90	0001	AL	O			0.0		1.	0.3
	0630	07/14/89	0001	AL	O			0.4		1.	0.2
	0630	04/23/90	0001	AL	O			0.0		1.	0.3
	0632	07/16/89	0001	AL	O			0.9		1.	0.3
	0632	04/23/90	0001	AL	O			0.0		1.	0.3
	0637	07/16/89	0001	AL	O			0.1		1.	0.2
	0637	04/23/90	0001	AL	O			0.0		1.	0.3
TIN	0505	06/10/86	0001	AL	O	MG/L	<	0.005		0.005	-
	0505	07/13/89	0001	AL	O		<	0.005		0.005	-
	0505	04/20/90	0001	AL	O			0.015		0.005	-
	0505	12/08/90	0001	AL	O		<	0.005		0.005	-
	0505	04/18/91	0001	AL	O		<	0.01	I	0.01	-
	0505	08/01/91	0001	AL	O		<	0.005		0.005	-
	0505	01/13/92	0001	AL	O		<	0.005		0.005	-
	0505	06/24/92	0001	AL	O		<	0.005		0.005	-
	0506	07/13/89	0001	AL	O		<	0.005		0.005	-
	0506	04/20/90	0001	AL	O			0.026		0.005	-
	0506	12/08/90	0001	AL	O		<	0.005		0.005	-
	0506	04/18/91	0001	AL	O		<	0.01	I	0.01	-
	0506	08/01/91	0001	AL	O		<	0.05	I	0.05	-
	0506	01/13/92	0001	AL	O		<	0.005		0.005	-
	0506	06/24/92	0001	AL	O		<	0.005		0.005	-
	0548	06/25/86	0001	AL	D			0.009		0.005	-
	0548	07/17/89	0001	AL	D		<	0.005		0.005	-
	0548	04/23/90	0001	AL	D		<	0.005		0.005	-
	0548	12/05/90	0001	AL	D		<	0.005		0.005	-
	0548	04/19/91	0001	AL	D		<	0.01	I	0.01	-
	0548	08/02/91	0001	AL	D		<	0.05	I	0.05	-
	0548	01/14/92	0001	AL	D		<	0.005		0.005	-
	0548	06/25/92	0001	AL	D		<	0.005		0.005	-
	0616	07/14/89	0001	AL	O		<	0.01		0.01	-
	0616	04/23/90	0001	AL	O			0.129		0.005	-
	0616	12/05/90	0001	AL	O		<	0.005		0.005	-
	0616	04/18/91	0001	AL	O		<	0.01	I	0.01	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

D - DOWN GRADIENT

O - ON-SITE

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
01/29/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
TIN	0616	01/09/92	0001	AL	0	MG/L	<	0.005		0.005	-
	0616	06/26/92	0001	AL	0		<	0.005		0.005	-
	0619	07/16/89	0001	AL	0		<	0.005		0.005	-
	0619	04/23/90	0001	AL	0		<	0.005		0.005	-
	0619	12/08/90	0001	AL	0		<	0.005		0.005	-
	0619	04/19/91	0001	AL	0		<	0.01	I	0.01	-
	0619	08/04/91	0001	AL	0		<	0.05	I	0.05	-
	0619	01/11/92	0001	AL	0		<	0.005		0.005	-
	0619	06/27/92	0001	AL	0		<	0.005		0.005	-
	0630	07/14/89	0001	AL	0		<	0.005		0.005	-
	0630	04/23/90	0001	AL	0		<	0.005		0.005	-
	0630	12/05/90	0001	AL	0		<	0.005		0.005	-
	0630	04/19/91	0001	AL	0		<	0.01	I	0.01	-
	0630	08/03/91	0001	AL	0		<	0.05	I	0.05	-
	0630	01/10/92	0001	AL	0		<	0.005		0.005	-
	0630	06/28/92	0001	AL	0		<	0.005		0.005	-
	0632	07/16/89	0001	AL	0		<	0.03		0.03	-
	0632	04/23/90	0001	AL	0		<	0.028		0.005	-
	0632	12/05/90	0001	AL	0		<	0.005		0.005	-
	0632	04/18/91	0001	AL	0		<	0.01	I	0.01	-
	0632	08/02/91	0001	AL	0		<	0.05	I	0.05	-
	0632	01/10/92	0001	AL	0		<	0.005		0.005	-
	0632	06/27/92	0001	AL	0		<	0.005		0.005	-
	0637	07/16/89	0001	AL	0		<	0.005		0.005	-
	0637	04/23/90	0001	AL	0		<	0.011		0.005	-
	0637	12/05/90	0001	AL	0		<	0.005		0.005	-
	0637	04/19/91	0001	AL	0		<	0.01	I	0.01	-
	0637	08/04/91	0001	AL	0		<	0.05	I	0.05	-
	0637	01/11/92	0001	AL	0		<	0.005		0.005	-
	0637	06/27/92	0001	AL	0		<	0.005		0.005	-
	0656	04/23/90	0001	AL	0		<	0.036		0.005	-
	0656	12/08/90	0001	AL	0		<	0.005		0.005	-
	0656	04/18/91	0001	AL	0		<	0.01	I	0.01	-
	0656	08/04/91	0001	AL	0		<	0.05	I	0.05	-
	0656	01/09/92	0001	AL	0		<	0.005		0.005	-
	0656	06/27/92	0001	AL	0		<	0.005		0.005	-
TOTAL DISSOLVED SOLIDS	0505	01/29/86	0001	AL	0	MG/L		1550.		10.	-
	0505	06/10/86	0001	AL	0			1380.		10.	-
	0505	04/10/87	0001	AL	0			1850.		10.	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
0 - ON-SITE

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

TABLE 3.12 ONSITE/DOWNGRAIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
TOTAL DISSOLVED SOLIDS	0505	10/08/87	0001	AL	O	MG/L		1800.		10.	-
	0505	07/13/89	0001	AL	O			1280.		10.	-
	0505	04/20/90	0001	AL	O			1090.		10.	-
	0505	12/08/90	0001	AL	O			944.		10.	-
	0505	04/18/91	0001	AL	O			1310.		10.	-
	0505	08/01/91	0001	AL	O			1500.		10.	-
	0505	01/13/92	0001	AL	O			1100		4	-
	0505	06/24/92	0001	AL	O			1250		10	-
	0506	01/30/86	0001	AL	O			2110.		10.	-
	0506	06/09/86	0001	AL	O			2080.		10.	-
	0506	04/10/87	0001	AL	O			2140.		10.	-
	0506	10/08/87	0001	AL	O			2280.		10.	-
	0506	07/13/89	0001	AL	O			2290.		10.	-
	0506	04/20/90	0001	AL	O			2000.		10.	-
	0506	12/08/90	0001	AL	O			1660.		10.	-
	0506	04/18/91	0001	AL	O			1830.		10.	-
	0506	08/01/91	0001	AL	O			2970.		10.	-
	0506	01/13/92	0001	AL	O			1820		4	-
	0506	06/24/92	0001	AL	O			1850		10	-
	0548	06/25/86	0001	AL	D			1070.		10.	-
	0548	04/10/87	0001	AL	D			2400.		10.	-
	0548	10/08/87	0001	AL	D			887.		10.	-
	0548	07/17/89	0001	AL	D			455.		10.	-
	0548	04/23/90	0001	AL	D			736.		10.	-
	0548	12/05/90	0001	AL	D			860.		10.	-
	0548	04/19/91	0001	AL	D			893.		10.	-
	0548	08/02/91	0001	AL	D			462.		10.	-
	0548	01/14/92	0001	AL	D			565		4	-
	0548	06/25/92	0001	AL	D			520		10	-
	0616	07/14/89	0001	AL	O			3910.		10.	-
	0616	04/23/90	0001	AL	O			4190.		10.	-
	0616	12/05/90	0001	AL	O			3100.		10.	-
	0616	04/18/91	0001	AL	O			2760.		10.	-
	0616	01/09/92	0001	AL	O			3120		4	-
	0616	06/26/92	0001	AL	O			3040		10	-
	0619	07/16/89	0001	AL	O			612.		10.	-
	0619	04/23/90	0001	AL	O			486.		10.	-
	0619	12/08/90	0001	AL	O			588.		10.	-
	0619	04/19/91	0001	AL	O			671.		10.	-
	0619	08/04/91	0001	AL	O			680.		10.	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
O - ON-SITE
D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
TOTAL DISSOLVED SOLIDS	0619	01/11/92	0001	AL	O	MG/L	-	-	J	-	-
	0619	06/27/92	0001	AL	O		580			10	-
	0630	07/14/89	0001	AL	O		467.			10.	-
	0630	04/23/90	0001	AL	O		530.			10.	-
	0630	12/05/90	0001	AL	O		500.			10.	-
	0630	04/19/91	0001	AL	O		600.			10.	-
	0630	08/03/91	0001	AL	O		373.			10.	-
	0630	01/10/92	0001	AL	O		-		J	-	-
	0630	06/28/92	0001	AL	O		410			10	-
	0632	07/16/89	0001	AL	O		2650.			10.	-
	0632	04/23/90	0001	AL	O		2410.			10.	-
	0632	12/05/90	0001	AL	O		2140.			10.	-
	0632	04/18/91	0001	AL	O		2310.			10.	-
	0632	08/02/91	0001	AL	O		2090.			10.	-
	0632	01/10/92	0001	AL	O		2140			4	-
	0632	06/27/92	0001	AL	O		1990			10	-
	0637	07/16/89	0001	AL	O		1200.			10.	-
	0637	04/23/90	0001	AL	O		954.			10.	-
	0637	12/05/90	0001	AL	O		924.			10.	-
	0637	04/19/91	0001	AL	O		1170.			10.	-
	0637	08/04/91	0001	AL	O		1020.			10.	-
	0637	01/11/92	0001	AL	O		1220			4	-
	0637	06/27/92	0001	AL	O		950			10	-
	0656	04/23/90	0001	AL	O		2800.			10.	-
	0656	12/08/90	0001	AL	O		2310.			10.	-
	0656	04/18/91	0001	AL	O		2460.			10.	-
	0656	01/09/92	0001	AL	O		-		J	-	-
	0656	06/27/92	0001	AL	O		1900			10	-
TOTAL KJELDAHL NITROGEN	0505	01/13/92	0001	AL	O	MG/L	<	1.0		1	-
	0505	06/24/92	0001	AL	O		<	1		1	-
	0506	01/13/92	0001	AL	O		<	1.0		1	-
	0506	06/24/92	0001	AL	O		<	1		1	-
	0548	01/14/92	0001	AL	D		<	1.0		1	-
	0548	06/25/92	0001	AL	D		<	1		1	-
	0616	01/09/92	0001	AL	O		<	1.0		1	-
	0616	06/26/92	0001	AL	O		<	1		1	-
	0619	01/11/92	0001	AL	O		<	1.0		1	-
	0619	06/27/92	0001	AL	O		<	1		1	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
O - ON-SITE
D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

OTHER PARAMETER VALUE FLAGS:
J - ESTIMATED VALUE

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA
01/29/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
TOTAL KJELDAHL NITROGEN	0630	01/10/92	0001	AL	O	MG/L	<	1.0		1	-
	0630	06/28/92	0001	AL	O		<	1		1	-
	0632	01/10/92	0001	AL	O		<	1.0		1	-
	0632	06/27/92	0001	AL	O		<	1		1	-
	0637	01/11/92	0001	AL	O		<	1.0		1	-
	0637	06/27/92	0001	AL	O		<	1		1	-
	0656	01/09/92	0001	AL	O		<	1.0		1	-
TOTAL ORGANIC CARBON	0505	07/13/89	0001	AL	O	MG/L		6.		1.	-
	0505	04/18/91	0001	AL	O			4.		1.	-
	0506	07/13/89	0001	AL	O			4.		1.	-
	0506	04/18/91	0001	AL	O			5.		1.	-
	0548	07/17/89	0001	AL	D			2.		1.	-
	0548	04/19/91	0001	AL	D			4.		1.	-
	0616	07/14/89	0001	AL	O			28.		1.	-
	0616	04/18/91	0001	AL	O			11.		1.	-
	0619	07/16/89	0001	AL	O			6.		1.	-
	0630	07/14/89	0001	AL	O			6.		1.	-
	0630	04/19/91	0001	AL	O			2.		1.	-
	0632	07/16/89	0001	AL	O			7.		1.	-
	0632	04/18/91	0001	AL	O			8.		1.	-
	0637	07/16/89	0001	AL	O			8.		1.	-
	0637	04/19/91	0001	AL	O			7.		1.	-
URANIUM	0505	01/29/86	0001	AL	O	MG/L		1.33		0.003	-
	0505	06/10/86	0001	AL	O			1.02		0.003	-
	0505	04/10/87	0001	AL	O			2.04		0.003	-
	0505	10/08/87	0001	AL	O			1.22		0.003	-
	0505	07/13/89	0001	AL	O			0.683		0.003	-
	0505	04/20/90	0001	AL	O			0.779		0.003	-
	0505	12/08/90	0001	AL	O			0.865		0.0003	-
	0505	04/18/91	0001	AL	O			0.848		0.001	-
	0505	08/01/91	0001	AL	O			0.022		0.001	-
	0505	01/14/92	0001	AL	O			0.734		0.0003	-
	0505	06/24/92	0001	AL	O			0.733		0.001	-
	0506	01/30/86	0001	AL	O			1.97		0.003	-
	0506	06/09/86	0001	AL	O			2.49		0.003	-
	0506	04/10/87	0001	AL	O			2.81		0.003	-
	0506	10/08/87	0001	AL	O			2.54		0.003	-
	0506	07/13/89	0001	AL	O			2.21		0.003	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
O - ON-SITE
D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
URANIUM	0506	04/20/90	0001	AL	O	MG/L		1.94		0.003	-
	0506	12/08/90	0001	AL	O			2.02		0.0003	-
	0506	04/18/91	0001	AL	O			2.29		0.001	-
	0506	08/01/91	0001	AL	O			0.845		0.001	-
	0506	01/13/92	0001	AL	O			2.35		0.0003	-
	0506	06/24/92	0001	AL	O			1.83		0.001	-
	0548	06/25/86	0001	AL	D			0.715		0.003	-
	0548	04/10/87	0001	AL	D			2.13		0.003	-
	0548	10/08/87	0001	AL	D			0.532		0.003	-
	0548	07/17/89	0001	AL	D			0.188		0.003	-
	0548	04/23/90	0001	AL	D			0.442		0.003	-
	0548	12/05/90	0001	AL	D			0.588		0.0003	-
	0548	04/19/91	0001	AL	D			0.534		0.001	-
	0548	08/05/91	0001	AL	D			0.1191		0.001	-
	0548	01/14/92	0001	AL	D			0.203		0.0003	-
	0548	06/25/92	0001	AL	D			0.228		0.001	-
	0616	07/14/89	0001	AL	O			5.2		0.003	-
	0616	04/23/90	0001	AL	O			5.09		0.003	-
	0616	12/05/90	0001	AL	O			2.41		0.0003	-
	0616	04/18/91	0001	AL	O			2.84		0.001	-
	0616	01/09/92	0001	AL	O			2.21		0.0003	-
	0616	06/26/92	0001	AL	O			2.03		0.001	-
	0619	07/16/89	0001	AL	O			0.014		0.003	-
	0619	04/23/90	0001	AL	O			0.114		0.003	-
	0619	12/08/90	0001	AL	O			0.176		0.0003	-
	0619	04/19/91	0001	AL	O			0.148		0.001	-
	0619	08/05/91	0001	AL	O			0.077		0.001	-
	0619	01/12/92	0001	AL	O			0.1700		0.0003	-
	0619	06/27/92	0001	AL	O			0.112		0.001	-
	0630	07/14/89	0001	AL	O			0.058		0.003	-
	0630	04/23/90	0001	AL	O			0.138		0.003	-
	0630	12/05/90	0001	AL	O			0.135		0.0003	-
	0630	04/19/91	0001	AL	O			0.144		0.001	-
	0630	08/05/91	0001	AL	O			0.045		0.001	-
	0630	01/10/92	0001	AL	O			0.114		0.0003	-
	0630	06/28/92	0001	AL	O			0.097		0.001	-
	0632	07/16/89	0001	AL	O			1.67		0.003	-
	0632	04/23/90	0001	AL	O			2.21		0.003	-
	0632	12/05/90	0001	AL	O			2.21		0.0003	-
	0632	04/18/91	0001	AL	O			2.04		0.001	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
O - ON-SITE
D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
URANIUM	0632	08/05/91	0001	AL	0	MG/L		1.003		0.001	-
	0632	01/10/92	0001	AL	0			2.88		0.0003	-
	0632	06/27/92	0001	AL	0			1.71		0.001	-
	0637	07/16/89	0001	AL	0			1.52		0.003	-
	0637	04/23/90	0001	AL	0			1.33		0.003	-
	0637	12/05/90	0001	AL	0			1.02		0.0003	-
	0637	04/19/91	0001	AL	0			1.02		0.001	-
	0637	08/05/91	0001	AL	0			0.352		0.001	-
	0637	01/11/92	0001	AL	0			0.908		0.0003	-
	0637	06/27/92	0001	AL	0			0.636		0.001	-
	0656	12/08/90	0001	AL	0			1.54		0.0003	-
	0656	04/18/91	0001	AL	0			1.57		0.001	-
	0656	08/05/91	0001	AL	0			0.739		0.001	-
	0656	01/09/92	0001	AL	0			0.884		0.0003	-
VANADIUM	0505	06/10/86	0001	AL	0	MG/L		2.		0.01	-
	0505	04/10/87	0001	AL	0			0.01		0.01	-
	0505	10/08/87	0001	AL	0			2.93		0.01	-
	0505	07/13/89	0001	AL	0			1.97		0.01	-
	0505	04/20/90	0001	AL	0			1.67		0.01	-
	0505	12/08/90	0001	AL	0			1.57		0.01	-
	0505	04/18/91	0001	AL	0			0.83		0.01	-
	0505	08/01/91	0001	AL	0			1.17		0.01	-
	0505	01/13/92	0001	AL	0			1.25		0.01	-
	0505	06/24/92	0001	AL	0			0.85		0.01	-
	0506	06/09/86	0001	AL	0			9.3		0.01	-
	0506	04/10/87	0001	AL	0			5.98		0.01	-
	0506	10/08/87	0001	AL	0			4.50		0.01	-
	0506	07/13/89	0001	AL	0			3.01		0.01	-
	0506	04/20/90	0001	AL	0			2.87		0.01	-
	0506	12/08/90	0001	AL	0			3.30		0.01	-
	0506	04/18/91	0001	AL	0			3.90		0.01	-
	0506	08/01/91	0001	AL	0			2.51		0.01	-
	0506	01/13/92	0001	AL	0			2.48		0.01	-
	0506	06/24/92	0001	AL	0			3.2		0.01	-
	0548	06/25/86	0001	AL	D			0.53		0.01	-
	0548	04/10/87	0001	AL	D			0.04		0.01	-
	0548	10/08/87	0001	AL	D			0.06		0.01	-
	0548	07/17/89	0001	AL	D			0.03		0.01	-
	0548	04/23/90	0001	AL	D			0.03		0.01	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

0 - ON-SITE

D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA

01/29/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PARAMETER PVI VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
VANADIUM	0548	12/05/90	0001	AL	D	MG/L	0.04		0.01	-
	0548	04/19/91	0001	AL	D		0.01		0.01	-
	0548	08/02/91	0001	AL	D		0.02		0.01	-
	0548	01/14/92	0001	AL	D		0.02		0.01	-
	0548	06/25/92	0001	AL	D		0.028		0.01	-
	0616	07/14/89	0001	AL	O		1.62		0.01	-
	0616	04/23/90	0001	AL	O		1.49		0.01	-
	0616	12/05/90	0001	AL	O		6.24		0.01	-
	0616	04/18/91	0001	AL	O		9.05		0.01	-
	0616	01/09/92	0001	AL	O		6.60		0.01	-
	0616	06/26/92	0001	AL	O		10.3		0.01	-
	0619	07/16/89	0001	AL	O		0.51		0.01	-
	0619	04/23/90	0001	AL	O		0.48		0.01	-
	0619	12/08/90	0001	AL	O		0.54		0.01	-
	0619	04/19/91	0001	AL	O		0.68		0.01	-
	0619	08/04/91	0001	AL	O		1.08		0.01	-
	0619	01/11/92	0001	AL	O		0.84		0.01	-
	0619	06/27/92	0001	AL	O		0.927		0.01	-
	0630	07/14/89	0001	AL	O		2.32		0.01	-
	0630	04/23/90	0001	AL	O		0.87		0.01	-
	0630	12/05/90	0001	AL	O		0.95		0.01	-
	0630	04/19/91	0001	AL	O		0.64		0.01	-
	0630	08/03/91	0001	AL	O		0.80		0.01	-
	0630	01/10/92	0001	AL	O		0.60		0.01	-
	0630	06/28/92	0001	AL	O		0.59		0.01	-
	0632	07/16/89	0001	AL	O		8.3		0.01	-
	0632	04/23/90	0001	AL	O		5.48		0.01	-
	0632	12/05/90	0001	AL	O		4.23		0.01	-
	0632	04/18/91	0001	AL	O		6.70		0.01	-
	0632	08/02/91	0001	AL	O		7.10		0.05	-
	0632	01/10/92	0001	AL	O		4.31		0.01	-
	0632	06/27/92	0001	AL	O		6.99		0.01	-
	0637	07/16/89	0001	AL	O		1.27		0.01	-
	0637	04/23/90	0001	AL	O		1.21		0.01	-
	0637	12/05/90	0001	AL	O		1.42		0.01	-
	0637	04/19/91	0001	AL	O		1.78		0.01	-
	0637	08/04/91	0001	AL	O		0.71		0.01	-
	0637	01/11/92	0001	AL	O		1.84		0.01	-
	0637	06/27/92	0001	AL	O		1.75		0.01	-
	0656	04/23/90	0001	AL	O		0.05		0.01	-

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

D - DOWN GRADIENT

O - ON-SITE

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO

SITE: NAT01 NATURITA
01/29/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
VANADIUM	0656	12/08/90	0001	AL	O	MG/L		0.04		0.01	-
	0656	04/18/91	0001	AL	O		<	0.01		0.01	-
	0656	08/04/91	0001	AL	O		<	0.01		0.01	-
	0656	01/09/92	0001	AL	O			0.03		0.01	-
	0656	06/27/92	0001	AL	O			0.042		0.01	-
ZINC	0505	06/10/86	0001	AL	O	MG/L		0.02		0.005	-
	0505	04/10/87	0001	AL	O			0.063		0.005	-
	0505	10/08/87	0001	AL	O			0.007		0.005	-
	0505	07/13/89	0001	AL	O			0.014		0.005	-
	0505	04/20/90	0001	AL	O			0.006		0.005	-
	0505	12/08/90	0001	AL	O			0.015		0.005	-
	0505	04/18/91	0001	AL	O			0.030		0.005	-
	0505	08/01/91	0001	AL	O			0.028		0.005	-
	0505	01/13/92	0001	AL	O			0.024		0.005	-
	0505	06/24/92	0001	AL	O			0.053		0.005	-
	0506	04/10/87	0001	AL	O			0.018		0.005	-
	0506	10/08/87	0001	AL	O			0.021		0.005	-
	0506	07/13/89	0001	AL	O		<	0.005		0.005	-
	0506	04/20/90	0001	AL	O		<	0.005		0.005	-
	0506	12/08/90	0001	AL	O		<	0.005		0.005	-
	0506	04/18/91	0001	AL	O		<	0.005		0.005	-
	0506	08/01/91	0001	AL	O		<	0.005		0.005	-
	0506	01/13/92	0001	AL	O			0.008		0.005	-
	0506	06/24/92	0001	AL	O			0.045		0.005	-
	0548	06/25/86	0001	AL	D			0.013		0.005	-
	0548	04/10/87	0001	AL	D			0.008		0.005	-
	0548	10/08/87	0001	AL	D		<	0.005		0.005	-
	0548	07/17/89	0001	AL	D			0.006		0.005	-
	0548	04/23/90	0001	AL	D			0.011		0.005	-
	0548	12/05/90	0001	AL	D			0.014		0.005	-
	0548	04/19/91	0001	AL	D			0.008		0.005	-
	0548	08/02/91	0001	AL	D		<	0.005		0.005	-
	0548	01/14/92	0001	AL	D			0.016		0.005	-
	0548	06/25/92	0001	AL	D			0.009		0.005	-
	0616	07/14/89	0001	AL	O		<	0.005		0.005	-
	0616	04/23/90	0001	AL	O			0.011		0.005	-
	0616	12/05/90	0001	AL	O		<	0.005		0.005	-
	0616	04/18/91	0001	AL	O		<	0.005		0.005	-
	0616	01/09/92	0001	AL	O			0.051		0.005	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
O - ON-SITE
D - DOWN GRADIENT

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.12 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY DATA BY PARAMETER,
ALLUVIUM, NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
01/29/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	FORM COMP	FLOW REL.	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ZINC	0616	06/26/92	0001	AL	0	MG/L		0.107		0.005	-
	0619	07/16/89	0001	AL	0			0.061		0.005	-
	0619	04/23/90	0001	AL	0			0.071		0.005	-
	0619	12/08/90	0001	AL	0			0.075		0.005	-
	0619	04/19/91	0001	AL	0			0.057		0.005	-
	0619	08/04/91	0001	AL	0			0.033		0.005	-
	0619	01/11/92	0001	AL	0			0.005		0.005	-
	0619	06/27/92	0001	AL	0			0.066		0.005	-
	0630	07/14/89	0001	AL	0		<	0.005		0.005	-
	0630	04/23/90	0001	AL	0			0.012		0.005	-
	0630	12/05/90	0001	AL	0			0.018		0.005	-
	0630	04/19/91	0001	AL	0			0.090		0.005	-
	0630	08/03/91	0001	AL	0		<	0.005		0.005	-
	0630	01/10/92	0001	AL	0			0.005		0.005	-
	0630	06/28/92	0001	AL	0			0.021		0.005	-
	0632	07/16/89	0001	AL	0		<	0.005		0.005	-
	0632	04/23/90	0001	AL	0		<	0.005		0.005	-
	0632	12/05/90	0001	AL	0		<	0.005		0.005	-
	0632	04/18/91	0001	AL	0		<	0.005		0.005	-
	0632	08/02/91	0001	AL	0		<	0.005		0.005	-
	0632	01/10/92	0001	AL	0			0.006		0.005	-
	0632	06/27/92	0001	AL	0			0.086		0.005	-
	0637	07/16/89	0001	AL	0		<	0.005		0.005	-
	0637	04/23/90	0001	AL	0			0.084		0.005	-
	0637	12/05/90	0001	AL	0			0.016		0.005	-
	0637	04/19/91	0001	AL	0			0.033		0.005	-
	0637	08/04/91	0001	AL	0			0.014		0.005	-
	0637	01/11/92	0001	AL	0			0.024		0.005	-
	0637	06/27/92	0001	AL	0			0.042		0.005	-
	0656	04/23/90	0001	AL	0			0.019		0.005	-
	0656	12/08/90	0001	AL	0		<	0.005		0.005	-
	0656	04/18/91	0001	AL	0			0.005		0.005	-
	0656	08/04/91	0001	AL	0		<	0.005		0.005	-
	0656	01/09/92	0001	AL	0			0.011		0.005	-
	0656	06/27/92	0001	AL	0			0.02		0.005	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
0 - ON-SITE

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

DATA FILE NAME: M:\DART\NAT01\GWQ10006.DAT

TABLE 3.13 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY MEASUREMENTS EXCEEDING
MAXIMUM CONCENTRATION LIMITS, ALLUVIUM, NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
01/29/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	TOTAL # OF SAMP.	UNITS OF MEASURE	MAXIMUM CONC. LIMIT	LOC. ID	LOG DATE	SAMP ID	FORM OF COMP	HYDR FLOW REL.	RESULT EXCEEDING MAX. CONCENTRATION LIMIT VALUE FLAGS	DETECTION LIMIT	PARAMETER UNCERT.
ARSENIC	72	MG/L	0.0500	0505	08/01/91	0001	AL	O	< 0.05 I	0.05	-
				0506	01/30/86	0001	AL	O	0.07	0.01	-
				0506	08/01/91	0001	AL	O	< 0.1 I	0.1	-
				0548	08/02/91	0001	AL	D	< 0.05 I	0.05	-
				0616	12/05/90	0001	AL	O	0.053	0.01	-
				0616	04/18/91	0001	AL	O	0.06	0.01	-
				0616	01/09/92	0001	AL	O	0.08 I	0.01	-
ARSENIC (TOTAL)	0	MG/L	0.0500	-	-	-	-	-	-	-	-
BARIUM	66	MG/L	1.0000	-	-	-	-	-	-	-	-
BARIUM (TOTAL)	0	MG/L	1.0000	-	-	-	-	-	-	-	-
CADMIUM	71	MG/L	0.0100	0619	01/11/92	0001	AL	O	< 0.01 I	0.01	-
				0630	07/14/89	0001	AL	O	0.014	0.001	-
				0630	01/10/92	0001	AL	O	< 0.01	0.01	-
				0656	01/09/92	0001	AL	O	< 0.01 I	0.01	-
CADMIUM (TOTAL)	0	MG/L	0.0100	-	-	-	-	-	-	-	-
CHROMIUM	60	MG/L	0.0500	0548	06/25/86	0001	AL	D	0.05	0.01	-
CHROMIUM (TOTAL)	0	MG/L	0.0500	-	-	-	-	-	-	-	-
GROSS ALPHA	59	PCI/L	15.0000	0505	07/13/89	0001	AL	O	358.	0.2	31.
				0505	04/20/90	0001	AL	O	560.	1.	30.
				0505	12/08/90	0001	AL	O	430.	1.	30.
				0505	04/18/91	0001	AL	O	416.	1.	35.8
				0505	08/01/91	0001	AL	O	383.9	1.	36.1
				0505	01/14/92	0001	AL	O	320.	1.	20
				0505	06/24/92	0001	AL	O	364.	1.0	35.7
				0506	07/13/89	0001	AL	O	1125.	0.2	76.
				0506	04/20/90	0001	AL	O	1500.	1.	100.
				0506	12/08/90	0001	AL	O	870.	1.	50.
				0506	04/18/91	0001	AL	O	1277.	1.	75.2

< - THE DATA IS FLAGGED AS A NON-DETECT, SO THE RESULT IS AN ESTIMATED VALUE OR THE DETECTION LIMIT

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
O - ON-SITE
D - DOWN GRADIENT

OTHER PARAMETER VALUE FLAGS:
I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.13 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY MEASUREMENTS EXCEEDING
MAXIMUM CONCENTRATION LIMITS, ALLUVIUM, NATURITA SITE, COLORADO

PARAMETER NAME	TOTAL OF SAMP.	UNITS OF MEASURE	MAXIMUM CONC. LIMIT	LOC. ID	LOG DATE	SAMP ID	FORM OF COMP	HYDR FLOW REL.	RESULT EXCEEDING MAX. CONCENTRATION LIMIT VALUE FLAGS	DETECTION LIMIT	PARAMETER UNCERT.
GROSS ALPHA	59	CI/L	15.0000	0506	08/01/91	0001	AL	O	1011.2	1.	67.7
				0506	01/13/92	0001	AL	O	710.	1.	40
				0506	06/24/92	0001	AL	O	1050.	1.0	68.8
				0548	07/17/89	0001	AL	D	116.	0.2	12.
				0548	04/23/90	0001	AL	D	290.	1.	20.
				0548	12/05/90	0001	AL	D	370.	1.	30.
				0548	04/19/91	0001	AL	D	286.	1.	24.6
				0548	08/05/91	0001	AL	D	115.	1.	12.
				0548	01/14/92	0001	AL	D	140.	1.	10
				0548	06/25/92	0001	AL	D	138.	1.0	15.2
				0616	07/14/89	0001	AL	O	4161.	0.2	219.
				0616	04/23/90	0001	AL	O	3200.	1.	200.
				0616	12/05/90	0001	AL	O	1600.	1.	100.
				0616	04/18/91	0001	AL	O	1957.	1.	118.
				0616	01/09/92	0001	AL	O	880.	1.	80
				0616	06/26/92	0001	AL	O	1310.	1.0	140.
				0619	07/16/89	0001	AL	O	95.	0.2	13.
				0619	04/23/90	0001	AL	O	78.	1.	10.
				0619	12/08/90	0001	AL	O	130.	1.	10.
				0619	08/05/91	0001	AL	O	93.7	1.	13.
				0619	01/12/92	0001	AL	O	120.	1.	10
				0619	06/27/92	0001	AL	O	77.7	1.0	12.1
				0630	07/14/89	0001	AL	O	54.	0.2	8.1
				0630	04/23/90	0001	AL	O	99.	1.	10.
				0630	12/05/90	0001	AL	O	100.	1.	10.
				0630	04/19/91	0001	AL	O	61.0	1.	8.0
				0630	08/05/91	0001	AL	O	18.0	1.	3.
				0630	01/10/92	0001	AL	O	59.	1.	6
				0630	06/28/92	0001	AL	O	68.6	1.0	10.2
				0632	07/16/89	0001	AL	O	1080.	0.2	79.
				0632	04/23/90	0001	AL	O	1500.	1.	100.
				0632	12/05/90	0001	AL	O	530.	1.	40.
				0632	04/18/91	0001	AL	O	1235.	1.	80.7
				0632	08/05/91	0001	AL	O	973.	1.	67.
				0632	01/10/92	0001	AL	O	1500.	1.	100
				0632	06/27/92	0001	AL	O	1090.	1.0	72.7
				0637	07/16/89	0001	AL	O	1018.	0.2	52.

FORMATION OF COMPLETION CODE:
- ALLUVIUM

FLOW RELATIONSHIP CODE:
D - DOWN GRADIENT
O - ON-SITE

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.13 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY MEASUREMENTS EXCEEDING
MAXIMUM CONCENTRATION LIMITS, ALLUVIUM, NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
01/29/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	TOTAL # OF SAMP.	UNITS OF MEASURE	MAXIMUM CONC. LIMIT	LOC. ID	LOG DATE	SAMP ID	FORM OF COMP	HYDR FLOW REL.	RESULT EXCEEDING MAX. CONCENTRATION LIMIT VALUE FLAGS	DETECTION LIMIT	PARAMETER UNCERT.
GROSS ALPHA	59	PCI/L	15.0000	0637	04/23/90	0001	AL	0	1100.	1.	100.
				0637	12/05/90	0001	AL	0	470.	1.	30.
				0637	04/19/91	0001	AL	0	468.	1.	36.3
				0637	08/05/91	0001	AL	0	265.	1.	25.
				0637	01/11/92	0001	AL	0	480.	1.	30
				0637	06/27/92	0001	AL	0	375.	1.0	33.5
				0656	12/08/90	0001	AL	0	1100.	1.	100.
				0656	04/18/91	0001	AL	0	746.	1.	69.3
				0656	08/05/91	0001	AL	0	640.	1.	64.
				0656	01/09/92	0001	AL	0	240.	1.	30
				0656	06/27/92	0001	AL	0	591.	1.0	61.4
GROSS ALPHA (TOTAL)	0	PCI/L	15.0000	-	-	-	-	-	-	-	-
LEAD	51	MG/L	0.0500	-	-	-	-	-	-	-	-
LEAD (TOTAL)	0	MG/L	0.0500	-	-	-	-	-	-	-	-
MERCURY	51	MG/L	0.0020	-	-	-	-	-	-	-	-
MERCURY (TOTAL)	0	MG/L	0.0020	-	-	-	-	-	-	-	-
MOLYBDENUM	72	MG/L	0.1000	0505	01/29/86	0001	AL	0	0.15	0.01	-
				0505	06/10/86	0001	AL	0	0.22	0.01	-
				0506	01/30/86	0001	AL	0	0.19	0.01	-
				0506	06/09/86	0001	AL	0	0.2	0.01	-
				0506	04/10/87	0001	AL	0	0.11	0.01	-
				0548	06/25/86	0001	AL	D	0.25	0.01	-
				0548	04/10/87	0001	AL	D	0.18	0.01	-
				0548	10/08/87	0001	AL	D	0.10	0.01	-
				0616	07/14/89	0001	AL	0	0.38	0.01	-
				0616	04/23/90	0001	AL	0	0.31	0.01	-
				0616	12/05/90	0001	AL	0	0.30	0.01	-
				0616	04/18/91	0001	AL	0	0.25	0.01	-
				0616	01/09/92	0001	AL	0	0.25	0.01	-
				0616	06/26/92	0001	AL	0	0.277	0.01	-
				0656	12/08/90	0001	AL	0	0.11	0.01	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
0 - ON-SITE
D - DOWN GRADIENT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.13 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY MEASUREMENTS EXCEEDING
 MAXIMUM CONCENTRATION LIMITS, ALLUVIUM, NATURITA SITE, COLORADO
 SITE: NAT01 NATURITA
 01/29/86 TO 06/28/92
 REPORT DATE: 01/17/94

PARAMETER NAME	TOTAL # OF SAMP.	UNITS OF MEASURE	MAXIMUM CONC. LIMIT	LOC. ID	LOG DATE	SAMP ID	FORM OF COMP	HYDR FLOW REL.	RESULT EXCEEDING MAX. CONCENTRATION LIMIT VALUE FLAGS	DETECTION LIMIT	PARAMETER UNCERT.
MOLYBDENUM (TOTAL)	0	MG/L	0.1000	-	-	-	-	-	-	-	-
NET GROSS ALPHA *	58	PCI/L	15.0000	0505	04/20/90	0001	AL	O	25.6	-	-
				0505	08/01/91	0001	AL	O	368.8	-	-
				0506	04/20/90	0001	AL	O	169.2	-	-
				0506	08/01/91	0001	AL	O	431.5	-	-
				0548	08/05/91	0001	AL	D	33.3	-	-
				0616	07/14/89	0001	AL	O	593.8	-	-
				0619	07/16/89	0001	AL	O	85.4	-	-
				0619	08/05/91	0001	AL	O	40.9	-	-
				0632	08/05/91	0001	AL	O	284.9	-	-
				0637	04/23/90	0001	AL	O	187.6	-	-
				0637	08/05/91	0001	AL	O	23.5	-	-
				0656	12/08/90	0001	AL	O	43.6	-	-
				0656	08/05/91	0001	AL	O	133.0	-	-
NET GROSS ALPHA (TOTAL) **	0	PCI/L	15.0000	-	-	-	-	-	-	-	-
NITRATE	66	MG/L	44.0000	0616	04/18/91	0001	AL	O	45.	1.	-
				0619	01/11/92	0001	AL	O	44.4	0.1	-
				0630	01/10/92	0001	AL	O	50.4	0.1	-
NITRATE (TOTAL)	0	MG/L	44.0000	-	-	-	-	-	-	-	-
RA-226 & RA-228	65	PCI/L	5.0000	0506	04/18/91	0001	AL	O	7.0	-	-
				0548	04/19/91	0001	AL	D	9.0	-	-
				0616	07/14/89	0001	AL	O	29.7	-	-
				0616	04/23/90	0001	AL	O	11.9	-	-
				0616	12/05/90	0001	AL	O	6.0	-	-
				0616	04/18/91	0001	AL	O	6.9	-	-
				0616	06/26/92	0001	AL	O	9.1	-	-
				0632	07/16/89	0001	AL	O	5.8	-	-
				0632	04/18/91	0001	AL	O	7.7	-	-

* NET GROSS ALPHA (GROSS ALPHA - URANIUM) WITH 1 MG URANIUM • 686 PCI

** TOTAL NET GROSS ALPHA (TOTAL GROSS ALPHA - TOTAL URANIUM)

FORMATION OF COMPLETION CODE:

AL - ALLUVIUM

FLOW RELATIONSHIP CODE:

O - ON-SITE

D - DOWN GRADIENT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.13 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY MEASUREMENTS EXCEEDING
 MAXIMUM CONCENTRATION LIMITS, ALLUVIUM, NATURITA SITE, COLORADO
 SITE: NAT01 NATURITA
 01/29/86 TO 06/28/92
 REPORT DATE: 01/17/94

PARAMETER NAME	TOTAL # OF SAMP.	UNITS OF MEASURE	MAXIMUM CONC. LIMIT	LOC. ID	LOG DATE	SAMP ID	FORM OF COMP	HYDR FLOW REL.	RESULT EXCEEDING MAX. CONCENTRATION LIMIT VALUE FLAGS	DETECTION LIMIT	PARAMETER UNCERT.
RA-226 & RA-228	65	PCI/L	5.0000	0632	08/05/91	0001	AL	0	8.7	-	-
				0632	06/27/92	0001	AL	0	7.3	-	-
				0637	07/16/89	0001	AL	0	12.6	-	-
				0637	04/23/90	0001	AL	0	11.1	-	-
				0637	12/05/90	0001	AL	0	11.7	-	-
				0637	04/19/91	0001	AL	0	12.5	-	-
				0637	08/05/91	0001	AL	0	12.9	-	-
				0637	01/11/92	0001	AL	0	8.2	-	-
				0637	06/27/92	0001	AL	0	8.4	-	-
				0656	12/08/90	0001	AL	0	7.6	-	-
				0656	08/05/91	0001	AL	0	17.4	-	-
				0656	01/09/92	0001	AL	0	5.2	-	-
RA-226 & RA-228 (TOTAL)	0	PCI/L	5.0000	-	-	-	-	-	-	-	-
SELENIUM	72	MG/L	0.0100	0505	10/08/87	0001	AL	0	0.010	0.005	-
				0505	08/01/91	0001	AL	0	< 0.03 I	0.03	-
				0506	10/08/87	0001	AL	0	0.010	0.005	-
				0506	08/01/91	0001	AL	0	< 0.05 I	0.05	-
				0616	04/23/90	0001	AL	0	0.014	0.005	-
				0616	12/05/90	0001	AL	0	0.026	0.005	-
				0616	04/18/91	0001	AL	0	0.040	0.005	-
				0632	12/05/90	0001	AL	0	0.010	0.005	-
				0632	04/18/91	0001	AL	0	0.045	0.005	-
				0632	01/10/92	0001	AL	0	0.08 I	0.02	-
				0632	06/27/92	0001	AL	0	0.0378	0.005	-
				0637	12/05/90	0001	AL	0	0.012	0.005	-
				0637	01/11/92	0001	AL	0	0.043	0.002	-
				0656	04/18/91	0001	AL	0	< 0.03 I	0.03	-
SELENIUM (TOTAL)	0	MG/L	0.0100	-	-	-	-	-	-	-	-
SILVER	69	MG/L	0.0500	-	-	-	-	-	-	-	-
SILVER (TOTAL)	0	MG/L	0.0500	-	-	-	-	-	-	-	-
URANIUM	70	MG/L	0.0440	0505	01/29/86	0001	AL	0	1.33	0.003	-

< - THE DATA IS FLAGGED AS A NON-DETECT, SO THE RESULT IS AN ESTIMATED VALUE OR THE DETECTION LIMIT

FORMATION OF COMPLETION CODE:
 AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
 0 - ON-SITE

OTHER PARAMETER VALUE FLAGS:
 I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.13 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY MEASUREMENTS EXCEEDING
 MAXIMUM CONCENTRATION LIMITS, ALLUVIUM, NATURITA SITE, COLORADO
 SITE: NATO1 NATURITA
 01/29/86 TO 06/28/92
 REPORT DATE: 01/17/94

PARAMETER NAME	TOTAL # OF SAMP.	UNITS OF MEASURE	MAXIMUM CONC. LIMIT	LOC. ID	LOG DATE	SAMP ID	FORM OF COMP	HYDR FLOW REL.	RESULT EXCEEDING MAX. CONCENTRATION LIMIT VALUE FLAGS	DETECTION LIMIT	PARAMETER UNCERT.
URANIUM	70	MG/L	0.0440	0505	06/10/86	0001	AL	O	1.02	0.003	-
				0505	04/10/87	0001	AL	O	2.04	0.003	-
				0505	10/08/87	0001	AL	O	1.22	0.003	-
				0505	07/13/89	0001	AL	O	0.683	0.003	-
				0505	04/20/90	0001	AL	O	0.779	0.003	-
				0505	12/08/90	0001	AL	O	0.865	0.0003	-
				0505	04/18/91	0001	AL	O	0.848	0.001	-
				0505	01/14/92	0001	AL	O	0.734	0.0003	-
				0505	06/24/92	0001	AL	O	0.733	0.001	-
				0506	01/30/86	0001	AL	O	1.97	0.003	-
				0506	06/09/86	0001	AL	O	2.49	0.003	-
				0506	04/10/87	0001	AL	O	2.81	0.003	-
				0506	10/08/87	0001	AL	O	2.54	0.003	-
				0506	07/13/89	0001	AL	O	2.21	0.003	-
				0506	04/20/90	0001	AL	O	1.94	0.003	-
				0506	12/08/90	0001	AL	O	2.02	0.0003	-
				0506	04/18/91	0001	AL	O	2.29	0.001	-
				0506	08/01/91	0001	AL	O	0.845	0.001	-
				0506	01/13/92	0001	AL	O	2.35	0.0003	-
				0506	06/24/92	0001	AL	O	1.83	0.001	-
				0548	06/25/86	0001	AL	D	0.715	0.003	-
				0548	04/10/87	0001	AL	D	2.13	0.003	-
				0548	10/08/87	0001	AL	D	0.532	0.003	-
				0548	07/17/89	0001	AL	D	0.188	0.003	-
				0548	04/23/90	0001	AL	D	0.442	0.003	-
				0548	12/05/90	0001	AL	D	0.588	0.0003	-
				0548	04/19/91	0001	AL	D	0.534	0.001	-
				0548	08/05/91	0001	AL	D	0.1191	0.001	-
				0548	01/14/92	0001	AL	D	0.203	0.0003	-
				0548	06/25/92	0001	AL	D	0.228	0.001	-
				0616	07/14/89	0001	AL	O	5.2	0.003	-
				0616	04/23/90	0001	AL	O	5.09	0.003	-
				0616	12/05/90	0001	AL	O	2.41	0.0003	-
				0616	04/18/91	0001	AL	O	2.84	0.001	-
				0616	01/09/92	0001	AL	O	2.21	0.0003	-
				0616	06/26/92	0001	AL	O	2.03	0.001	-
				0619	04/23/90	0001	AL	O	0.114	0.003	-

FORMATION OF COMPLETION CODE:
 AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
 O - ON-SITE
 D - DOWN GRADIENT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)

TABLE 3.13 ONSITE/DOWNGRADIENT GROUNDWATER QUALITY MEASUREMENTS EXCEEDING
MAXIMUM CONCENTRATION LIMITS, ALLUVIUM, NATURITA SITE, COLORADO
SITE: NAT01 NATURITA
01/29/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	TOTAL # OF SAMP.	UNITS OF MEASURE	MAXIMUM CONC. LIMIT	LOC. ID	LOG DATE	SAMP ID	FORM OF COMP	HYDR FLOW REL.	RESULT EXCEEDING MAX. CONCENTRATION LIMIT VALUE FLAGS	DETECTION LIMIT	PARAMETER UNCERT.
URANIUM	70	MG/L	0.0440	0619	12/08/90	0001	AL	0	0.176	0.0003	-
				0619	04/19/91	0001	AL	0	0.148	0.001	-
				0619	08/05/91	0001	AL	0	0.077	0.001	-
				0619	01/12/92	0001	AL	0	0.1700	0.0003	-
				0619	06/27/92	0001	AL	0	0.112	0.001	-
				0630	07/14/89	0001	AL	0	0.058	0.003	-
				0630	04/23/90	0001	AL	0	0.138	0.003	-
				0630	12/05/90	0001	AL	0	0.135	0.0003	-
				0630	04/19/91	0001	AL	0	0.144	0.001	-
				0630	08/05/91	0001	AL	0	0.045	0.001	-
				0630	01/10/92	0001	AL	0	0.114	0.0003	-
				0630	06/28/92	0001	AL	0	0.097	0.001	-
				0632	07/16/89	0001	AL	0	1.67	0.003	-
				0632	04/23/90	0001	AL	0	2.21	0.003	-
				0632	12/05/90	0001	AL	0	2.21	0.0003	-
				0632	04/18/91	0001	AL	0	2.04	0.001	-
				0632	08/05/91	0001	AL	0	1.003	0.001	-
				0632	01/10/92	0001	AL	0	2.88	0.0003	-
				0632	06/27/92	0001	AL	0	1.71	0.001	-
				0637	07/16/89	0001	AL	0	1.52	0.003	-
				0637	04/23/90	0001	AL	0	1.33	0.003	-
				0637	12/05/90	0001	AL	0	1.02	0.0003	-
				0637	04/19/91	0001	AL	0	1.02	0.001	-
				0637	08/05/91	0001	AL	0	0.352	0.001	-
				0637	01/11/92	0001	AL	0	0.908	0.0003	-
				0637	06/27/92	0001	AL	0	0.636	0.001	-
				0656	12/08/90	0001	AL	0	1.54	0.0003	-
				0656	04/18/91	0001	AL	0	1.57	0.001	-
				0656	08/05/91	0001	AL	0	0.739	0.001	-
				0656	01/09/92	0001	AL	0	0.884	0.0003	-
URANIUM (TOTAL)	0	MG/L	0.0440	-	-	-	-	-	-	-	-

FORMATION OF COMPLETION CODE:
AL - ALLUVIUM

FLOW RELATIONSHIP CODE:
0 - ON-SITE

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)

DATA FILE NAME: M:\DART\NAT01\GWQ10006.DAT

Table 3.14 Maximum observed concentrations of hazardous constituents in on-site/downgradient monitor wells that exceed the statistical maximum for background water quality, and analysis of variance (ANOVA) on hazardous constituents that exceed the statistical maximum in the alluvium, Naturita site, Colorado

Hazardous constituent	Maximum observed concentration (milligrams per liter) on-site/downgradient	Statistical maximum concentration (milligrams per liter) background water quality	Proposed maximum concentration limits (MCLs) (milligrams per liter)	ANOVA	Null hypothesis	Comments
Aluminum	0.38	0.23	Background	K-W ^b	Accepted	Not a ground water contaminant, same populations
Antimony	0.056	0.018	Background	NA ^d	NA	Not a ground water contaminant, < DL ^a except some isolated samples
Arsenic	0.07	0.01	0.05	K-W	Rejected	Ground water contaminant, different populations, max. obs. > MCL
Cadmium	0.014	0.001	0.01	K-W	Accepted	Same populations, include as potential ground water contaminant
Chromium	0.05	0.02	0.05	NA	NA	Ground water contaminant, max. obs. = MCL
Fluoride	1.6	0.3617	Background	One-Way ^c	Rejected	Ground water contaminant, different populations
Lead	0.02	0.01	0.05	NA	NA	Not a ground water contaminant, max. obs. < MCL
Molybdenum	0.38	0.23	0.1	K-W	Rejected	Ground water contaminant, different populations, max. obs. > MCL
Nickel	0.06	0.05	Background	K-W	Accepted	Not a ground water contaminant, same populations
Nitrate	20.4	12.0	44.0	NA	NA	Not a ground water contaminant, max. obs. < MCL
Silver	0.03	0.01	0.05	NA	NA	Not a ground water contaminant, max. obs. < MCL

Table 3.14 Maximum observed concentrations of hazardous constituents in on-site/downgradient monitor wells that exceed the statistical maximum for background water quality, and analysis of variance (ANOVA) on hazardous constituents that exceed the statistical maximum in the alluvium, Naturita site, Colorado (concluded)

Hazardous constituent	Maximum observed concentration (milligrams per liter) on-site/downgradient	Statistical maximum concentration (milligrams per liter) background water quality	Proposed maximum concentration limits (MCLs) (milligrams per liter)	ANOVA	Null hypothesis	Comments
Strontium	4.1	1.6	Background	NA	NA	Insufficient data ^d , n=3 for bkgrd. Include as potential ground water contaminant.
Thallium	0.05	0.01	Background	NA	NA	Insufficient data ^d , n=3 for bkgrd. Include as potential ground water contaminant.
Tin	0.009	0.005	Background	K-W	Rejected	Ground water contaminant, different populations
Uranium	5.2	0.0318	0.044	One-Way	Rejected	Ground water contaminant, different populations, max. obs. > MCL
Vanadium	9.3	0.35	Background	One-Way	Accepted	Same populations. Include as potential ground water contaminant.
Radium-226, -228	30.4 pCi/L	1.3 pCi/L	5.0 pCi/L	NA	NA	Ground water contaminant, max. obs. > MCL
Gross alpha ^a	4161 pCi/L	6.2 pCi/L	15.0 pCi/L	NA	NA	Ground water contaminant, max. obs. net gross alpha > MCL

^aTotal gross alpha.

^bKruskal-Wallis one-way non-parametric ANOVA.

^cOne-way ANOVA.

^dNo analysis conducted.

^eDetection limit.

pCi/L - picocuries per liter

TABLE 3.15 SURFACE WATER QUALITY DATA BY PARAMETER, NATURITA SITE,
 COLORADO
 SITE: NAT01 NATURITA
 01/30/86 TO 06/28/92
 REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALKALINITY	0531	01/30/86	0001	MG/L CaCO3		143.		-	-
	0531	06/10/86	0001			233.		-	-
	0531	10/08/87	0001			161.		-	-
	0531	07/11/89	0001			86.		-	-
	0531	04/20/90	0001			144.		-	-
	0531	04/20/90	N001			144.		-	-
	0531	12/08/90	0001			133.		-	-
	0531	04/19/91	N001			76.		-	-
	0531	08/01/91	0001			111.		-	-
	0531	01/12/92	0001			137		-	-
	0531	06/28/92	0001			67		-	-
	0532	01/30/86	0001			145.		-	-
	0532	06/10/86	0001			120.		-	-
	0532	10/08/87	0001			147.		-	-
	0532	07/11/89	0001			102.		-	-
	0532	04/20/90	0001			147.		-	-
	0532	04/20/90	N001			147.		-	-
	0532	12/05/90	0001			120.		-	-
	0532	04/19/91	N001			73.		-	-
	0532	07/31/91	0001			111.		-	-
	0532	01/10/92	0001			160		-	-
	0532	06/28/92	0001			74		-	-
	0533	01/30/86	0001			146.		-	-
	0533	06/10/86	0001			210.		-	-
	0533	10/08/87	0001			162.		-	-
	0533	07/11/89	0001			104.		-	-
	0533	04/20/90	0001			153.		-	-
	0533	04/20/90	N001			153.		-	-
	0533	12/08/90	0001			128.		-	-
	0533	04/19/91	N001			75.		-	-
	0533	08/04/91	0001			124.		-	-
	0533	08/05/91	0001			124.		-	-
	0533	06/28/92	0001			70		-	-
ALUMINUM	0531	06/10/86	0001	MG/L		0.5		0.1	-
	0531	10/08/87	0001			0.20		0.1	-
	0531	07/11/89	0001		<	0.1		0.1	-
	0531	04/20/90	0001		<	0.1		0.1	-
	0531	12/08/90	0001		<	0.1		0.1	-
	0531	08/01/91	0001		<	0.05		0.05	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

TABLE 3.15 SURFACE WATER QUALITY DATA BY PARAMETER, NATURITA SITE,
COLORADO
SITE: NAT01 NATURITA
01/30/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ALUMINUM	0531	01/12/92	0001	MG/L	<	0.05		0.05	-
	0531	06/28/92	0001			0.148		0.05	-
	0532	06/10/86	0001			0.3		0.1	-
	0532	10/08/87	0001			0.18		0.1	-
	0532	07/11/89	0001		<	0.1		0.1	-
	0532	04/20/90	0001		<	0.1		0.1	-
	0532	12/05/90	0001		<	0.1		0.1	-
	0532	07/31/91	0001		<	0.05		0.05	-
	0532	01/10/92	0001		<	0.05		0.05	-
	0532	06/28/92	0001			0.189		0.05	-
	0533	06/10/86	0001			0.5		0.1	-
	0533	10/08/87	0001			0.17		0.1	-
	0533	07/11/89	0001		<	0.1		0.1	-
	0533	04/20/90	0001		<	0.1		0.1	-
	0533	12/08/90	0001		<	0.1		0.1	-
	0533	08/04/91	0001		<	0.05		0.05	-
	0533	01/12/92	0001		<	0.05		0.05	-
	0533	06/28/92	0001			0.204		0.05	-
ALUMINUM (TOTAL)	0531	04/20/90	N001	MG/L		0.1		0.1	-
	0531	04/19/91	N001			2.35		0.05	-
	0532	04/20/90	N001			0.4		0.1	-
	0532	04/19/91	N001			2.10		0.05	-
	0533	04/20/90	N001			0.2		0.1	-
	0533	04/19/91	N001			2.21		0.05	-
AMMONIUM	0531	01/30/86	0001	MG/L	<	0.1		0.1	-
	0531	10/08/87	0001		<	0.1		0.1	-
	0531	07/11/89	0001			0.8		0.1	-
	0531	04/20/90	0001		<	0.1		0.1	-
	0531	12/08/90	0001			0.8		0.1	-
	0531	08/01/91	0001		<	0.1		0.1	-
	0531	01/12/92	0001		<	1.0	I	1.0	-
	0531	06/28/92	0001		<	0.1		0.1	-
	0532	01/30/86	0001		<	0.1		0.1	-
	0532	06/10/86	0001			0.1		0.1	-
	0532	10/08/87	0001		<	0.1		0.1	-
	0532	07/11/89	0001			0.2		0.1	-
	0532	04/20/90	0001		<	0.1		0.1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

TABLE 3.15 SURFACE WATER QUALITY DATA BY PARAMETER, NATURITA SITE,
COLORADO
SITE: NAT01 NATURITA
01/30/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
AMMONIUM	0532	12/05/90	0001	MG/L	<	0.1		0.1	-
	0532	07/31/91	0001		<	0.1		0.1	-
	0532	01/10/92	0001		<	1.0	I	1.0	-
	0532	06/28/92	0001		<	0.1		0.1	-
	0533	01/30/86	0001		<	0.1		0.1	-
	0533	10/08/87	0001		<	0.1		0.1	-
	0533	07/11/89	0001			0.2		0.1	-
	0533	04/20/90	0001		<	0.1		0.1	-
	0533	12/08/90	0001		<	0.1		0.1	-
	0533	08/04/91	0001			0.2		0.1	-
	0533	01/12/92	0001		<	1.0	I	1.0	-
	0533	06/28/92	0001		<	0.1		0.1	-
AMMONIUM (TOTAL)	0531	04/19/91	N001	MG/L		0.19		0.01	-
	0532	04/19/91	N001			0.14		0.01	-
	0533	04/19/91	N001			0.23		0.01	-
ANTIMONY	0531	07/11/89	0001	MG/L	<	0.003		0.003	-
	0531	04/20/90	0001		<	0.003		0.003	-
	0531	12/08/90	0001		<	0.003		0.003	-
	0531	08/01/91	0001		<	0.003		0.003	-
	0531	01/12/92	0001		<	0.003		0.003	-
	0531	06/28/92	0001			0.0033		0.003	-
	0532	06/10/86	0001		<	0.003		0.003	-
	0532	07/11/89	0001		<	0.003		0.003	-
	0532	04/20/90	0001		<	0.003		0.003	-
	0532	12/05/90	0001		<	0.003		0.003	-
	0532	07/31/91	0001		<	0.003		0.003	-
	0532	01/10/92	0001		<	0.003		0.003	-
	0532	06/28/92	0001		<	0.003		0.003	-
	0533	07/11/89	0001		<	0.003		0.003	-
	0533	04/20/90	0001		<	0.003		0.003	-
	0533	12/08/90	0001		<	0.003		0.003	-
	0533	08/04/91	0001			0.003		0.003	-
	0533	01/12/92	0001		<	0.003		0.003	-
	0533	06/28/92	0001		<	0.003		0.003	-
ANTIMONY (TOTAL)	0531	04/20/90	N001	MG/L	<	0.003		0.003	-
	0531	04/19/91	N001			0.005		0.003	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

TABLE 3.15 SURFACE WATER QUALITY DATA BY PARAMETER, NATURITA SITE,
 COLORADO
 SITE: NAT01 NATURITA
 01/30/86 TO 06/28/92
 REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ANTIMONY (TOTAL)	0532	04/20/90	N001	MG/L	<	0.003		0.003	-
	0532	04/19/91	N001		<	0.003		0.003	-
	0533	04/20/90	N001		<	0.003		0.003	-
	0533	04/19/91	N001		<	0.003		0.003	-
ARSENIC	0531	01/30/86	0001	MG/L	<	0.01		0.01	-
	0531	06/10/86	0001		<	0.01		0.01	-
	0531	10/08/87	0001			0.005	J	0.01	-
	0531	07/11/89	0001		<	0.01		0.01	-
	0531	04/20/90	0001		<	0.01		0.01	-
	0531	12/08/90	0001		<	0.01		0.01	-
	0531	08/01/91	0001		<	0.01		0.01	-
	0531	01/12/92	0001			0.002		0.001	-
	0531	06/28/92	0001		<	0.005		0.005	-
	0532	01/30/86	0001		<	0.01		0.01	-
	0532	06/10/86	0001		<	0.01		0.01	-
	0532	10/08/87	0001			0.004	J	0.01	-
	0532	07/11/89	0001		<	0.01		0.01	-
	0532	04/20/90	0001		<	0.01		0.01	-
	0532	12/05/90	0001		<	0.01		0.01	-
	0532	07/31/91	0001		<	0.01		0.01	-
	0532	01/10/92	0001		<	0.001		0.001	-
	0532	06/28/92	0001		<	0.005		0.005	-
	0533	01/30/86	0001		<	0.01		0.01	-
	0533	06/10/86	0001		<	0.01		0.01	-
	0533	10/08/87	0001			0.003	J	0.01	-
	0533	07/11/89	0001		<	0.01		0.01	-
	0533	04/20/90	0001		<	0.01		0.01	-
	0533	12/08/90	0001		<	0.01		0.01	-
	0533	08/04/91	0001		<	0.01		0.01	-
	0533	01/12/92	0001			0.001		0.001	-
	0533	06/28/92	0001		<	0.005		0.005	-
ARSENIC (TOTAL)	0531	04/20/90	N001	MG/L	<	0.01		0.01	-
	0531	04/19/91	N001		<	0.01		0.01	-
	0532	04/20/90	N001		<	0.01		0.01	-
	0532	04/19/91	N001		<	0.01		0.01	-
	0533	04/20/90	N001		<	0.01		0.01	-
	0533	04/19/91	N001		<	0.01		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
 J - ESTIMATED VALUE

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

TABLE 3.15 SURFACE WATER QUALITY DATA BY PARAMETER, NATURITA SITE,
COLORADO
SITE: NAT01 NATURITA
01/30/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
BARIUM	0531	10/08/87	0001	MG/L		0.06	J	0.1	-
	0531	07/11/89	0001		<	0.1		0.1	-
	0531	04/20/90	0001		<	0.1		0.1	-
	0531	12/08/90	0001		<	0.1		0.1	-
	0531	08/01/91	0001			0.05		0.01	-
	0531	01/12/92	0001			0.05		0.01	-
	0531	06/28/92	0001		<	0.1		0.1	-
	0532	06/10/86	0001			0.3		0.1	-
	0532	10/08/87	0001			0.07	J	0.1	-
	0532	07/11/89	0001		<	0.1		0.1	-
	0532	04/20/90	0001		<	0.1		0.1	-
	0532	12/05/90	0001		<	0.1		0.1	-
	0532	07/31/91	0001			0.05		0.01	-
	0532	01/10/92	0001			0.05		0.01	-
	0532	06/28/92	0001		<	0.1		0.1	-
	0533	10/08/87	0001			0.06	J	0.1	-
	0533	07/11/89	0001		<	0.1		0.1	-
	0533	04/20/90	0001		<	0.1		0.1	-
	0533	12/08/90	0001		<	0.1		0.1	-
	0533	08/04/91	0001			0.09		0.01	-
	0533	01/12/92	0001			0.05		0.01	-
	0533	06/28/92	0001		<	0.1		0.1	-
BARIUM (TOTAL)	0531	04/20/90	N001	MG/L	<	0.1		0.1	-
	0531	04/19/91	N001			0.11		0.01	-
	0532	04/20/90	N001		<	0.1		0.1	-
	0532	04/19/91	N001			0.10		0.01	-
	0533	04/20/90	N001		<	0.1		0.1	-
	0533	04/19/91	N001			0.24		0.01	-
BERYLLIUM	0531	07/11/89	0001	MG/L	<	0.005		0.005	-
	0531	04/20/90	0001		<	0.01		0.01	-
	0531	12/08/90	0001		<	0.01		0.01	-
	0531	08/01/91	0001		<	0.005		0.005	-
	0532	07/11/89	0001		<	0.005		0.005	-
	0532	04/20/90	0001		<	0.01		0.01	-
	0532	12/05/90	0001		<	0.01		0.01	-
	0532	07/31/91	0001		<	0.005		0.005	-
	0533	07/11/89	0001		<	0.005		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
J - ESTIMATED VALUE

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)
N001 - UNFILTERED SAMPLE

TABLE 3.15 SURFACE WATER QUALITY DATA BY PARAMETER, NATURITA SITE,
COLORADO
SITE: NAT01 NATURITA
01/30/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
BERYLLIUM	0533	04/20/90	0001	MG/L	<	0.01		0.01	-
	0533	12/08/90	0001		<	0.01		0.01	-
	0533	08/04/91	0001		<	0.005		0.005	-
BERYLLIUM (TOTAL)	0531	04/20/90	N001	MG/L	<	0.01		0.01	-
	0531	04/19/91	N001		<	0.005		0.005	-
	0532	04/20/90	N001		<	0.01		0.01	-
	0532	04/19/91	N001		<	0.005		0.005	-
	0533	04/20/90	N001		<	0.01		0.01	-
	0533	04/19/91	N001		<	0.005		0.005	-
BORON	0531	10/08/87	0001	MG/L		0.13		0.1	-
	0531	07/11/89	0001		<	0.1		0.1	-
	0531	04/20/90	0001		<	0.1		0.1	-
	0532	06/10/86	0001		<	0.1		0.1	-
	0532	10/08/87	0001			0.10		0.1	-
	0532	07/11/89	0001		<	0.1		0.1	-
	0532	04/20/90	0001		<	0.1		0.1	-
	0533	10/08/87	0001			0.11		0.1	-
	0533	07/11/89	0001		<	0.1		0.1	-
	0533	04/20/90	0001		<	0.1		0.1	-
BORON (TOTAL)	0531	04/20/90	N001	MG/L	<	0.1		0.1	-
	0532	04/20/90	N001		<	0.1		0.1	-
	0533	04/20/90	N001		<	0.1		0.1	-
BROMIDE	0531	07/11/89	0001	MG/L	<	2.		2.	-
	0531	04/20/90	0001		<	0.1		0.1	-
	0532	07/11/89	0001		<	2.		2.	-
	0532	04/20/90	0001		<	0.1		0.1	-
	0533	07/11/89	0001		<	2.		2.	-
	0533	04/20/90	0001		<	0.1		0.1	-
BROMIDE (TOTAL)	0531	04/20/90	N001	MG/L	<	0.1		0.1	-
	0532	04/20/90	N001		<	0.1		0.1	-
	0533	04/20/90	N001		<	0.1		0.1	-
CADMIUM	0531	01/30/86	0001	MG/L	<	0.001		0.001	-
	0531	10/08/87	0001		<	0.005		0.005	-
	0531	07/11/89	0001		<	0.001		0.001	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)
N001 - UNFILTERED SAMPLE

TABLE 3.15 SURFACE WATER QUALITY DATA BY PARAMETER, NATURITA SITE,
 COLORADO
 SITE: NAT01 NATURITA
 01/30/86 TO 06/28/92
 REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
CADMIUM	0531	04/20/90	0001	MG/L	<	0.001		0.001	-
	0531	12/08/90	0001		<	0.001		0.001	-
	0531	08/01/91	0001		<	0.001		0.001	-
	0531	01/12/92	0001		<	0.001		0.001	-
	0531	06/28/92	0001		<	0.001		0.001	-
	0532	01/30/86	0001		<	0.001		0.001	-
	0532	06/10/86	0001		<	0.001		0.001	-
	0532	10/08/87	0001		<	0.005		0.005	-
	0532	07/11/89	0001		<	0.001		0.001	-
	0532	04/20/90	0001		<	0.001		0.001	-
	0532	12/05/90	0001		<	0.001		0.001	-
	0532	07/31/91	0001		<	0.001		0.001	-
	0532	01/10/92	0001		<	0.001		0.001	-
	0532	06/28/92	0001		<	0.001		0.001	-
	0533	01/30/86	0001		<	0.001		0.001	-
	0533	10/08/87	0001		<	0.005		0.005	-
	0533	07/11/89	0001		<	0.001		0.001	-
	0533	04/20/90	0001		<	0.001		0.001	-
	0533	12/08/90	0001		<	0.001		0.001	-
	0533	08/04/91	0001		<	0.001		0.001	-
	0533	01/12/92	0001		<	0.001		0.001	-
	0533	06/28/92	0001		<	0.001		0.001	-
CADMIUM (TOTAL)	0531	04/20/90	N001	MG/L	<	0.001		0.001	-
	0531	04/19/91	N001		<	0.001		0.001	-
	0532	04/20/90	N001		<	0.001		0.001	-
	0532	04/19/91	N001		<	0.001		0.001	-
	0533	04/20/90	N001		<	0.001		0.001	-
	0533	04/19/91	N001		<	0.001		0.001	-
CALCIUM	0531	01/30/86	0001	MG/L		80.2		0.01	-
	0531	06/10/86	0001			50.1		0.01	-
	0531	10/08/87	0001			121.		0.01	-
	0531	07/11/89	0001			66.		0.01	-
	0531	04/20/90	0001			86.9		0.01	-
	0531	12/08/90	0001			86.0		0.01	-
	0531	08/01/91	0001			77.9		0.5	-
	0531	01/12/92	0001			80		0.05	-
	0531	06/28/92	0001			43.9		0.5	-
	0532	01/30/86	0001			83.		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

TABLE 3.15 SURFACE WATER QUALITY DATA BY PARAMETER, NATURITA SITE,
COLORADO
SITE: NAT01 NATURITA
01/30/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
CALCIUM	0532	06/10/86	0001	MG/L		40.9		0.01	-
	0532	10/08/87	0001			107.		0.01	-
	0532	07/11/89	0001			64.		0.01	-
	0532	04/20/90	0001			82.5		0.01	-
	0532	12/05/90	0001			78.8		0.01	-
	0532	07/31/91	0001			74.5		0.5	-
	0532	01/10/92	0001			86		0.05	-
	0532	06/28/92	0001			44.6		0.5	-
	0533	01/30/86	0001			79.3		0.01	-
	0533	06/10/86	0001			28.7		0.01	-
	0533	10/08/87	0001			115.		0.01	-
	0533	07/11/89	0001			65.		0.01	-
	0533	04/20/90	0001			85.0		0.01	-
	0533	12/08/90	0001			90.1		0.01	-
	0533	08/04/91	0001			70.3		0.5	-
	0533	01/12/92	0001			82		0.05	-
	0533	06/28/92	0001			44.1		0.5	-
CALCIUM (TOTAL)	0531	04/20/90	N001	MG/L		95.6		0.01	-
	0531	04/19/91	N001			35.3		0.5	-
	0532	04/20/90	N001			86.0		0.01	-
	0532	04/19/91	N001			34.4		0.5	-
	0533	04/20/90	N001			86.7		0.01	-
	0533	04/19/91	N001			35.3		0.5	-
CHLORIDE	0531	01/30/86	0001	MG/L		15.		1.	-
	0531	06/10/86	0001			8.		1.	-
	0531	10/08/87	0001			14.2		1.	-
	0531	07/11/89	0001			2.6		1.	-
	0531	04/20/90	0001			15.		1.	-
	0531	12/08/90	0001			2.		1.	-
	0531	08/01/91	0001			2.9		0.5	-
	0531	01/12/92	0001			5		1.0	-
	0531	06/28/92	0001			1.73		0.5	-
	0532	01/30/86	0001			14.		1.	-
	0532	06/10/86	0001			5.		1.	-
	0532	10/08/87	0001			9.9		1.	-
	0532	07/11/89	0001			2.4		1.	-
	0532	04/20/90	0001			8.		1.	-
	0532	12/05/90	0001			1.		1.	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)
N001 - UNFILTERED SAMPLE

TABLE 3.15 SURFACE WATER QUALITY DATA BY PARAMETER, NATURITA SITE,
COLORADO
SITE: NAT01 NATURITA
01/30/86 TO 06/28/92
REPORT DATE: 01/17/04

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
CHLORIDE	0532	07/31/91	0001	MG/L		<.1		0.5	-
	0532	01/10/92	0001			6		1.0	-
	0532	06/28/92	0001			1.88		0.5	-
	0533	01/30/86	0001			13.		1.	-
	0533	06/10/86	0001			6.		1.	-
	0533	10/08/87	0001			10.9		1.	-
	0533	07/11/89	0001			2.6		1.	-
	0533	04/20/90	0001			7.		1.	-
	0533	12/08/90	0001			2.		1.	-
	0533	08/04/91	0001			2.5		0.5	-
	0533	01/12/92	0001			6		1.0	-
	0533	06/28/92	0001			1.79		0.5	-
CHLORIDE (IL)	0531	04/20/90	N001	MG/L		1.		1.	-
	0531	04/19/91	N001			2.2		0.5	-
	0532	04/20/90	N001			7.		1.	-
	0532	04/19/91	N001			2.1		0.5	-
	0533	04/20/90	N001			6.		1.	-
	0533	04/19/91	N001		<	0.5		0.5	-
CHROMIUM	0531	10/08/87	0001	MG/L	<	0.01		0.01	-
	0531	07/11/89	0001		<	0.01		0.01	-
	0531	04/20/90	0001		<	0.01		0.01	-
	0531	12/08/90	0001		<	0.01		0.01	-
	0531	08/01/91	0001		<	0.01		0.01	-
	0531	01/12/92	0001		<	0.01		0.01	-
	0532	06/10/86	0001			0.05		0.01	-
	0532	10/08/87	0001		<	0.01		0.01	-
	0532	07/11/89	0001		<	0.01		0.01	-
	0532	04/20/90	0001		<	0.01		0.01	-
	0532	12/05/90	0001		<	0.01		0.01	-
	0532	07/31/91	0001		<	0.01		0.01	-
	0532	01/10/92	0001		<	0.01		0.01	-
	0533	10/08/87	0001		<	0.01		0.01	-
	0533	07/11/89	0001		<	0.01		0.01	-
	0533	04/20/90	0001		<	0.01		0.01	-
	0533	12/08/90	0001		<	0.01		0.01	-
	0533	08/04/91	0001		<	0.01		0.01	-
	0533	01/12/92	0001		<	0.01		0.01	-
CHROMIUM (TOTAL)	0531	04/20/90	N001	MG/L	<	0.01		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)
N001 - UNFILTERED SAMPLE

TABLE 3.15 SURFACE WATER QUALITY DATA BY PARAMETER, NATURITA SITE,
COLORADO
SITE: NAT01 NATURITA
01/30/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
CHROMIUM (TOTAL)	0531	04/19/91	N001	MG/L	<	0.01		0.01	-
	0532	04/20/90	N001		<	0.01		0.01	-
	0532	04/19/91	N001		<	0.01		0.01	-
	0533	04/20/90	N001		<	0.01		0.01	-
	0533	04/19/91	N001		<	0.01		0.01	-
COBALT	0531	07/11/89	0001	MG/L	<	0.05		0.05	-
	0531	04/20/90	0001		<	0.05		0.05	-
	0532	07/11/89	0001		<	0.05		0.05	-
	0532	04/20/90	0001		<	0.05		0.05	-
	0533	07/11/89	0001		<	0.05		0.05	-
	0533	04/20/90	0001		<	0.05		0.05	-
COBALT (TOTAL)	0531	04/20/90	N001	MG/L	<	0.05		0.05	-
	0532	04/20/90	N001		<	0.05		0.05	-
	0533	04/20/90	N001		<	0.05		0.05	-
COPPER	0531	10/08/87	0001	MG/L		0.01	J	0.02	-
	0531	07/11/89	0001		<	0.02		0.02	-
	0531	04/20/90	0001		<	0.02		0.02	-
	0531	12/08/90	0001		<	0.02		0.02	-
	0531	08/01/91	0001		<	0.01		0.01	-
	0532	06/10/86	0001		<	0.02		0.02	-
	0532	10/08/87	0001		<	0.01		0.02	-
	0532	07/11/89	0001		<	0.02		0.02	-
	0532	04/20/90	0001		<	0.02		0.02	-
	0532	12/05/90	0001		<	0.02		0.02	-
	0532	07/31/91	0001		<	0.01		0.01	-
	0533	10/08/87	0001		<	0.01		0.02	-
	0533	07/11/89	0001		<	0.02		0.02	-
	0533	04/20/90	0001		<	0.02		0.02	-
	0533	12/08/90	0001		<	0.02		0.02	-
	0533	08/04/91	0001		<	0.01		0.01	-
COPPER (TOTAL)	0531	04/20/90	N001	MG/L	<	0.02		0.02	-
	0531	04/19/91	N001			0.01		0.01	-
	0532	04/20/90	N001		<	0.02		0.02	-
	0532	04/19/91	N001			0.01		0.01	-
	0533	04/20/90	N001		<	0.02		0.02	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
J - ESTIMATED VALUE

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)
N001 - UNFILTERED SAMPLE

TABLE 3.15 SURFACE WATER QUALITY DATA BY PARAMETER, NATURITA SITE,
COLORADO
SITE: NAT01 NATURITA
01/30/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
COPPER (TOTAL)	0533	04/19/91	N001	MG/L		0.02		0.01	-
CYANIDE	0531	07/11/89	0001	MG/L	<	0.02		0.02	-
	0531	04/20/90	0001		<	0.01		0.01	-
	0531	12/08/90	0001		<	0.01		0.01	-
	0531	08/01/91	0001		<	0.01		0.01	-
	0531	01/12/92	0001		<	0.01		0.01	-
	0531	06/28/92	0001		<	0.01		0.01	-
	0532	07/11/89	0001		<	0.02		0.02	-
	0532	04/20/90	0001		<	0.01		0.01	-
	0532	12/05/90	0001		<	0.01		0.01	-
	0532	07/31/91	0001		<	0.01		0.01	-
	0532	01/10/92	0001		<	0.01		0.01	-
	0532	06/28/92	0001		<	0.01		0.01	-
	0533	07/11/89	0001		<	0.02		0.02	-
	0533	04/20/90	0001		<	0.01		0.01	-
	0533	12/08/90	0001		<	0.01		0.01	-
	0533	08/04/91	0001		<	0.01		0.01	-
	0533	01/12/92	0001		<	0.01		0.01	-
	0533	06/28/92	0001		<	0.01		0.01	-
CYANIDE (TOTAL)	0531	04/19/91	N001	MG/L	<	0.01		0.01	-
	0532	04/19/91	N001		<	0.01		0.01	-
	0533	04/19/91	N001		<	0.01		0.01	-
DISSOLVED ORGANIC CARBON	0531	04/20/90	0001	MG/L		60.		1.	-
	0531	12/08/90	0001			35.		1.	-
	0531	08/01/91	0001			2.		2.	-
	0531	01/12/92	0001			4.0		1.0	-
	0531	06/28/92	0001			4.9	*N	1	-
	0532	04/20/90	0001			26.		1.	-
	0532	12/05/90	0001			23.		1.	-
	0532	07/31/91	0001			2.		2.	-
	0532	01/10/92	0001			1.9		1.0	-
	0532	06/28/92	0001			1.5	*N	1	-
	0533	04/20/90	0001			28.		1.	-
	0533	12/08/90	0001			33.		1.	-
	0533	08/04/91	0001			6.		2.	-
	0533	01/12/92	0001			3.7		1.0	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:

* - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS
N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)
N001 - UNFILTERED SAMPLE

TABLE 3.15 SURFACE WATER QUALITY DATA BY PARAMETER, NATURITA SITE,
 COLORADO
 SITE: NAT01 NATURITA
 01/30/86 TO 06/28/92
 REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
DISSOLVED ORGANIC CARBON	0533	06/28/92	0001	MG/L		2	*N	1	-
FLUORIDE	0531	10/08/87	0001	MG/L		0.40		0.1	-
	0531	07/11/89	0001			0.2		0.1	-
	0531	04/20/90	0001			0.3		0.1	-
	0531	12/08/90	0001			0.3		0.1	-
	0531	08/01/91	0001			0.3		0.1	-
	0531	01/12/92	0001			0.4		0.1	-
	0531	06/28/92	0001			0.276		0.1	-
	0532	06/10/86	0001			0.3		0.1	-
	0532	10/08/87	0001			0.36		0.1	-
	0532	07/11/89	0001			0.2		0.1	-
	0532	04/20/90	0001			0.3		0.1	-
	0532	12/05/90	0001			0.3		0.1	-
	0532	07/31/91	0001			0.2		0.1	-
	0532	01/10/92	0001			0.4		0.1	-
	0532	06/28/92	0001			0.248		0.1	-
	0533	10/08/87	0001			0.40		0.1	-
	0533	07/11/89	0001			0.2		0.1	-
	0533	04/20/90	0001			0.3		0.1	-
	0533	12/08/90	0001			0.3		0.1	-
	0533	08/04/91	0001			0.3		0.1	-
	0533	01/12/92	0001			0.3		0.1	-
	0533	06/28/92	0001			0.261		0.1	-
FLUORIDE (TOTAL)	0531	04/20/90	N001	MG/L		0.3		0.1	-
	0531	04/19/91	N001		<	0.1		0.1	-
	0532	04/20/90	N001			0.3		0.1	-
	0532	04/19/91	N001			0.1		0.1	-
	0533	04/20/90	N001			0.3		0.1	-
	0533	04/19/91	N001		<	0.1		0.1	-
GROSS ALPHA	0531	07/11/89	0001	PCI/L		1.3		0.2	2.6
	0531	04/20/90	0001			0.5		1.	3.1
	0531	12/08/90	0001			1.7		1.	3.6
	0531	08/01/91	0001			0.0		1.	2.4
	0531	01/12/92	0001			2.5		1.	2.6
	0531	06/28/92	0001			0.0		1.0	2.3
	0532	07/11/89	0001			0.4		0.2	2.5

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:

* - DUPLICATE ANALYSIS NOT WITHIN CONTROL LIMITS
 N - SPIKE SAMPLE RECOVERY NOT WITHIN CONTROL LIMITS

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

TABLE 3.15 SURFACE WATER QUALITY DATA BY PARAMETER, NATURITA SITE,
COLORADO
SITE: NAT01 NATURITA
01/30/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PARAMETER PVI VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
GROSS ALPHA	0532	04/20/90	0001	PCI/L	2.1		1.	3.5
	0532	12/05/90	0001		0.0		1.	3.1
	0532	07/31/91	0001		0.8		1.	2.4
	0532	01/10/92	0001		1.1		1.	2.3
	0532	06/28/92	0001		0.0		1.0	2.3
	0533	07/11/89	0001		0.2		0.2	2.4
	0533	04/20/90	0001		0.7		1.	3.3
	0533	12/08/90	0001		0.6		1.	3.3
	0533	08/05/91	0001		1.8		1.	3.
	0533	01/12/92	0001		0.4		1.	2.1
	0533	06/28/92	0001		0.4		1.0	2.9
GROSS ALPHA (TOTAL)	0531	04/20/90	N001	PCI/L	6.3		1.	2.9
	0531	04/19/91	N001		2.5		1.	2.9
	0532	04/20/90	N001		5.4		1.	2.6
	0532	04/19/91	N001		1.4		1.	2.6
	0533	04/20/90	N001		3.6		1.	2.7
	0533	04/19/91	N001		0.0		1.	2.7
GROSS BETA	0531	07/11/89	0001	PCI/L	1.7		1.	1.4
	0531	04/20/90	0001		6.2		0.5	2.5
	0531	12/08/90	0001		3.5		0.5	1.8
	0531	08/01/91	0001		1.0		0.5	1.9
	0531	01/12/92	0001		4.9		0.5	2.1
	0531	06/28/92	0001		2.5		0.5	3.0
	0532	07/11/89	0001		1.9		1.	1.4
	0532	04/20/90	0001		5.3		0.5	2.0
	0532	12/05/90	0001		3.5		0.5	1.8
	0532	07/31/91	0001		2.7		0.5	2.0
	0532	01/10/92	0001		4.1		0.5	1.9
	0532	06/28/92	0001		1.2		0.5	2.7
	0533	07/11/89	0001		0.9		1.	1.1
	0533	04/20/90	0001		3.6		0.5	1.9
	0533	12/08/90	0001		3.5		0.5	1.7
	0533	08/05/91	0001		3.5		0.5	2.3
	0533	01/12/92	0001		3.3		0.5	1.9
	0533	06/28/92	0001		0.0		0.5	2.5
GROSS BETA (TOTAL)	0531	04/20/90	N001	PCI/L	7.0		0.5	1.8
	0531	04/19/91	N001		5.9		0.5	1.7

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)
N001 - UNFILTERED SAMPLE

TABLE 3.15 SURFACE WATER QUALITY DATA BY PARAMETER, NATURITA SITE,
COLORADO
SITE: NAT01 NATURITA
01/30/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	LAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
GROSS BETA (TOTAL)	0532	04/20/90	N001	PCI/L		7.0		0.5	1.8
	0532	04/19/91	N001			5.7		0.5	2.1
	0533	04/20/90	N001			4.9		0.5	2.2
	0533	04/19/91	N001			5.3		0.5	2.0
RON	0531	01/30/86	0001	MG/L	<	0.03		0.03	-
	0531	06/10/86	0001			0.07		0.03	-
	0531	10/08/87	0001		<	0.01		0.03	-
	0531	07/11/89	0001		<	0.03		0.03	-
	0531	04/20/90	0001			0.04		0.03	-
	0532	01/30/86	0001		<	0.03		0.03	-
	0532	06/10/86	0001			0.05		0.03	-
	0532	10/08/87	0001		<	0.01		0.03	-
	0532	07/11/89	0001		<	0.03		0.03	-
	0532	04/20/90	0001			0.06		0.03	-
	0533	01/30/86	0001		<	0.03		0.03	-
	0533	06/10/86	0001			0.06		0.03	-
	0533	10/08/87	0001		<	0.01		0.03	-
	0533	07/11/89	0001		<	0.03		0.03	-
	0533	04/20/90	0001			0.05		0.03	-
IRON (TOTAL)	0531	04/20/90	N001	MG/L		0.18		0.03	-
	0532	04/20/90	N001			0.43		0.03	-
	0533	04/20/90	N001			0.23		0.03	-
LEAD	0531	10/08/87	0001	MG/L	<	0.01		0.01	-
	0531	07/11/89	0001		<	0.01		0.01	-
	0531	04/20/90	0001		<	0.01		0.01	-
	0531	12/08/90	0001		<	0.01	J	0.01	-
	0531	08/01/91	0001		<	0.005		0.005	-
	0532	06/10/86	0001		<	0.01		0.01	-
	0532	10/08/87	0001		<	0.01		0.01	-
	0532	07/11/89	0001		<	0.01		0.01	-
	0532	04/20/90	0001		<	0.01		0.01	-
	0532	12/05/90	0001		<	0.01	J	0.01	-
	0532	07/31/91	0001		<	0.005		0.005	-
	0533	10/08/87	0001		<	0.01		0.01	-
	0533	07/11/89	0001		<	0.01		0.01	-
	0533	04/20/90	0001		<	0.01		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
J - ESTIMATED VALUE

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)
N001 - UNFILTERED SAMPLE

TABLE 3.15 SURFACE WATER QUALITY DATA BY PARAMETER, NATURITA SITE,
COLORADO
SITE: NAT01 NATURITA
01/30/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
LEAD	0533	12/08/90	0001	MG/L	<	0.01	J	0.01	-
	0533	08/04/91	0001		<	0.005		0.005	-
LEAD (TOTAL)	0531	04/20/90	N001	MG/L	<	0.01		0.01	-
	0531	04/19/91	N001			0.024		0.005	-
	0532	04/20/90	N001		<	0.01		0.01	-
	0532	04/19/91	N001			0.017		0.005	-
	0533	04/20/90	N001		<	0.01		0.01	-
	0533	04/19/91	N001			0.030		0.005	-
LEAD-210	0531	07/11/89	0001	PCI/L		0.0		1.5	1.0
	0531	04/20/90	0001			0.2		1.5	0.8
	0532	06/10/86	0001			1.2		1.5	1.
	0532	07/11/89	0001			0.0		1.5	1.0
	0532	04/20/90	0001			0.4		1.5	0.9
	0533	07/11/89	0001			0.0		1.5	1.0
LEAD-210 (TOTAL)	0533	04/20/90	0001			0.0		1.5	0.9
	0531	04/20/90	N001	PCI/L		0.0		1.5	0.8
	0532	04/20/90	N001			0.2		1.5	0.8
MAGNESIUM	0533	04/20/90	N001			0.4		1.5	1.3
	0531	01/30/86	0001	MG/L		53.1		0.001	-
	0531	06/10/86	0001			20.7		0.001	-
	0531	10/08/87	0001			40.5		0.001	-
	0531	07/11/89	0001			13.8		0.001	-
	0531	04/20/90	0001			29.1		0.001	-
	0531	12/08/90	0001			16.4		0.001	-
	0531	08/01/91	0001			18.1		0.1	-
	0531	01/12/92	0001			21		0.05	-
	0531	06/28/92	0001			8.06		0.1	-
	0532	01/30/86	0001			45.1		0.001	-
	0532	06/10/86	0001			13.9		0.001	-
	0532	10/08/87	0001			34.0		0.001	-
	0532	07/11/89	0001			12.7		0.001	-
	0532	04/20/90	0001			29.6		0.001	-
	0532	12/05/90	0001			16.0		0.001	-
	0532	07/31/91	0001			17.1		0.1	-
	0532	01/10/92	0001			23		0.05	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
J - ESTIMATED VALUE

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)
N001 - UNFILTERED SAMPLE

TABLE 3.15 SURFACE WATER QUALITY DATA BY PARAMETER, NATURITA SITE,
COLORADO
SITE: NAT01 NATURITA
01/30/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MAGNESIUM	0532	06/28/92	0001	MG/L		8.85		0.1	-
	0533	01/30/86	0001			48.		0.001	-
	0533	06/10/86	0001			6.19		0.001	-
	0533	10/08/87	0001			36.4		0.001	-
	0533	07/11/89	0001			13.7		0.001	-
	0533	04/20/90	0001			28.0		0.001	-
	0533	12/08/90	0001			17.8		0.001	-
	0533	08/04/91	0001			17.0		0.1	-
	0533	01/12/92	0001			22		0.05	-
	0533	06/28/92	0001			8.17		0.1	-
MAGNESIUM (TOTAL)	0531	04/20/90	N001	MG/L		28.2		0.001	-
	0531	04/19/91	N001			7.2		0.1	-
	0532	04/20/90	N001			26.8		0.001	-
	0532	04/19/91	N001			7.2		0.1	-
	0533	04/20/90	N001			25.1		0.001	-
	0533	04/19/91	N001			7.5		0.1	-
MANGANESE	0531	01/30/86	0001	MG/L		0.03		0.01	-
	0531	06/10/86	0001			0.04		0.01	-
	0531	10/08/87	0001			0.05		0.01	-
	0531	07/11/89	0001			0.03		0.01	-
	0531	04/20/90	0001			0.03		0.01	-
	0531	12/08/90	0001			0.05		0.01	-
	0531	08/01/91	0001			0.03		0.01	-
	0531	01/12/92	0001			0.02		0.01	-
	0531	06/28/92	0001			0.021		0.01	-
	0532	01/30/86	0001			0.03		0.01	-
	0532	06/10/86	0001			0.03		0.01	-
	0532	10/08/87	0001			0.03		0.01	-
	0532	07/11/89	0001			0.02		0.01	-
	0532	04/20/90	0001			0.03		0.01	-
	0532	12/05/90	0001			0.06		0.01	-
	0532	07/31/91	0001			0.02		0.01	-
	0532	01/10/92	0001			0.02		0.01	-
	0532	06/28/92	0001			0.022		0.01	-
	0533	01/30/86	0001			0.03		0.01	-
	0533	06/10/86	0001			0.04		0.01	-
	0533	10/08/87	0001			0.03		0.01	-
	0533	07/11/89	0001			0.02		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

TABLE 3.15 SURFACE WATER QUALITY DATA BY PARAMETER, NATURITA SITE,
COLORADO
SITE: NAT01 NATURITA
01/30/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MANGANESE	0533	04/20/90	0001	MG/L		0.03		0.01	-
	0533	12/08/90	0001			0.10		0.01	-
	0533	08/04/91	0001			0.02		0.01	-
	0533	01/12/92	0001			0.02		0.01	-
	0533	06/28/92	0001			0.017		0.01	-
MANGANESE (TOTAL)	0531	04/20/90	N001	MG/L		0.04		0.01	-
	0531	04/19/91	N001			0.15		0.01	-
	0532	04/20/90	N001			0.09		0.01	-
	0532	04/19/91	N001			0.13		0.01	-
	0533	04/20/90	N001			0.04		0.01	-
	0533	04/19/91	N001			0.13		0.01	-
MERCURY	0531	10/08/87	0001	MG/L	<	0.0002		0.0002	-
	0531	07/11/89	0001		<	0.0002		0.0002	-
	0531	04/20/90	0001		<	0.0002		0.0002	-
	0531	12/08/90	0001		<	0.0002		0.0002	-
	0531	08/01/91	0001		<	0.0002		0.0002	-
	0532	06/10/86	0001		<	0.0002		0.0002	-
	0532	10/08/87	0001		<	0.0002		0.0002	-
	0532	07/11/89	0001		<	0.0002		0.0002	-
	0532	04/20/90	0001		<	0.0002		0.0002	-
	0532	12/05/90	0001		<	0.0002		0.0002	-
	0532	07/31/91	0001		<	0.0002		0.0002	-
	0533	10/08/87	0001		<	0.0002		0.0002	-
	0533	07/11/89	0001		<	0.0002		0.0002	-
	0533	04/20/90	0001		<	0.0002		0.0002	-
	0533	12/08/90	0001		<	0.0002		0.0002	-
	0533	08/04/91	0001		<	0.0002		0.0002	-
MERCURY (TOTAL)	0531	04/20/90	N001	MG/L	<	0.0002		0.0002	-
	0531	04/19/91	N001		<	0.0002		0.0002	-
	0532	04/20/90	N001		<	0.0002		0.0002	-
	0532	04/19/91	N001		<	0.0002		0.0002	-
	0533	04/20/90	N001		<	0.0002		0.0002	-
	0533	04/19/91	N001		<	0.0002		0.0002	-
MOLYBDENUM	0531	01/30/86	0001	MG/L		0.11		0.01	-
	0531	06/10/86	0001			0.26		0.01	-
	0531	10/08/87	0001		<	0.01		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)
N001 - UNFILTERED SAMPLE

TABLE 3.15 SURFACE WATER QUALITY DATA BY PARAMETER, NATURITA SITE,
COLORADO
SITE: NAT01 NATURITA
01/30/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
MOLYBDENUM	0531	07/11/89	0001	MG/L	<	0.01		0.01	-
	0531	04/20/90	0001		<	0.01		0.01	-
	0531	12/08/90	0001			0.02		0.01	-
	0531	08/01/91	0001		<	0.01		0.01	-
	0531	01/12/92	0001		<	0.01		0.01	-
	0531	06/28/92	0001		<	0.01		0.01	-
	0532	01/30/86	0001			0.13		0.01	-
	0532	06/10/86	0001			0.27		0.01	-
	0532	10/08/87	0001		<	0.01		0.01	-
	0532	07/11/89	0001		<	0.01		0.01	-
	0532	04/20/90	0001		<	0.01		0.01	-
	0532	12/05/90	0001			0.02		0.01	-
	0532	07/31/91	0001		<	0.01		0.01	-
	0532	01/10/92	0001		<	0.01		0.01	-
	0532	06/28/92	0001		<	0.01		0.01	-
	0533	01/30/86	0001			0.14		0.01	-
	0533	06/10/86	0001			0.2		0.01	-
	0533	10/08/87	0001		<	0.01		0.01	-
	0533	07/11/89	0001		<	0.01		0.01	-
	0533	04/20/90	0001		<	0.01		0.01	-
	0533	12/08/90	0001			0.02		0.01	-
	0533	08/04/91	0001		<	0.01		0.01	-
	0533	01/12/92	0001		<	0.01		0.01	-
	0533	06/28/92	0001		<	0.01		0.01	-
MOLYBDENUM (TOTAL)	0531	04/20/90	N001	MG/L	<	0.01		0.01	-
	0531	04/19/91	N001		<	0.01		0.01	-
	0532	04/20/90	N001		<	0.01		0.01	-
	0532	04/19/91	N001		<	0.01		0.01	-
	0533	04/20/90	N001		<	0.01		0.01	-
	0533	04/19/91	N001		<	0.01		0.01	-
NET GROSS ALPHA *	0531	07/11/89	0001	PCI/L		-2.13		-	-
	0531	04/20/90	0001			-1.49		-	-
	0531	12/08/90	0001			0.67		-	-
	0531	08/01/91	0001			-11.66		-	-
	0531	01/12/92	0001			0.44		-	-
	0531	06/28/92	0001			-0.34		-	-

* NET GROSS ALPHA (GROSS ALPHA - URANIUM) WITH 1 MG URANIUM = 686 PCI

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

TABLE 3.15 SURFACE WATER QUALITY DATA BY PARAMETER, NATURITA SITE,
 COLORADO
 SITE: NAT01 NATURITA
 01/30/86 TO 06/28/92
 REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
NET GROSS ALPHA *	0532	07/11/89	0001	PCI/L		-1.66		-	-
	0532	04/20/90	0001			0.45		-	-
	0532	12/05/90	0001			-0.96		-	-
	0532	07/31/91	0001			-3.32		-	-
	0532	01/10/92	0001			-0.61		-	-
	0532	06/28/92	0001			-0.34		-	-
	0533	07/11/89	0001			-1.86		-	-
	0533	04/20/90	0001			-1.15		-	-
	0533	12/08/90	0001			-0.63		-	-
	0533	08/05/91	0001			1.11		-	-
	0533	01/12/92	0001			-1.31		-	-
	0533	06/28/92	0001			0.06		-	-
NET GROSS ALPHA (TOTAL) **	0531	04/20/90	N001	PCI/L		4.45		-	-
	0531	04/19/91	N001			0.44		-	-
	0532	04/20/90	N001			3.41		-	-
	0532	04/19/91	N001			1.06		-	-
	0533	04/20/90	N001			1.54		-	-
	0533	04/19/91	N001			-0.34		-	-
NICKEL	0531	10/08/87	0001	MG/L	<	0.01		0.04	-
	0531	07/11/89	0001		<	0.04		0.04	-
	0531	04/20/90	0001		<	0.04		0.04	-
	0531	12/08/90	0001		<	0.04		0.04	-
	0531	08/01/91	0001		<	0.04		0.04	-
	0532	06/10/86	0001		<	0.04		0.04	-
	0532	10/08/87	0001		<	0.01		0.04	-
	0532	07/11/89	0001		<	0.04		0.04	-
	0532	04/20/90	0001		<	0.04		0.04	-
	0532	12/05/90	0001		<	0.04		0.04	-
	0532	07/31/91	0001		<	0.04		0.04	-
	0533	10/08/87	0001		<	0.01		0.04	-
	0533	07/11/89	0001		<	0.04		0.04	-
	0533	04/20/90	0001		<	0.04		0.04	-
	0533	12/08/90	0001		<	0.04		0.04	-
	0533	08/04/91	0001		<	0.04		0.04	-

* NET GROSS ALPHA (GROSS ALPHA - URANIUM) WITH 1 MG URANIUM = 686 PCI
 ** NET GROSS ALPHA (TOTAL) (TOTAL GROSS ALPHA - TOTAL URANIUM)

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
 0001 - FILTERED SAMPLE (.45 MICRONS)
 N001 - UNFILTERED SAMPLE

TABLE 3.15 SURFACE WATER QUALITY DATA BY PARAMETER, NATURITA SITE,
COLORADO
SITE: NAT01 NATURITA
01/30/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
NICKEL (TOTAL)	0531	04/20/90	N001	MG/L	<	0.04		0.04	-
	0531	04/19/91	N001		<	0.04		0.04	-
	0532	04/20/90	N001		<	0.04		0.04	-
	0532	04/19/91	N001		<	0.04		0.04	-
	0533	04/20/90	N001		<	0.04		0.04	-
	0533	04/19/91	N001		<	0.04		0.04	-
	0533	04/19/91	N001		<	0.04		0.04	-
NITRATE	0531	01/30/86	0001	MG/L	<	1.		1.	-
	0531	06/10/86	0001		<	1.		1.	-
	0531	10/08/87	0001		<	0.1		1.	-
	0531	07/11/89	0001		<	1.0		1.	-
	0531	04/20/90	0001		<	0.1		1.	-
	0531	12/08/90	0001		<	1.		1.	-
	0531	08/01/91	0001			2.2		1.	-
	0531	01/12/92	0001			12.7		0.1	-
	0531	06/28/92	0001		<	1		1	-
	0532	01/30/86	0001		<	1.		1.	-
	0532	06/10/86	0001		<	1.		1.	-
	0532	10/08/87	0001		<	0.1		1.	-
	0532	07/11/89	0001			2.4		1.	-
	0532	04/20/90	0001		<	0.1		1.	-
	0532	12/05/90	0001		<	1.		1.	-
	0532	07/31/91	0001			1.3		1.	-
	0532	01/10/92	0001			13.7		0.1	-
	0532	06/28/92	0001		<	1		1	-
	0533	01/30/86	0001		<	1.		1.	-
	0533	06/10/86	0001		<	1.		1.	-
	0533	10/08/87	0001		<	0.1		1.	-
	0533	07/11/89	0001			1.3		1.	-
	0533	04/20/90	0001		<	0.1		1.	-
	0533	12/08/90	0001		<	1.		1.	-
	0533	08/04/91	0001			1.3		1.	-
	0533	01/12/92	0001			13.2		0.1	-
	0533	06/28/92	0001		<	1		1	-
NITRATE (TOTAL)	0531	04/19/91	N001	MG/L		1.		1.	-
	0532	04/19/91	N001		<	1.0		1.	-
	0533	04/19/91	N001			1.3		1.	-
NITRITE AND NITRATE	0531	12/08/90	0001	MG/L	<	1.		1.	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)
N001 - UNFILTERED SAMPLE

TABLE 3.15 SURFACE WATER QUALITY DATA BY PARAMETER, NATURITA SITE,
COLORADO
SITE: NAT01 NATURITA
01/30/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
NITRITE AND NITRATE	0531	08/01/91	0001	MG/L		0.50		0.05	-
	0531	01/12/92	0001			2.9		0.1	-
	0532	12/05/90	0001		<	1.		1.	-
	0532	07/31/91	0001			0.34		0.05	-
	0532	01/10/92	0001			3.1		0.1	-
	0533	12/08/90	0001		<	1.		1.	-
	0533	08/04/91	0001			0.34		0.05	-
	0533	01/12/92	0001			3.0		0.1	-
NITRITE AND NITRATE (TOTAL)	0531	04/19/91	N001	MG/L		0.36		0.05	-
	0532	04/19/91	N001			0.27		0.05	-
	0533	04/19/91	N001			0.31		0.05	-
PH	0531	01/30/86	0001	SU		8.19		-	-
	0531	06/10/86	0001			8.2		-	-
	0531	10/08/87	0001			8.10		-	-
	0531	07/11/89	0001			8.73		-	-
	0531	04/20/90	0001			8.45		-	-
	0531	04/20/90	N001			8.45		-	-
	0531	12/08/90	0001			8.15		-	-
	0531	04/19/91	N001			7.84		-	-
	0531	08/01/91	0001			8.31		-	-
	0531	01/12/92	0001			8.35		-	-
	0531	06/28/92	0001			8.50		-	-
	0532	01/30/86	0001			8.18		-	-
	0532	06/10/86	0001			8.06		-	-
	0532	10/08/87	0001			8.61		-	-
	0532	07/11/89	0001			8.56		-	-
	0532	04/20/90	0001			8.17		-	-
	0532	04/20/90	N001			8.17		-	-
	0532	12/05/90	0001			8.3		-	-
	0532	04/19/91	N001			7.96		-	-
	0532	07/31/91	0001			8.73		-	-
	0532	01/10/92	0001			8.35		-	-
	0532	06/28/92	0001			8.36		-	-
	0533	01/30/86	0001			8.25		-	-
	0533	06/10/86	0001			7.89		-	-
	0533	10/08/87	0001			8.13		-	-
	0533	07/11/89	0001			8.74		-	-
	0533	04/20/90	0001			8.45		-	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)
N001 - UNFILTERED SAMPLE

TABLE 3.15 SURFACE WATER QUALITY DATA BY PARAMETER, NATURITA SITE,
COLORADO
SITE: NAT01 NATURITA
01/30/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
PH	0533	04/20/90	N001	SU		8.45		-	-
	0533	12/08/90	0001			7.85		-	-
	0533	04/19/91	N001			7.95		-	-
	0533	08/04/91	0001			8.01		-	-
	0533	08/05/91	0001			8.01		-	-
	0533	06/28/92	0001			8.56		-	-
PHOSPHATE	0531	10/08/87	0001	MG/L	<	0.1		0.1	-
	0531	07/11/89	0001		<	0.1		0.1	-
	0531	04/20/90	0001		<	0.1		0.1	-
	0531	12/08/90	0001		<	0.1		0.1	-
	0531	08/01/91	0001			0.2		0.1	-
	0531	01/12/92	0001		<	0.1		0.1	-
	0531	06/28/92	0001		<	0.1		0.1	-
	0532	06/10/86	0001		<	0.1		0.1	-
	0532	10/08/87	0001		<	0.1		0.1	-
	0532	07/11/89	0001		<	0.1		0.1	-
	0532	04/20/90	0001		<	0.1		0.1	-
	0532	12/05/90	0001		<	0.1		0.1	-
	0532	07/31/91	0001			0.1		0.1	-
	0532	01/10/92	0001		<	0.1		0.1	-
	0532	06/28/92	0001			0.19		0.1	-
	0533	10/08/87	0001		<	0.1		0.1	-
	0533	07/11/89	0001		<	0.1		0.1	-
	0533	04/20/90	0001		<	0.1		0.1	-
	0533	12/08/90	0001		<	0.1		0.1	-
	0533	08/04/91	0001			0.1		0.1	-
	0533	01/12/92	0001		<	0.1		0.1	-
	0533	06/28/92	0001		<	0.1		0.1	-
PHOSPHATE (TOTAL)	0531	04/20/90	N001	MG/L	<	0.1		0.1	-
	0531	04/19/91	N001			0.6		0.1	-
	0532	04/20/90	N001		<	0.1		0.1	-
	0532	04/19/91	N001			0.6		0.1	-
	0533	04/20/90	N001		<	0.1		0.1	-
	0533	04/19/91	N001			0.5		0.1	-
POLONIUM-210	0531	07/11/89	0001	PCI/L		0.2		1.	0.2
	0531	04/20/90	0001			0.0		1.	0.4
	0532	06/10/86	0001			0.		1.	0.5

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

TABLE 3.15 SURFACE WATER QUALITY DATA BY PARAMETER, NATURITA SITE,
COLORADO
SITE: NAT01 NATURITA
01/30/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
POLONIUM-210	0532	07/11/89	0001	PCI/L		0.0		1.	0.1
	0532	04/20/90	0001			0.0		1.	0.4
	0533	07/11/89	0001			0.0		1.	0.1
	0533	04/20/90	0001			0.0		1.	0.4
POLONIUM-210 (TOTAL)	0531	04/20/90	N001	PCI/L		0.6		1.	0.3
	0532	04/20/90	N001			0.0		1.	0.4
	0533	04/20/90	N001			0.8		1.	0.6
POTASSIUM	0531	01/30/86	0001	MG/L		2.14		0.01	-
	0531	06/10/86	0001			1.71		0.01	-
	0531	10/08/87	0001			2.58		0.01	-
	0531	07/11/89	0001			1.77		0.01	-
	0531	04/20/90	0001			3.2		0.01	-
	0531	12/08/90	0001			1.5		0.01	-
	0531	08/01/91	0001			1.21		0.01	-
	0531	01/12/92	0001			1.3		0.5	-
	0531	06/28/92	0001		<	2		2	-
	0532	01/30/86	0001			1.9		0.01	-
	0532	06/10/86	0001			1.22		0.01	-
	0532	10/08/87	0001			2.14		0.01	-
	0532	07/11/89	0001			1.50		0.01	-
	0532	04/20/90	0001			2.9		0.01	-
	0532	12/05/90	0001			1.4		0.01	-
	0532	07/31/91	0001			1.17		0.01	-
	0532	01/10/92	0001			1.6		0.5	-
	0532	06/28/92	0001		<	2		2	-
	0533	01/30/86	0001			2.15		0.01	-
	0533	06/10/86	0001			1.33		0.01	-
	0533	10/08/87	0001			2.28		0.01	-
	0533	07/11/89	0001			1.52		0.01	-
	0533	04/20/90	0001			3.1		0.01	-
	0533	12/08/90	0001			1.7		0.01	-
	0533	08/04/91	0001			2.1		0.01	-
	0533	01/12/92	0001			1.4		0.5	-
	0533	06/28/92	0001		<	2		2	-
POTASSIUM (TOTAL)	0531	04/20/90	N001	MG/L		3.1		0.01	-
	0531	04/19/91	N001			2.6		0.1	-
	0532	04/20/90	N001			3.1		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)
N001 - UNFILTERED SAMPLE

TABLE 3.15 SURFACE WATER QUALITY DATA BY PARAMETER, NATURITA SITE,
COLORADO

SITE: NAT01 NATURITA

01/30/86 TO 06/28/92

REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
POTASSIUM (TOTAL)	0532	04/19/91	N001	MG/L		2.28		0.01	-
	0533	04/20/90	N001			2.8		0.01	-
	0533	04/19/91	N001			2.28		0.01	-
RADIUM-226	0531	10/08/87	0001	PCI/L		0.0		1.	0.1
	0531	07/11/89	0001			0.1		1.	0.1
	0531	04/20/90	0001			0.1		1.	0.2
	0531	12/08/90	0001			0.0		1.	0.1
	0531	08/01/91	0001			0.1		1.	0.1
	0531	01/12/92	0001			0.0		1.	0.1
	0531	06/28/92	0001			0.0		1.0	0.4
	0532	06/10/86	0001			0.1		1.	0.1
	0532	10/08/87	0001			0.4		1.	0.3
	0532	07/11/89	0001			0.1		1.	0.1
	0532	04/20/90	0001			0.0		1.	0.1
	0532	12/05/90	0001			0.1		1.	0.2
	0532	07/31/91	0001			0.0		1.	0.1
	0532	01/10/92	0001			0.3		1.	0.2
	0532	06/28/92	0001			0.3		1.0	0.5
	0533	10/08/87	0001			0.1		1.	0.2
	0533	07/11/89	0001			0.0		1.	0.1
	0533	04/20/90	0001			0.0		1.	0.1
	0533	12/08/90	0001			0.0		1.	0.1
	0533	08/05/91	0001			0.1		1.	0.2
	0533	01/12/92	0001			0.6		1.	0.3
	0533	06/28/92	0001			0.4		1.0	0.5
RADIUM-226 (TOTAL)	0531	04/20/90	N001	PCI/L		0.0		1.	0.1
	0531	04/19/91	N001			0.3		1.	0.2
	0532	04/20/90	N001			0.0		1.	0.1
	0532	04/19/91	N001			0.4		1.	0.2
	0533	04/20/90	N001			0.0		1.	0.1
	0533	04/19/91	N001			0.2		1.	0.2
RADIUM-226 + RADIUM-228	0531	10/08/87	0001	PCI/L		0.00		-	-
	0531	07/11/89	0001			0.10		-	-
	0531	04/20/90	0001			1.20		-	-
	0531	12/08/90	0001			1.00		-	-
	0531	08/01/91	0001			0.10		-	-
	0531	01/12/92	0001			0.20		-	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

TABLE 3.15 SURFACE WATER QUALITY DATA BY PARAMETER, NATURITA SITE,
COLORADO
SITE: NAT01 NATURITA
01/30/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PARAMETER PVI VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
RADIUM-226 + RADIUM-228	0531	06/28/92	0001	PCI/L	0.00		-	-
	0532	06/10/86	0001		0.10		-	-
	0532	10/08/87	0001		0.40		-	-
	0532	07/11/89	0001		0.20		-	-
	0532	04/20/90	0001		0.50		-	-
	0532	12/05/90	0001		1.10		-	-
	0532	07/31/91	0001		22.70		-	-
	0532	01/10/92	0001		0.30		-	-
	0532	06/28/92	0001		0.70		-	-
	0533	10/08/87	0001		0.30		-	-
	0533	07/11/89	0001		0.40		-	-
	0533	04/20/90	0001		0.00		-	-
	0533	12/08/90	0001		0.90		-	-
	0533	08/05/91	0001		0.90		-	-
	0533	01/12/92	0001		1.40		-	-
	0533	06/28/92	0001		0.80		-	-
RADIUM-226 + RADIUM-228 TOTAL	0531	04/20/90	N001	PCI/L	0.40		-	-
	0531	04/19/91	N001		3.10		-	-
	0532	04/20/90	N001		0.80		-	-
	0532	04/19/91	N001		11.90		-	-
	0533	04/20/90	N001		0.80		-	-
	0533	04/19/91	N001		3.50		-	-
RADIUM-228	0531	10/08/87	0001	PCI/L	0.0		1.	0.9
	0531	07/11/89	0001		0.0		1.	1.2
	0531	04/20/90	0001		1.1		1.	0.9
	0531	12/08/90	0001		1.0		1.	0.8
	0531	08/01/91	0001		0.0		1.	1.3
	0531	01/12/92	0001		0.2		1.	0.9
	0531	06/28/92	0001		0.0		1.0	1.8
	0532	06/10/86	0001		0.		1.	1.1
	0532	10/08/87	0001		0.0		1.	1.1
	0532	07/11/89	0001		0.1		1.	1.3
	0532	04/20/90	0001		0.5		1.	0.9
	0532	12/05/90	0001		1.0		1.	0.8
	0532	07/31/91	0001		22.7		1.	1.9
	0532	01/10/92	0001		0.0		1.	0.9
	0532	06/28/92	0001		0.4		1.0	2.0
	0533	10/08/87	0001		0.2		1.	1.3

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

TABLE 3.15 SURFACE WATER QUALITY DATA BY PARAMETER, NATURITA SITE,
COLORADO
SITE: NATO1 NATURITA
01/30/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
RADIUM-228	0533	07/11/89	0001	PCI/L		0.4		1.	1.4
	0533	04/20/90	0001			0.0		1.	0.8
	0533	12/08/90	0001			0.9		1.	0.8
	0533	08/05/91	0001			0.8		1.	1.5
	0533	01/12/92	0001			0.8		1.	1.4
	0533	06/28/92	0001			0.4		1.0	2.0
RADIUM-228 (TOTAL)	0531	04/20/90	N001	PCI/L		0.4		1.	0.7
	0531	04/19/91	N001			2.8		1.	1.3
	0532	04/20/90	N001			0.8		1.	0.7
	0532	04/19/91	N001			11.5		1.	1.9
	0533	04/20/90	N001			0.8		1.	0.7
	0533	04/19/91	N001			3.3		1.	1.6
SELENIUM	0531	01/30/86	0001	MG/L	<	0.005		0.005	-
	0531	06/10/86	0001		<	0.005		0.005	-
	0531	10/08/87	0001			0.004	J	0.005	-
	0531	07/11/89	0001		<	0.005		0.005	-
	0531	04/20/90	0001		<	0.005		0.005	-
	0531	12/08/90	0001		<	0.005		0.005	-
	0531	08/01/91	0001		<	0.03	I	0.03	-
	0531	01/12/92	0001		<	0.002		0.002	-
	0531	06/28/92	0001		<	0.005		0.005	-
	0532	01/30/86	0001		<	0.005		0.005	-
	0532	06/10/86	0001		<	0.005		0.005	-
	0532	10/08/87	0001			0.002	J	0.005	-
	0532	07/11/89	0001		<	0.005		0.005	-
	0532	04/20/90	0001		<	0.005		0.005	-
	0532	12/05/90	0001		<	0.005		0.005	-
	0532	07/31/91	0001		<	0.005		0.005	-
	0532	01/10/92	0001		<	0.002		0.002	-
	0532	06/28/92	0001		<	0.005		0.005	-
	0533	01/30/86	0001		<	0.005		0.005	-
	0533	06/10/86	0001		<	0.005		0.005	-
	0533	10/08/87	0001			0.003	J	0.005	-
	0533	07/11/89	0001		<	0.005		0.005	-
	0533	04/20/90	0001		<	0.005		0.005	-
	0533	12/08/90	0001		<	0.005		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:

I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

J - ESTIMATED VALUE

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

TABLE 3.15 SURFACE WATER QUALITY DATA BY PARAMETER, NATURITA SITE,
COLORADO
SITE: NAT01 NATURITA
01/30/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SELENIUM	0533	08/04/91	0001	MG/L	<	0.005		0.005	-
	0533	01/12/92	0001		<	0.002		0.002	-
	0533	06/28/92	0001		<	0.005		0.005	-
SELENIUM (TOTAL)	0531	04/20/90	N001	MG/L	<	0.005		0.005	-
	0531	04/19/91	N001		<	0.005		0.005	-
	0532	04/20/90	N001		<	0.005		0.005	-
	0532	04/19/91	N001		<	0.005		0.005	-
	0533	04/20/90	N001		<	0.005		0.005	-
	0533	04/19/91	N001		<	0.005		0.005	-
SILICA - SiO2	0531	10/08/87	0001	MG/L		8.34		2.	-
	0531	07/11/89	0001			7.7		2.	-
	0531	04/20/90	0001			8.		2.	-
	0532	06/10/86	0001			3.		2.	-
	0532	10/08/87	0001			8.49		2.	-
	0532	07/11/89	0001			7.3		2.	-
	0532	04/20/90	0001			8.		2.	-
	0533	10/08/87	0001			8.45		2.	-
	0533	07/11/89	0001			7.7		2.	-
SILICA - SiO2 (TOTAL)	0531	04/20/90	N001	MG/L		8.		2.	-
	0532	04/20/90	N001			10.		2.	-
	0533	04/20/90	N001			8.		2.	-
SILVER	0531	10/08/87	0001	MG/L	<	0.01		0.01	-
	0531	07/11/89	0001		<	0.01		0.01	-
	0531	04/20/90	0001		<	0.01		0.01	-
	0531	12/08/90	0001		<	0.01		0.01	-
	0531	08/01/91	0001		<	0.01		0.01	-
	0531	01/12/92	0001		<	0.01		0.01	-
	0531	06/28/92	0001			0.02		0.01	-
	0532	06/10/86	0001		<	0.01		0.01	-
	0532	10/08/87	0001		<	0.01		0.01	-
	0532	07/11/89	0001		<	0.01		0.01	-
	0532	04/20/90	0001		<	0.01		0.01	-
	0532	12/05/90	0001		<	0.01		0.01	-
	0532	07/31/91	0001		<	0.01		0.01	-
	0532	01/10/92	0001		<	0.01		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

TABLE 3.15 SURFACE WATER QUALITY DATA BY PARAMETER, NATURITA SITE,
COLORADO
SITE: NAT01 NATURITA
01/30/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SILVER	0532	06/28/92	0001	MG/L		0.014		0.01	-
	0533	10/08/87	0001		<	0.01		0.01	-
	0533	07/11/89	0001		<	0.01		0.01	-
	0533	04/20/90	0001		<	0.01		0.01	-
	0533	12/08/90	0001		<	0.01		0.01	-
	0533	08/04/91	0001		<	0.01		0.01	-
	0533	01/12/92	0001		<	0.01		0.01	-
	0533	06/28/92	0001			0.013		0.01	-
SILVER (TOTAL)	0531	04/20/90	N001	MG/L	<	0.01		0.01	-
	0531	04/19/91	N001		<	0.01		0.01	-
	0532	04/20/90	N001		<	0.01		0.01	-
	0532	04/19/91	N001		<	0.01		0.01	-
	0533	04/20/90	N001		<	0.01		0.01	-
	0533	04/19/91	N001		<	0.01		0.01	-
SODIUM	0531	01/30/86	0001	MG/L		58.3		0.002	-
	0531	06/10/86	0001			100.		0.002	-
	0531	10/08/87	0001			49.5		0.002	-
	0531	07/11/89	0001			16.1		0.002	-
	0531	04/20/90	0001			29.8		0.002	-
	0531	12/08/90	0001			15.4		0.002	-
	0531	08/01/91	0001			17.		1.	-
	0531	01/12/92	0001			24.1		0.05	-
	0531	06/28/92	0001			7.87		1	-
	0532	01/30/86	0001			42.		0.002	-
	0532	06/10/86	0001			27.2		0.002	-
	0532	10/08/87	0001			36.1		0.002	-
	0532	07/11/89	0001			14.6		0.002	-
	0532	04/20/90	0001			30.7		0.002	-
	0532	12/05/90	0001			14.8		0.002	-
	0532	07/31/91	0001			16.		1.	-
	0532	01/10/92	0001			26.6		0.05	-
	0532	06/28/92	0001			8.91		1	-
	0533	01/30/86	0001			43.6		0.002	-
	0533	06/10/86	0001			100.		0.002	-
	0533	10/08/87	0001			40.5		0.002	-
	0533	07/11/89	0001			15.3		0.002	-
	0533	04/20/90	0001			29.6		0.002	-
	0533	12/08/90	0001			16.9		0.002	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

TABLE 3.15 SURFACE WATER QUALITY DATA BY PARAMETER, NATURITA SITE,
COLORADO
SITE: NAT01 NATURITA
01/30/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SODIUM	0533	08/04/91	0001	MG/L		15.		1.	-
	0533	01/12/92	0001			26.6		0.05	-
	0533	06/28/92	0001			8.34		1	-
SODIUM (TOTAL)	0531	04/20/90	N001	MG/L		29.8		0.002	-
	0531	04/19/91	N001			5.0		0.1	-
	0532	04/20/90	N001			28.8		0.002	-
	0532	04/19/91	N001			5.1		0.1	-
	0533	04/20/90	N001			28.2		0.002	-
	0533	04/19/91	N001			4.9		0.1	-
SPECIFIC CONDUCTANCE	0531	01/30/86	0001	UMHO/CM		510.		-	-
	0531	06/10/86	0001			350.		-	-
	0531	10/08/87	0001			600.		-	-
	0531	07/11/89	0001			155.		-	-
	0531	04/20/90	0001			500.		-	-
	0531	04/20/90	N001			500.		-	-
	0531	12/08/90	0001			315.		-	-
	0531	04/19/91	N001			235.		-	-
	0531	08/01/91	0001			590.		-	-
	0531	01/12/92	0001			660.		-	-
	0531	06/28/92	0001			279.		-	-
	0532	01/30/86	0001			450.		-	-
	0532	06/10/86	0001			250.		-	-
	0532	10/08/87	0001			750.		-	-
	0532	07/11/89	0001			170.		-	-
	0532	04/20/90	0001			460.		-	-
	0532	04/20/90	N001			460.		-	-
	0532	12/05/90	0001			315.		-	-
	0532	04/19/91	N001			236.		-	-
	0532	07/31/91	0001			558.		-	-
	0532	01/10/92	0001			725.		-	-
	0532	06/28/92	0001			274.		-	-
	0533	01/30/86	0001			430.		-	-
	0533	06/10/86	0001			170.		-	-
	0533	10/08/87	0001			420.		-	-
	0533	07/11/89	0001			210.		-	-
	0533	04/20/90	0001			500.		-	-
	0533	04/20/90	N001			500.		-	-
	0533	12/08/90	0001			342.		-	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

TABLE 3.15 SURFACE WATER QUALITY DATA BY PARAMETER, NATURITA SITE,
COLORADO
SITE: NAT01 NATURITA
01/30/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SPECIFIC CONDUCTANCE	0533	04/19/91	N001	UMHO/CM		242.		-	-
	0533	08/04/91	0001			522.		-	-
	0533	08/05/91	0001			522.		-	-
	0533	06/28/92	0001			285		-	-
STRONTIUM	0531	07/11/89	0001	MG/L		0.9		0.1	-
	0531	04/20/90	0001			1.19		0.1	-
	0531	12/08/90	0001			0.9		0.1	-
	0531	08/01/91	0001			1.13		0.01	-
	0531	01/12/92	0001			0.88		0.01	-
	0531	06/28/92	0001			0.483		0.01	-
	0532	07/11/89	0001			0.9		0.1	-
	0532	04/20/90	0001			1.14		0.1	-
	0532	12/05/90	0001			0.9		0.1	-
	0532	07/31/91	0001			1.10		0.01	-
	0532	01/10/92	0001			0.96		0.01	-
	0532	06/28/92	0001			0.514		0.01	-
	0533	07/11/89	0001			0.9		0.1	-
	0533	04/20/90	0001			1.16		0.1	-
	0533	12/08/90	0001			1.0		0.1	-
	0533	08/04/91	0001			0.92		0.01	-
	0533	01/12/92	0001			0.93		0.01	-
	0533	06/28/92	0001			0.492		0.01	-
STRONTIUM (TOTAL)	0531	04/20/90	N001	MG/L		1.14		0.1	-
	0531	04/19/91	N001			0.25		0.01	-
	0532	04/20/90	N001			1.07		0.1	-
	0532	04/19/91	N001			0.25		0.01	-
	0533	04/20/90	N001			1.08		0.1	-
SULFATE	0531	01/30/86	0001	MG/L		378.		0.1	-
	0531	06/10/86	0001			193.		0.1	-
	0531	10/08/87	0001			380.		0.1	-
	0531	07/11/89	0001			150.		0.1	-
	0531	04/20/90	0001			250.		0.1	-
	0531	12/08/90	0001			163.		0.1	-
	0531	08/01/91	0001			134.		10.	-
	0531	01/12/92	0001			199		0.1	-
	0531	06/28/92	0001			84		1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

TABLE 3.15 SURFACE WATER QUALITY DATA BY PARAMETER, NATURITA SITE,
COLORADO
SITE: NAT01 NATURITA
01/30/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SULFATE	0532	01/30/86	0001	MG/L		319.		0.1	-
	0532	06/10/86	0001			101.		0.1	-
	0532	10/08/87	0001			317.		0.1	-
	0532	07/11/89	0001			113.		0.1	-
	0532	04/20/90	0001			238.		0.1	-
	0532	12/05/90	0001			146.		0.1	-
	0532	07/31/91	0001			126.		10.	-
	0532	01/10/92	0001			241		0.1	-
	0532	06/28/92	0001			87		1	-
	0533	01/30/86	0001			321.		0.1	-
	0533	06/10/86	0001			118.		0.1	-
	0533	10/08/87	0001			337.		0.1	-
	0533	07/11/89	0001			123.		0.1	-
	0533	04/20/90	0001			243.		0.1	-
	0533	12/08/90	0001			178.		0.1	-
	0533	08/04/91	0001			117.		10.	-
	0533	01/12/92	0001			214		0.1	-
	0533	06/28/92	0001			83		1	-
SULFATE (TOTAL)	0531	04/20/90	N001	MG/L		255.		0.1	-
	0531	04/19/91	N001			39.		0.1	-
	0532	04/20/90	N001			253.		0.1	-
	0532	04/19/91	N001			40.		0.1	-
	0533	04/20/90	N001			242.		0.1	-
	0533	04/19/91	N001		<	0.1		0.1	-
SULFIDE	0531	06/10/86	0001	MG/L	<	0.1		0.1	-
	0531	07/11/89	0001			0.1		0.1	-
	0531	04/20/90	0001		<	0.1		0.1	-
	0531	12/08/90	0001		<	0.1	J	0.1	-
	0531	08/01/91	0001			0.6		0.1	-
	0531	01/12/92	0001		<	0.1		0.1	-
	0531	06/28/92	0001		<	1		1	-
	0532	06/10/86	0001		<	0.1		0.1	-
	0532	07/11/89	0001		<	0.1		0.1	-
	0532	04/20/90	0001		<	0.1		0.1	-
	0532	12/05/90	0001		<	0.1	J	0.1	-
	0532	07/31/91	0001			0.2		0.1	-
	0532	01/10/92	0001		<	0.1		0.1	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
J - ESTIMATED VALUE

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)
N001 - UNFILTERED SAMPLE

TABLE 3.15 SURFACE WATER QUALITY DATA BY PARAMETER, NATURITA SITE,
COLORADO
SITE: NAT01 NATURITA
01/30/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
SULFIDE	0532	06/28/92	0001	MG/L	<	1		1	-
	0533	06/10/86	0001		<	0.1		0.1	-
	0533	07/11/89	0001		<	0.1		0.1	-
	0533	04/20/90	0001		<	0.1		0.1	-
	0533	12/08/90	0001		<	0.1	J	0.1	-
	0533	08/04/91	0001			1.0		0.1	-
	0533	01/12/92	0001		<	0.1		0.1	-
	0533	06/28/92	0001			1.49		1	-
SULFIDE (TOTAL)	0531	04/19/91	N001	MG/L		3.6		1.	-
	0532	04/19/91	N001			1.7		1.	-
	0533	04/19/91	N001		<	1.		1.	-
TEMPERATURE	0531	01/30/86	0001	C - DEGREE		2.5		-	-
	0531	06/10/86	0001			11.5		-	-
	0531	10/08/87	0001			10.0		-	-
	0531	07/11/89	0001			25.0		-	-
	0531	04/20/90	0001			14.0		-	-
	0531	04/20/90	N001			14.0		-	-
	0531	12/08/90	0001			0.2		-	-
	0531	04/19/91	N001			4.6		-	-
	0531	08/01/91	0001			22.6		-	-
	0531	01/12/92	0001			0.0		-	-
	0531	06/28/92	0001			17.6		-	-
	0532	01/30/86	0001			3.		-	-
	0532	06/10/86	0001			13.		-	-
	0532	10/08/87	0001			18.75		-	-
	0532	07/11/89	0001			18.		-	-
	0532	04/20/90	0001			11.0		-	-
	0532	04/20/90	N001			11.0		-	-
	0532	12/05/90	0001			2.0		-	-
	0532	04/19/91	N001			4.7		-	-
	0532	07/31/91	0001			25.4		-	-
	0532	01/10/92	0001			0.3		-	-
	0532	06/28/92	0001			15.0		-	-
	0533	01/30/86	0001			2.		-	-
	0533	06/10/86	0001			11.		-	-
	0533	10/08/87	0001			12.0		-	-
	0533	07/11/89	0001			26.0		-	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
J - ESTIMATED VALUE

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)
N001 - UNFILTERED SAMPLE

TABLE 3.15 SURFACE WATER QUALITY DATA BY PARAMETER, NATURITA SITE,
 COLORADO
 SITE: NAT01 NATURITA
 01/30/86 TO 06/28/92
 REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
TEMPERATURE	0533	04/20/90	0001	C - DEGREE		15.0		-	-
	0533	04/20/90	N001			15.0		-	-
	0533	12/08/90	0001			0.9		-	-
	0533	04/19/91	N001			5.9		-	-
	0533	08/04/91	0001			22.5		-	-
	0533	08/05/91	0001			22.5		-	-
	0533	06/28/92	0001			18.7		-	-
THALLIUM	0531	07/11/89	0001	MG/L	<	0.1		0.1	-
	0531	04/20/90	0001		<	0.01		0.01	-
	0531	12/08/90	0001		<	0.01		0.01	-
	0531	08/01/91	0001		<	0.01		0.01	-
	0532	07/11/89	0001		<	0.1		0.1	-
	0532	04/20/90	0001		<	0.01		0.01	-
	0532	12/05/90	0001		<	0.01		0.01	-
	0532	07/31/91	0001		<	0.01		0.01	-
	0533	07/11/89	0001		<	0.1		0.1	-
	0533	04/20/90	0001		<	0.01		0.01	-
	0533	12/08/90	0001		<	0.01		0.01	-
	0533	08/04/91	0001		<	0.01		0.01	-
THALLIUM (TOTAL)	0531	04/20/90	N001	MG/L	<	0.01		0.01	-
	0531	04/19/91	N001		<	0.01		0.01	-
	0532	04/20/90	N001		<	0.01		0.01	-
	0532	04/19/91	N001		<	0.01		0.01	-
	0533	04/20/90	N001		<	0.01		0.01	-
	0533	04/19/91	N001		<	0.01		0.01	-
THORIUM-230	0531	07/11/89	0001	PCI/L		0.1		1.	0.3
	0531	04/20/90	0001			0.0		1.	0.3
	0531	04/20/90	N001			0.0		1.	0.4
	0532	06/10/86	0001			0.1		1.	0.2
	0532	07/11/89	0001			0.5		1.	0.3
	0532	04/20/90	0001			0.1		1.	0.4
	0532	04/20/90	N001			0.3		1.	0.5
	0533	07/11/89	0001			0.1		1.	0.2
	0533	04/20/90	0001			0.0		1.	0.3
	0533	04/20/90	N001			0.0		1.	0.5
TIN	0531	07/11/89	0001	MG/L	<	0.005		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

TABLE 3.15 SURFACE WATER QUALITY DATA BY PARAMETER, NATURITA SITE,
COLORADO
SITE: NAT01 NATURITA
01/30/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
TIN	0531	04/20/90	0001	MG/L	<	0.005		0.005	-
	0531	12/08/90	0001		<	0.005		0.005	-
	0531	08/01/91	0001		<	0.005		0.005	-
	0531	01/12/92	0001		<	0.005		0.005	-
	0531	06/28/92	0001		<	0.005		0.005	-
	0532	06/10/86	0001		<	0.005		0.005	-
	0532	07/11/89	0001		<	0.005		0.005	-
	0532	04/20/90	0001		<	0.005		0.005	-
	0532	12/05/90	0001		<	0.005		0.005	-
	0532	07/31/91	0001		<	0.005		0.005	-
	0532	01/10/92	0001		<	0.005		0.005	-
	0532	06/28/92	0001		<	0.005		0.005	-
	0533	07/11/89	0001		<	0.005		0.005	-
	0533	04/20/90	0001		<	0.005		0.005	-
	0533	12/08/90	0001		<	0.005		0.005	-
	0533	08/04/91	0001		<	0.05	I	0.05	-
	0533	01/12/92	0001		<	0.005		0.005	-
	0533	06/28/92	0001		<	0.005		0.005	-
TIN (TOTAL)	0531	04/20/90	N001	MG/L	<	0.005		0.005	-
	0531	04/19/91	N001		<	0.01	I	0.01	-
	0532	04/20/90	N001		<	0.005		0.005	-
	0532	04/19/91	N001		<	0.01	I	0.01	-
	0533	04/20/90	N001		<	0.005		0.005	-
	0533	04/19/91	N001		<	0.01	I	0.01	-
TOTAL DISSOLVED SOLIDS	0531	01/30/86	0001	MG/L		786.		10.	-
	0531	06/10/86	0001			373.		10.	-
	0531	10/08/87	0001			823.		10.	-
	0531	07/11/89	0001			320.		10.	-
	0531	04/20/90	0001			466.		10.	-
	0531	12/08/90	0001			368.		10.	-
	0531	08/01/91	0001			415.		10.	-
	0531	01/12/92	0001			441		4	-
	0531	06/28/92	0001			200		10	-
	0532	01/30/86	0001			695.		10.	-
	0532	06/10/86	0001			261.		10.	-
	0532	10/08/87	0001			666.		10.	-
	0532	07/11/89	0001			304.		10.	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
I - INCREASED DETECTION LIMIT DUE TO REQUIRED DILUTION

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)
N001 - UNFILTERED SAMPLE

TABLE 3.15 SURFACE WATER QUALITY DATA BY PARAMETER, NATURITA SITE,
COLORADO
SITE: NAT01 NATURITA
01/30/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
TOTAL DISSOLVED SOLIDS	0532	04/20/90	0001	MG/L		466.		10.	-
	0532	12/05/90	0001			24.		10.	-
	0532	07/31/91	0001			408.		10.	-
	0532	01/10/92	0001			486		4	-
	0532	06/28/92	0001			210		10	-
	0533	01/30/86	0001			633.		10.	-
	0533	06/10/86	0001			254.		10.	-
	0533	10/08/87	0001			710.		10.	-
	0533	07/11/89	0001			315.		10.	-
	0533	04/20/90	0001			430.		10.	-
	0533	12/08/90	0001			396.		10.	-
	0533	08/04/91	0001			348.		10.	-
	0533	01/12/92	0001			452		4	-
	0533	06/28/92	0001			200		10	-
TOTAL DISSOLVED SOLIDS (TOTAL)	0531	04/20/90	N001	MG/L		456.		10.	-
	0532	04/20/90	N001			470.		10.	-
	0533	04/20/90	N001			446.		10.	-
TOTAL KJELDAHL NITROGEN	0531	01/12/92	0001	MG/L	<	1.0		1	-
	0531	06/28/92	0001		<	1		1	-
	0532	01/10/92	0001		<	1.0		1	-
	0532	06/28/92	0001		<	1		1	-
	0533	01/12/92	0001		<	1.0		1	-
	0533	06/28/92	0001		<	1		1	-
TOTAL ORGANIC CARBON	0531	07/11/89	0001	MG/L		2.		1.	-
	0531	04/19/91	N001			7.		1.	-
	0532	07/11/89	0001			2.		1.	-
	0532	04/19/91	N001			7.		1.	-
	0533	07/11/89	0001			1.		1.	-
	0533	04/19/91	N001			7.		1.	-
TOTAL ORGANIC CARBON (TOTAL)	0531	04/20/90	N001	MG/L		27.		1.	-
	0532	04/20/90	N001			23.		1.	-
	0533	04/20/90	N001			15.		1.	-
URANIUM	0531	01/30/86	0001	MG/L		0.0023	J	0.003	-
	0531	06/10/86	0001			0.0018	J	0.003	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
J - ESTIMATED VALUE

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)
N001 - UNFILTERED SAMPLE

TABLE 3.15 SURFACE WATER QUALITY DATA BY PARAMETER, NATURITA SITE,
COLORADO
SITE: NAT01 NATURITA
01/30/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
URANIUM	0531	10/08/87	0001	MG/L		0.0041		0.003	-
	0531	07/11/89	0001			0.005		0.003	-
	0531	04/20/90	0001			0.0029	J	0.003	-
	0531	12/08/90	0001			0.0015		0.0003	-
	0531	08/01/91	0001			0.017		0.001	-
	0531	01/12/92	0001			0.0030		0.0003	-
	0531	06/28/92	0001		<	0.001		0.001	-
	0532	01/30/86	0001			0.001	J	0.003	-
	0532	06/10/86	0001			0.001	J	0.003	-
	0532	10/08/87	0001			0.0038		0.003	-
	0532	07/11/89	0001			0.003		0.003	-
	0532	04/20/90	0001			0.0024	J	0.003	-
	0532	12/05/90	0001			0.0014		0.0003	-
	0532	07/31/91	0001			0.006		0.001	-
	0532	01/10/92	0001			0.0025		0.0003	-
	0532	06/28/92	0001		<	0.001		0.001	-
	0533	01/30/86	0001			0.0008	J	0.003	-
	0533	06/10/86	0001			0.0012	J	0.003	-
	0533	10/08/87	0001			0.0037		0.003	-
	0533	07/11/89	0001			0.003		0.003	-
	0533	04/20/90	0001			0.0027	J	0.003	-
	0533	12/08/90	0001			0.0018		0.0003	-
	0533	08/05/91	0001			0.001		0.001	-
	0533	01/12/92	0001			0.0025		0.0003	-
	0533	06/28/92	0001		<	0.001		0.001	-
URANIUM (TOTAL)	0531	04/20/90	N001	MG/L		0.0027	J	0.003	-
	0531	04/19/91	N001			0.003		0.001	-
	0532	04/20/90	N001			0.0029	J	0.003	-
	0532	04/19/91	N001		<	0.001		0.001	-
	0533	04/20/90	N001			0.0030		0.003	-
	0533	04/19/91	N001		<	0.001		0.001	-
VANADIUM	0531	06/10/86	0001	MG/L		0.34		0.01	-
	0531	10/08/87	0001			0.04		0.01	-
	0531	07/11/89	0001		<	0.01		0.01	-
	0531	04/20/90	0001			0.02		0.01	-
	0531	12/08/90	0001			0.02		0.01	-
	0531	08/01/91	0001		<	0.01		0.01	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

OTHER PARAMETER VALUE FLAGS:
J - ESTIMATED VALUE

SAMPLE ID CODES:
0001 - FILTERED SAMPLE (.45 MICRONS)
N001 - UNFILTERED SAMPLE

TABLE 3.15 SURFACE WATER QUALITY DATA BY PARAMETER, NATURITA SITE,
COLORADO
SITE: NAT01 NATURITA
01/30/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
VANADIUM	0531	01/12/92	0001	MG/L	<	0.01		0.01	-
	0531	06/28/92	0001			0.02		0.01	-
	0532	06/10/86	0001			0.2		0.01	-
	0532	10/08/87	0001			0.03		0.01	-
	0532	07/11/89	0001		<	0.01		0.01	-
	0532	04/20/90	0001			0.01		0.01	-
	0532	12/05/90	0001			0.02		0.01	-
	0532	07/31/91	0001		<	0.01		0.01	-
	0532	01/10/92	0001		<	0.01		0.01	-
	0532	06/28/92	0001			0.014		0.01	-
	0533	06/10/86	0001			0.42		0.01	-
	0533	10/08/87	0001			0.03		0.01	-
	0533	07/11/89	0001		<	0.01		0.01	-
	0533	04/20/90	0001			0.01		0.01	-
	0533	12/08/90	0001			0.02		0.01	-
	0533	08/04/91	0001		<	0.01		0.01	-
	0533	01/12/92	0001		<	0.01		0.01	-
	0533	06/28/92	0001			0.013		0.01	-
VANADIUM (TOTAL)	0531	04/20/90	N001	MG/L	<	0.01		0.01	-
	0531	04/19/91	N001		<	0.01		0.01	-
	0532	04/20/90	N001		<	0.01		0.01	-
	0532	04/19/91	N001		<	0.01		0.01	-
	0533	04/20/90	N001		<	0.01		0.01	-
	0533	04/19/91	N001		<	0.01		0.01	-
ZINC	0531	10/08/87	0001	MG/L	<	0.005		0.005	-
	0531	07/11/89	0001			0.008		0.005	-
	0531	04/20/90	0001		<	0.005		0.005	-
	0531	12/08/90	0001			0.023		0.005	-
	0531	08/01/91	0001		<	0.005		0.005	-
	0531	01/12/92	0001		<	0.005		0.005	-
	0531	06/28/92	0001			0.011		0.005	-
	0532	06/10/86	0001			0.01		0.005	-
	0532	10/08/87	0001			0.007		0.005	-
	0532	07/11/89	0001			0.005		0.005	-
	0532	04/20/90	0001			0.008		0.005	-
	0532	12/05/90	0001		<	0.005		0.005	-
	0532	07/31/91	0001		<	0.005		0.005	-
	0532	01/10/92	0001			0.007		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

TABLE 3.15 SURFACE WATER QUALITY DATA BY PARAMETER, NATURITA SITE,
COLORADO
SITE: NAT01 NATURITA
01/30/86 TO 06/28/92
REPORT DATE: 01/17/94

PARAMETER NAME	LOCATION ID	LOG DATE	SAMPLE ID	UNITS OF MEASURE	PVI	PARAMETER VALUE	FLAGS	DETECTION LIMIT	PARAMETER UNCERTAINTY
ZINC	0532	06/28/92	0001	MG/L		0.011		0.005	-
	0533	10/08/87	0001			0.006		0.005	-
	0533	07/11/89	0001		<	0.005		0.005	-
	0533	04/20/90	0001			0.013		0.005	-
	0533	12/08/90	0001			0.013		0.005	-
	0533	08/04/91	0001		<	0.005		0.005	-
	0533	01/12/92	0001			0.010		0.005	-
	0533	06/28/92	0001			0.012		0.005	-
ZINC (TOTAL)	0531	04/20/90	N001	MG/L		0.026		0.005	-
	0531	04/19/91	N001			0.094		0.005	-
	0532	04/20/90	N001			0.049		0.005	-
	0532	04/19/91	N001			0.080		0.005	-
	0533	04/20/90	N001			0.026		0.005	-
	0533	04/19/91	N001			0.097		0.005	-

PARAMETER VALUE INDICATOR (PVI): < - LESS THAN DETECTION LIMIT

SAMPLE ID CODES:

0001 - FILTERED SAMPLE (.45 MICRONS)

N001 - UNFILTERED SAMPLE

DATA FILE NAME: M:\DART\NAT01\SWQ10002.DAT

Table 3.16 Field geochemical data in alluvium at the Naturita site, Colorado

Monitor well no.	pH	Eh (v)	Temp (°C)	Alkalinity (CaCO ₃ , milligrams per liter)	Electrical conductance (micromhos/cm)
505	7.12	+0.112	13.9	370	650
506	6.68	-0.115	18.0	491	780
546	7.10	+0.004	17.0	254	400
547	7.32	+0.172	16.0	211	290
548	7.43	-0.015	12.9	168	186
549	7.11	+0.133	14.0	240	240
616	7.55	-0.095	23.2	842	1420
619	7.59	+0.127	19.5	219	290
630	7.63	+0.147	24.0	165	280
632	6.89	+0.143	22.0	590	780
637	7.34	+0.025	25.0	497	320

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CODE OF FEDERAL REGULATIONS

- 40 CFR Part 192, *Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings*, U.S. Environmental Protection Agency, 1994.
- 40 CFR Part 264, *Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities*, U.S. Environmental Protection Agency, 1994.
- 60 FR 2854, *Groundwater Standards for Remedial Action at Inactive Uranium Processing Sites; Final Rule*, January 11, 1995.

FEDERAL REGISTER

- 48 FR 590, *Standards for Remedial Actions at Inactive Uranium Processing Sites*, January 5, 1983.
- 52 FR 36000, "Standards for Remedial Actions at Inactive Uranium Processing Sites; Proposed Rule," September 24, 1987.

ATTACHMENT 4

SUPPLEMENTAL INFORMATION

**SUPPLEMENTAL STANDARDS AREAS
FOR NATURITA PROCESSING SITE
AND SURROUNDING VICINITY PROPERTIES**

FINAL CONTAMINATED MATERIAL EXCAVATION PLAN

LEGEND

FINAL CONTAMINATED MATERIAL
EXCAVATED BOTTOM ELEVATION
CONTOUR (FEET)

Limits are Approximate

Several areas within the process site boundary have been proposed for supplemental standards. Justification has varied from environmental damage potential to hazardous operations along a high pressure gas line. The areas for which supplemental standards are being applied are shown on the following figure. Attachment 1 contains a revised calculation for "Proposed Supplemental Standards for the Naturita Processing site."

A complete discussion and data compilation for supplemental standards for both the processing site and adjacent vicinity properties will appear in Appendix K of the Naturita Completion Report.

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**U.S. DEPARTMENT OF ENERGY/U.S. NUCLEAR REGULATORY COMMISSION
CORRESPONDENCE**

**GENERIC PROTOCOL FOR THORIUM-230 CLEANUP/VERIFICATION AT UMTRA
PROJECT SITES**

0.5.3

UMT/NRC/991-66

ORIGINATOR DM:NRC
UMTRA File DC
Pink
M&R

SEP 06 1991

FEDERAL EXPRESS

Mr. John Surmeier
Chief, Uranium Recovery Branch
Division of Low-Level Waste
Management & Decommissioning
Office of Nuclear Materials Safety
and Safeguards
U.S. Nuclear Regulatory Commission
Mail Stop 5-E-2
1 White Flint North
11555 Rockville Pike
Rockville, MD 20852

Dear Mr. Surmeier:

Historically, the majority of Ra-226 contaminated materials being cleaned up at Uranium Mill Tailings Remedial Action (UMTRA) Project sites consisted of tailings, ore spoils, tailings intermixed with fine-grained soils (windblown and vicinity properties) and fine-grained soils under residual milling waste (tailings and raffinate ponds). However, in 1988, conditions encountered while remediating Th-230 contamination which persisted once Ra-226 had been removed at both the Riverton, Wyoming, and Durango, Colorado, sites were substantially different.

At both sites, which were located on alluvial floodplains, subsurface soils consisted of a large percentage of cobbles and gravels which were retained on a #4 sieve (4.76 mm). In addition, it was determined that approximately 95 percent of the total concentration of radioactivity was deposited on the fines (those soils passing a #4 sieve).

Based on these considerations and the fact that cleanup verification sampling routinely employed by the Remedial Action Contractors did not readily accommodate sampling and analysis of materials greater than #4 sieve, the following protocol for Th-230 cleanup/verification to a bulk subsurface concentration of 35 pCi/g was adopted and approved by the U.S. Department of Energy (DOE) and the U.S. Nuclear Regulatory Commission (NRC) in modifications to the Remedial Action Plans for those sites.

1. Determine the "fines mass fraction" by collecting several (10) representative bulk field samples, and separating fractions greater than and less than a #4 sieve:

$$\text{fines mass fraction} = \text{mass fines} / \text{mass total} = \text{unitless fraction}$$

CONCURRENCES	
RTG SYMBOL	UMTRA:PBC
INITIALS/SIG	METZLER
DATE	9/6/91
RTG SYMBOL	
INITIALS/SIG	BOSILJEVA
DATE	9/6/91
RTG SYMBOL	
INITIALS/SIG	RAEL
DATE	9/6/91
RTG SYMBOL	
INITIALS/SIG	MATTHEWS
DATE	9/6/91
RTG SYMBOL	
INITIALS/SIG	
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RTG SYMBOL	
INITIALS/SIG	
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DATE	
RTG SYMBOL	
INITIALS/SIG	
DATE	

SEP 06 1991

2. Determine Ra-226 (or Th-230) concentration (passing the #4 sieve) in verification samples collected and analyzed according to standard methodology described in MK-Ferguson Company (MK-F) Procedure RAC-015, "Verification Procedures for Vicinity Properties and Tailings Sites."
3. Determine "bulk" Ra-226 (or Th-230) concentration during cleanup and verification by correcting the Ra-226 (or Th-230) concentration on fines as follows:

bulk Ra-226 concentration = (fines Ra-226 concentration) X (fines mass fraction) or,
bulk Th-230 concentration = (fines Th-230 concentration) X (fines mass fraction)

The DOE proposes to adopt this basic protocol, on a site specific basis, as a standard operating practice for cleanup and verification of both residual Ra-226 and Th-230 contamination at UMTRA sites yet to be remediated. The bulk concentrations of Ra-226 and Th-230 determined by above procedure will comply with the remediation standard for Ra-226, and supplemental cleanup requirements for Th-230, as specified in 40 CFR 192. Bulk Ra-226 concentrations will not exceed 5 and 15 pCi/g for respective 15 cm deep surface and subsurface layers averaged over 100 m². Similarly, the bulk concentration of subsurface Th-230 in 15 cm depth increments will not exceed 35 pCi/g averaged over 100 m². The details of the protocol will be more completely described in an added section to Procedure RAC-015 which will address when the protocol would be implemented; the number of samples needed to provide the initial value for the fines mass fraction; the frequency of updating/verifying the fines mass fraction as work progresses across a site; how the fines mass fraction used will be logged on field data sheets, etc. It will also be included in future updates of the Technical Approach Document and referenced as appropriate in Remedial Action Plans for sites where it will be applied.

The sites where this protocol could be applied would likely include Grand Junction, Gunnison, Rifle, Slick Rock, and Naturita, Colorado, since they are all located on alluvial floodplains possessing characteristics similar to those described above. Therefore, the DOE requests the NRC's concurrence that such a protocol is consistent with the requirements of 40 CFR 192 and that its contractors should be directed to formally incorporate the protocol into standard operating procedures and address its potential application in site Remedial Action Plans.

Mr. John Surmeier

- 3 -

SEP 06 1991

If you should have any further questions regarding this request, please call Mr. Don Metzler of my staff at (FTS) 845-5657.

Sincerely,

Mark L. Matthews, P.E.
Project Manager
Uranium Mill Tailings Remedial Action
Project Office

cc:

F. Bosiljevac, UMTRA
S. Hill, TAC
M. Miller, TAC
D. Gonzales, TAC
J. Oldham, MK-F
D. Carlson, MK-F
M. Madsen, CN-Geotech

NRC/UMT/0991-0067

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

0.5.3

SEP 17 1991

Mr. Mark L. Matthews P.E.
Project Manager
Uranium Mill Tailings Remedial Action
Project Office
Department of Energy
Albuquerque Operations Office
P.O. Box 5400
Albuquerque, New Mexico 87115

Dear Mr. Matthews:

Your letter of September 6, 1991, requested U.S. Nuclear Regulatory Commission (NRC) concurrence in the use of a procedure for determining and verifying radium-226 concentrations at locations with large quantities of cobbly material. Your letter states that at several Title I sites, DOE has encountered large quantities of radium-226 or thorium-230 contaminated material with a high content of cobbly material (greater than a No. 4 sieve size). Your tests show that the contained radioactivity is concentrated in the finer fraction with the coarse fraction containing negligible quantities (less than 5 percent). Procedures presently in use by your contractors for sampling and analyses are designed for relatively fine grained homogeneous soils with a minimum of larger material and are not adequate to characterize the radioactive concentrations in the heterogeneous size material being encountered. Your proposed approach would rely on measurement of the radium-226 or thorium-230 content in the finer fraction to obtain an average concentration for the entire sample.

We agree that determining an average radium-226 or thorium-230 content over an entire sample would be consistent with the Environmental Protection Agency (EPA) standards in 40 CFR 192 if the radium-226 content of the two size fractions and the percentage of each size fraction are properly factored. Part 192.12 states that the concentration of radium-226 in land can be averaged over an area of 100 square meters to meet the standards of not exceeding background level by more than 5 pCi/g averaged over the first 15 cm of soil below the surface and 15 pCi/g averaged over 15 cm thick layers of soil more than 15 cm below the surface.

You plan to address the details of the procedure in a section to be added to Procedure RAC-015 which will define when the procedure would be used, the number and distribution of samples to be taken, the determination of the radium-226 distribution and size fractions, and other appropriate details.

We agree that the proposed approach has the potential for maintaining compliance with EPA's standards while avoiding over excavation of contaminated

Mark Matthews

- 2 -

material. However, for final concurrence, we will have to review the details of your revised Procedure RAC-015 and the effects of its implementation on a site-specific basis. Any questions can be addressed to Allan Mullins of my staff at FTS-492-0578.

Sincerely,

A handwritten signature in cursive script, reading "John J. Surmeier".

John J. Surmeier, Chief
Uranium Recovery Branch
Division of Low-Level Waste Management
and Decommissioning, NMSS

cc: D. Metzler, DOE, Alb.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

APR 4 1992

Mr. Albert R. Chernoff, Project Manager
Uranium Mill Tailings Remedial Action
Project Office
U.S. Department of Energy
Albuquerque Operations Office
P.O. Box 5400
Albuquerque, New Mexico 87115

Dear Mr. Chernoff:

We have reviewed the procedure on "Bulk Radionuclide Determination, Excavation Control, and Site Verification For Cobbly Soils" sent with your letter of March 26, 1992, and supplemented by a revised Page 12 sent by facsimile on March 30, 1992. We hereby concur with its use on U.S. Department of Energy Uranium Mill Tailings Remedial Action Project sites containing a high percentage of cobbly subsoil. This procedure, designated RAC-OP-003, should be referenced in the specific Remedial Action Plans for those sites where it will be used.

One item of note concerns the section of the procedure discussing authority (Section 1.3). This section should be revised to reference this letter of concurrence rather than the September 17, 1991, letter cited, which agreed with the concept but did not concur with the procedure.

Any questions should be addressed to Allan Mullins of my staff at FTS 964-2578.

Sincerely,

A handwritten signature in dark ink, appearing to read "John J. Surmeier".

John J. Surmeier, Chief
Uranium Recovery Branch
Division of Low-Level Waste Management
and Decommissioning, NMSS

cc: D. Metzler, DOE A1b
P. Mann, DOE A1b
D. Gonzalez, TAC

Generic Protocol for Thorium-230 Cleanup/Verification at UMTRA Project Sites

The excavation of materials contaminated with thorium-230 (Th^{230}) at one or more UMTRA Project sites may require extensive, deep removal of soil materials to ensure that the radium-226 (Ra^{226}) concentrations will comply with EPA's surface and subsurface soil cleanup standards (i.e., 40 CFR 192). The following discussion presents a unified approach for the future application of standards for Th^{230} at the UMTRA Sites.

1. Introduction

The cleanup of radiologically contaminated soils on UMTRA Project sites provides explicit requirements for the remediation of soils contaminated with Radium-226 (Ra^{226}), which include limits of 5 and 15 picocuries/gram (pCi/g) for the initial and successive 15 centimeter (cm) deep layers, respectively, averaged over an area of 100 m². If other radionuclides are encountered in sufficient quantities and concentrations to constitute a significant radiological hazard, the supplemental standards provisions of 40 CFR 192.21 and 40 CFR 192.22 provide guidance for performing remedial action for these radionuclides to reduce residual radioactivity to levels that are as low as reasonable achievable.

Thorium-230 (Th^{230}), which naturally decays, with a half-life of 77,000 years, to form Ra^{226} is also present in uranium mill tailings and contaminated soils. Therefore, it may be readily shown that for soils containing initial Ra^{226} and Th^{230} concentrations, at time $t=0$, of $\text{Ra}^{226}(t=0)$ and $\text{Th}^{230}(t=0)$, respectively, the Ra^{226} concentration at any later time, t , is:

$$\text{Ra}^{226}(t) = \text{Ra}^{226}(t=0) e^{-\lambda t} + \text{Th}^{230}(t=0) (1 - e^{-\lambda t}),$$

where λ is the decay constant for Ra^{226} , or $4.32 \times 10^{-4} \text{ yrs}^{-1}$.

Furthermore, the geochemical behavior of Ra^{226} and Th^{230} in typical UMTRA site environments have been observed to be significantly different. Under neutral or basic soil conditions, neither Ra^{226} nor Th^{230} are preferentially mobile geochemically (i.e., both radionuclides will form chemical compounds that have similar potential for migrating into soils). However, under acidic conditions, the chemical forms taken by these radionuclides are significantly different in their potential for depth migration in soil, with Th^{230} being more mobile than Ra^{226} .

In windblown tailings areas, mill yards, and ore storage areas of UMTRA sites, it has been observed that: 1) the surface and subsurface soils are normally at neutral pH; 2) the radiological material does not contain abundant quantities of free acid; and 3) the Ra^{226} and Th^{230} concentrations are in near secular equilibrium (their activities are approximately equal). The near secular equilibrium for the radiological contamination in these areas results from the fact that most of the uranium ores processed were in near equilibrium. Therefore, the application of soil cleanup procedures for Ra^{226} according to EPA standards would also reduce the Th^{230} concentrations to acceptable levels by default, and the total Ra^{226} as a function of time will not exceed 5 or 15 pCi/g, for surface and subsurface soil respectively.

However, under acidic soil conditions that may prevail in the foundation soil under uranium mill tailings, the subpile region, or in surface and subsurface soils of raffinate or evaporation

pond, the different geochemical interactions of Ra^{226} and Th^{230} will cause these radionuclides to differentially migrate. Generally, under these conditions, Ra^{226} is adsorbed or co-precipitated on soil within a depth of one to two feet, and Th^{230} migrates deeper into the subsoil until neutralization of the transporting pore water occurs, where it is removed from solution by the formation of insoluble precipitates or co-precipitates (thorium or thorio-ferro hydroxides, for example). For example, at the Spook, Wyoming site, Th^{230} differentially migrated as deep as 20 feet below the raffinate pond before being stabilized by neutralization.

In order to be in harmony with the supplemental standards provisions to reduce Th^{230} concentrations to as low as reasonably achievable (ALARA), and to come as close to meeting otherwise applicable standards as is reasonable under the circumstances, an excavation depth less than 20 feet was selected as a viable solution for this site.

It may be concluded that the cleanup of the initial Ra^{226} contamination according to standards does not necessarily mitigate against the ultimate ingrowth of residual Ra^{226} with time due to the radioactive decay of residual Th^{230} in all areas within a site. As a consequence, residual Ra^{226} concentrations at a later date, due to ingrowth from Th^{230} contamination, may pose an undesirable health hazard. Therefore, the supplemental standards provision of 40 CFR 192 requires the development of a cleanup criterion for Th^{230} , which is health protective by reducing exposures to levels that are ALARA, keeping in consideration the measures necessary to implement the remedial actions under the circumstances that exist at the site. The following procedure establishes appropriate remedial action concentration limits for Th^{230} , and is proposed to be implemented at UMTRA Project sites after concurrence from all governing agencies involved with activities at each site agree to its implementation.

2. Generic Protocol

As can be seen from the equation presented in the introduction, the overall 1000-year maximum concentration of Ra^{226} in the soils will either be equal to the present Ra^{226} inventory (if Th^{230} concentrations are equal to or less than Ra^{226} concentrations), or the total Ra^{226} inventory one thousand years in the future (if Th^{230} concentrations exceed Ra^{226} concentrations). If Ra^{226} concentrations are equal to or exceed Th^{230} concentrations, the site will already meet the Th^{230} supplemental standard by default when the site is remediated to the 40 CFR 192 standards for Ra^{226} .

- (1) Therefore, the supplemental standard chosen for Th^{230} needs only to ensure that the overall Ra^{226} concentration one thousand years in the future, when averaged over 100 square-meter areas, will not exceed either 5 pCi/g in the first 15 cm layer or 15 pCi/g in successive 15 cm layers.

It should be noted that the Ra^{226} concentrations are considered to be bulk concentrations, as determined by the recently developed, NRC-approved protocol for excavation control and soil verification of cobbly subsoils.

2.1 Protocol for Contamination at Depth

As the depths of excavations become deeper to remove elevated Th^{230} , the thickness of overlying fill material that is eventually used to remediate the site will increase. As a result, attenuation of radon-222 (Rn^{222}) diffusing through the overlying fill material will also increase.

Therefore, as the overlying clean fill material thickness increases, the resultant attenuation of the radon generated from the associated ingrowth of Ra^{226} will allow higher residual concentrations of Th^{230} to be left in place, while still attaining a level of protection equivalent to the intent of the Ra^{226} soil cleanup standards. To determine this concentration, the NRC model (presented in the Draft Generic Environmental Impact Statement on Uranium Milling; NUREG-0511; April 1979) can be used to determine the radon-222 (Rn^{222}) flux that would produce 0.02 Working Levels (WL) in a hypothetical structure built on a 100 square-meter (m^2) grid. The following equation was used:

$C = FAB/(VR * 1000)$, where:

C = Rn^{222} concentration (pCi/l)
 F = Rn^{222} flux (pCi/ m^2 -s)
 A = Area over which the flux enters (m^2)
 B = Flux reduction factor for entering structure (unitless)
 V = Volume of the structure (m^3)
 R = Effective Rn^{222} removal rate (s^{-1})
 1000 = conversion factor (l/m^3)

In areas where basements are feasible (based on local construction practices and deep groundwater table), it should be assumed that the thickness of fill material is eight feet less than the depth of the excavation. Using $A = 103m^2$, $B = 0.5$, $V = 250m^3$, and $R = 1.98 \times 10^{-4} s^{-1}$, a flux of 3.9 pCi/ m^2 -s would produce indoor air concentrations of approximately 4.0 pCi/l Rn^{222} . Assuming radon daughters are present at 50% equilibrium, this would correspond to 0.02 WL.

- (2) Thus, the RAECOM computer code can be used to calculate the resultant flux from higher concentrations at depth as one factor to consider in determining if further excavation is warranted. As long as the calculated flux is less than 3.9 pCi/ m^2 -s, it can be assumed that equivalent protection is provided as long as the backfill thickness is maintained. Therefore, the analysis will consider the potential future (at least 200 years) erosion and land use in the determination of excavation depth. The calculations shall use site-specific parameters when available. Reasonably conservative parameters that consider the expected site conditions shall be used when site-specific data are unavailable. Selection on backfill materials with superior (low) diffusion coefficients may be included in the ALARA considerations of the design. When evaluating this option for the Th-230 supplemental standard, considerations of the construction hazards to remedial action workers and the feasibility of the anticipated construction requirements should be taken into account.

2.2 Protocol for Contamination in the Saturated Zone

Another scenario potentially impacting excavations to remove elevated Th^{230} concentrations is when groundwater is encountered at shallow depths. Since the Th^{230} contamination has been present within the saturated zone long enough for soluble constituents to have been mobilized, it is reasonable to assume that any remaining Th^{230} that may be encountered within a saturated zone will not be appreciably mobilized by pH neutral groundwater. Furthermore, it is known that the diffusion coefficient decreases dramatically as soils approach full

saturation until it reaches values typical of water (Radon Attenuation Handbook for Uranium Mill Tailings Cover Design; NUREG/CR-3533; April 1984). It is therefore reasonable to assume that Rn^{222} generated within a saturated zone generally will not diffuse to the surface. Finally, it is very difficult to perform deep, cost effective excavations within a saturated zone.

(3) Therefore, whenever shallow groundwater is encountered, the following options will be considered:

(a) Excavation into the saturated zone will be considered when water pumping or other controls are reasonable and when high concentrations of Th^{230} extend only a short distance into the saturated zone.

(b) An ALARA analysis will be performed in cases where a major portion of the site contains Th^{230} which extends into the saturated zone, and excavation into the zone is impractical. The ALARA analysis will use reasonably conservative assumptions to project future doses. If water pumping or other controls are not reasonable, excavation will halt at the level of the water table (a nominal extra foot of excavation may be considered so long as it does not require pumping/dewatering).

3. Verification Sampling

Under typical site conditions, verification of the Th^{230} supplemental standard is to be achieved by a three-tiered sampling approach.

(4) In areas within an UMTRA processing site that are suspected of preferentially mobilizing thorium contamination over radium contamination (e.g., under raffinate pits), based upon process knowledge or other sources such as previous sampling data, 100% of the grids are to be sampled and analyzed for Th^{230} .

(5) In subpile areas, 10% of the grids will be sampled.

(6) In areas where process knowledge and characterization data indicates no potential for preferential mobilization (e.g., windblown tailings), grids will not be sampled for Th^{230} .

An analysis of verification data from the Tuba City, Arizona, UMTRA site, which has completed remediation and used this strategy, found no instances in the area sampled at the rate of 1 out of 25 grids where Th^{230} concentrations would cause future (i.e., at $t=1000$ years) expected Ra^{226} concentrations to exceed 40 CFR 192 standards for Ra^{226} . Furthermore, preliminary results confirm the expectation that Th^{230} concentrations are generally equal to or less than Ra^{226} concentrations in areas other than beneath the raffinate pits, and Ra^{226} concentrations are well correlated to Th^{230} concentrations in these areas.

If any verification samples exceed the Th^{230} criteria of this protocol, the surrounding eight grids will be examined to determine whether or not these grids also exceed the criteria. If sample results have not been generated for the surrounding grids already, archived samples of such grids will be analyzed. If any of the surrounding grids also exceed the Th^{230} criteria,

the surrounding eight grids around such grids will also be examined. This process will continue until no more of the surrounding grids exceed the Th^{230} criteria. All grids that exceed the criteria will undergo further remediation unless there is sufficient justification and concurring parties agreement to do otherwise.

4. Conclusion

Based upon the above discussions, the following generic protocol shall be used for the excavation of Th^{230} at all future UMTRA Project sites:

- (1) Excavate bulk Th^{230} to a 1000-year corrected bulk Ra^{226} concentration of 5 or 15 pCi/g (as appropriate) in 15-cm layers;
- (2) For deeply buried material, stop excavations when the RAECOM computer code, using site-specific parameters, calculates a Rn^{222} flux of 3.9 pCi/m²-s and expected long-term conditions are appropriate or when construction safety or feasibility become a concern;
- (3) Consider the following options whenever shallow groundwater is encountered:
 - (a) Excavate into the saturated zone when water pumping or other controls are reasonable, especially when high concentrations of Th^{230} extend only a short distance into the saturated zone.
 - (b) An ALARA analysis will be performed in cases where a major portion of the site contains Th^{230} which extends into the saturated zone, and excavation into the zone is impractical. The ALARA analysis will use reasonably conservative assumptions to project future doses. Halt excavations at the level of the water table when water pumping or other controls are not reasonable (a nominal extra foot of excavation may be considered so long as it does not require pumping/dewatering).
- (4) Perform verification sampling for bulk Th^{230} in all grids underneath raffinate pits or other areas suspected of having a mechanism to preferentially mobilize Th^{230} over Ra^{226} ;
- (5) Perform verification sampling for bulk Th^{230} in 10% of the grids underneath sub-pile areas; and
- (6) Do not perform verification sampling for bulk Th^{230} in grids for which process knowledge and characterization data indicates no potential for preferential migration.
- (7) When practical, delay backfilling until verification results are obtained.

**U.S. DEPARTMENT OF ENERGY/U.S. NUCLEAR REGULATORY COMMISSION
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**SOIL VERIFICATION USING COBBLES-TO-FINES CORRECTION
(OP-003-4)**

Health Physics Standard Operating Procedure

Title: SOIL VERIFICATION USING COBBLES-TO-FINES
CORRECTION

Author:
DAVE ANDREWS

Procedure No.: OP-003-4

Rev.: 3

Page 1 of 14

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APPROVAL

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Soil Verification Using Cobbles-To-Fines Correction

1.0 SCOPE

1.1 Purpose

This procedure will be used for determining and verifying average bulk radionuclide concentrations for Radium-226 (Ra-226), Thorium-230 (Th-230), and, if necessary, Thorium-232 (Th-232) at locations where the subsoil consists of a percentage of cobbles in the bulk sample sufficient to affect measurement of the total radionuclide concentration. Excavation control and verification will be based on bulk concentrations determined by this procedure.

1.2 Applicability

This guidance applies to processing sites and vicinity property areas. This procedure may be applied in areas designated for routine soil excavation and verification where the subsoil media contains a high percentage of cobbles. This procedure should be implemented along with References 2.4 and 2.5 (as applicable) as directed by the DOE (Reference 2.3).

1.3 Authority

Letter to A.R. Chernoff, DOE/UMTRA from J.J. Surmeier, NRC dated April 4, 1992.

1.4 Revisions

Revision 3 incorporates ICN-01 and ICN-02 of Revision 2 and corrects the formula found in section 5.4.3.

2.0 REFERENCES

- 2.1 RAC Health Physics Procedure RAC-IN-001 - UMTRA HP Instrumentation Program.
- 2.2 RAC Health Physics Procedure RAC-OP-002 - Excavation Control
- 2.3 Letter from Sharon Arp of DOE to Charlie Spencer of MK-Ferguson dated June 14, 1994 (3050-94-625).
- 2.4 Generic Protocol for Thorium-230 Cleanup/Verification at UMTRA Project Site.
- 2.5 Surface and Subsurface Cleanup Protocol for Radionuclides Gunnison, Colorado, UMTRA Project Processing Site.

3.0 DEFINITIONS

3.1 Bulk radionuclide concentration (Ra-226, Th-230, or Th-232), in pCi/g, is designated by C_B , and calculated using

$$C_B = \text{Total Sample Radioactivity (pCi)} / \text{Total Dry Mass of Sample (g)}$$

$$C_B = (C_{<#4} \times M_{<#4} + C_{>#4} \times M_{>#4}) / (M_{<#4} + M_{>#4})$$

$$C_B = C_{<#4} (1/(1+f)) + C_{>#4} (f/(1+f)).$$

3.2 Cobbles - The portion of a composite soil sample which will not pass through a #4 mesh sieve.

3.3 Fines - The portion of a composite soil sample which will pass through a #4 mesh sieve.

3.4 Mass partition function, f , of a cobbly soil sample - the ratio of the dry mass of the cobbles ($M_{>#4}$), to the dry mass of the fines ($M_{<#4}$):

$$f = M_{>#4} / M_{<#4} \text{ (cobble to fine ratio),}$$

where the total dry mass of the sample, M_T , is

$$M_T = M_{>#4} + M_{<#4}.$$

3.5 Radiological concentration (Ra-226, Th-230, or Th-232), in picocuries per gram (pCi/g), for the fines or cobbles, are designated by $C_{<#4}$ and $C_{>#4}$, respectively.

3.6 Running Average - The determination of statistical quantities based on the available data and recalculated as more data becomes available.

3.7 Statistical Cobble Radionuclide Concentration ($C_{>U}$) - The cobble radionuclide concentration ($C_{>#4}$) at the upper 95 percent confidence value calculated from test pit or running average data.

3.8 Statistical Mass Partition Function (f_L) - The mass partition function (f), at the lower 95 percent confidence value calculated from test pit or running average data.

3.9 Student t distribution (t) - the mathematical quantity used to define the distribution of test statistics for small sample populations; used herein to determine the lower and upper 95 percent confidence values for mass partition function and cobble radionuclide concentrations respectively.

4.0 REQUIREMENTS

4.1 Prerequisites

- 4.1.1 All instruments used under this procedure shall have valid calibration.**
- 4.1.2 Backup data (correlations, etc.) must be acquired, retained on-site, and made available for audit, on all methods and analyses used for excavation control and verification measurements.**

4.2 Tools, Material, Equipment

- 4.2.1 Buckets, wheelbarrows, #4 mesh sieves or screens (4.8 millimeter), shovels or backhoe, weighing scale up to 200 lbs., drying oven, and other materials, as necessary, to obtain representative bulk soil samples. It should be noted that a 1/4 inch hardware cloth is approximately equivalent to a #4 mesh sieve, and may be used in lieu of a #4 mesh sieve.**

4.3 Precautions/Limits

N/A

4.4 Acceptance Criteria

N/A

5.0 PROCEDURE

5.1 Site Evaluation

- 5.1.4 If test pit excavation activities are performed during remedial action, the statistical mass partition function (f_l) shall be obtained by calculating a running average of the corresponding parameters obtained as test pit work progresses across the site.

5.2 Test Pit Soil Sampling and Analysis

- 5.2.1 Dig each test pit to the estimated depth of contamination at the location, and record the test pit surface elevation and maximum depth of each test pit. If groundwater is encountered, the elevation of the water level at the time of test pitting shall be recorded.
- 5.2.2 Collect one composite sample from each test pit. The composite soil sample shall be comprised of all the material contained in a standard shovel from each one foot increment (no material shall be discarded). Sampling shall begin at the cobbly soil surface or tailings/cobbly soil interface and continue through a minimum of 5 feet of cobbly material or all the cobbly material (whichever is less).
- 5.2.3 Sieve the composite sample through a #4 mesh sieve, collecting the fines and cobbles in separate buckets of known weight. Weigh both fractions separately. Thoroughly mix the fine fraction and extract two (2) representative 500 gram can samples.
- 5.2.4 Determine the percent moisture content by weight of one of the can samples and calculate the adjusted dry weight of the fines. Calculate the adjusted dry weight of the cobbles assuming a moisture content of 1.5 percent. Record all pertinent information on the Cobbles-to-Fines Calculation Sheet (Attachment 1). Calculate the mass partition function (f) for the test pit using the adjusted dry weight of the fines and cobbles in the relation defined in Definition 3.4.
- 5.2.5 The second can shall be analyzed by the site laboratory for Ra-226 (and Th-232, if necessary) and sent to the vendor laboratory for Ra-226 and Th-230 analysis (and Th-232, if necessary). Record on-site and vendor analysis results on Attachment 1. The initial Ra-226 on-site laboratory result shall be corrected using the site-specific correction factor. If a site-specific correction factor has not been developed, a default correction factor of 1.8 will be used to correct the initial Ra-226 results.

Note: Analysis for Th-232 shall only be performed if the site characterization indicates Th-232 is present.

5.2.6 Ship the fraction retained on the #4 sieve from each test pit to the vendor laboratory, in the 5-gallon bucket. This material shall be cleaned, crushed, and analyzed for Ra-226, Th-230 and, if necessary, Th-232. Record vendor analysis results on Attachment 1.

5.2.7 Calculate the bulk radionuclide concentration (C_B) for the test pit using the mass partition function (f) for the test pit (Section 5.2.4), the vendor radiological concentration of the fines ($C_{<\#4}$), and the radiological concentration of the cobbles ($C_{>\#4}$) in the equation defined in Definition 3.1. Bulk radionuclide concentrations should be calculated for Ra-226, Th-230, and Th-232 (if necessary).

5.3 Establish background bulk radionuclide concentrations for Ra-226, Th-230, and, if necessary, Th-232, by the sampling and analyses detailed in Sections 5.2.1 through 5.2.6 at three uncontaminated background locations containing cobbly subsoil of similar geologic deposition.

5.4 Statistical Mass Partition Function - Alternative 1 (Test Pits)

5.4.1 Upon completion of test pit sampling, pertinent data shall be compiled on the Statistical Data Sheet (Attachment 2), and the statistical mass partition function shall be calculated using the following equation:

$$f_L = \bar{f} - t(s/\sqrt{n})$$

where, f_L = statistical average mass partition function at the lower 95 percent confidence value,
 $\bar{f}$ = mean mass partition functions of n samples,
 s = sample standard deviation for the n samples,
 t = t from Attachment 3, and
 n = number of observations.

5.4.2 The mean of the sample population is determined as follows:

$$\bar{f} = \frac{f_1 + f_2 + \dots + f_n}{n}$$

where, $f_{1,2 \text{ or } n}$ = the value of f for sample 1, 2, or n ; and
 n = the number of samples.

5.4.3 The standard deviation is calculated as follows:

$$S = \sqrt{\frac{\sum_{n=1}^n (f_n - \bar{f})^2}{n - 1}}$$

where, S = sample standard deviation,
 f_n = value of f for sample n,
 $\bar{f}$ = mean of f for n samples, and
n = number of samples.

5.4.4 The statistical cobble radionuclide concentration for Ra-226, Th-230 and Th-232 (if necessary) shall be calculated using the following equation:

$$C_{>u} = \bar{C} + t(s/\sqrt{n})$$

where, $C_{>u}$ = The statistical cobble radionuclide concentration at the upper 95 percent confidence value,
 $\bar{C}$ = mean radionuclide concentration of the n samples,
s = standard deviation of the 30 samples,
t = t from Attachment 3, and
n = number of samples.

5.5 Statistical Mass Partition Function - Alternative 2 (Running Average)

5.5.1 The statistical mass partition function (f_L) and the statistical cobble radionuclide concentration ($C_{>u}$) may be obtained by calculating a running average of the corresponding parameters using the equations in Sections 5.4.1 and 5.4.4, respectively. Compile data on the Statistical Data Sheet and recalculate f_L and $C_{>u}$ as data is obtained from each new test pit.

5.6 The statistical mass partition function and statistical cobble radionuclide concentration for alternative 1 or 2, will only be used for excavation control to obtain an estimate of the final excavation depth to comply with EPA's radiological cleanup standards. Final excavation depths and verification will be determined as described in Section 5.7 through 5.9.

- 5.6.1 By solving the equation in Section 3.1 for $C_{<#4}$ and using the statistical mass partition function (f_L) and the statistical cobble radionuclide concentration ($C_{>u}$) an estimate of the allowable fines radionuclide concentration may be obtained as follows:

$$C_{<#4} = \frac{C_B - C_{>u} [f_L / (1 + f_L)]}{[1 / (1 + f_L)]}$$

- where,
- $C_{<#4}$ = The estimated fines radionuclide concentration,
 - C_B = the applicable limit (i.e., 5 or 15 pCi/g for Ra-226 or Th-232),
 - f_L = statistical mass partition function, and
 - $C_{>u}$ = statistical cobble radionuclide concentration.

- 5.6.2 When Th-230 contamination is considered along with Ra-226, the applicable limit for Ra-226 (5 or 15 pCi/g) applies and the 1000 year Bulk Ra-226 concentration must be calculated and compared to the EPA limits.

5.7 Verification Soil Sampling & Analysis

- 5.7.1 Grid the area to be verified into squares of 30' x 30' (~100 m²). For the RFL, NAT, SRK and MAY sites, reference to 30' x 30' can be replaced with 10m x 10m. Grids shall be uniformly distributed over the site so as to obtain representative data. Record location and elevation for each 30' x 30' grid.
- 5.7.2 Further subdivide each grid where excavation control is being performed into approximately 10' x 10' squares (see below). Subdividing grids may normally be done visually by the technician performing the survey. Soil sample extraction will be performed at each of the nine 10' x 10' squares within the grid. Each soil plug should consist of all the material contained in a standard shovel. This will include soil, rock, small/large gravel and cobble. No material is to be discarded. The soil plug will be taken to a depth of 15 centimeters (cm). Sample collection shall be random (non-biased).

(30') or 10m

	0	0
	0	0
	0	0

(30') or 10m

0 = sample location

5.7.3 The nine soil plugs (80-100 lbs combined weight) comprise a composite sample.

5.7.4 Sieve the composite sample through a #4 mesh sieve, collecting the fines and cobbles in separate buckets of known weight. Thoroughly mix the fine fraction.

5.8 Site Verification-Alternative 1 (Grid Specific)

5.8.1 For verification using Alternative 1, weigh both fractions separately and record information on Attachment 1.

5.8.2 Extract two (2) 500g can samples of the fine fraction for moisture content and radiological analysis.

5.8.3 Determine the moisture content of the fines and calculate the adjusted dry weight. Calculate the adjusted dry weight of cobbles assuming a moisture content of 1.5 percent. Calculate and record the mass partition function for the grid (Attachment 1).

5.8.4 Analyze the second can sample of fines for Ra-226 and, if necessary, Th-232 with the on-site OCS. Calculate the corrected radionuclide concentration using the site Ra-226 correction factor.

5.8.5 Calculate the bulk radionuclide concentration C_B for the grid using the grid specific mass partition function, radionuclide concentration of the fines (the initial corrected concentration shall be used for calculating the Ra-226 bulk radionuclide concentration) and the statistical cobbles radionuclide concentration ($C_{>0}$) in the formula in Section 3.1. All data shall be recorded on Attachment 1.

5.8.6 Dry, seal and store the sample for 20 day on-site analysis.

5.8.7 After a minimum of 20 days, reanalyze the sample and calculate the final bulk radionuclide concentration (C_B) for the grid.

5.9 Site Verification-Alternative 2 (Statistical - Running Average)

5.9.1 For each 100 m² grid, a 9-plug composite soil sample of the fines soil will be obtained following the technique outlined in Section 5.7.

5.9.2 Extract a 500g can sample of the fine fraction for radiometric analysis. Discard the larger size soil fraction.

5.9.3 Analyze the can sample for Ra-226 and, if necessary, Th-232 with the on-site OCS. Calculate the corrected radionuclide concentration using the site Ra-226 correction factor.

- 5.9.4 Calculate the bulk radionuclide concentration for the grid using the radionuclide concentration of the fines (the initial corrected concentration shall be used for calculating the Ra-226 bulk radionuclide concentration), the statistical mass partition function (f_L) and the statistical cobble radionuclide concentration ($C_{>u}$) in the formula from Section 3.1 as modified below:

$$C_B = C_{<4} [1/(1 + f_L)] + C_{>u} [f_L/(1 + f_L)]$$

Record the pertinent data on the Alternative 2 Bulk Concentration Data Sheet (Attachment 4).

- 5.9.5 If Th-230 is considered along with Ra-226, calculate the individual bulk concentrations for Th-230 and Ra-226 from the equation in 5.9.4 and then use the following equation to calculate the 1000-year bulk Ra-226 concentration:

$$BRC_{1000} = (BRC * 0.65) + (BTC * 0.35)$$

where, BRC_{1000} = Estimated 1000-Year Bulk Ra-226 Concentration
 BRC = Bulk Ra-226 Concentration
 BTC = Bulk Th-230 Concentration

- 5.9.6 Dry, seal and store the sample for 20 day on-site analysis.

- 5.9.7 After a minimum of 20 days, reanalyze the sample and calculate the final bulk radionuclide concentration (C^B) for the grid.

6.0 RECORDS/REPORTS/NOTIFICATIONS

The data sheets should be sent to the APO in accordance with AD-005-1, QA Records Administration, Maintenance, Transmittal, and Storage Guidelines.

7.0 ATTACHMENTS

- 7.1 Attachment 1 - Cobbles-to-Fines Calculation Sheet (F1-OP-003-4), Rev. 1, ICN-01
- 7.2 Attachment 2 - Statistical Data Sheet (F2-OP-003-4)
- 7.3 Attachment 3 - Critical Values of t
- 7.4 Attachment 4 - Alternative 2 Bulk Concentration Data Sheet (F4-OP-003-4)

Attachment 1

COBBLES-TO-FINES CALCULATION SHEET

Site: _____
Sample/Grid I.D. _____

Sheet _____ of _____
Date: _____

Fines	Cobbles	Moisture Content Fines
Wt. Sample & Bucket _____	Wt. Sample & Bucket _____	Wet Wt. Sample/Pan _____
Wt. Bucket _____	Wt. Bucket _____	Dry Wt. Sample/Pan _____
Wt. Sample _____	Wt. Sample _____	Tare Wt. Pan _____
Adjusted _____	Adjusted _____	Wt. Water* _____
Dry Wt. (M _{<#4})* _____	Dry Wt. (M _{>#4})** _____	Wt. Soil** _____
		% Moisture(*/**) _____

- * Adjusted Dry Wt. of the Fines = Wt. Sample / (1 + % Moisture)
 ** Adjusted Dry Wt. of the Cobbles = Wt. Sample / (1 + 0.015)

Mass Partition function (f) = $M_{>#4}/M_{<#4}$ = _____

Radiological Analysis	²²⁶ Ra (pCi/g)	²³⁰ Th (pCi/g)	²³² Th (pCi/g)	COMMENTS
Cobbles (C _{>#4})				
On-Site Analysis Fines (C _{<#4})	* ** ***	N/A		
Vendor Analysis Fines (C _{<#4})				
Bulk Radionuclide Concentration (C _B)	# ## ###			

* Initial; ** Initial Corrected; *** 20 day (N/A for Test Pit or Running AVE.)
 # Using Vendor; ## Using Initial Corrected; ### Using 20 day (N/A for Test Pits or Running AVE.)

²²⁶Ra Correction Factor: _____

Reviewed By: _____ Date: _____

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Date: _____ Sheet _____ of _____

[illegible]

Reviewed By: _____ Date: _____

Attachment 2

Attachment 3
CRITICAL VALUES OF t

n-1	t_{.050}
1	6.314
2	2.920
3	2.353
4	2.132
5	2.015
6	1.943
7	1.895
8	1.860
9	1.833
10	1.812
11	1.796
12	1.782
13	1.771
14	1.761
15	1.753
16	1.746
17	1.740
18	1.734
19	1.729
20	1.725
21	1.721
22	1.717
23	1.714
24	1.711
25	1.708
26	1.706
27	1.703
28	1.701
29	1.699
inf.	1.645

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Radiological Analysis (Fines)

DATE: _____

[illegible]

F4-OP-003.4

Attachment 4

**U.S. DEPARTMENT OF ENERGY/U.S. NUCLEAR REGULATORY COMMISSION
CORRESPONDENCE**

**URANIUM CLEANUP AND VERIFICATION AT NATURITA
(RAC-OP-007)**

Health Physics Procedure

Title: URANIUM CLEANUP AND VERIFICATION AT
NATURITA

Author: DAVE ANDREWS

Procedure No.: RAC-OP-007

Rev.: 1

Page 1 of 4

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APPROVAL

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6-27-97

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Health Physics Operations Manager, Remedial Action Contractor, UMTRA Project

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Health Physics QA Coordinator, Remedial Action Contractor, UMTRA Project

6/26/97

Uranium Cleanup and Verification at Naturita

1.0 SCOPE

1.1 Purpose

This procedure is to be used to remediate areas with elevated uranium that extend past the design or actual excavation depth for Ra-226 and Th-230.

1.2 Applicability

This procedure applies only to the Naturita, Colorado UMTRA Project Site.

1.3 Authority

Memorandum From W. Woodworth to J. Isham dated May 28, 1996 (3050-96-0378).

1.4 Revisions

Revision 1 incorporates ICN-01, Revision 0, and some changes that clarify the sampling, analysis and documentation procedures.

2.0 REFERENCES

2.1 Remedial Action Plan and Site Design for Stabilization of the Inactive Uranium Processing Site at Naturita, Colorado, March 1994.

2.2 U.S. NRC Branch Technical Position: Disposal or On-site Storage of Thorium and Uranium Wastes from Past Operations, 1981.

2.3 Verification Soil Sampling, OP-003-1.

2.4 Soil Verification Using Cobbles to Fines Correction, OP-003-2.

3.0 DEFINITIONS

N/A

4.0 REQUIREMENTS

4.1 Prerequisites

Ra-226 and Th-230 must be remediated to the requirements given in Naturita Remedial Action Plan (Reference 2.1) prior to implementing this procedure.

4.2 Tools, Material, Equipment

N/A

4.3 Precautions/Limits

N/A

4.4 Acceptance Criteria

4.4.1 Uranium shall be remediated to less than or equal to 35 pCi/g total uranium (15 pCi/g, U-238) or to one foot below the water table level at the time of excavation. The criteria given above are based on dry soil weights.

4.4.2 10% of verification locations in the former pile area and mill yard shall be sampled for uranium analysis to determine if uranium concentrations are elevated in the absence of Ra-226.

If an area of elevated uranium concentrations is identified (by test pits, characterization information, excavation control information, etc.), 100% of final verification samples in that area shall be analyzed for uranium to determine compliance with the criteria given in section 4.4.1.

4.4.3 Results of fines samples shall be corrected to bulk concentrations prior to comparison to the limit.

5.0 PROCEDURE

5.1 After Ra-226 has been cleaned up to EPA Standards with field excavation control instrumentation, samples shall be collected according to reference 2.3 or 2.4. Ten percent (10%) of all the verification samples taken from the mill yard area and former pile area

shall be analyzed for uranium. The uranium analysis may be conducted on a duplicate sample taken from the same bucket of field homogenized material as the Ra-226 sample or the Ra-226 sample may be analyzed for uranium. The sample may be counted on a germanium system or sent to Barringer Laboratories for uranium analysis and analyzed for Th-230, if required by the RAP.

- 5.2 If the result indicates total uranium above the 35 pCi/g (15 pCi/g, U-238) standard, additional excavation shall be conducted as directed by the MK-F Site Manager or designee and the location will be resampled. The eight grid locations surrounding the elevated grid shall also be sampled for uranium analysis.
- 5.3 If a result from the germanium system indicates total uranium below the 35 pCi/g (15 pCi/g, U-238) standard, the grid has met the uranium standard; and if Ra-226 and Th-230 analysis (if applicable) also meet the standards, the location may be backfilled.
- 5.4 Excavation may be terminated at one foot below the water table level at the time of excavation, regardless of the uranium concentration of the soil. A sample will then be collected and counted for Ra-226 and if below the Ra-226 standards, the area may be backfilled and the sample analyzed for uranium to document the existing concentrations. If elevated Th-230 is encountered below the water table, then the generic Th-230 cleanup protocol given in reference 2.1 shall be used in conjunction with this procedure.
- 5.5 Test pits may be used to characterize subsurface soils to determine excavation depths.

6.0 RECORDS/REPORTS/NOTIFICATION

- 6.1 Analytical results for uranium shall be entered into the lab soil table of the database.
- 6.2 If excavation is conducted to 1 foot below the existing water table, this condition shall be documented in the verification database.

7.0 ATTACHMENTS

N/A

**ANALYSIS OF SAN MIGUEL RIVER SURFACE WATER QUALITY DURING
PERIODS OF LOW FLOW**

JACOBS ENGINEERING GROUP INC.

DATE

4/13/95

SUBJECT

DISTRIBUTION
OF MEAN MONTHLY
DISCHARGE

SHEET NO.

BY

JDC

CHKD.

JOB NO.

MEAN DISCHARGE (cfs)

Figure 6-50
Surface Water Sampling Locations

ASER36 NAT SURFWATWELLS

6-153

	INITIALS	DATE
REVISED BY		
REVIEWED BY		
APPROVED BY		

Table 6-27 Surface water quality results, processing site

Location	Sulfate		Total dissolved solids		Uranium	
	4/94	11/94	4/94	11/94	4/94	11/94
531 (upstream)	60	205	190	467	<0.001	0.002
532 (site)	59	209	210	465	<0.001	0.002
533 (downstream)	56	197	220	438	<0.001	0.002
534 (upstream)	56	193	220	444	<0.001	0.002
535 (downstream)	55	208	220	470	<0.001	0.002
536 (downstream)	60	190	230	441	<0.001	0.001
538 (spring-downgradient)	X	391 ^a	X	847	X	0.110 ^b

^aExceeds secondary maximum contaminant level of 250 mg/L.^bExceeds maximum contaminant level of 0.044 mg/L.

X - no sample taken.

< indicates actual value is less than number indicated (limit of detection).

Table 6-31 Surface water quality results, processing site

Indicator parameter	Location							
	531 upstream	532 adjacent to site	533 downstream	534 upstream	535 downstream	536 downstream	556 downstream	538 spring-downgradient
Sulfate								
4/95	170	148	170	59	144	142	X	325
9/95	234	188	233	X	X	X	247	139
Total dissolved solids								
4/95	370	340	380	200	340	340	X	700
9/95	510	420	500	X	X	X	530	480
Uranium								
4/95	0.003	0.001	0.002	<0.00	0.002	0.002	X	0.067 ^a
9/95	0.003	0.002	0.003	X	X	X	0.003	0.042

^aExceeds maximum concentration level of 0.44 mg/L.

Note: Concentrations reported in milligrams per liter.

X - no sample taken.

< - indicates actual value is less than number indicated (limit of detection).

EXISTING PRIVATE WELLS NEAR THE NATURITA PROCESSING SITE

Table 2-1 Summary of Information on private wells within 2-mi (3-km) downgradient and upgradient of the Naturita, Colorado, site

Well ^a	Date installed	Yield (gpm)	Depth (ft bls)	Water level (ft bls)	Water-bearing unit	Current status	Water use/comments
1	1977	Unknown	Unknown	Unknown	Alluvium	In use	Industrial
2	1956	200	50 (perf. from 25) ^b	10	Alluvium	In use	Domestic
3	1954	200	30.5 (perf. from 25) ^b	7	Alluvium	Active	Registered as domestic irrigation; currently not in use
4	Unknown	Unknown	150	Unknown	Salt Wash Member	Inactive	Well capped; poor water quality
5	1976	3	216 (perf. from 90-214) ^b	80	Salt Wash Member	Inactive	Well capped; poor water quality
6	1964	8	36 (19-35 perf.) ^b	20	Alluvium	Abandoned	Registered as domestic well; caved in about 20 years ago
7	1994	Unknown	200 (perf. from 172 to 192) ^b	Unknown	Salt Wash Member	In use	Industrial, nondrinking
8	About 1920	Unknown	10.4 ^c	8 ^c	Alluvium	Inactive	Used as a domestic well; about 9 years ago use as irrigation well
9	Unknown	Unknown	Unknown	Unknown	Alluvium	Inactive	Drilled as irrigation well never used (little water)
10	1962	8	240 (perf. from 218) ^b	218	Salt Wash Member	NA	Registered as domestic present use unknown

^aRefer to Figure 2.7 for well locations.

^bPerf. - perforated. Numbers in parentheses indicate that perforations in well casing can be found at this depth.

^cMeasured from the top of the casing.

NA - Information is not available at this time due to difficulty in locating current owner based on records from the Colorado Division of Water Resources.

gpm - gallons per minute.

ft bls - feet below land surface.

SITE-SPECIFIC HAZARDOUS CONSTITUENTS

BARREL NUMBER	DRUM NUMBER	CONTENTS	VOLUME	UNIT	RCRA CHARACTERISTICS	RRM	ASBESTOS	OTHER CONDITIONS	DISPOSAL METHOD
23	54	White Powder	300	lbs	zNA	X		pH 10.2	Spread and mix in cell with tailings.
24		Yellow Powder (Light)	300	lbs	zNA	X		pH 6.6	Spread and mix in cell with tailings.
25	56	White Powder	150	lbs	zNA	X		pH 10.0	Spread and mix in cell with tailings.
26	43A	White powder	300	lbs	zNA	X		pH 10.1	Spread and mix in cell with tailings.
27	59	White Powder	220	lbs	zNA	X		pH 8.4	Spread and mix in cell with tailings.
28	60	White Powder	180	lbs	zNA	X		pH 10.4	Spread and mix in cell with tailings.
29	61	White Powder	200	lbs	zNA	X		pH 10.6	Spread and mix in cell with tailings.
30	62	White Powder	125	lbs	zNA	X		pH 9.4	Spread and mix in cell with tailings.
31	63	White Powder	180	lbs	zNA	X		pH 9.9	Spread and mix in cell with tailings.
32	64	White Powder	110	lbs	zNA	X		pH 10.0	Spread and mix in cell with tailings.
33	66	Tar	55	gals	zNA	X			Place in cell per Spec.
34	67, 72	Sludge-RRM	80	lbs	zNA	X			Place in Cell per Spec.
35	68, 73	Sludge-RRM	200	lbs	zNA	X			Place in Cell per Spec.
36	69, 74	Sludge-RRM	800	lbs	zNA	X			Place in Cell per Spec.
37	70, 72	Sludge-RRM	180	lbs	zNA	X			Place in Cell per Spec.
38	75, 78	Sludge-RRM	120	lbs	zNA	X			Place in Cell per Spec.
39	77, 78	Sludge-RRM	200	lbs	zNA	X			Place in Cell per Spec.
40	79A, 83	Sludge-RRM	160	lbs	zNA	X			Place in Cell per Spec.
41	76, 84	Sludge-RRM	210	lbs	zNA	X			Place in Cell per Spec.
42	81, 85	Sludge-RRM	185	lbs	zNA	X			Place in Cell per Spec.
43	81, 85	Sludge-RRM	160	lbs	zNA	X			Place in Cell per Spec.

Sorted By: Barrel

BARREL NUMBER	DRUM NUMBER	CONTENTS	VOLUME	UNIT	RCRA CHARACTERISTICS	RRM	ASBESTOS	OTHER CONDITIONS	DISPOSAL METHOD
0	Trailer	Asbestos	323 17	bags wraps	zNA	X	X		Place in Cell per Spec.
0	Trailer	Fiber Glass	342	bags	zNA	X			Place in Cell per Spec.
1	11	Oil (Heavy Lube)	50	gals	zNA	X		Water Mixed	Place in Cell per Spec.
2	12	Oil (Heavy Lube)	20	gals	zNA	X		Water Mixed	Place in Cell per Spec.
3	13	Oil (From Equipment)	55	gals	zNA	X		Water Mixed	Place in Cell per Spec.
4	14	Oil (Heavy Lube)	65	gals	zNA	X		Water Mixed	Place in Cell per Spec.
5	15	Oil (From Equipment)	20	gals	zNA	X		Water Mixed	Place in Cell per Spec.
6	26	Oil (Heavy Lube)	20	gals	zNA	X		Water Mixed	Place in Cell per Spec.
7	28-31	Liquid-Red	45	gals	Herbicides				Disposal off-site.
8	32	Grease	35	gals	zNA	X			Place in Cell per Spec.
9	33,35	Grease	35	gals	zNA	X			Place in Cell per Spec.
10	34, 37	Grease	20	gals	zNA	X			Place in Cell per Spec.
11	38	Oil (Heavy Lube)	15	gals	zNA	X		Water Mixed	Place in Cell per Spec.
12	39	Oil (From Equipment)	50	gals	Ignitable FP 128F			Water Mixed	Disposal off-site.
13	40	Liquid-Clear	45	gals	Ignitable FP 86F			Acetone 5100 ppm Z-Betanone 480 ppm Benzene 83 ppm Toluene 110 ppm	Disposal off-site.
14	42	Oil (From Equipment)	25	gals	Ignitable FP 128F			Water Mixed	Disposal off-site.
15	43	Liquid-Red	20	gals	Herbicides	X			Use on-site as useful product.
16	43A	Soil/Oil	50	lbs	zNA	X		Soil from around leaky drums	Place in cell per Spec.
18	44	Liquid-Clear	5	gals	Ignitable FP 92F	X		Same as Barrel Number 13.	Accidentally evaporated from drum seams, no disposal required.
19	45	Oil (Heavy Lube)	20	gals	zNA	X		Water Mixed	Place in Cell per Spec.
20	46	Oil (Heavy Lube)	30	gals	zNA	X		Water Mixed	Place in Cell per Spec.
21	46A	Oil (From Equipment)	40	gals	zNA	X		Water Mixed	Place in Cell per Spec.
22	47	Oil (Heavy Lube)	50	gals	zNA	X		Water Mixed	Place in Cell per Spec.

BARREL NUMBER	DRUM NUMBER	CONTENTS	VOLUME	UNIT	RCRA CHARACTERISTIC	RRM	ASBESTOS	OTHER CONDITIONS	DISPOSAL METHOD
44	79, 83A	Sudge-RRM	160	lbs	zNA	X			Place in Cell per Spec.
45	103, 104	White Powder	200	lbs		X		pH 8.2	Spread and mix in cell w/tailings.
46	104, 105	White Powder	180	lbs		X		pH 9.1	Spread and mix in cell w/tailings.
47	105, 106	White Powder	180	lbs		X		pH 11.1	Spread and mix in cell w/tailings.
48	107	Diesel rinsate (From Transformers)	20	gals	zNA	X		Aroclor 17 ppm - Rinsate below 50 ppm is not regulated.	Bioremediate, then place in Cell per Spec.
49	108	Oil (From Equipment)	55	gals	zNA	X		Water Mixed	Place in Cell per Spec.
50	109	Soil/Oil	225	lbs	zNA	X		Soil from around leaky oil drums	Place in cell per Spec.
51	110	Batteries (Emergency Power Source)	280	lbs	Lead Plates	X		Broken and Dry	Radiologically decon the batteries and recycle lead.
52	111	Batteries (Emergency Power Source)	280	lbs	Lead Plates	X		Broken and Dry	Radiologically decon the batteries and recycle lead.
53	112	Batteries (Emergency Power Source)	280	lbs	Lead Plates	X		Broken and Dry	Radiologically decon the batteries and recycle lead.
54	113	Batteries (Emergency Power Source)	280	lbs	Lead Plates	X		Broken and Dry	Radiologically decon the batteries and recycle lead.
55	114	Yellow Powder (Dark)	50	lbs	Corrosivity pH 1.3	X			Spread and mix in cell w/tailings.
56	115	White Powder	100	lbs		X		pH 4.4	Spread and mix in cell w/tailings.
57	116	Oil (From Equipment)	55	gals	zNA	X		Water Mixed	Place in Cell per Spec.
58	117	Diesel Fuel	40	gals	zNA	X			Bioremediate, then place in Cell per Spec.
59	118	Diesel Fuel	40	gals	zNA	X			Bioremediate, then place in Cell per Spec.
60	119	Oil (From Equipment)	50	gals	zNA	X		Water Mixed	Place in Cell per Spec.
61	120	First Aid Supplies			zNA	X			Place in Cell per Spec.
62	121	Batteries (Emergency Power Source)	280	lbs	Lead Plates	X		Broken and Dry	Radiologically decon the batteries and recycle lead.
63	122	Oil (From Equipment)	40	gals	zNA	X		Water Mixed	Place in Cell per Spec.
65	124	Oil (From Equipment)	35	gals	zNA	X		Water Mixed	Place in Cell per Spec.
66	125	Oil (From Equipment)	35	gals	zNA	X		Water Mixed	Place in Cell per Spec.

- NOTES: 1) The "Barrel Number" column is the current identification system for these materials. The "Drum Number" column was the original identification system used during the original characterization.
- 2) Barrel contents listed as "white powder" are either lime or soda ash.
- 3) Barrel contents listed as "yellow powder" are unknown materials.
- 4) Barrels Numbered 1, 2, 3, 4, 5, 6, 11, 12, 14, 19, 20, 21, 22, 48, 57, 60, 65, and 66 are being resampled for radiological contamination. If radiological levels do not exceed background, then the barrel will be disposed of off-site.
- 5) The zNA symbol means the barrel was tested for RCRA characteristics, but was below regulatory levels.

COBBLES-TO-FINE TEST PIT ANALYSIS

ADDITIONAL URANIUM DATA COLLECTED AS A RESULT OF THE COBBLES-TO-FINES TEST PITTING EFFORT AT THE NATURITA, CO UMTRA SITE

Test Pit Number	Sample Number*	Depth at which Sample was Collected (ft)	Total U (ug/g)	U-238 (pCi/g)	Ra-226 (pCi/g)	Ra/U Ratio
7	990	8	37	12.2	22.2	1.8
8	957	11	91	30.0	52.4	1.7
10	1205	2	62	20.5	70.2	3.4
10	1206	3	44	14.5	71.0	4.9
11	1061	10	43	14.2	26.6	1.9
19	1185	15	23	7.6	25.0	3.3
19A	1015	10	36	11.9	20.7	1.7
20	914	3	32	10.6	33.6	3.2
20	915	4	80	26.4	84.1	3.2
20	918	7	36	11.9	26.1	2.2
22	997	4	114	37.6	54.1	1.4
25	887	6	45	14.9	84.8	5.7
25	889	9	11	3.6	18.1	5.0
26	895	6	36	11.9	29.1	2.4
26	897	8	40	13.2	36.0	2.7
28	851	7	15	5.0	27.7	5.6
28	852	8	12	4.0	23.2	5.9
30	871	13	26	8.6	23.6	2.8

* Samples collected January 1995.

Attachment to Response to Comment 19

ENGINEERS
AND
CONSTRUCTORS

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

HEADQUARTERS OFFICE
1500 WEST 3RD STREET
CLEVELAND, OHIO U.S.A. 44113-1406
PHONE: (216) 523-5600/TELEX: 985542

REPLY TO: MK-FERGUSON COMPANY
REMEDIAL ACTIONS
CONTRACTOR-UMTRA PROJECT
P.O. BOX 9136
ALBUQUERQUE, NEW MEXICO U.S.A. 87119

May 4, 1995

95-3050-345

Mr. Woody Woodworth
Site Manager
U.S. Department of Energy
Uranium Mill Tailings Remedial Action Project
2155 Louisiana N.E., Suite 4000
Albuquerque, NM 87110

**SUBJECT: Cobbles to Fines Analysis - Naturita Process Site
Preliminary Calculation Report
Naturita, CO**

REFERENCE: Contract No. DE-AC04-83AL18796

Dear Mr. Woodworth:

Enclosed is a copy of the subject report from MKES showing the results of their analysis of the cobbles to fines data. A copy is also being sent to the CDPHE as requested.

If you have any questions, please contact me.

Sincerely,

MK-FERGUSON COMPANY

R.C. Hindman for

C.R. Spencer
Construction Engineering Manager

CRS\REW\spp

Enclosure

cc: w/enc:
P. Oliver, CDPHE
E. Artiglia, TAC

1460KZ

Mark Miller

MORRISON KNUDSEN CORPORATION

ENVIRONMENTAL SERVICES DIVISION

Project UMTRA-NAT
Feature CONTAMINATED MATERIAL EXCAVATION
Item COBBLES-TO-FINES ANALYSIS

Contract No. 3885-67
Designed PYL
Checked WYL

Sheet 1
File No. _____
Date 4/26/95
Date 5/1/95

REFERENCES & SOURCES OF DATA

1. MK-Ferguson Company & CWM Federal Environmental Services, Inc., "Health Physics Standard Operating Procedure - Soil Verification Using Cobbles-To-Fines Correction", Procedure No. OP-003-4, Rev. 0, April 1992. ~
2. MK Environmental Services, "Scope of Work for Cobbles-to-Fines Investigation, UMTRA Project - Naturita", August 1994, MKES Doc. No. 3885-NAT-R-01-01319-02.
3. MK-Ferguson Company, "IOC to DOE, Re- Naturita Cobbles to Fines Lab Data from Barringer Lab", March 29, 1995. MKES Doc. No. 3885-NAT-L-02-01571-00.
4. MK-Ferguson Company, "IOC to MKES, Re- Cobbles to Fines Calculation Sheet", February 8, 1995. MKES Doc. No. 3885-NAT-I-02-01552-00.
5. CWM Federal Environmental Services, Inc., " OCS Sample Logs, Naturita", MKES Doc. No. 3885-NAT-X-06-1584-00 .
6. MKES, "UMTRA-Naturita, Contaminated Material Excavation - Excavation Extent & Depths, Volume, Ra-226 Concentrations", April 1993, Calc. No. 17-730-01-01, MKES Doc. No. 3885-NAT-C-01-00817-01.

MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES DIVISION
Project UMTRA-NAT
Feature CONTAMINATED MATERIAL EXCAVATION
Item COBBLES-TO-FINES ANALYSIS

Contract No. 3885-67
Designed PYL
Checked WYL

Sheet II
File No. _____
Date 4/26/95
Date 5/1/95

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MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES DIVISION

Project UMTRA-NAT
Feature CONTAMINATED MATERIAL EXCAVATION
Item COBBLES-TO-FINES ANALYSIS

Contract No. 3885-67
Designed PYL
Checked WYL

Sheet 1
File No. _____
Date 4/26/95
Date 5/1/95

I. PURPOSE & INTRODUCTION

The Naturita Processing site consists of the former tailings pile area (28 ac.), millyard (12 ac.), former ore storage area (12 ac.) and surrounding windblown areas (195 ac.). Estimated average contamination depths in these areas are: 2.5 ft in the former tailings pile area, 6 ft in the millyard, 0.5 ft in the former ore storage area and 1 ft in windblown areas. The former tailings pile area and the millyard are underlain by a thick layer of sand and gravel alluvium, which is blanketed by a thin layer of clayey soil.

The purpose of this calculation is to analyze the data obtained from the cobbles-to-fines (CTF) investigation at the Naturita processing site according to the "Soil Verification Using Cobbles-to-Fines Correction" procedure (Ref. 1). The subsoil in the former tailings area and the millyard at the processing site consists of a percentage of cobbles (gravels) that may be sufficient to affect measurement of the total radionuclide concentration. The statistical mass partition function and statistical cobble radionuclide concentration analyzed are used for excavation control to obtain an estimate depth of contamination to comply with EPA's radiological cleanup standards. The estimated depth of contamination was then used to compare the excavation depth according to our current excavation plan (subcontract drawing NAT-PS-10-1715)(sheet 13). The impact of CTF correction on the current estimated excavation volume was evaluated.

II. INTRODUCTION :COBBLES-TO-FINES INVESTIGATION

The cobbles-to-fines investigation was performed in January 1995. Thirty-one plus three background test pits were dug in the former tailings pile area and the millyard at the Naturita processing site. (See locations on sheet 12.) Composite samples of gravelly soils were obtained, sieved, weighed and tested in the laboratory for radionuclide concentrations in accordance with the investigation Scope of Work (Ref. 2) and Ref. 1.

Project UMTRA - Naturita
Feature CONTAMINATED MATERIAL EXCAVATION
Item COBBLES TO FINE RATIO

Contract No. 3885-67
Designed RETA BARAD
Checked PYL

Sheet 2 A
File No. _____
Date 3.4.98
Date 3/4/98

The test pit logs are presented in Appendix A. Laboratory data are presented in Appendix B (Ref. 3). In addition, on-site Opposed Crystal System (OCS) radionuclide analysis was also performed on 1-foot interval samples throughout the depths of the test pits. (Ref. 4 & 5).

III. METHODOLOGY & APPROACH

The analysis was performed following the detailed procedures in Ref. 1. The following points highlight the steps and supplement the procedures.

1. Pertinent data for the cobbles-to-fines correction were compiled on the statistical data sheets in Appendix C. The mass partition function (f) was calculated for each test pit. The data were then summarized and presented in Table II on sheet 8.
2. The statistical mass partition coefficient and statistical cobble radionuclide concentration for Ra-226, Th-230 and Th-232 were calculated using the formula in Ref. 1 (see sheet 9); the results are presented in Table II. An average Ra-226 correction factor, which is the vendor's (lab) results divided by the OCS results, was also obtained.
3. Using the statistical mass partition, and the statistical cobble radionuclide concentration, the allowable fines radionuclide concentrations corresponding to the applicable EPA limits for Ra226 and Th232 were estimated. The calculation is presented on sheet 4. The allowable fines TH230 calculation was not performed since the allowable concentration is dependent on the Ra226 concentration present. i.e., the Th230 limit is not definitive.
4. Average background fines radionuclide concentrations in gravelly soil were obtained from the three background test pits data. See table III on sheet 10. (Note that for fine-grained soil in the upper strata, the background Ra226 of 2.3

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Project UMTRA-NAT
Feature CONTAMINATED MATERIAL EXCAVATION
Item COBBLES-TO-FINES ANALYSIS

Contract No. 3885-67Designed PYLChecked WYLSheet 3

File No. _____

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pCi/g used previously (Ref.6) was assumed to remain valid.)

5. The background fines radionuclide concentrations were then added to the allowable fines radionuclide concentrations to establish the limits to estimate the depth of contamination for each test pit. They are presented on sheet 5.
6. The on-site corrected OCS Ra-226 results obtained along the depths of each test pit were recorded in the test pit logs in Appendix A. These values were then corrected using the Ra-226 correction factor obtained in Step 2 and recorded in parenthesis in the logs. Lab Th-230 results were also recorded in the logs.
7. Using the concentration limits obtained in Step 5 to check against the corrected Ra226 (values in parenthesis on logs) and Th230 results obtained throughout the length of each test pit, the depth of contamination was estimated and indicated in the logs and Figures 1 & 3 on sheet 12 & 14. (Note: Ref. 5 shows Th-232 concentrations are very small, thus the depth of contamination was controlled by Ra226 and Th230 contamination.) The depth of contamination was then compared with the excavation depth according to the current excavation plan (sheet 11). The comparison is summarized in Table I on sheet 7 .
8. Since the thirty-one test pits were uniformly distributed over the former tailings pile area and the millyard, it is considered valid to obtain an average for the difference (discrepancy) between the depth of contamination and the excavation depth, as shown in Table I. The impact of the CTF correction to the excavation volume based on the current excavation plan can be evaluated by examining the magnitude of this average discrepancy.

Project UMTRA - Naturita
Feature CONTAMINATED MATERIAL EXCAVATION
Item COBBLES TO FINE RATIO

Contract No. 3885-67
Designed REZA BARAO
Checked PYL

Sheet 4
File No.
Date 3-4-98
Date 3/4/98

IV. CALCULATIONS

The calculations are based on the formula presented in Ref. 1.

$$\text{Estimated allowable fines radionuclide concentration} = C_{<u>4} = \frac{C_B - C_{>u} [f_L / (1 + f_L)]}{[1 / (1 + f_L)]}$$

(less than #4 sieve)

where C_B = applicable bulk concentration limit for Ra-226, Th-230 or Th-232

f_L = statistical mass partition function

$C_{>u}$ = statistical cobble radionuclide concentration

(Refer to Table II on sheet 8 for values used here.)

Ra-226:

For depth < 15 cm, allowable bulk radionuclide concentration = 5 pCi/g

$$\therefore \text{allowable fines Ra-226 concentration} = C_{<u>4} = \frac{5 - 0.9 [2.8 / (1 + 2.8)]}{[1 / (1 + 2.8)]}$$

$$= \underline{16.5 \text{ pCi/g}}$$

For depth > 15 cm, allowable bulk radionuclide concentration = 15 pCi/g

$$\therefore \text{allowable fines Ra-226 concentration} = C_{<u>4} = \frac{15 - 0.9 [2.8 / (1 + 2.8)]}{[1 / (1 + 2.8)]}$$

$$= \underline{54.5 \text{ pCi/g}}$$

For depth < 15 cm, allowable bulk radionuclide concentration = 5 pCi/g

$$\therefore \text{allowable fines Th-232 concentration} = C_{<u>4} = \frac{5 - 0.36 [2.8 / (1 + 2.8)]}{[1 / (1 + 2.8)]}$$

$$= \underline{18.0 \text{ pCi/g}}$$

For depth > 15 cm, allowable bulk radionuclide concentration = 15 pCi/g

$$\therefore \text{allowable fines Th-232 concentration} = C_{<u>4} = \frac{15 - 0.36 [2.8 / (1 + 2.8)]}{[1 / (1 + 2.8)]}$$

$$= \underline{56.0 \text{ pCi/g}}$$

(continued on next page)

Project UMTRA - Naturita
Feature CONTAMINATED MATERIAL EXCAVATION
Item COBBLES TO FINE RATIO

Contract No. 3885-67
Designed RETA ISRAO
Checked PYL

Sheet 5
File No.
Date 3-4-98
Date 3/4/98

Background radionuclide concentrations for gravelly soil:

Data for the gravelly soil from the three background test pits are presented in Table III on sheet 10.

The average background bulk radionuclide concentrations are as follows:

Ra-226 : 0.6 pCi/g

Th-232 : 0.3 pCi/g

The corresponding average background fines radionuclide concentrations are as follows:

Ra-226 : 1.2 pCi/g

Th-232 : 0.3 pCi/g

Therefore, allowable fines radionuclide concentration + background (used for excavation control) are as follows:

Ra-226 (depth <15cm): 17.7 pCi/g
(depth >15cm): 55.7 pCi/g

Th-232 (depth <15cm): 18.3 pCi/g
(depth >15cm): 56.3 pCi/g

Project UMTRA - Naturita
Feature CONTAMINATED MATERIAL EXCAVATION
Item COBBLES TO FINE RATIO

Contract No. 3885-67
Designed REIA BARAO
Checked PYL

Sheet 6
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Date 3-4-98
Date 3/4/98

V. RESULTS & CONCLUSIONS

Based on the CTF analysis, the allowable fines plus background radionuclide concentrations used for excavation control are as follows:

Ra226: (depth <15 cm) : $16.5 + 1.2$ (background) = 17.7 pCi/g (without 6" topsoil backfill)
(depth >15 cm) : $54.5 + 1.2$ (background) = 55.7 pCi/g (with 6" topsoil backfill)

Th232: (depth <15 cm) : $18.0 + 0.3$ (background) = 18.3 pCi/g (without 6" topsoil backfill)
(depth >15 cm) : $56.0 + 0.3$ (background) = 56.3 pCi/g (with 6" topsoil backfill)

The average discrepancy between the depth of contamination and the excavation depth according to the current excavation plan, as shown on Table I, was found to vary from 0 ft without 6" topsoil backfill for site restoration to -0.7 ft with topsoil backfill. (Negative value means that the excavation is deeper than the contamination depth.) The current excavation plan was developed and zoned based on average contamination depths, and was considered that there will be no protection layer above it in the future. Although there are some expected hot areas, the current excavation plan and the results of the cobbles-to-fines investigation are consistent.

Note that, as indicated in the test pit logs, the gravelly material in CF-11 and the lower gravelly material layer in CF-22 are slopewash material, which is not considered representative of the gravelly material of the site. Cobbles-to-fines analysis is not applicable to the slopewash material. Excavation depth of contaminated material at these two locations should be considered individually. These locations have been labelled as "contaminated soil spots" in the current excavation plan.

PYL 4/28/95 Sh. 7
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TABLE 1

COMPARISON OF DEPTH OF CONTAMINATION WITH
EXCAVATION DEPTH ACCORDING TO CURRENT EXCAVATION PLAN

TEST PIT NO.	DEPTH OF CONTAMINATION (ft)	EXCAVATION DEPTH ACCORDING TO CURRENT EXCAVATION PLAN (ft)	DIFFERENCE IN DEPTH (Depth of Contamination - Excavation depth) (ft)
CF-1	0	2	-2
CF-2	5	5	0
CF-3	0 (with 6" topsoil backfill)	2	-2 (with 6" topsoil backfill)
	2 (without 6" topsoil backfill)	2	0 (without 6" topsoil backfill)
CF-4	1	2	-1
CF-5	0 (with 6" topsoil backfill)	3	-3 (with 6" topsoil backfill)
	2 (without 6" topsoil backfill)	3	-1 (without 6" topsoil backfill)
CF-6	5	5	0
CF-7	3	2	1
CF-8	4	8.5	-4.5
CF-9	0	1	-1
CF-10	3	3	0
CF-11	9 (with 6" topsoil backfill)	5	4 (with 6" topsoil backfill)
	10 (without 6" topsoil backfill)	5	5 (without 6" topsoil backfill)
CF-12	2 (with 6" topsoil backfill)	10	-8 (with 6" topsoil backfill)
	3 (without 6" topsoil backfill)	10	-7 (without 6" topsoil backfill)
CF-13	0	1	-1
CF-14	1	2	-1
CF-15	0	2	-2
CF-16	7	8.5	-1.5
CF-17	0	5	-5
	3	5	-2
CF-18	4.5 (with 6" topsoil backfill)	5	-0.5 (with 6" topsoil backfill)
	5.5 (without 6" topsoil backfill)	5	0.5 (without 6" topsoil backfill)
CF-19	5	8.5	-3.5
CF-19A	8 (with 6" topsoil backfill)	5	3 (with 6" topsoil backfill)
	10 (without 6" topsoil backfill)	5	5 (without 6" topsoil backfill)
CF-20	4	1	3
CF-21	0	0	0
CF-22	4	1	3
CF-23	0	0.5	-0.5
CF-24	4	3	1
CF-25	6	5	1
CF-26	4 (with 6" topsoil backfill)	3	1 (with 6" topsoil backfill)
	8 (without 6" topsoil backfill)	3	5 (without 6" topsoil backfill)
CF-27	2 (with 6" topsoil backfill)	3	-1 (with 6" topsoil backfill)
	3 (without 6" topsoil backfill)	3	0 (without 6" topsoil backfill)
CF-28	0 (with 6" topsoil backfill)	5	-5 (with 6" topsoil backfill)
	4 (without 6" topsoil backfill)	5	-1 (without 6" topsoil backfill)
CF-29	2 (with 6" topsoil backfill)	3	-1 (with 6" topsoil backfill)
	4 (without 6" topsoil backfill)	3	1 (without 6" topsoil backfill)
CF-30	4 (with 6" topsoil backfill)	3	1 (with 6" topsoil backfill)
	7 (without 6" topsoil backfill)	3	4 (without 6" topsoil backfill)
AVERAGE			-0.8 (with 6" topsoil backfill) 0.0 (without 6" topsoil backfill)

TABLE II
UMTRA - NATURITA SITE
COBBLES - TO - FINES STATISTICAL DATA SHEET

Test Pit No.	f		C(>#4) Vendor (cobble)			C(<#4) On-Site (Corr.)	C(<#4) Vendor (fines)			Correction Factor 226 Ra(2)/226 Ra(1)
			226 Ra (pCi/g)	230 Th (pCi/g)	232 Th (pCi/g)		226 Ra (2) (pCi/g)	230 Th (pCi/g)	232 Th (pCi/g)	
CF 1	1.86		1.0	0.6	0.0	1.7	0.6	0.8	0.0	0.35
CF 2	3.73		1.2	0.7	0.6	2.2	1.3	1.6	0.0	0.59
CF 3	2.06		0.8	0.7	0.0	3.4	1.2	1.6	0.0	0.35
CF 4	3.01		0.8	0.6	0.2	2.3	0.9	1.7	0.2	0.39
CF 5	3.78		0.2	1.7	0.0	8.5	5.6	7.8	0.4	0.66
CF 6	3.18		0.8	0.8	0.8	3.1	1.3	2.2	0.3	0.42
CF 7	3.38		0.7	0.6	0.3	6.8	6.4	4.3	0.1	0.94
CF 8	3.16		0.3	0.9	0.2	9.0	9.0	9.9	0.0	1.00
CF 9	3.59		1.1	0.5	0.0	4.0	1.8	3.8	0.1	0.45
CF 10	3.72		1.1	1.9	0.2	6.3	7.1	8.6	0.2	1.13
CF 11	N/A		N/A	N/A	N/A	5.6	6.5	5.7	1.2	1.16
CF 12	2.50		0.2	0.5	0.0	4.3	2.5	5.5	0.0	0.58
CF 13 (lower)	N/A		N/A	N/A	N/A	4.0	1.7	3.5	0.0	0.43
CF 13 (upper)	2.78		0.5	0.9	0.0	2.5	0.9	2.5	0.0	0.36
CF 14	3.05		0.8	0.3	0.0	3.1	2.0	2.8	0.6	0.65
CF 15	3.07		1.1	1.7	0.0	10.4	0.7	1.7	0.0	0.07
CF- 16	2.87		0.2	0.6	0.6	1.8	1.7	1.9	0.4	0.94
CF 18	4.39		0.8	0.3	0.0	2.9	0.5	0.7	0.0	0.17
CF 19	1.24		1.1	0.9	0.0	16.4	16.0	15.0	1.5	0.98
CF 19A	1.57		1.0	0.6	0.0	5.0	4.2	3.1	0.5	0.84
CF 20	4.95		0.6	1.0	0.4	18.7	3.4	14.0	1.2	0.18
CF 21	3.24		0.1	0.6	0.0	4.9	3.6	7.0	0.7	0.73
CF 22A	0.43		0.6	0.9	0.4	35.6	29.0	20.0	3.3	0.81
CF 22B	N/A		N/A	N/A	N/A	5.0	3.3	3.5	0.9	0.66
CF 23	3.61		1.0	1.4	0.4	2.5	0.6	1.7	1.1	0.24
CF 24	3.68		0.7	0.6	0.4	9.2	6.7	5.6	0.9	0.73
CF 25	3.67		0.4	0.9	0.0	51.8	35.0	32.0	2.6	0.68
CF 26	4.10		0.5	0.9	0.8	22.3	21.0	19.0	1.1	0.94
CF 27	3.53		1.0	0.1	0.4	6.7	8.0	8.3	0.9	1.19
CF 28	3.42		1.9	0.9	0.6	24.3	22.0	25.0	1.6	0.91
CF 29	2.43		0.3	1.4	0.6	1.4	1.2	0.6	0.2	0.86
CF 30	4.05		1.4	0.5	0.8	11.7	10.0	9.2	1.4	0.85
avg f	3.11	avg C	0.77	0.83	0.27	(Not Applicable to Cobble-to-Fines Calculations)				0.66
n	29	n	29	29	29					
Std. Dev. S	0.97	Std. Dev. S	0.41	0.43	0.29					
sqrt(n)	5.39	sqrt(n)	5.39	5.39	5.39					
t *	1.701	t **	1.701	1.701	1.701					
t (L)	2.80	C (U)	0.90	0.96	0.36					

See Notes on Next Page

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MORRISON KNUDSEN CORPORATION
ENVIRONMENTAL SERVICES DIVISION

Project UMTRA-NAT
Feature CONTAMINATED MATERIAL EXCAVATION
Item COBBLES-TO-FINES ANALYSIS

Contract No. 3885-67
Designed PYL
Checked WYL

Sheet 9
File No. _____
Date 4/26/95
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Notes for Table II Cobbles-to-Fines Data on previous sheet:

1. f = mass partition function
2. t^* = t value for f at lower 95% confidence for $n-1$, where n = number of observations
(see sheet 11 obtained from Attachment 3 of Ref. 1)
3. $f_{(L)}$ = statistical average mass partition function at the lower 95% confidence value
= $f_{(avg)} - t^*(s/\sqrt{n})$ where s = sample standard deviation
4. C = Radionuclide concentration
5. t^{**} = t value for C at upper 95% confidence for $n-1$
(see sheet 11 obtained from Attachment 3 of Ref. 1)
6. $C_{(upper)}$ = statistical cobble radionuclide concentration in the upper 95% confidence value
= $C_{(avg)} + t^{**}(s/\sqrt{n})$

TABLE III
UMTRA - NATURITA SITE

BACKGROUND TEST PITS DATA SHEET

Test Pit No.	f		C(>#4) Vendor (cobble)			C(<#4) On-Site (Corr.)	C(<#4) Vendor (fines)			Correction Factor 226 Ra(2)/226 Ra(1)
			226 Ra (pCi/g)	230 Th (pCi/g)	232 Th (pCi/g)		226 Ra (2) (pCi/g)	230 Th (pCi/g)	232 Th (pCi/g)	
B-1	4.14		0.2	0.5	0.5	2.0	0.6	1.1	0.2	0.30
B-2	2.2		0.4	0.8	0.2	1.6	1.0	0.3	0.2	0.63
B-3	3		0.4	0.6	0.1	3.2	2.0	2.7	0.4	0.63
avg f	3.11	avg C	0.3	0.6	0.3	2.3	1.2	1.4	0.3	0.52
n	3	n	3	3	3	3	3	3	3	
Std. Dev. S	0.97	Std. Dev. S	0.12	0.15	0.21	0.83	0.72	1.22	0.12	

Test Pit No.	f		BULK RADIONUCLIDE CONCENTRATION (C(B))			
			226 Ra (pCi/g)		230 Th	232 Th
			Using Vendor	Using Initial Corr.	(pCi/g)	(pCi/g)
B-1	4.14		0.3	0.6	0.6	0.4
B-2	2.2		0.6	0.8	0.6	0.2
B-3	3		0.8	1.1	1.1	0.2
		avg C	0.6	0.8	0.8	0.3
		n	3	3	3	3
		Std. Dev. S	0.25	0.25	0.29	0.12

Notes:

$$C(B) = C(<#4)[1/(1+f)] + C(>#4)[f/(1+f)]$$

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MK-FERGUSON COMPANY
A MORRISON-KRUESSER COMPANY

CWM Federal Environmental Services, Inc.

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W/L 5/1/95

Attachment 3

CRITICAL VALUES OF t

n-1	t _{.050}
1	6.314
2	2.920
3	2.353
4	2.132
5	2.015
6	1.943
7	1.895
8	1.860
9	1.833
10	1.812
11	1.796
12	1.782
13	1.771
14	1.761
15	1.753
16	1.746
17	1.740
18	1.734
19	1.729
20	1.725
21	1.721
22	1.717
23	1.714
24	1.711
25	1.708
26	1.706
27	1.703
28	1.701
29	1.699
Inf.	1.645

Ref. 1

PYL 4/28/95
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PYL 4/28/95
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NOTE: THIS SEAL IS NOT VALID IN THE STATE OF COLORADO
UNLESS THE ORIGINAL SIGNATURE APPEARS BELOW.

REFERENCE DRAWINGS:

NAT-PS-10-1712	TEMPORARY SITE DRAINAGE AND CONSTRUCTION FACILITIES PLAN
NAT-PS-10-1717	EXISTING UTILITIES PLAN

LEGEND:

APPROXIMATE DEPTH OF CONTAMINATION TO BE EXCAVATED, IN FEET (SEE NOTE 2)
HIGH PRESSURE GAS LINE
EXCAVATION
CONTAMINATED SOIL SPOT

CONTAMINATED MATERIAL EXCAVATION PLAN

MONRISSON KNUDSEN CORPORATION
URTHA PROJECT

PROJECT NO.	DATE
DE-AC04-83AL18796	1/1/84
ORGANIZING NO.	10
NAT-PS-10-1715	

[illegible]

MORRISON KNUDSEN CORPORATION

ENVIRONMENTAL SERVICES DIVISION

Project UMTRA-NAT
Feature CONTAMINATED MATERIAL EXCAVATION
Item COBBLES-TO-FINES ANALYSIS

Contract No. 3885-67
Designed PYL
Checked WYL

Sheet A-1
File No. _____
Date 4/26/95
Date 5/1/95

APPENDIX A

: TEST PIT LOGS

TEST PIT LOG

SITE LOCATION:	PROCESSING SITE
-----------------------	------------------------

DATE - STARTED	FINISHED
----------------	----------

JOB NO. 3885-67

COORDINATES:	N50,370 E 49,920
--------------	------------------

ELEVATION: ~ 5300 ft

TEST PIT SIZE

CONTRACTOR: REAMS

DEPTH TO WATER:	10.5 ft.
-----------------	----------

EXCAVATION METHOD:	BACKHOE 225
--------------------	-------------

LOGGED BY: J. Cercone

REVIEWED BY

Depth of Contaminant = 0'
 Started 16:05. Finished 16:55.
 ----- Excavation depth 2' -----
 !
 Bulk Sample 6 ft. to 11 ft.

SHEET 1 of 1

* Ra 226 e.g. 4.6 = On-site initial corrected value (Ref. 5)

(3.0) = value corrected using average correction

clor (i.e. $\frac{\text{Vendor's}}{\text{Op-site}}$) from Table I, sheet 8

TEST PIT NO. CF-1

4. Then Vendor's value (Ref. 2)

PRC 4/28/95 A
WYL 5/1/95-

TEST PIT LOG

PROJECT: UMTA - NATURITA, COLORADO				JOB NO. 3885-67	
SITE LOCATION: PROCESSING SITE		DATE - STARTED 1/16/95		FINISHED 1/16/95	
COORDINATES: approx. N50,989 E 49,811		ELEVATION: 5302.0 ft		TEST PIT SIZE 4' x 24' x 14'	
CONTRACTOR: REAMS		DEPTH TO WATER: 11 ft.			
EXCAVATION METHOD: BACKHOE 225		LOGGED BY: J. Cercone		REVIEWED BY	

DEPTH	RAD SAMPLE NUMBER (OCS)	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	MATERIAL CLASSIFICATION AND PHYSICAL DESCRIPTION		REMARKS
	RA226 Th30					
0						
1	#1 17.3 (11.4)	CL		clay, slightly plast., moist, med stiff, dark brown		Started 10:10. Finished 11:15. located 15 ft, SE of original site
2	#2 63.1 (41.6)	cinder		cinders in a soil matrix		
3	#3 60.2 (37.7)	ML		silt, dark brown, slightly moist, soft		
4	#4 83.4 (55.0)					
5	#5 40.6 (26.8)					Depth of Contamination = 5' Bulk Sample 6 ft. to 11 ft.
6	#6 2.9 (1.7)	GW		gravel, and cobbles, well sorted (25%S/60%G/15%C), dry cobbles to mx.6"		
7	#7 1.8 (1.2)					
8	#8 1.5 (1.0)			gravels and cobbles, some boulder (max 18"), moist to sat., loose.		
10	#10 1.5 (1.0)					
11	#11 4.4 (2.7)		▽			
13	#13 1.7 (1.1)					
15				test pit terminated at 14 ft		
20						

TEST PIT LOG

PROJECT: UMTRA - NATURITA, COLORADO				JOB NO. 3885-67	
SITE LOCATION: PROCESSING SITE		DATE - STARTED 1/12/95		FINISHED 1/12/95	
COORDINATES: approx. N51,218 E 49,818		ELEVATION:		TEST PIT SIZE	
CONTRACTOR: REAMS		DEPTH TO WATER: 11.5 ft.		4' x 14' x 10.5'	
EXCAVATION METHOD: BACKHOE 225		LOGGED BY: J. Cercone		REVIEWED BY	

DEPTH	RAD SAMPLE NUMBER (OCS)	UNIFIED SOIL CLASSI- FICATION	GRAPHIC LOG	MATERIAL CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
	R2226 11.5				
0	11 22.2 (14.7)	CL		clay, with trash (fill)	Depth of Contamination = 0' (w/ topsoil back fill) Started 10:55. Finished 11:45.
	12 13.6 (9.0)	CL		clay, low plast, dry, light brwn, stiff	Depth of Contamination = 2' (w/ topsoil back fill)
	13 5.6 (3.7)				
	14 5.7 (3.0)				
5	15 0.9 (0.6)	SP/GP		sand & gravel, poorly sorted, light brwn, dry to slightly moist	
	16 1.1 (0.7)				
	17 1.6 (1.1)				
	18 1.2 (0.8)				
	19 2.1 (1.4)	GP		gravel, cobbles and boulders, 50%G/25%C/25%B, light brwn to gray	Bulk Sample 4 ft. to 11 ft.
10	20 0.7 (0.6)			slightly moist to moist

				test pit terminated at 11.5 ft	

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WFL 5/1/95

TEST PIT NO. CF-4

TEST PIT LOG

PROJECT: UMTRA - NATURITA, COLORADO				JOB NO. 3885-67	
SITE LOCATION: PROCESSING SITE		DATE - STARTED 1/12/95		FINISHED 1/12/95	
COORDINATES: N51,600 E 49,800		ELEVATION: 5297.0 ft		TEST PIT SIZE	
CONTRACTOR: REAMS		DEPTH TO WATER: 8.5 ft.		5' x 18' x 11'	
EXCAVATION METHOD: BACKHOE 225		LOGGED BY: J. Cercone		REVIEWED BY	

DEPTH	RAD SAMPLE NUMBER (OCS)	UNIFIED SOIL CLASSI- FICATION	GRAPHIC LOG	MATERIAL CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
0	1 253.6 (118.7)				
	2 9.6 (6.3)	ML		soil with trace roots	Started 9:45. Finished 10:35. Depth of Contamination = 1' 2'
	3 4.6 (7.5)	ML-SM		silty and very fine sand, dry to moist, loose, brown, trace roots	
	4 1.6 (1.1)	SP/GP			
5	5 9.5 (6.3)			sand and gravels, light brwn, cobbles size increases with depth,	Bulk Sample 3 ft. to 8.5 ft. 3-4 ft - sand & gravels (max. 3") 4-5 ft - coarse sand & gravel (max 5") 5-6 ft - sand- Increase in gravels 6-7 ft- coarser sand - Increase gravels 7-8 ft - less sand - more gravels overall sample consist of a sandy gravel t gravel and cobbles with less than 20% sa
	6 1.7 (1.1)				
	7 8.3 (5.5)				
	8 2.1 (1.4)	GP	Σ	cobbles sizes increase below 6.5 ft.	
	9 4.0 (2.6)				
10	10 1.3 (0.9)				
15				test pit terminated at 11.0 ft	
20					

SHEET 1 of 1

TEST PIT NO. CF-4

P/L 4/18/95
W/L 5/11/95

TEST PIT LOG

PROJECT: UMTRA - NATURITA, COLORADO				JOB NO. 3885-67	
SITE LOCATION: PROCESSING SITE		DATE - STARTED 1/18/95		FINISHED 1/18/95	
COORDINATES: N52,400 E 48,800		ELEVATION: 5287.5 ft		TEST PIT SIZE 4' x 22' x 8'	
CONTRACTOR: REAMS		DEPTH TO WATER: 6 ft			
EXCAVATION METHOD: BACKHOE 225		LOGGED BY: J. Cercone		REVIEWED BY	

D E P T H	RAD SAMPLE NUMBER (OCS)	UNIFIED SOIL CLASSI- FICATION	GRAPHIC LOG	MATERIAL CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
	Re 226 Th 30				
0					Depth of Contamination = 0' (w/ topsoil backfill)
1	4.7 (3.2)	ML		slit, moist, soft to loose, brown to light brown, root to 2 feet.	started at 9:35. Completed 10:20
2	11.3 (7.5)	SM		silty sand, slightly moist, loose, tan	Depth of Contamination = 2' (w/o topsoil bulk sample - 3.0ft to 6.0 ft backfill)
3	7.4 (4.9)	GP	▽	gravel, poorly sorted, slightly moist, brown to gray, R: 25% S/ 45-50% G/ 30% C	
4	20.5 (13.5)				
5	2.7 (1.8)				
6	2.3 (1.5)				
7	1.7 (1.1)				
8	2.4 (1.7)				
10				test pit terminated at 8.0 ft	
15				test pit terminated at 13.5 ft	
20					

PK 4/28/95
WFL 5/1/95

A-5

TEST PIT NO. CF-6

TEST PIT LOG

PROJECT: UMTA - NATURITA, COLORADO		JOB NO. 3885-67	
SITE LOCATION: PROCESSING SITE		DATE - STARTED 1/16/95	FINISHED 1/16/95
COORDINATES: N51,000 E 49,600		ELEVATION: 5308.4 ft	TEST PIT SIZE 4' x 30' x 17'
CONTRACTOR: REAMS		DEPTH TO WATER: 16.0 ft.	
EXCAVATION METHOD: BACKHOE 225		LOGGED BY: J. Cercone	REVIEWED BY:

D E P T H	RAD SAMPLE NUMBER (OCS)	UNIFIED SOIL CLASSI- FICATION	GRAPHIC LOG	MATERIAL CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
0	226			(m)	Started 8:45. Finished 9:55.
5	#1 6.1 (4.0) 4.4 #2 35.1 (23.2) 22.0 #3 18.5 (12.5) 8.4 #4 24.7 (16.3) 9.1 #5 25.9 (17.1) 14.0 #6 5.2 (3.4) 3.3	CL-ML cinder CH-CL		silt-clay with some grass and roots. cool and rock cinders layer clay, med to high plast., with lenses of wood debris and a few sand lenses	Depth of Contamination 5' - 5' Bulk Sample 12 ft. to 16.5 ft.
10	#7 2.7 (1.8) 1.2 #8 3.4 (2.2) 1.0 #9 2.9 (1.9) 0.9 #10 2.2 (1.1) 1.1 #11 2.5 (1.2) 0.6 #12 2.7 (1.8) 1.6 #13 1.1 (0.7) 1.2	SP/GP GP		gravel-sand, 60%G/40%S mixture, gray, slightly moist, loose grading, more cobbles below 13 feet, 30%S/60%G/10%C, some boulder (mx 16") at bottom test pit terminated at 17.0 ft	

PTL 4/28/95
 WYL 5/1/95
 4-6

TEST PIT NO. CF-7

TEST PIT LOG

PROJECT: UMTRA - NATURITA, COLORADO			
SITE LOCATION: PROCESSING SITE		DATE - STARTED 1/12/95	FINISHED 1/12/95
COORDINATES: N51,400 E 49,615		ELEVATION: 5296.8 ft	JOB NO. 3885-67
CONTRACTOR: REAMS		DEPTH TO WATER: 10.3 ft.	TEST PIT SIZE 5' x 20' x 13'
EXCAVATION METHOD: BACKHOE 225		LOGGED BY: J. Cercone	REVIEWED BY

DEPTH	RAD SAMPLE NUMBER (OCS)	UNIFIED SOIL CLASSI- FICATION	GRAPHIC LOG	MATERIAL CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
	16.226 17.130				
0	1 228.5 (150.8)	ML		silt with wood and concrete, (fill)	Started 8:00. Finished . ----- 2' Depth of Contamination = 3'
	2 245.2 (161.8)	ML		silt, dry to moist, brown, trace roots.	
	3 76.6 (50.6)				
	4 7.0 (1.3)	1.5			
	5 2.0 (1.3)	0.5	GW	gravels in a sand matrix (50%G/50%S), dry, gray-brown	
	6 7.6 (5.0)	6.5			
	7 1.5 (1.0)	0.8			
	8 22.2 (14.7)	5.4	GP	gravel and cobbles, poorly sorted, dirty gray, moist to wet, boulders up to 18" and 22", 25% sand	
	9 5.7 (3.9)				
	10 1.7 (1.1)	0.9			
	11 2.2 (1.5)	2.3			
		Bedrock		Sandstone bedrock	
15				test pit terminated at 13.5 ft	
20					

SHEET 1 of 1

TEST PIT NO. CF-7

PRC 4/28/95
WYL 5/10/95

TEST PIT LOG

PROJECT: UMTRA - NATURITA, COLORADO				JOB NO. 3885-67	
SITE LOCATION: PROCESSING SITE		DATE - STARTED 1/11/95		FINISHED 1/11/95	
COORDINATES: N51,540 E 49,600		ELEVATION: 5297.2 ft		TEST PIT SIZE 4' x 24' x 12'	
CONTRACTOR: REAMS		DEPTH TO WATER: 10 ft.			
EXCAVATION METHOD: BACKHOE 225		LOGGED BY: J. Cercone		REVIEWED BY	

D E P T H	RAD SAMPLE NUMBER (OCS)	UNITED SOIL CLASSI- FICATION	GRAPHIC LOG	MATERIAL CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
	R6226 ¹ Th230 ²				
1	#1 38.0 (15.8)	ML		silt(tailings), gray, yellowish, trace rotten wood	Started 16:00. Depth of Consolidation = 4'
2	#2 815.9 (545.1)	ML		silt, reddish brown, soft, slightly moist	
3	#3 720.3 (475.9)				
4	#4 232.5 (53.5)				
5	#5 2.8 (1.8)	GW		sand & gravels (40%S/60%G), reddish brown, moist, loose, cave-in easily	
6	#6 1.5 (1.0)				
7	#7 1.4 (0.9)				
8	#8 5.9 (2.9)				
9	#9 7.2 (4.8)				
10	#10 52.4 (34.6)	GP		gravel & cobbles, poorly sorted, gray, loose, boulder up to 16"-18", sandstone fragments at bottom.	
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
				test pit terminated at 12 ft	

TEST PIT NO. CF-9

TEST PIT LOG

PROJECT: UMTRA - NATURITA, COLORADO						JOB NO. 3885-67	
SITE LOCATION:		PROCESSING SITE		DATE - STARTED 1/11/95		FINISHED 1/11/95	
COORDINATES:		N51,800 E 49,600		ELEVATION: 5289.6 ft		TEST PIT SIZE	
CONTRACTOR:		REAMS		DEPTH TO WATER: 4 ft.		6' x 8' x 6'	
EXCAVATION METHOD:		BACKHOE 225		LOGGED BY: J. Cercione		REVIEWED BY	

DEPTH	RAD SAMPLE NUMBER (OCS)	UNIFIED SOIL CLASSI- FICATION	GRAPHIC LOG	MATERIAL CLASSIFICATION AND PHYSICAL DESCRIPTION		REMARKS
0	Pa226					Depth of Contamination: 0'
1	7.9 (5.2)	SP/GP		sand-gravel, 60%S/40%G, poorly sorted, cobble, at to 5", brown,		Started 15:10. Finished 15:30
2	3.1 (2.0)			trace roots, upper terrace materials.		
3	2.0 (1.3)	GP	▽	gravel, & cobble, cobble size to 8", river channel deposit.		
5	1.6 (1.1)					
6	1.8 (1.2)					
				test pit terminated at 6.0 ft		

PTL 4/28/95
WFL 5/1/95

A-9

TEST PIT LOG

PROJECT: UMTA - NATURITA, COLORADO				JOB NO. 3885-67	
SITE LOCATION: PROCESSING SITE		DATE - STARTED 1/18/95		FINISHED 1/18/95	
COORDINATES: N52,000 E 48,800		ELEVATION: 5287.2 ft		TEST PIT SIZE	
CONTRACTOR: REAMS		DEPTH TO WATER: 5 ft.		4' x 19' x 7'	
EXCAVATION METHOD: BACKHOE 225		LOGGED BY: J. Cercone		REVIEWED BY	

DEPTH	RAD SAMPLE NUMBER (OCS)	UNIFIED SOIL CLASSI- FICATION	GRAPHIC LOG	MATERIAL CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
	Ra. 226 / Th. 30				
0					
1	4.7 (3.1)	2.2	CL	clay, low plast, drk brwn, moist, med stiff, trace roots	Started 10:30. Finished 11:00 Bulk sample- 1.5ft to 5 ft. --- 3' Depth of Continuation: 3'
2	70.2 (46.3)				
3	71.0 (46.9)			gravel, 25% sand, poorly sorted, moist, brown, med-dense	
4	4.5 (3.0)	2.8			
5	2.5 (1.7)	2.6	▽		
6	4.0 (2.6)	3.2			
7	2.3 (1.5)	2.3			
				test pit terminated at 7.0 ft	
10					
15					
20					

PTL 4/28/95
WFL 5/1/95

TEST PIT NO. CF-11

TEST PIT LOG

PROJECT: UMTRA - NATURITA, COLORADO				JOB NO. 3885-67	
SITE LOCATION: PROCESSING SITE		DATE - STARTED 1/17/95		FINISHED 1/17/95	
COORDINATES: N50,800 E 49,400		ELEVATION: 5346.4 ft		TEST PIT SIZE	
CONTRACTOR: REAMS		DEPTH TO WATER not encountered		4' x 18' x 11.5'	
EXCAVATION METHOD: BACKHOE 225		LOGGED BY: J. Cercone		REVIEWED BY	

DEPTH	RAD SAMPLE NUMBER (OCS)	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	MATERIAL CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
	* Ra226 Th230				
0	#1 23.0 (21.8)	GP		gravel (road fill)	Started at 8:00. Finished 9:15.
	#2 18.7 (12.3)	S.		sandstone, angular fragments in a clay matrix, dry, reddish brwn, some roots.	
	#3 6.5 (4.3)	L		grading coarse angular sandstone fragments in a clay matrix, dry, dk brwn, some roots.	
	#4 2.1 (1.4)	O			
	#5 3.7 (2.4)	P			
	#6 2.3 (1.5)	E		clay with 15-20% angular frag. sandstone, trace roots.	
	#7 3.6 (2.9)	W			
	#8 4.4 (2.7)	A			
	#9 17.4 (7.5)	SH			
10	#10 26.6 (17.6)	GM/SM		cemented fine gravel in sand matrix.	
	#11 14.1 (9.4)	GC		clay with bedrock structure & texture.	Depth of Contamination = 7' (w/ topsoil backfill) = 10' (without topsoil backfill)
				test pit terminated at 11.5 ft.	

PRC 4/28/95
WFL 5/1/95

TEST PIT LOG

PROJECT: UMTRA - NATURITA, COLORADO		JOB NO. 3885-67	
SITE LOCATION: PROCESSING SITE		DATE - STARTED 1/12/95	FINISHED 1/12/95
COORDINATES: N51,100 E 49,500		ELEVATION: 5301.4 ft	TEST PIT SIZE 4' x 16' x 13'
CONTRACTOR: REAMS		DEPTH TO WATER: 11 ft	
EXCAVATION METHOD: BACKHOE 225		LOGGED BY: J. Cercone	REVIEWED BY:

D H	RAD MPLE MBER DCS)	UNIFIED SOIL CLASSI- FICATION	GRAPHIC LOG	MATERAIL CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
	Ra226 Th230				
1	10.4 (6.7)	8.3	CL	clay, low plast, purple-gray, slightly moist, med stiff, (fill)	Started at 16:25
2	96.7 (12.8)	80.0	GP	Gravels and cobbles, dark gray to blk, underground cables & pvc pipes exposed. (fill)	Depth of Contamination = 2' (w/ topsoil backfill)
3	35.1 (23.2)	14.0			= 5' (w/o topsoil backfill)
4	2.0 (1.3)	0.9			
5	2.4 (1.6)	3.2	ML	silt, yellow-brown, soft, moist to sat, orig. top soil ?	
6	3.4 (2.2)	2.1	CH	clay, med to high plast, gray, moist to sat, old flood plain deposit, strong putric (H2S) odor.	bulk sample - 8 to 12 ft
7	1.5 (1.0)	1.0			
8	1.1 (0.7)	0.9	GW	Gravels, coarse sand matrix, well sorted, dk gray, strong putric smell.	
10	11 2.9 (1.9)	1.5			
	12 2.0 (1.3)	0.5			
	13 2.0 (1.3)	0.9			
15				test pit terminated at 13 ft.	

PYL
W/L
4/28/95
5/1/95

TEST PIT NO. CF-13

TEST PIT LOG

PROJECT: **UMTRA - NATURITA, COLORADO**
 SITE LOCATION: **PROCESSING SITE** DATE - STARTED **1/11/95** FINISHED **1/11/95** JOB NO. **3885-67**
 COORDINATES: **N51,600 E 49,400** ELEVATION: **5289.5 ft** TEST PIT SIZE
 CONTRACTOR: **REAMS** DEPTH TO WATER: **4 ft.** **8' x 22' x 7'**
 EXCAVATION METHOD: **BACKHOE 225** LOGGED BY: **J. Cercione** REVIEWED BY

DEPTH	RAD SAMPLE NUMBER (OCS)	UNIFIED SOIL CLASSI- FICATION	GRAPHIC LOG	MATERIAL CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
	RA 226" TH 230"				
0	#1 2.2 (1.5)	GP		gravels with some cobbles, 15%(sand), 50% (1"-2"), 30-40% (3-5"),	Depth of Contamination = 0'
	#2 1.0 (0.7)			moist, loose, light brwn to gray	Started 14:15. Finished 14:55
	#3 0.7 (0.5)				
	#4 1.2 (0.8)		Σ		Two bulk samples:
	#5 1.7 (1.1)	GW		gravels with cobbles, 10-15% <1", 25%(1-3"), 25%(3-5"), 30% >5"	0'- 4' terrace material
	#6 1.7 (1.2)			dark gray to black, strong smell	4' - 7' old river alluvium
	#7 2.7 (1.8)			test pit terminated at 7 ft.	
10					
15					
20					

SHEET 1 of 1

TEST PIT NO. CF-13

PRC 4/28/95
W/L 5/11/95

A-1

TEST PIT LOG

PROJECT: UMTRA - NATURITA, COLORADO			JOB NO. 3885-67
SITE LOCATION: PROCESSING SITE	DATE - STARTED 1/11/95	FINISHED 1/11/95	TEST PIT SIZE
COORDINATES: N52,000 E 49,400	ELEVATION: 5290 ft		4' x 13' x 7'
CONTRACTOR: REAMS	DEPTH TO WATER: 5.5 ft.		
EXCAVATION METHOD: BACKHOE 225	LOGGED BY: J. Cercone		REVIEWED BY

DEPTH	RAD SAMPLE NUMBER (OC5)	UNIFIED SOIL CLASSI- FICATION	GRAPHIC LOG	MATERIAL CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
	RA226 TH 230				
1	29.3 (19.3)	ML		silt, dk brown, slightly moist, soft, trace root, few gravel.	Started 9:45. Depth of Contamination = 1' - 2'
2	4.0 (2.6)	SP/GP		gravelly, sand to sandy gravels,	
3	4.0 (2.6)				
4	4.7 (3.1)				
5	2.8 (1.8)	GP	Σ	gravels, poorly sorted, light brown	
6	6.0 (4.0)				
				test pit terminated at 7 ft.

MORRISON KNUDSEN CORPORATION
ENGINEERING, CONSTRUCTION AND ENVIRONMENTAL GROUP

TEST PIT NO. CF-15
(OP-10)

TEST PIT LOG

PROJECT: UMTRA - NATURITA, COLORADO		JOB NO. 3885-67	
SITE LOCATION: N51,400 E 49,800		TEST PIT SIZE 6' X 22' X 10'	
COORDINATES: REAMS		ELEVATION: 5297.4 ft	
CONTRACTOR: REAMS		DEPTH TO WATER: 7 ft.	
EXCAVATION METHOD: BACKHOE 225		LOGGED BY: J. Cercone	
		REVIEWED BY	

DEPTH	RAD SAMPLE NUMBER (OC5)	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	MATERIAL CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
0	Ra226				
0.6	2.7 (1.8)	ML		silt, moist, drk brwn, soft to med stiff, abundant roots	Depth of Contamination = 0' Started 11:10. Finished 12:00 Bulk sample- 3ft to 7 ft.
1.4	1.4 (0.9)				
5.2 (3.4)	4.5 (2.7)				
0.8	2.0 (1.3)	GW	▽	gravels, yell sorted, fine-gd. to mx.3", moist, drk brown to brown, a few cobbles mx 5", sand - 20-25%, trace roots	
1.2	0.7 (0.8)				
0.9	0.9 (1.4)				
0.8	0.6 (0.4)	GP		gravels and cobbles, poorly sorted, drity gray, a few boulders to 18"	
1.2	0.7 (0.8)				
10.0				test pit terminated at 10.0 ft.	

SHEET 1 of 1

TEST PIT NO. CF-15
(10)

PRC 4/28/55
WYL 5/11/95

4.

TEST PIT LOG

PROJECT: UMTA - NATURITA, COLORADO		JOB NO. 3885-67	
SITE LOCATION: PROCESSING SITE	DATE - STARTED 1/16/95	FINISHED 1/16/95	TEST PIT SIZE
COORDINATES: ~ N57,500 E49,390	ELEVATION:		
CONTRACTOR: REAMS	DEPTH TO WATER: 15 ft.		
EXCAVATION METHOD: BACKHOE 225	LOGGED BY: J. Cercone	REVIEWED BY	

D E P T H	RAD SAMPLE NUMBER (OCS)	UNIFIED SOIL CLASSI- FICATION	GRAPHIC LOG	MATERIAL CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
	RA 226 TH 130				
0	#1 53.1 (35.0)				Located midway between CF-19 & CF-8 Started 16:00. Finished 17:00 Depth of Contamination = 7' Bulk sample- 8 ft to 14 ft.
	#2 20.3 (13.4)	cinder		cinders in soil matrix, with junk, pipes, bags, sewer pipes, etc. }	
	#3 350.6 (234.4)			gravel in sand-clay matrix, reddish brown } (fill)	
	#4 150.7 (97.5)				
5	#5 210.4 (138.4)	SP		sand, yellow-tan, (tailings ?)	
	#6 307.6 (203.0)				
	#7 157.7 (104.1)	CL		clay, low plast, drk gray, moist, roots, wood, trunk	
	#8 1.8 (1.2)				
	#9 2.5 (1.7)	GP		gravels, poorly sorted, slightly moist, loose to med dense	
10	#10 2.3 (1.5)			8 - 12' 40%S/60%G	
	#11 1.5 (1.0)				
	#12 2.5 (1.7)				
	#13 3.6 (2.4)			12 - 15' 25%S/75%G	
	#14 0.3 (5.5)				
15	#15 16.4 (10.8)				
	#16 1.7 (1.1)			test pit terminated at 16 ft	

PTC 4/28/95
W/L 5/11/95

TEST PIT NO. CF-17

TEST PIT LOG

PROJECT: UMTRA - NATURITA, COLORADO
SITE LOCATION: PROCESSING SITE
COORDINATES: N51,000 E 49,200
CONTRACTOR: REAMS
EXCAVATION METHOD: BACKHOE 225

DATE - STARTED 1/17/95 **FINISHED** 1/17/95
ELEVATION: 5350.0 ft
DEPTH TO WATER: not encountered
LOGGED BY: J. Cercone

JOB NO. 3885-67
TEST PIT SIZE 4' x 22' x 13'
REVIEWED BY

DEPTH	RAD SAMPLE NUMBER (OCS)	UNIFIED SOIL CLASSI- FICATION	GRAPHIC LOG	MATERIAL CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
	RA226 Th230				
0	#1 32.2 (21.2)	GP		gravels with junk, pipes, rebar (fill)	Depth of Contamination = 0' (up to top of backfill) Started 9:35. Finished 10:40
	#2 26.4 (17.9)	GC		decomposed sandstone, & sandstone fragments in a clay matrix dec. rock 30%, rock frag. 40%, clay 30% (slope wash)	Depth of Contamination = 3' (w/o topsoil)
	#3 27.7 (18.3)				
	#4 1.3 (0.9)				
	#5 6.1 (4.0)				
	#6 2.6 (1.7)	GC		clay, highly decomposed rock altered to clay, greenish brown, stiff, moist, with abundant CaCO3 stringers.	
	#7 2.8 (1.8)				
	#8 1.5 (1.0)				
	#9 2.6 (1.7)				
	#10 2.0 (1.3)	GC		sandstone boulders in a clay matrix (slope wash)	
	#11 2.7 (1.8)				
	#12 1.6 (1.1)				
15				test pit terminated at 13 ft.	
20					

SHEET 1 of 1

TEST PIT NO. CF-17

PTL 4/26/95
WYL 5/10/95

TEST PIT LOG

PROJECT: UMTRA - NATURITA, COLORADO
 SITE LOCATION: PROCESSING SITE DATE - STARTED 1/16/95 FINISHED 1/16/95
 COORDINATES: N51,300 E 49,250 ELEVATION: ~ 5303.0 ft
 CONTRACTOR: REAMS DEPTH TO WATER: 17 ft
 EXCAVATION METHOD: BACKHOE 225 LOGGED BY: J. Cercone
 JOB NO. 3885-67
 TEST PIT SIZE 5' x 27' x 20'
 REVIEWED BY

D E P T H	RAD SAMPLE NUMBER (OCS)	UNIFIED SOIL CLASSI- FICATION	GRAPHIC LOG	MATERIAL CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
	RA226 Th270				
0	#1 1.5 (1.0)	I		soil with junk, concrete, old foundtn with bricks	Started 11:15.
	#2 118.4 (78.1)	I		concrete slabs, old wires	
		I		gray, yellowish mat. (tailings)	
5	#4.5 157.0 (107.6)	ML		sandy silt, brown, moist	Depth of Contamination = 4.5' (w/ top soil)
	#5.5 20.0 (13.1)	CL		clay, low to med plast, reddish brown, moist to sat, med stiff.	Depth of Contamination = 5.5' (w/o top soil)
	#7 1.6 (1.1)				
	#8 3.5 (2.3)				
	#9 1.4 (0.9)				
10	#10 2.3 (1.5)				
	#11 1.0 (0.7)				
	#11.5 3.6 (2.4)				
	#12 2.0 (1.3)				
15	#13.5 2.2 (1.5)	GP/GW		gravel & cobbles, dirty gray, moist, loose, well graded at 13 ft.	
	#14.5 1.0 (0.7)				
	#15.5 1.7 (1.1)				
	#17 4.7 (3.1)	GM		gravel in clay matrix, very sticky	
20				sandstone bedrock at 20 ft	
				test pit terminated at 20 ft	

PTL 4/28/95
WYL 5/1/95

TEST PIT LOG

PROJECT: UMTRA - NATURITA, COLORADO				JOB NO. 3885-67	
SITE LOCATION: PROCESSING SITE		DATE - STARTED		FINISHED	
COORDINATES: N51,600 E 49,200		ELEVATION: ~ 5300 ft		TEST PIT SIZE	
CONTRACTOR: REAMS		DEPTH TO WATER: 20 ft		4' x 30' x 20'	
EXCAVATION METHOD: BACKHOE 225		LOGGED BY: J. Cercione		REVIEWED BY	

DEPTH	RAD SAMPLE NUMBER (OCS)	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	MATERIAL CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
	<i>Ra 226 Th 230</i>				
0					
1	8.3 (5.5)	ML-CL		silt and clay, low plast, moist, brown to drk brown, loose to med dense (tailings)	Started 12:00. Finished 13:45
2	692.9 (458.0)				
3	7012.1 (668.0)				
4	728.6 (480.9)	OH		organic clay, some plast, loose, gray-black, moist.	
5	374.2 (247.0)				
6	1.1 (0.7)	CL-ML		clay and silt, drk brown to gray, moist, soft to med stiff	Depth of Contamination 4... 5 8.5
7	2.0 (1.3)				
8	15.1 (10.0)				
9	1.7 (1.1)				
10	7.0 (1.3)				
11	7.7 (5.2)				
12	1.0 (0.7)				
13	3.2 (2.1)				
14	75.0 (16.5)				
15	7.0 (4.6)				
16	5.6 (3.7)				
17	6.1 (4.0)	GP		gravel-sand mixture, poorly sorted, brown	
18	14.2 (9.4)				
19	11.0 (7.3)				
20				test pit terminated at 20 ft	

PRL 4/28/95
WYL 5/1/95

TEST PIT LOG

PROJECT:	UMTRA - NATURITA, COLORADO			JOB NO.	3885-67
SITE LOCATION:	PROCESSING SITE	DATE - STARTED	1/12/95	FINISHED	1/12/95
COORDINATES:	N 51,480 E 49,200	ELEVATION:	5307 ft	TEST PIT SIZE	4' x 16' x 20'
CONTRACTOR:	REAMS	DEPTH TO WATER:	not encountered	LOGGED BY:	J. Cercone
EXCAVATION METHOD:	BACKHOE 225	REVIEWED BY:			

D E P T H	RAD SAMPLE NUMBER (OCS)	UNIFIED SOIL CLASSI- FICATION	GRAPHIC LOG	MATERIAL CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
	Ra226/1130				
1	#1 71.3 (47.1)			tailings, with old wood, concrete, foundation remains.	
2	#2 47.3 (31.2)				
3	#3 47.2 (32.5)				
4	#4 70.7 (46.9)				
5	#5 25.7 (34.7)				
		ML		sandy silt, moist, brown, soft.	
7	#7 34.3 (24.6)				
8	#8 17.8 (12.4)				
9	#9 2.4 (1.6)	3.7 CL		clay, low to med plast, moist to sat, brown, med stiff to soft.	Depth of Continuation = 8' (w/typical backfill)
10	#10 20.7 (12.7)				
	#11 9.3 (6.1)	8.8			Depth of Continuation = 10' (w/o topsoil backfill)
	#12 2.5 (1.7)	1.7			
15	#15 1.1 (0.7)				
	#16 1.8 (1.2)	2.4 GP		gravels in a fine sand matrix, moist to sat., ave gravel 1 1/2", max 4"	Bulk sample- 14ft to 19 ft.
	#17 2.3 (1.5)	1.0			
	#18 2.1 (1.4)	0.8			
	#19 2.2 (1.5)	0.6		below 18 ft. some cobbles max 6".	
20				test pit terminated at 20 ft.	

PRC 4/28/95
WYL 5/1/95

TEST PIT LOG

PROJECT:	UMTRA - NATURITA, COLORADO	JOB NO.	3885-67
SITE LOCATION:	PROCESSING SITE	DATE - STARTED	1/11/95
COORDINATES:	N51,800 E 49,200	FINISHED	1/11/95
CONTRACTOR:	REAMS	ELEVATION:	5289.0 ft
EXCAVATION METHOD:	BACKHOE 225	DEPTH TO WATER:	5 ft
		LOGGED BY:	J. Cercone
		REVIEWED BY:	

D E P T H	RAD SAMPLE NUMBER (OCS)	UNITED SOIL CLASSI- FICATION	GRAPHIC LOG	MATERIAL CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
	Ra 226 th 230				
0	1 38.7 (25.5)	ML		silt, brown, soft, moist	Started 10:15
	2 6.9 (4.6)			gray sand (tailings)	
	3 33.6 (22.2)	SP		gravelly sand (30% S/40%G)	
	4 84.1 (55.5)	GP	▽	gravels & cobbles, poorly sorted, brown-gray, approx. 20-30 % sand, cobbles at to 15", (ave 3"-5")	Depth of Contamination 4'
	5 3.0 (2.0)				
	6 3.0 (2.0)				
	7 26.1 (17.2)			test pit terminated at 7 ft	
10					
15					
20					

TEST PIT NO. CF-21

TEST PIT LOG						
PROJECT: UMTRA - NATURITA, COLORADO						
SITE LOCATION:		PROCESSING SITE		DATE - STARTED 1/10/95	FINISHED 1/10/95	JOB NO. 3885-67
COORDINATES:		N52,200 E 49,200		ELEVATION: 5290 ft	TEST PIT SIZE 4' x 14' x 7'	
CONTRACTOR:		REAMS		DEPTH TO WATER: 5 ft		
EXCAVATION METHOD:		BACKHOE 225		LOGGED BY: J. Cercone	REVIEWED BY	
DEPTH	RAD SAMPLE NUMBER (OCS)	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	MATERIAL CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS	
0	RA24* TR23					
1	#1 3.0 (2.0)	2.0	ML	silt, moist to dry, brown	Depth of Contamination = 0' started at 8:30. Finished at 9:35	
2	#2 5.7 (3.8)	3.1				
3	#3A 4.4 (2.9)	2.7	SP/GP	sandy gravel, yellowish brown, sand(30-40%), gravels (40-50%), moist, dense		
4	#3B 7.7 (4.6)	11				
5	#4 4.0 (2.6)	4.1			bulk sample 2ft to 5ft	
6	#4B 1.2 (2.1)	4.1				
7	#5 1.5 (1.0)	0.6	GW	gravels, well sorted, moist to sat, 1/4"-1/2" 50-60%, coarse sand 30% some cobbles, max 5"		
8	#6 2.4 (1.6)	2.0				
9	#7 1.7 (1.1)	0.5				
10				test-pit terminated at 7ft		
15						
20						

SHEET 1 of 1

TEST PIT NO. CF-21

PRC 4/28/95
WYL 5/11/95
A-2.

TEST PIT LOG

PROJECT: UMTA - NATURITA, COLORADO				JOB NO. 3885-67	
SITE LOCATION: PROCESSING SITE		DATE - STARTED 1/12/95		FINISHED 1/12/95	
COORDINATES: approx. 'N51,385 E 49,014		ELEVATION: 5317.0 ft		TEST PIT SIZE 4' x 16' x 13'	
CONTRACTOR: REAMS		DEPTH TO WATER: not encountered			
EXCAVATION METHOD: BACKHOE 225		LOGGED BY: J. Cercone		REVIEWED BY	

D E P T H	RAD SAMPLE NUMBER (oc 5)	UNIFIED SOIL CLASSI- FICATION	GRAPHIC LOG	MATERIAL CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
	226 230				
1	5.0 (3.3)	GP/SP		gravel and sand (access road fill)	started at 13:30. Finished at 14:25
2	7.2 (4.8)				
3	7.0 (5.1)				
4	54.1 (35.7)	cinder		cinder layer	Two bulk samples:
5	10.7 (7.1)	GM		sandstone fragments and boulders in a sandy silt-clay matrix.	0' - 3' gravel (road fill)
6	2.1 (1.4)			dry, tan to light brown. (slopewash)	Depth of Consolidation = 4'
7	2.0 (1.3)				4' - 9' slopewash material
8	7.8 (5.1)				
9	14.0 (9.2)				
10	2.3 (1.5)				
11	2.8 (1.8)				
12	9.8 (6.1)				
13	2.2 (1.5)				
				test pit terminated at 13 ft	

PRC 4/28/95
WYL 5/1/95
A-2

TEST PIT LOG

PROJECT: UMTRA - NATURITA, COLORADO			JOB NO. 3885-67	
SITE LOCATION: PROCESSING SITE		DATE - STARTED 1/11/95	FINISHED 1/11/95	
COORDINATES: N51,600 E 49,000		ELEVATION: 5297.6 ft	TEST PIT SIZE 4' x 18' x 4'	
CONTRACTOR: REAMS		DEPTH TO WATER: 12 ft		
EXCAVATION METHOD: BACKHOE 225		LOGGED BY: J. Cercone	REVIEWED BY	

D E P T H	RAD SAMPLE NUMBER (OC5)	UNIFIED SOIL CLASSI- FICATION	GRAPHIC LOG	MATERIAL CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
	2.0 (1.3)	ML		silt with some caliche, brown, stiff, dry to slightly moist	Depth of Contamination = 0' started at 12:45
	2.5 (1.7)				
	2.2 (1.5)				
	1.9 (1.3)	CL		clay, low to med plast, reddish brown, med stiff, moist	
		ML		silt, soft, brown, moist	
	2.4 (1.6)	CL		clay, med to high plast, dk brown to black, med stiff, moist to sat	
	3.8 (2.0)				
	2.0 (1.3)				
	3.2 (2.1)				
	3.2 (2.1)				
	1.2 (0.8)	GP		gravels and cobbles in a sand matrix, poorly sorted, gray-brown	bulk sample - 9.5ft to 13 ft
	2.2 (1.5)				
	2.1 (1.4)				
	2.7 (1.8)				
		bedrock		weathered bedrock	
				test pit terminated at 14.5 ft	

PRC 4/28/95
WYL 4/11/95

A-

TEST PIT NO. CF-24

TEST PIT LOG

PROJECT: UMTRA - NATURITA, COLORADO		JOB NO. 3885-67	
SITE LOCATION: PROCESSING SITE		DATE - STARTED 1/10/95	FINISHED 1/10/95
COORDINATES: N52,000 E 49,000		ELEVATION: 5288.9 ft	TEST PIT SIZE 4' x 14' x 9.5'
CONTRACTOR: REAMS		DEPTH TO WATER: 6 ft	
EXCAVATION METHOD: BACKHOE 225		LOGGED BY: J. Cercone	REVIEWED BY

D E P T H	RAD SAMPLE NUMBER (OCS)	UNIFIED SOIL CLASSI- FICATION	GRAPHIC LOG	MATERIAL CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
	RA 226 ¹ 74-230				
0					
1	13.9 (7.2)	13	ML	sandy-silt, brown, slightly moist, some plst, soft, some roots	
2	12.1 (8.0)	9.0			
3	12.3 (8.1)	6.7	SM	sandy silt, brown	
4	14.8 (9.7)		GP/SM	gravels and silty sand, light brown, slightly moist, loose	bulk sample - 3.0ft to 8.0 ft
5	17.7 (11.7)	11.0			Depth of Contamination = 4'
6	10.4 (6.4)	5.6	GP	Σ gravels and cobbles, with putric odor, cobbles to mx6"	
7	10.8 (7.1)	10			
8	2.3 (1.5)	0.6			
9	5.3 (3.5)	5.1			
10			bedrock	sandstone bedrock, light green	
15				test pit terminated at 8.5 ft	
20					

SHEET 1 of 1

TEST PIT NO. CF-24

FILE 4/28/95
WYL 5/1/95

A-2

TEST PIT LOG

PROJECT: UMTA - NATURITA, COLORADO				JOB NO. 3885-67	
SITE LOCATION: PROCESSING SITE		DATE - STARTED 1/10/95		FINISHED 1/10/95	
COORDINATES: N52,400 E 49,000		ELEVATION: 5286 ft		TEST PIT SIZE 3' x 16' x 10'	
CONTRACTOR: REAMS		DEPTH TO WATER: 8 ft			
EXCAVATION METHOD: BACKHOE 225		LOGGED BY: J. Cercone		REVIEWED BY	

DEPTH	RAD SAMPLE NUMBER (OCS)	UNIFIED SOIL CLASSI- FICATION	GRAPHIC LOG	MATERIAL CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
	RA 226 # 17230				
1	3.1 (2.0)	ML		silt, dk brown, soft to loose, slightly moist, trace roots	started at 16:15. Completed 17:15 bulk sample - 3.0ft to 8.0 ft ----- 5' Depth of Contamination = 6'
2	5.9 (3.9)	SP		sand lense, tan, loose	
3	5.3 (3.5)	SP/GP		fine to coarse sand-gravels, light brown, dense gravel at to 8"	
4	387.0 (255.2)	GP	▽	gravels & cobbles, light brwn to gray, poorly sorted 20% sand, 60% gravel max. 3", 10-15% cobble max 5", a few boulders max 15"	
5	16.4 (10.8)				
6	84.8 (56)				
7	15.3 (10.1)				
8	18.1 (11.9)			test pit terminated at 8 ft.	

PRC 4/28/95
WYL 5/11/95

A-1

TEST PIT LOG					
PROJECT: UMTRA - NATURITA, COLORADO					JOB NO. 3885-67
SITE LOCATION: PROCESSING SITE		DATE - STARTED 1/10/95		FINISHED 1/10/95	
COORDINATES: N51,800 E 48,800		ELEVATION: 5290 ft		TEST PIT SIZE 4' x 12' x 7'	
CONTRACTOR: REAMS		DEPTH TO WATER: 6 ft			
EXCAVATION METHOD: BACKHOE 225		LOGGED BY: J. Cercone		REVIEWED BY	
DEPTH	RAD SAMPLE NUMBER (OC5)	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	MATERIAL CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
	Pa226 ⁴⁸ Th-230				
0					
1	1327.5 (216.2)	ML		sandy silt, reddish brown, moist, soft to med. stiff	started at 15:45. Completed 16:30
2	572.7 (246.0)				
3	277.7 (182.3)				
4	175.6 (115.7)				
5	6.2 (4.1)	GP	∇	Gravels poorly sorted, with lenses of sand silt, reddish brown, moist to sat., loose	Depth of Contamination = 4' (w/ topsoil backfill) bulk sample - 4.0ft to 7.0 ft
6	29.1 (19.2)	GP		gravels with brushes, small trees, branches	
7	8.2 (5.4)				
8	36.0 (23.8)			test pit terminated at 7 ft	Depth of Contamination = 8' (w/o topsoil backfill)
10					
15					
20					

PTL 4/28/95
 WYL 5/11/95
 B-2

TEST PIT LOG

PROJECT:	UMTRA - NATURITA, COLORADO			JOB NO.	3885-67
SITE LOCATION:	PROCESSING SITE	DATE - STARTED	1/10/95	FINISHED	1/10/95
COORDINATES:	N52,200 E 48,800	ELEVATION:	~ 5287.1 ft		
CONTRACTOR:	REAMS	DEPTH TO WATER:	7 ft		
EXCAVATION METHOD:	BACKHOE 225	LOGGED BY:	J. Cercone		
					REVIEWED BY

D E P T H	RAD SAMPLE NUMBER (OC'S)	UNIFIED SOIL CLASSI- FICATION	GRAPHIC LOG	MATERIAL CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
	Re 226 ⁸ 16.270				
0	1 9.5 (6.9)	5.8	CL	clay, low plast, moist, brown, shallow root	started at 14:00. Completed 14:30 Depth of Contamination = 2' (w/typical backfill) bulk sample - 3.0ft to 7.0 ft Depth of Contamination = 3' (w/o typical backfill)
1	2 240.0 (158.4)		GP/SP	gravels-sand, variegated color, 20% coarse sand, 30% gravel up to max. 5"	
2	3 37.8 (24.9)				
3	4 2.0 (1.3)	1.1			
4	5 1.9 (1.3)	0.8	GP	cobbles & gravels, poorly sorted, moist to sat, gravel size increases with depth, approx 60% gravels and 40% fines.	
5	6 7.5 (5.0)	7.4			
6	7 6.1 (4.0)	5.6			
7	8 1.7 (1.1)	1.1			
10				test pit terminated at 9 ft	

PTL 4/28/95
W/L 5/1/95
A-2

TEST PIT NO. CF-28

TEST PIT LOG

PROJECT: UMTRA - NATURITA, COLORADO				JOB NO. 3885-67	
SITE LOCATION: PROCESSING SITE		DATE - STARTED 1/10/95		FINISHED 1/10/95	
COORDINATES: N52,600 E 48,800		ELEVATION: 5288 ft		TEST PIT SIZE	
CONTRACTOR: REAMS		DEPTH TO WATER: 5 ft		4' x 16' x 8'	
EXCAVATION METHOD: BACKHOE 225		LOGGED BY: J. Cercione		REVIEWED BY	

D E P T H	RAD SAMPLE NUMBER (OCS)	UNIFIED SOIL CLASSI- FICATION	GRAITIC LOG	MATERIAL CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
	Rad 2.6' 7' 2.70				
0					
1	6.2 (4.1)	5.8	CL	clay, low plst, moist, brown, soft	Depth of Contamination = 0' (w/ topsoil back fill) started at 10:45. Completed 11:10
2	6.1 (4.0)	1.9			
3	13.4 (8.8)	5.6	ML	silt, light brown, soft, moist, roots	
4	11.1 (7.3)	8.7	SM	silty sand, light brown, loose, moist	Depth of Contamination = 4' (w/o topsoil back fill) bulk sample - 4.0 ft to 6.0 ft 5'
5	7.2 (1.7)	1.3	GW	gravel in a sand matrix, 30% <1/4", 50% 1/4"-2", 20% >2", gray	
6	4.1 (2.7)	2.0			
7	27.7 (18.3)				
8	23.2 (15.3)				
10				test pit terminated at 8 ft	
15					
20					

SHEET 1 of 1

TEST PIT NO. CF-28

PRC 4/28/95
W/L 5/1/95

TEST PIT LOG

PROJECT: UMTRA - NATURITA, COLORADO			JOB NO. 3885-67	
SITE LOCATION:	PROCESSING SITE	DATE - STARTED	1/10/95	FINISHED 1/10/95
COORDINATES:	N52,000 E 48,600	ELEVATION:	5288.1 ft	
CONTRACTOR:	REAMS	DEPTH TO WATER:	6.5 ft	
EXCAVATION METHOD:	BACKHOE 225	LOGGED BY:	J. Cercone	
			REVIEWED BY	

DEPTH	RAD SAMPLE NUMBER (ocs)	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	MATERIAL CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
	RA 226 ⁹¹ Th-230 ⁹²				
0					
1	#1 49.2 (3.5)	ML		silt, low plst, moist, brown, few scattered gravels, some roots	started at 13:15. Completed 13:35 Depth of Contamination = 2' (w/o topsoil backfill) bulk sample - 4.0ft to 7.0 ft _____ 3' Depth of Contamination = 4' (w/ topsoil backfill) Groundwater appeared to be from the (slopewash) area rather than from alluv orig.
2	#2 108.2 (7.4)	GP		gravel, light brown	
3	#3 11.9 (7.9)	SM		silty sand, light brown, trace roots	
4	#4 11.2 (7.4)	GP		gravels, poorly sorted, (60% G/ 40% S), moist to sat., gray, ave gravel size 2", max 5"	
5	#5 3.0 (2.0)				
6	#6 2.8 (1.8)				
7				bedrock(sandstone) at 7 ft	
8				test pit terminated at 7 ft	
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

PTL 4/28/95
W/L 5/11/95

TEST PIT NO. CF-30

TEST PIT LOG

PROJECT: UMTRA - NATURITA, COLORADO				JOB NO. 3885-67	
SITE LOCATION: PROCESSING SITE		DATE - STARTED 1/10/95		FINISHED 1/10/95	
COORDINATES: N52,400 E 48,600		ELEVATION: 5290 ft		TEST PIT SIZE	
CONTRACTOR: REAMS		DEPTH TO WATER: 12 ft		4' x 16' x 13'	
EXCAVATION METHOD: BACKHOE 225		LOGGED BY: J. Cercone		REVIEWED BY	

D E P T H	RAD SAMPLE NUMBER (OCS)	UNITED SOIL CLASSI- FICATION	GRAPHIC LOG	MATERIAL CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
	Ra 226 ⁴ Th-230 ⁴				
0					
1	#1 44.2.8 (292.2)	SM		gravelly sandy silt, brwn, moist, soft to loose, some roots	started at 9:00. Completed 10:30
2	#2 382.9 (252.7)	CL		clay, low plast, dk brwn, some roots, moist, med stiff	
3	#3 1677.6 (1107.3)				
4	#4 278.8 (184.0)	ML		silt, light brwn, soft	Depth of Contamination = 4' (w/ topsoil backfill)
5	#5 11.3 (7.5)				
6	#6 12.6 (8.3)				
7	#7 11.8 (7.8)	CL		clay, med to low plast, brwn, moist to slight moist, med stiff	Depth of Contamination = 7' (w/ topsoil backfill)
8	#8 3.7 (2.4)				
9	#9 4.8 (3.2)				
10	#10 1.7 (1.1)	GP	▽	gravels, poorly sorted, gray to brwn., 10-15% <1/4", 50% 1/4"-2"	bulk sample - 9.5ft to 13.0 ft
11	#11 5.4 (3.6)			25% 3-5", 10-15% >5"	
12	#12 6.0 (4.0)				
13	#13 23.6 (15.6)				
14	#14 7.6 (1.7)				Below 13 ft water inflow very fast
15					
20				test pit terminated at 13.5 ft	

SHEET 1 of 1

TEST PIT NO. CF-30

RYL 4/28/95
WYL 5/1/95

TEST PIT LOG

PROJECT: UMTRA - NATURITA, COLORADO		JOB NO. 3885-67	
SITE LOCATION: BACKGROUND		DATE - STARTED 1/17/95	FINISHED 1/17/95
COORDINATES: N50,600 E 50,400		TEST PIT SIZE 6'x20'x8'	
CONTRACTOR: REAMS		ELEVATION: 5303.7 ft	
EXCAVATION METHOD: BACKHOE 225		DEPTH TO WATER: 6.0 ft.	
		LOGGED BY: J. Cicone	REVIEWED BY

DEPTH	RAD SAMPLE NUMBER (OC S)	UNIFIED SOIL CLASSIFICATION	GRAPHIC LOG	MATERIAL CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
	^{**} R0226 (PC/5)				
	^{**} Th230 (PC/9)				
0		CB/CL		top soil - contaminated wind blown	Started 14:25. Finished 15:15.
1	7.2 (1.5)	GP	▽	Gravel and Sand (50%-50% mixture), Gravel (mx 3"). Drk Brwn, moist, some roots, gravel size increases with depth (mx-6") and sand percentage decreases. Below 6 ft. grading more cobbles, a few bouldes up to 15" R: 15%S/65%G/20%C.	Bulk Sample 1 ft. to 6.0 ft. Test pit cave in badly below 6 feet.
2	6.6 (1.1)				
3	2.1 (1.4)				
4	2.0 (1.3)				
5	2.7 (1.7)				
6	1.6 (1.1)				
7	2.3 (1.3)				
8	(C.7)				
10				Test Pit terminated at 8.0 ft.	
15					
20					

RYL 4/28/95
W/L 5/1/95

TEST PIT LOG

PROJECT: UMITRA - NATURITA, COLORADO
SITE LOCATION: BACKGROUND DATE - STARTED 1/17/95 FINISHED 1/17/95
COORDINATES: N51,000 E 50,000 ELEVATION: 5298.2 ft
CONTRACTOR: REAMS DEPTH TO WATER: 5.5 ft
EXCAVATION METHOD: BACKHOE 225 LOGGED BY: J. Cicone
JOB NO. 3885-67
TEST PIT SIZE 4'x18'x6.5'
REVIEWED BY

D E P T H	RAD SAMPLE NUMBER (OCS)	UNIFIED SOIL CLASSI- FICATION	GRAPHIC LOG	MATERIAL CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
	Rc. 726 / Th. 230 (pc-1/3) (pc-1/3)				
#1		CLML		top soil, organic clay/silt - contaminated by wind blown	Started 15:50. Finished 16:15.
#2 2.2 (1.5)					
#3 2.5 (1.7)					
#4 1.6 (1.1)		GP		Gravels in a Sand matrix, R: 40%S/40%G/20%C, moist, gray to light brown, loose, cobbles to 6". Sand content increases with depth, and less cobbles, 50%S/50%G.	
#5 1.2 (0.8)			Σ		
#6					
#7				Test pit terminated at 6.5ft.	Bulk Sample 1 ft. to 5.5 ft. water inflows fast in all directions.
10					
15					
20					

PRC 4/28/95
W/L 5/1/95

TEST PIT LOG

PROJECT: **UMTRA - NATURITA, COLORADO** JOB NO. **3885-67**
 SITE LOCATION: **BACKGROUND** DATE - STARTED **1/17/95** FINISHED **1/17/95** TEST PIT SIZE
 COORDINATES: **N50,300 E 50,700** ELEVATION: **~ 5300 ft** **4'x18'x9'**
 CONTRACTOR: **REAMS** DEPTH TO WATER: **6 ft.**
 EXCAVATION METHOD: **BACKHOE 225** LOGGED BY: **J. Cercone** REVIEWED BY

DEPTH	RAD SAMPLE NUMBER (OC5)	UNIFIED SOIL CLASSI- FICATION	GRAPHIC LOG	MATERIAL CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
	^{PR} Ra226 (pc/g)				
	^{PR} Th230 (pc/g)				
1	11.9 (7.9)	CL		clay, low plast, dry to slightly moist, brown to tan, with roots	Started 12:45. Finished 13:50.
2	7.5 (5.0)				
3	2.5 (1.7)				Bulk Sample 2 ft. to 9 ft.
4	3.1 (2.0)	GP		gravel, sand and cobbles, 30%S/65%G/5%C	
5	1.7 (1.1)			dry to slightly moist, light brown, cobble to 10"	
6	2.2 (1.5)			grading more cobbles 20%S/50%G/30%C	
7	1.4 (0.9)				
8	2.3 (1.5)				
10				test pit terminated at 9 ft	
15					
20					

PRC 4/28/95
WYL 5/11/95

MORRISON KNUDSEN CORPORATION

ENVIRONMENTAL SERVICES DIVISION

Project UMTRA-NAT
Feature CONTAMINATED MATERIAL EXCAVATION
Item COBBLES-TO-FINES ANALYSIS

Contract No. 3885-67
Designed PYL
Checked wyl

Sheet B-1
File No. _____
Date 4/26/95
Date 5/1/95

APPENDIX B

LAB (VENDOR) DATA

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

RECEIVED-MKE

MAR 31 1995

ULMTRA S.F.

March 29, 1995

MKES Doc. No. *B-2*
3885-NAT-L-02-01571-00

PYL 4/28/95
WYL 5/1/95

REPLY TO: MK-FERGUSON COMPANY
REMEDIAL ACTIONS
CONTRACTOR-UMTRA PROJECT
P.O. BOX 8138
ALBUQUERQUE, NEW MEXICO U.S.A. 87119

95-3050-225

Mr. Woody Woodworth
DOE Site Manager
U.S. Department of Energy
Uranium Mill Tailings Remedial Action Project Office
2155 Louisiana, N.E.
Suite 4000
Albuquerque, NM 87110

SUBJECT: NATURITA COBBLES TO FINES LAB DATA

REFERENCE: DOE Contract No. DE-AC04-83AL18796

Dear Mr. Woodworth:

Enclosed, as requested, is the subject data for your information and use.

Should you have any questions, please contact Bob Hindman of my staff at 246-2557.

Sincerely,

MR. FERGUSON COMPANY

C. R. Spencer
Construction Engineering Manager

CRS/RCH/spp

Enclosures: as stated

cc: w/o attachments:
M. Scoutaris, DOE
E. Artiglia, TAC

bcc: w/o attachments:
C. R. Spencer
File - SJM
bcc: w/attachments:
D. R. Sanders
File

1425KZ

Ref 3

BARRINGER LABORATORIES INC.

15000 W. 6TH AVE., SUITE 300 GOLDEN, CO 80401 (303) 277-1687 FAX (303) 277-1689

PYL 4/28/95
WYL 5/1/95

B-3

22-Feb-95

Page: R-1
Job: 951245E
Status: Final

MK-FERGUSON (Naturita)

*V Nat
Equalibrium
Data*

REQUEST

#27

Sample Id: NAT-SS-0876-0024-CTF

Lab Id: 951245-1

Date Sampled: 10-Jan-95

Project: Naturita

Matrix: Soil

Analyte	Fraction	Conc. + 1σ		LLD	Date Analyzed
Th-230	Total	141±3	pCi/g	0.4	02/16-02/21
U-234	Total	45±2	pCi/g	0.4	02/17-02/22
U-235	Total	2.2±0.5	pCi/g	0.4	02/17-02/22
U-238	Total	45±2	pCi/g	0.4	02/17-02/22

Sample Id: NAT-SS-0885-0025-CTF

Lab Id: 951245-2

Date Sampled: 10-Jan-95

Project: Naturita

Matrix: Soil

Analyte	Fraction	Conc. + 1σ		LLD	Date Analyzed
Th-230	Total	517±6	pCi/g	0.4	02/16-02/21
U-234	Total	106±3	pCi/g	0.4	02/17-02/22
U-235	Total	6.3±0.7	pCi/g	0.4	02/17-02/22
U-238	Total	113±3	pCi/g	0.4	02/17-02/22

Sample Id: NAT-SS-0996-0022-CTF

Lab Id: 951245-3

Date Sampled: 12-Jan-95

Project: Naturita

Matrix: Soil

Analyte	Fraction	Conc. + 1σ		LLD	Date Analyzed
Th-230	Total	66±2	pCi/g	0.4	02/16-02/21
U-234	Total	38±2	pCi/g	0.4	02/17-02/22
U-235	Total	1.2±0.4	pCi/g	0.4	02/17-02/22
U-238	Total	39±2	pCi/g	0.4	02/17-02/22

BARRINGER LABORATORIES INC.

15000 W. 6TH AVE., SUITE 300 GOLDEN, CO 80401 (303) 277-1657 FAX (303) 277-1689

MR-FERGUSON (Naturita)

PYL 4/28/95

wyl 5/1/95

27-Feb-95

Page: R-1

Job: 951243E

Status: Final

Analyte: Th-230

Fraction: Total

Method: USAEC

Units: pCi/g

Project: Naturita

Date Analyzed: 02/08-02/24

LLD: 0.4

Th-230
Results

Lab Id	Date Sampled	Matrix	Sample Id	Concentration+ 1σ	LLD
951243-1	10-Jan-95	Soil	NAT-SS-0845-28-CTF	5.8±0.6	0.4
951243-2	10-Jan-95	Soil	NAT-SS-0846-28-CTF	1.9±0.4	0.4
951243-3	10-Jan-95	Soil	NAT-SS-0847-28-CTF	5.6±0.6	0.4
951243-4	10-Jan-95	Soil	NAT-SS-0848-28-CTF	8.7±0.7	0.4
951243-5	10-Jan-95	Soil	NAT-SS-0849-28-CTF	1.3±0.3	0.4
951243-6	10-Jan-95	Soil	NAT-SS-0850-28-CTF	2.0±0.4	0.4
951243-7	10-Jan-95	Soil	NAT-SS-0856-29-CTF	8.2±0.7	0.4
951243-8	10-Jan-95	Soil	NAT-SS-0857-29-CTF	0.8±0.3	0.4
951243-9	10-Jan-95	Soil	NAT-SS-0858-29-CTF	1.1±0.4	0.4
951243-10	10-Jan-95	Soil	NAT-SS-0863-30-CTF	10±1	0.4
951243-11	10-Jan-95	Soil	NAT-SS-0864-30-CTF	13±1	0.4
951243-12	10-Jan-95	Soil	NAT-SS-0865-30-CTF	8.8±0.9	0.4
951243-13	10-Jan-95	Soil	NAT-SS-0866-30-CTF	2.6±0.6	0.4
951243-14	10-Jan-95	Soil	NAT-SS-0867-30-CTF	3.2±0.6	0.4
951243-15	10-Jan-95	Soil	NAT-SS-0868-30-CTF	1.0±0.4	0.4
951243-16	10-Jan-95	Soil	NAT-SS-0869-30-CTF	5.6±0.7	0.4
951243-17	10-Jan-95	Soil	NAT-SS-0870-30-CTF	7.7±0.9	0.4
951243-18	10-Jan-95	Soil	NAT-SS-0872-30-CTF	1.1±0.4	0.4
951243-19	10-Jan-95	Soil	NAT-SS-0873-24-CTF	13±1	0.4
951243-20	10-Jan-95	Soil	NAT-SS-0874-24-CTF	9.0±0.9	0.4
951243-21	10-Jan-95	Soil	NAT-SS-0875-24-CTF	6.7±0.8	0.4
951243-22	10-Jan-95	Soil	NAT-SS-0878-24-CTF	5.6±0.7	0.4
951243-23	10-Jan-95	Soil	NAT-SS-0879-24-CTF	10±1	0.4
951243-24	10-Jan-95	Soil	NAT-SS-0880-24-CTF	0.6±0.3	0.4
951243-25	10-Jan-95	Soil	NAT-SS-0881-24-CTF	5.1±0.7	0.4
951243-26	10-Jan-95	Soil	NAT-SS-0882-25-CTF	0.9±0.4	0.4
951243-27	10-Jan-95	Soil	NAT-SS-0883-25-CTF	0.9±0.4	0.4
951243-28	10-Jan-95	Soil	NAT-SS-0884-25-CTF	1.9±0.5	0.4
951243-29	10-Jan-95	Soil	NAT-SS-0894-26-CTF	0.9±0.4	0.4
951243-30	10-Jan-95	Soil	NAT-SS-0896-26-CTF	7.4±0.8	0.4
951243-31	10-Jan-95	Soil	NAT-SS-0898-27-CTF	5.8±0.7	0.4
951243-32	10-Jan-95	Soil	NAT-SS-0901-27-CTF	1.1±0.3	0.4
951243-33	10-Jan-95	Soil	NAT-SS-0902-27-CTF	0.8±0.3	0.4
951243-34	10-Jan-95	Soil	NAT-SS-0903-27-CTF	7.4±0.6	0.4
951243-35	10-Jan-95	Soil	NAT-SS-0904-27-CTF	5.6±0.6	0.4
951243-36	10-Jan-95	Soil	NAT-SS-0905-27-CTF	1.1±0.3	0.4
951243-37	11-Jan-95	Soil	NAT-SS-0907-14-CTF	2.4±0.4	0.4
951243-38	11-Jan-95	Soil	NAT-SS-0908-14-CTF	4.7±0.5	0.4
951243-39	11-Jan-95	Soil	NAT-SS-0909-14-CTF	4.2±0.5	0.4
951243-40	11-Jan-95	Soil	NAT-SS-0910-14-CTF	3.1±0.4	0.4
951243-41	11-Jan-95	Soil	NAT-SS-0911-14-CTF	5.1±0.5	0.4
951243-42	11-Jan-95	Soil	NAT-SS-0913-20-CTF	4.4±0.4	0.4

BARRINGER LABORATORIES INC.

15000 W. 6TH AVE., SUITE 300 GOLDEN, CO 80401 (303) 277-1687 FAX (303) 277-1689

MK-FERGUSON (Naturita)

PYL 4/28/95

B-5

WYL 5/1/95

27-Feb-95

Page: R-2

Job: 951243E

Status: Final

Analyte: Th-230

Fraction: Total

Method: USAEC

Units: pCi/g

Project: Naturita

Date Analyzed: 02/08-02/24

LLD: 0.4

Lab Id	Date Sampled	Matrix	Sample Id	Concentration ± 1σ	LLD
951243-43	11-Jan-95	Soil	NAT-SS-0916-20-CTF	1.0±0.2	0.4
951243-44	11-Jan-95	Soil	NAT-SS-0917-20-CTF	2.3±0.3	0.4
951243-45	11-Jan-95	Soil	NAT-SS-0919-21-CTF	2.0±0.3	0.4
951243-46	11-Jan-95	Soil	NAT-SS-0920-21-CTF	3.1±0.4	0.4
951243-47	11-Jan-95	Soil	NAT-SS-0921-21-CTF	2.7±0.4	0.4
951243-48	11-Jan-95	Soil	NAT-SS-0922-21-CTF	11±1	0.4
951243-49	11-Jan-95	Soil	NAT-SS-0923-21-CTF	4.1±0.4	0.4
951243-50	11-Jan-95	Soil	NAT-SS-0924-21-CTF	4.1±0.7	0.4
951243-51	11-Jan-95	Soil	NAT-SS-0925-21-CTF	0.6±0.2	0.4
951243-52	11-Jan-95	Soil	NAT-SS-0926-21-CTF	2.0±0.3	0.4
951243-53	11-Jan-95	Soil	NAT-SS-0927-21-CTF	0.5±0.2	0.4
951243-54	11-Jan-95	Soil	NAT-SS-0928-13-CTF	0.6±0.2	0.4
951243-55	11-Jan-95	Soil	NAT-SS-0929-13-CTF	0.4±0.2	0.4
951243-56	11-Jan-95	Soil	NAT-SS-0930-13-CTF	1.0±0.3	0.4
951243-57	11-Jan-95	Soil	NAT-SS-0931-13-CTF	0.3±0.2	0.4
951243-58	11-Jan-95	Soil	NAT-SS-0932-13-CTF	0.4±0.2	0.4
951243-59	11-Jan-95	Soil	NAT-SS-0933-13-CTF	0.6±0.2	0.4
951243-60	11-Jan-95	Soil	NAT-SS-0934-13-CTF	0.7±0.2	0.4
951243-61	11-Jan-95	Soil	NAT-SS-0935-23-CTF	1.1±0.3	0.4
951243-62	11-Jan-95	Soil	NAT-SS-0936-23-CTF	0.7±0.2	0.4
951243-63	11-Jan-95	Soil	NAT-SS-0937-23-CTF	0.7±0.2	0.4
951243-64	11-Jan-95	Soil	NAT-SS-0938-23-CTF	0.4±0.2	0.4
951243-65	11-Jan-95	Soil	NAT-SS-0939-23-CTF	1.0±0.3	0.4
951243-66	11-Jan-95	Soil	NAT-SS-0940-23-CTF	0.9±0.3	0.4
951243-67	11-Jan-95	Soil	NAT-SS-0941-23-CTF	0.8±0.2	0.4
951243-68	11-Jan-95	Soil	NAT-SS-0942-23-CTF	0.5±0.2	0.4
951243-69	11-Jan-95	Soil	NAT-SS-0943-23-CTF	0.7±0.2	0.4
951243-70	11-Jan-95	Soil	NAT-SS-0944-23-CTF	0.6±0.2	0.4
951243-71	11-Jan-95	Soil	NAT-SS-0945-23-CTF	0.8±0.2	0.4
951243-72	11-Jan-95	Soil	NAT-SS-0946-23-CTF	0.5±0.2	0.4
951243-73	11-Jan-95	Soil	NAT-SS-0947-23-CTF	1.6±0.3	0.4
951243-74	11-Jan-95	Soil	NAT-SS-0952-8-CTF	0.7±0.2	0.4
951243-75	11-Jan-95	Soil	NAT-SS-0953-8-CTF	0.5±0.2	0.4
951243-76	11-Jan-95	Soil	NAT-SS-0954-8-CTF	0.7±0.2	0.4
951243-77	11-Jan-95	Soil	NAT-SS-0955-8-CTF	3.5±0.4	0.4
951243-78	11-Jan-95	Soil	NAT-SS-0956-8-CTF	2.7±0.4	0.4
951243-79	11-Jan-95	Soil	NAT-SS-0958-9-CTF	7.8±0.6	0.4
951243-80	11-Jan-95	Soil	NAT-SS-0959-9-CTF	1.0±0.2	0.4
951243-81	11-Jan-95	Soil	NAT-SS-0960-9-CTF	1.4±0.3	0.4
951243-82	11-Jan-95	Soil	NAT-SS-0961-9-CTF	1.4±0.3	0.4
951243-83	11-Jan-95	Soil	NAT-SS-0962-9-CTF	0.8±0.2	0.4
951243-84	11-Jan-95	Soil	NAT-SS-0964-3-CTF	11.6±0.7	0.4

BARRINGER LABORATORIES INC.

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MK-FERGUSON (Naturita)

PXL 4/28/95

WYL 5/1/95

27-Feb-95

Page: R-3

Job: 951243E

Status: Final

Analyte: Th-230

Fraction: Total

Method: USAEC

Units: pCi/g

Project: Naturita

Date Analyzed: 02/08-02/24

LLD: 0.4

Lab Id	Date Sampled	Matrix	Sample Id	Concentration ± 1σ	LLD
951243-85	12-Jan-95	Soil	NAT-SS-0965-3-CTF	3.9±0.4	0.4
951243-86	12-Jan-95	Soil	NAT-SS-0966-3-CTF	3.1±0.4	0.4
951243-87	12-Jan-95	Soil	NAT-SS-0967-3-CTF	0.1±0.1	0.4
951243-88	12-Jan-95	Soil	NAT-SS-0968-3-CTF	0.7±0.2	0.4
951243-89	12-Jan-95	Soil	NAT-SS-0969-3-CTF	0.8±0.2	0.4
951243-90	12-Jan-95	Soil	NAT-SS-0970-3-CTF	0.8±0.2	0.4
951243-91	12-Jan-95	Soil	NAT-SS-0971-3-CTF	0.8±0.4	0.4
951243-92	12-Jan-95	Soil	NAT-SS-0972-3-CTF	0.5±0.4	0.4
951243-93	12-Jan-95	Soil	NAT-SS-0974-4-CTF	8.6±0.9	0.4
951243-94	12-Jan-95	Soil	NAT-SS-0975-4-CTF	0.0±0.3	0.4
951243-95	12-Jan-95	Soil	NAT-SS-0976-4-CTF	0.0±0.4	0.4
951243-96	12-Jan-95	Soil	NAT-SS-0977-4-CTF	7.0±0.9	0.4
951243-97	12-Jan-95	Soil	NAT-SS-0978-4-CTF	0.9±0.4	0.4
951243-98	12-Jan-95	Soil	NAT-SS-0979-4-CTF	5.2±0.8	0.4
951243-99	12-Jan-95	Soil	NAT-SS-0980-4-CTF	1.0±0.5	0.4
951243-100	12-Jan-95	Soil	NAT-SS-0981-4-CTF	2.2±0.5	0.4
951243-101	12-Jan-95	Soil	NAT-SS-0982-4-CTF	1.6±0.5	0.4
951243-102	12-Jan-95	Soil	NAT-SS-0986-7-CTF	1.5±0.5	0.4
951243-103	12-Jan-95	Soil	NAT-SS-0987-7-CTF	0.5±0.4	0.4
951243-104	12-Jan-95	Soil	NAT-SS-0988-7-CTF	6.5±0.8	0.4
951243-105	12-Jan-95	Soil	NAT-SS-0989-7-CTF	0.8±0.4	0.4
951243-106	12-Jan-95	Soil	NAT-SS-0991-7-CTF	5.4±0.8	0.4
951243-107	12-Jan-95	Soil	NAT-SS-0992-7-CTF	0.9±0.4	0.4
951243-108	12-Jan-95	Soil	NAT-SS-0993-7-CTF	2.3±0.6	0.4
951243-109	12-Jan-95	Soil	NAT-SS-0994-22-CTF	5.5±0.8	0.4
951243-110	12-Jan-95	Soil	NAT-SS-0995-22-CTF	6.0±0.9	0.4
951243-111	12-Jan-95	Soil	NAT-SS-0998-22-CTF	8.0±1.0	0.4
951243-112	12-Jan-95	Soil	NAT-SS-0999-22-CTF	0.7±0.4	0.4
951243-113	12-Jan-95	Soil	NAT-SS-1000-22-CTF	2.8±0.6	0.4
951243-114	12-Jan-95	Soil	NAT-SS-1001-22-CTF	5.6±0.8	0.4
951243-115	12-Jan-95	Soil	NAT-SS-1002-22-CTF	12±1	0.4
951243-116	12-Jan-95	Soil	NAT-SS-1003-22-CTF	0.0±0.3	0.4
951243-117	12-Jan-95	Soil	NAT-SS-1004-22-CTF	1.3±0.5	0.4
951243-118	12-Jan-95	Soil	NAT-SS-1005-22-CTF	9.8±1.1	0.4
951243-119	12-Jan-95	Soil	NAT-SS-1006-22-CTF	0.8±0.4	0.4
951243-120	12-Jan-95	Soil	NAT-SS-1014-19A-CTF	3.7±0.7	0.4
951243-121	12-Jan-95	Soil	NAT-SS-1016-19A-CTF	8.8±1.0	0.4
951243-122	12-Jan-95	Soil	NAT-SS-1017-19A-CTF	1.7±0.5	0.4
951243-123	12-Jan-95	Soil	NAT-SS-1018-19A-CTF	0.8±0.4	0.4
951243-124	12-Jan-95	Soil	NAT-SS-1019-19A-CTF	2.4±0.6	0.4
951243-125	12-Jan-95	Soil	NAT-SS-1020-19A-CTF	1.0±0.3	0.4
951243-126	12-Jan-95	Soil	NAT-SS-1021-19A-CTF	0.8±0.2	0.4

BARRINGER LABORATORIES INC.

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MK-FERGUSON (Naturita)

PYL 4/28/95
WYL 5/1/95

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27-Feb-95

Page: R-4
Job: 951243E
Status: Final

Analyte: Th-230
Fraction: Total
Method: USAEC
Units: pCi/g

Project: Naturita
Date Analyzed: 02/08-02/24
LLD: 0.4

Lab Id	Date Sampled	Matrix	Sample Id	Concentration± 1σ	LLD
951243-127	12-Jan-95	Soil	NAT-SS-1022-19A-CTF	0.6±0.2	0.4
951243-128	12-Jan-95	Soil	NAT-SS-1023-12-CTF	8.3±0.6	0.4
951243-129	12-Jan-95	Soil	NAT-SS-1026-12-CTF	0.9±0.2	0.4
951243-130	12-Jan-95	Soil	NAT-SS-1027-12-CTF	3.2±0.4	0.4
951243-131	12-Jan-95	Soil	NAT-SS-1028-12-CTF	2.1±0.3	0.4
951243-132	12-Jan-95	Soil	NAT-SS-1029-12-CTF	1.0±0.3	0.4
951243-133	12-Jan-95	Soil	NAT-SS-1030-12-CTF	0.9±0.3	0.4
951243-134	12-Jan-95	Soil	NAT-SS-1031-12-CTF	1.5±0.3	0.4
951243-135	12-Jan-95	Soil	NAT-SS-1032-12-CTF	0.5±0.2	0.4
951243-136	12-Jan-95	Soil	NAT-SS-1033-12-CTF	0.9±0.3	0.4
951243-137	17-Jan-95	Soil	NAT-SS-1054-11-CTF	4.9±0.5	0.4
951243-138	17-Jan-95	Soil	NAT-SS-1055-11-CTF	0.8±0.2	0.4
951243-139	17-Jan-95	Soil	NAT-SS-1057-11-CTF	1.9±0.3	0.4
951243-140	17-Jan-95	Soil	NAT-SS-1059-11-CTF	2.2±0.4	0.4
951243-141	17-Jan-95	Soil	NAT-SS-1112-1-CTF	2.6±0.4	0.4
951243-142	17-Jan-95	Soil	NAT-SS-1113-1-CTF	1.0±0.3	0.4
951243-143	17-Jan-95	Soil	NAT-SS-1114-1-CTF	0.5±0.2	0.4
951243-144	17-Jan-95	Soil	NAT-SS-1115-1-CTF	0.1±0.2	0.4
951243-145	17-Jan-95	Soil	NAT-SS-1116-1-CTF	0.4±0.2	0.4
951243-146	17-Jan-95	Soil	NAT-SS-1117-1-CTF	0.1±0.2	0.4
951243-147	17-Jan-95	Soil	NAT-SS-1118-1-CTF	0.3±0.2	0.4
951243-148	17-Jan-95	Soil	NAT-SS-1119-1-CTF	0.5±0.2	0.4
951243-149	17-Jan-95	Soil	NAT-SS-1120-1-CTF	0.5±0.2	0.4
951243-150	17-Jan-95	Soil	NAT-SS-1121-1-CTF	1.1±0.3	0.4
951243-151	17-Jan-95	Soil	NAT-SS-1122-1-CTF	1.2±0.3	0.4
951243-152	17-Jan-95	Soil	NAT-SS-1123-1-CTF	0.5±0.2	0.4
951243-153	17-Jan-95	Soil	NAT-SS-1124-1-CTF	0.5±0.2	0.4
951243-154	17-Jan-95	Soil	NAT-SS-1129-17-CTF	0.8±0.2	0.4
951243-155	17-Jan-95	Soil	NAT-SS-1130-17-CTF	3.7±0.4	0.4
951243-156	17-Jan-95	Soil	NAT-SS-1131-17-CTF	1.1±0.3	0.4
951243-157	17-Jan-95	Soil	NAT-SS-1132-17-CTF	1.1±0.3	0.4
951243-158	17-Jan-95	Soil	NAT-SS-1133-17-CTF	1.0±0.2	0.4
951243-159	17-Jan-95	Soil	NAT-SS-1134-17-CTF	1.0±0.2	0.4
951243-160	17-Jan-95	Soil	NAT-SS-1135-17-CTF	0.9±0.2	0.4
951243-161	17-Jan-95	Soil	NAT-SS-1136-17-CTF	0.4±0.2	0.4
951243-162	17-Jan-95	Soil	NAT-SS-1137-17-CTF	0.7±0.2	0.4
951243-163	16-Jan-95	Soil	NAT-SS-1138-6-CTF	1.6±0.3	0.4
951243-164	16-Jan-95	Soil	NAT-SS-1139-6-CTF	1.2±0.2	0.4
951243-165	16-Jan-95	Soil	NAT-SS-1142-18-CTF	0.5±0.2	0.4
951243-166	16-Jan-95	Soil	NAT-SS-1143-18-CTF	0.9±0.2	0.4
951243-167	16-Jan-95	Soil	NAT-SS-1144-18-CTF	0.9±0.2	0.4
951243-168	16-Jan-95	Soil	NAT-SS-1145-18-CTF	0.6±0.2	0.4

BARRINGER LABORATORIES INC.

15000 W. 6TH AVE., SUITE 300 GOLDEN, CO 80401 (303) 277-1657 FAX (303) 277-1689

MK-FERGUSON (Naturita)

PTL 4/28/95 B-8
WYL 5/1/95

27-Feb-95
Page: R-5
Job: 951243E
Status: Final

Analyte: Th-230
Fraction: Total
Method: USAEC
Units: pCi/g

Project: Naturita
Date Analyzed: 02/08-02/24
LLD: 0.4

Lab Id	Date Sampled	Matrix	Sample Id	Concentration+ 1σ	LLD
951243-169	16-Jan-95	Soil	NAT-SS-1146-18-CTF	0.4±0.2	0.4
951243-170	16-Jan-95	Soil	NAT-SS-1147-18-CTF	1.3±0.3	0.4
951243-171	16-Jan-95	Soil	NAT-SS-1148-18-CTF	0.5±0.2	0.4
951243-172	16-Jan-95	Soil	NAT-SS-1149-18-CTF	0.7±0.2	0.4
951243-173	16-Jan-95	Soil	NAT-SS-1155-2-CTF	1.1±0.3	0.4
951243-174	16-Jan-95	Soil	NAT-SS-1156-2-CTF	0.5±0.2	0.4
951243-175	16-Jan-95	Soil	NAT-SS-1157-2-CTF	1.1±0.4	0.4
951243-176	16-Jan-95	Soil	NAT-SS-1158-2-CTF	3.5±0.6	0.4
951243-177	16-Jan-95	Soil	NAT-SS-1159-2-CTF	1.5±0.5	0.4
951243-178	16-Jan-95	Soil	NAT-SS-1160-2-CTF	0.8±0.4	0.4
951243-179	16-Jan-95	Soil	NAT-SS-1161-6-CTF	4.4±0.7	0.4
951243-180	16-Jan-95	Soil	NAT-SS-1166-6-CTF	3.3±0.6	0.4
951243-181	16-Jan-95	Soil	NAT-SS-1167-6-CTF	1.2±0.3	0.4
951243-182	16-Jan-95	Soil	NAT-SS-1168-6-CTF	1.0±0.3	0.4
951243-183	16-Jan-95	Soil	NAT-SS-1169-6-CTF	0.9±0.2	0.4
951243-184	16-Jan-95	Soil	NAT-SS-1170-6-CTF	1.1±0.3	0.4
951243-185	16-Jan-95	Soil	NAT-SS-1171-6-CTF	0.6±0.2	0.4
951243-186	16-Jan-95	Soil	NAT-SS-1172-19-CTF	5.0±0.5	0.4
951243-187	16-Jan-95	Soil	NAT-SS-1177-19-CTF	0.7±0.2	0.4
951243-188	16-Jan-95	Soil	NAT-SS-1178-19-CTF	1.3±0.3	0.4
951243-189	16-Jan-95	Soil	NAT-SS-1179-19-CTF	6.8±0.6	0.4
951243-190	16-Jan-95	Soil	NAT-SS-1180-19-CTF	0.5±0.2	0.4
951243-191	16-Jan-95	Soil	NAT-SS-1181-19-CTF	1.3±0.3	0.4
951243-192	16-Jan-95	Soil	NAT-SS-1182-19-CTF	7.0±0.6	0.4
951243-193	16-Jan-95	Soil	NAT-SS-1183-19-CTF	1.0±0.2	0.4
951243-194	16-Jan-95	Soil	NAT-SS-1184-19-CTF	1.7±0.3	0.4
951243-195	16-Jan-95	Soil	NAT-SS-1186-19-CTF	3.8±0.4	0.4
951243-196	16-Jan-95	Soil	NAT-SS-1187-19-CTF	2.5±0.3	0.4
951243-197	16-Jan-95	Soil	NAT-SS-1188-19-CTF	4.6±0.4	0.4
951243-198	16-Jan-95	Soil	NAT-SS-1189-19-CTF	10.0±0.6	0.4
951243-199	16-Jan-95	Soil	NAT-SS-1190-19-CTF	10.5±0.6	0.4
951243-200	18-Jan-95	Soil	NAT-SS-1191-5-CTF	1.7±0.3	0.4
951243-201	18-Jan-95	Soil	NAT-SS-1192-5-CTF	6.8±0.5	0.4
951243-202	18-Jan-95	Soil	NAT-SS-1193-5-CTF	3.5±0.4	0.4
951243-203	18-Jan-95	Soil	NAT-SS-1195-5-CTF	1.0±0.2	0.4
951243-204	18-Jan-95	Soil	NAT-SS-1196-5-CTF	1.3±0.4	0.4
951243-205	18-Jan-95	Soil	NAT-SS-1197-5-CTF	1.9±0.5	0.4
951243-206	18-Jan-95	Soil	NAT-SS-1198-5-CTF	2.4±0.5	0.4
951243-207	16-Jan-95	Soil	NAT-SS-1199-18-CTF	0.9±0.4	0.4
951243-208	16-Jan-95	Soil	NAT-SS-1201-18-CTF	3.7±0.6	0.4
951243-209	16-Jan-95	Soil	NAT-SS-1202-18-CTF	0.2±0.3	0.4
951243-210	16-Jan-95	Soil	NAT-SS-1203-18-CTF	4.4±0.6	0.4

BARRINGER LABORATORIES INC.

15000 W. 6TH AVE.; SUITE 300 GOLDEN, CO 80401 (303) 277-1687 FAX (303) 277-1689

MK-FERGUSON (Naturita)

PYL 4/28/95 B-9
WYL 5/1/95

27-Feb-95
Page: R-6
Job: 951243E
Status: Final

Analyte: Th-230
Fraction: Total
Method: USAEC
Units: pCi/g

Project: Naturita
Date Analyzed: 02/08-02/24
LLD: 0.4

Lab Id	Date Sampled	Matrix	Sample Id	Concentration+ 1σ	LLD
951243-211	18-Jan-95	Soil	NAT-SS-1204-10-CTF	2.2±0.5	0.4
951243-212	18-Jan-95	Soil	NAT-SS-1207-10-CTF	2.8±0.5	0.4
951243-213	18-Jan-95	Soil	NAT-SS-1208-10-CTF	2.6±0.5	0.4
951243-214	18-Jan-95	Soil	NAT-SS-1209-10-CTF	3.2±1.1	0.4
951243-215	18-Jan-95	Soil	NAT-SS-1210-10-CTF	2.3±0.5	0.4
951243-216	18-Jan-95	Soil	NAT-SS-1211-15-CTF	0.6±0.3	0.4
951243-217	18-Jan-95	Soil	NAT-SS-1212-15-CTF	1.4±0.4	0.4
951243-218	18-Jan-95	Soil	NAT-SS-1213-15-CTF	4.5±1.0	0.4
951243-219	18-Jan-95	Soil	NAT-SS-1214-15-CTF	0.4±0.5	0.4
951243-220	18-Jan-95	Soil	NAT-SS-1215-15-CTF	0.8±0.6	0.4
951243-221	18-Jan-95	Soil	NAT-SS-1216-15-CTF	0.7±0.5	0.4
951243-222	18-Jan-95	Soil	NAT-SS-1217-15-CTF	0.9±0.6	0.4
951243-223	18-Jan-95	Soil	NAT-SS-1218-15-CTF	0.9±0.6	0.4
951243-224	18-Jan-95	Soil	NAT-SS-1219-15-CTF	0.8±0.6	0.4
951243-225	18-Jan-95	Soil	NAT-SS-1220-15-CTF	0.7±0.5	0.4
951243-226	16-Jan-95	Soil	NAT-SS-1228-15-CTF	0.9±0.4	0.4
951243-227	16-Jan-95	Soil	NAT-SS-1229-15-CTF	0.7±0.4	0.4
951243-228	16-Jan-95	Soil	NAT-SS-1230-15-CTF	2.5±0.7	0.4
951243-229	16-Jan-95	Soil	NAT-SS-1231-15-CTF	1.1±0.5	0.4
951243-230	16-Jan-95	Soil	NAT-SS-1232-15-CTF	1.2±0.5	0.4
951243-231	16-Jan-95	Soil	NAT-SS-1233-15-CTF	1.9±0.6	0.4
951243-232	16-Jan-95	Soil	NAT-SS-1234-15-CTF	7.6±1.1	0.4
951243-233	16-Jan-95	Soil	NAT-SS-1235-15-CTF	14±2	0.4
951243-234	16-Jan-95	Soil	NAT-SS-1236-15-CTF	0.8±0.4	0.4
951243-235	10-Jan-95	Soil	NAT-SS-0877-24-CTF	11±1	0.4
951243-236	12-Jan-95	Soil	NAT-SS-1024-12-CTF	80±3	0.4
951243-237	12-Jan-95	Soil	NAT-SS-1025-12-CTF	14±2	0.4
951243-238	16-Jan-95	Soil	NAT-SS-1140-18-CTF	161±4	0.4
951243-239	16-Jan-95	Soil	NAT-SS-1141-18-CTF	18±2	0.4
951243-240	16-Jan-95	Soil	NAT-SS-1162-6-CTF	22±2	0.4
951243-241	16-Jan-95	Soil	NAT-SS-1163-6-CTF	8.4±1.2	0.4
951243-242	16-Jan-95	Soil	NAT-SS-1164-6-CTF	9.1±1.2	0.4
951243-243	16-Jan-95	Soil	NAT-SS-1165-6-CTF	14±1	0.4
951243-244	16-Jan-95	Soil	NAT-SS-1200-18-CTF	73±2	0.4

BARRINGER LABORATORIES INC.

15000 W. 6TH AVE., SUITE 300 GOLDEN, CO 80401 (303) 277-1887 FAX (303) 277-1889

PYL 4/18/95

WYL 5/1/95

ME
B-10

28-Feb-95

Page: R-1

Job: 951247E

Status: Final

MR-FERGUSON (Naturita) ^{REQUEST}

#029

Analyte: Ra-226

Fraction: Total

Method: SM-705

Units: pCi/g

Cobbles

Project: Naturita

Date Analyzed: 02/22-02/27

LLD: 0.3

Lab Id	Date Sampled	Matrix	Sample Id	Concentration+ 1σ	LL
951247-1	30-Jan-95	Soil	NAT-SS-N/A-1-CTF	1.0±0.4	0.
951247-2	30-Jan-95	Soil	NAT-SS-N/A-2-CTF	1.2±0.4	0.
951247-3	30-Jan-95	Soil	NAT-SS-N/A-3-CTF	0.8±0.3	0.
951247-4	30-Jan-95	Soil	NAT-SS-N/A-4-CTF	0.8±0.3	0.
951247-5	30-Jan-95	Soil	NAT-SS-N/A-5-CTF	0.2±0.2	0.
951247-6	30-Jan-95	Soil	NAT-SS-N/A-6-CTF	0.8±0.3	0.
951247-7	30-Jan-95	Soil	NAT-SS-N/A-7-CTF	0.7±0.3	0.
951247-8	30-Jan-95	Soil	NAT-SS-N/A-8-CTF	0.3±0.3	0.
951247-9	30-Jan-95	Soil	NAT-SS-N/A-9-CTF	1.1±0.4	0.
951247-10	30-Jan-95	Soil	NAT-SS-N/A-10-CTF	1.1±0.3	0.
951247-11	30-Jan-95	Soil	NAT-SS-N/A-12-CTF	0.2±0.2	0.
951247-12	30-Jan-95	Soil	NAT-SS-N/A-13-CTF	0.5±0.3	0.
951247-13	30-Jan-95	Soil	NAT-SS-N/A-14-CTF	0.8±0.3	0.
951247-14	30-Jan-95	Soil	NAT-SS-N/A-15-CTF	1.1±0.4	0.
951247-15	30-Jan-95	Soil	NAT-SS-N/A-18-CTF	0.8±0.3	0.
951247-16	30-Jan-95	Soil	NAT-SS-N/A-19-CTF	1.1±0.4	0.
951247-17	30-Jan-95	Soil	NAT-SS-N/A-19A-CTF	1.0±0.7	0.
951247-18	30-Jan-95	Soil	NAT-SS-N/A-20-CTF	0.6±0.3	0.
951247-19	30-Jan-95	Soil	NAT-SS-N/A-21-CTF	0.1±0.3	0.
951247-20	30-Jan-95	Soil	NAT-SS-N/A-22-CTF	0.6±0.3	0.
951247-21	30-Jan-95	Soil	NAT-SS-N/A-23-CTF	1.0±0.4	0.
951247-22	30-Jan-95	Soil	NAT-SS-N/A-24-CTF	0.7±0.3	0.
951247-23	30-Jan-95	Soil	NAT-SS-N/A-25-CTF	0.4±0.3	0.
951247-24	30-Jan-95	Soil	NAT-SS-N/A-26-CTF	0.5±0.3	0.
951247-25	30-Jan-95	Soil	NAT-SS-N/A-27-CTF	1.0±0.3	0.
951247-26	30-Jan-95	Soil	NAT-SS-N/A-28-CTF	1.9±0.4	0.
951247-27	30-Jan-95	Soil	NAT-SS-N/A-29-CTF	0.3±0.3	0.
951247-28	30-Jan-95	Soil	NAT-SS-N/A-30-CTF	1.4±0.4	0.
951247-29	30-Jan-95	Soil	NAT-SS-N/A-OPA-CTF	0.2±0.2	0.
951247-30	30-Jan-95	Soil	NAT-SS-N/A-B1-CTF	0.2±0.2	0.
951247-31	30-Jan-95	Soil	NAT-SS-N/A-B2-CTF	0.4±0.3	0.
951247-32	30-Jan-95	Soil	NAT-SS-N/A-B3-CTF	0.4±0.3	0.

BARRINGER LABORATORIES INC.

15000 W. 6TH AVE., SUITE 300 GOLDEN, CO 80401 (303) 277-1687 FAX (303) 277-1689

PYL 4/28/95

B-11

WYL 5/1/95

28-Feb-95

Page: R-2

Job: 951247E

Status: Final

MK-FERGUSON (Naturita)

Analyte: Th-230

Fraction: Total

Method: USAEC

Units: pCi/g

Project: Naturita

Date Analyzed: 02/23-02/28

LLD: 0.4

Lab Id	Date Sampled	Matrix	Sample Id	Concentration+ 1σ	LLD
951247-1	30-Jan-95	Soil	NAT-SS-N/A-1-CTF	0.6±0.5	0.4
951247-2	30-Jan-95	Soil	NAT-SS-N/A-2-CTF	0.7±0.5	0.4
951247-3	30-Jan-95	Soil	NAT-SS-N/A-3-CTF	0.7±0.5	0.4
951247-4	30-Jan-95	Soil	NAT-SS-N/A-4-CTF	0.6±0.5	0.4
951247-5	30-Jan-95	Soil	NAT-SS-N/A-5-CTF	1.7±0.6	0.4
951247-6	30-Jan-95	Soil	NAT-SS-N/A-6-CTF	0.8±0.5	0.4
951247-7	30-Jan-95	Soil	NAT-SS-N/A-7-CTF	0.6±0.5	0.4
951247-8	30-Jan-95	Soil	NAT-SS-N/A-8-CTF	0.9±0.5	0.4
951247-9	30-Jan-95	Soil	NAT-SS-N/A-9-CTF	0.5±0.4	0.4
951247-10	30-Jan-95	Soil	NAT-SS-N/A-10-CTF	1.9±0.6	0.4
951247-11	30-Jan-95	Soil	NAT-SS-N/A-12-CTF	0.5±0.5	0.4
951247-12	30-Jan-95	Soil	NAT-SS-N/A-13-CTF	0.9±0.5	0.4
951247-13	30-Jan-95	Soil	NAT-SS-N/A-14-CTF	0.3±0.4	0.4
951247-14	30-Jan-95	Soil	NAT-SS-N/A-15-CTF	1.7±0.6	0.4
951247-15	30-Jan-95	Soil	NAT-SS-N/A-18-CTF	0.3±0.4	0.4
951247-16	30-Jan-95	Soil	NAT-SS-N/A-19-CTF	0.9±0.5	0.4
951247-17	30-Jan-95	Soil	NAT-SS-N/A-19A-CTF	0.6±0.5	0.4
951247-18	30-Jan-95	Soil	NAT-SS-N/A-20-CTF	1.0±0.4	0.4
951247-19	30-Jan-95	Soil	NAT-SS-N/A-21-CTF	0.6±0.3	0.4
951247-20	30-Jan-95	Soil	NAT-SS-N/A-22-CTF	0.9±0.3	0.4
951247-21	30-Jan-95	Soil	NAT-SS-N/A-23-CTF	1.4±0.4	0.4
951247-22	30-Jan-95	Soil	NAT-SS-N/A-24-CTF	0.6±0.3	0.4
951247-23	30-Jan-95	Soil	NAT-SS-N/A-25-CTF	0.9±0.3	0.4
951247-24	30-Jan-95	Soil	NAT-SS-N/A-26-CTF	0.9±0.3	0.4
951247-25	30-Jan-95	Soil	NAT-SS-N/A-27-CTF	0.1±0.2	0.4
951247-26	30-Jan-95	Soil	NAT-SS-N/A-28-CTF	0.9±0.4	0.4
951247-27	30-Jan-95	Soil	NAT-SS-N/A-29-CTF	1.4±0.4	0.4
951247-28	30-Jan-95	Soil	NAT-SS-N/A-30-CTF	0.5±0.3	0.4
951247-29	30-Jan-95	Soil	NAT-SS-N/A-OPA-CTF	0.6±0.3	0.4
951247-30	30-Jan-95	Soil	NAT-SS-N/A-B1-CTF	0.5±0.3	0.4
951247-31	30-Jan-95	Soil	NAT-SS-N/A-B2-CTF	0.8±0.3	0.4
951247-32	30-Jan-95	Soil	NAT-SS-N/A-B3-CTF	0.6±0.3	0.4

PYL 4/28/95 B-12
WYL 5/1/95

28-Feb-95
Page: R-3
Job: 951247E
Status: Final

MK-FERGUSON (Naturita)

Analyte: Th-232
Fraction: Total
Method: USAEC
Units: pCi/g

Project: Naturita
Date Analyzed: 02/23-02/28
LLD: 0.4

Lab Id	Date Sampled	Matrix	Sample Id	Concentration+ 1σ	LLD
951247-1	30-Jan-95	Soil	NAT-SS-N/A-1-CTF	-0.2±0.5	0.4
951247-2	30-Jan-95	Soil	NAT-SS-N/A-2-CTF	0.6±0.6	0.4
951247-3	30-Jan-95	Soil	NAT-SS-N/A-3-CTF	-0.2±0.5	0.4
951247-4	30-Jan-95	Soil	NAT-SS-N/A-4-CTF	0.2±0.5	0.4
951247-5	30-Jan-95	Soil	NAT-SS-N/A-5-CTF	-0.1±0.5	0.4
951247-6	30-Jan-95	Soil	NAT-SS-N/A-6-CTF	0.8±0.6	0.4
951247-7	30-Jan-95	Soil	NAT-SS-N/A-7-CTF	0.3±0.5	0.4
951247-8	30-Jan-95	Soil	NAT-SS-N/A-8-CTF	0.2±0.5	0.4
951247-9	30-Jan-95	Soil	NAT-SS-N/A-9-CTF	-0.3±0.4	0.4
951247-10	30-Jan-95	Soil	NAT-SS-N/A-10-CTF	0.2±0.5	0.4
951247-11	30-Jan-95	Soil	NAT-SS-N/A-12-CTF	-0.8±0.4	0.4
951247-12	30-Jan-95	Soil	NAT-SS-N/A-13-CTF	-0.3±0.4	0.4
951247-13	30-Jan-95	Soil	NAT-SS-N/A-14-CTF	-0.1±0.5	0.4
951247-14	30-Jan-95	Soil	NAT-SS-N/A-15-CTF	-0.1±0.5	0.4
951247-15	30-Jan-95	Soil	NAT-SS-N/A-18-CTF	-0.4±0.4	0.4
951247-16	30-Jan-95	Soil	NAT-SS-N/A-19-CTF	-0.2±0.5	0.4
951247-17	30-Jan-95	Soil	NAT-SS-N/A-19A-CTF	-0.2±0.5	0.4
951247-18	30-Jan-95	Soil	NAT-SS-N/A-20-CTF	0.4±0.3	0.4
951247-19	30-Jan-95	Soil	NAT-SS-N/A-21-CTF	0.0±0.3	0.4
951247-20	30-Jan-95	Soil	NAT-SS-N/A-22-CTF	0.4±0.3	0.4
951247-21	30-Jan-95	Soil	NAT-SS-N/A-23-CTF	0.4±0.3	0.4
951247-22	30-Jan-95	Soil	NAT-SS-N/A-24-CTF	0.4±0.3	0.4
951247-23	30-Jan-95	Soil	NAT-SS-N/A-25-CTF	0.0±0.3	0.4
951247-24	30-Jan-95	Soil	NAT-SS-N/A-26-CTF	0.8±0.4	0.4
951247-25	30-Jan-95	Soil	NAT-SS-N/A-27-CTF	0.4±0.3	0.4
951247-26	30-Jan-95	Soil	NAT-SS-N/A-28-CTF	0.6±0.4	0.4
951247-27	30-Jan-95	Soil	NAT-SS-N/A-29-CTF	0.6±0.4	0.4
951247-28	30-Jan-95	Soil	NAT-SS-N/A-30-CTF	0.8±0.4	0.4
951247-29	30-Jan-95	Soil	NAT-SS-N/A-OPA-CTF	0.6±0.4	0.4
951247-30	30-Jan-95	Soil	NAT-SS-N/A-B1-CTF	0.5±0.4	0.4
951247-31	30-Jan-95	Soil	NAT-SS-N/A-B2-CTF	0.2±0.3	0.4
951247-32	30-Jan-95	Soil	NAT-SS-N/A-B3-CTF	0.1±0.3	0.4

BARRINGER LABORATORIES INC.

15000 W. 6TH AVE., SUITE 300 GOLDEN, CO 80401 (303) 277-1687 FAX (303) 277-1683

PYL 4/28/95
WYL 5/1/95

B-13

22-Feb-95

Page: R-1
Job: 951246E
Status: Final

MK-FERGUSON (Naturita)

REQUEST #28

Analyte: Ra-226
Fraction: Total
Method: SM-705
Units: pCi/g

Fines

Project: Naturita
Date Analyzed: 02/15-02/21
LLD: 0.3

Lab Id	Date Sampled	Matrix	Sample Id	Concentration ± 1σ	LLD
951246-1	19-Jan-95	Soil	NAT-SS-1237-1-CTF	0.6±0.3	0.3
951246-2	19-Jan-95	Soil	NAT-SS-1238-2-CTF	1.3±0.3	0.3
951246-3	19-Jan-95	Soil	NAT-SS-1239-3-CTF	1.2±0.3	0.3
951246-4	19-Jan-95	Soil	NAT-SS-1240-4-CTF	0.9±0.3	0.3
951246-5	19-Jan-95	Soil	NAT-SS-1241-5-CTF	5.6±0.6	0.3
951246-6	19-Jan-95	Soil	NAT-SS-1242-6-CTF	1.3±0.3	0.3
951246-7	19-Jan-95	Soil	NAT-SS-1243-7-CTF	6.4±0.6	0.3
951246-8	19-Jan-95	Soil	NAT-SS-1244-8-CTF	9.0±0.7	0.3
951246-9	19-Jan-95	Soil	NAT-SS-1245-9-CTF	1.8±0.4	0.3
951246-10	19-Jan-95	Soil	NAT-SS-1246-10-CTF	7.1±0.6	0.3
951246-11	19-Jan-95	Soil	NAT-SS-1247-11-CTF	6.5±0.6	0.3
951246-12	19-Jan-95	Soil	NAT-SS-1248-12-CTF	2.5±0.4	0.3
951246-13	19-Jan-95	Soil	NAT-SS-1249-13-CTF	1.7±0.4	0.3
951246-14	19-Jan-95	Soil	NAT-SS-1250-13-CTF	0.9±0.3	0.3
951246-15	19-Jan-95	Soil	NAT-SS-1251-14-CTF	2.0±0.4	0.3
951246-16	19-Jan-95	Soil	NAT-SS-1252-15-CTF	0.7±0.3	0.3
951246-17	19-Jan-95	Soil	NAT-SS-1253-18-CTF	0.5±0.3	0.3
951246-18	19-Jan-95	Soil	NAT-SS-1254-19-CTF	16±1	0.3
951246-19	19-Jan-95	Soil	NAT-SS-1255-19A-CTF	4.2±0.5	0.3
951246-20	19-Jan-95	Soil	NAT-SS-1256-20-CTF	3.4±0.5	0.3
951246-21	19-Jan-95	Soil	NAT-SS-1257-21-CTF	3.6±0.5	0.3
951246-22	19-Jan-95	Soil	NAT-SS-1258-22B-CTF	3.3±0.5	0.3
951246-23	19-Jan-95	Soil	NAT-SS-1259-23-CTF	0.6±0.3	0.3
951246-24	19-Jan-95	Soil	NAT-SS-1260-24-CTF	6.7±0.7	0.3
951246-25	19-Jan-95	Soil	NAT-SS-1261-25-CTF	35±1	0.3
951246-26	19-Jan-95	Soil	NAT-SS-1262-26-CTF	21±1	0.3
951246-27	19-Jan-95	Soil	NAT-SS-1263-27-CTF	8.0±0.8	0.3
951246-28	19-Jan-95	Soil	NAT-SS-1264-28-CTF	22±1	0.3
951246-29	19-Jan-95	Soil	NAT-SS-1265-29-CTF	1.2±0.4	0.3
951246-30	19-Jan-95	Soil	NAT-SS-1266-30-CTF	10±1	0.3
951246-31	19-Jan-95	Soil	NAT-SS-1267-OPA-CTF	1.7±0.4	0.3
951246-32	19-Jan-95	Soil	NAT-SS-1268-22A-CTF	29±2	0.3
951246-33	19-Jan-95	Soil	NAT-SS-1269-B1-CTF	0.6±0.3	0.3
951246-34	19-Jan-95	Soil	NAT-SS-1270-B2-CTF	1.0±0.4	0.3
951246-35	19-Jan-95	Soil	NAT-SS-1271-B3-CTF	2.0±0.5	0.3

BARRINGER LABORATORIES INC.

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MR-FERGUSON (Naturita)

PYL 4/28/95
WYL 5/11/95

22-Feb-95

Page: R-2
Job: 951246E
Status: Final

Analyte: Th-230

Fraction: Total

Method: USAEC

Units: pci/g

Project: Naturita

Date Analyzed: 02/14-02/21

LLD: 0.4

Lab Id	Date Sampled	Matrix	Sample Id	Concentration+ 1σ	LLD
951246-1	19-Jan-95	Soil	NAT-SS-1237-1-CTF	0.8±0.5	0.4
951246-2	19-Jan-95	Soil	NAT-SS-1238-2-CTF	1.6±0.6	0.4
951246-3	19-Jan-95	Soil	NAT-SS-1239-3-CTF	1.6±0.6	0.4
951246-4	19-Jan-95	Soil	NAT-SS-1240-4-CTF	1.7±0.6	0.4
951246-5	19-Jan-95	Soil	NAT-SS-1241-5-CTF	7.8±1.0	0.4
951246-6	19-Jan-95	Soil	NAT-SS-1242-6-CTF	2.2±0.6	0.4
951246-7	19-Jan-95	Soil	NAT-SS-1243-7-CTF	4.3±0.8	0.4
951246-8	19-Jan-95	Soil	NAT-SS-1244-8-CTF	9.9±1.1	0.4
951246-9	19-Jan-95	Soil	NAT-SS-1245-9-CTF	3.8±0.7	0.4
951246-10	19-Jan-95	Soil	NAT-SS-1246-10-CTF	8.6±1.0	0.4
951246-11	19-Jan-95	Soil	NAT-SS-1247-11-CTF	5.7±0.8	0.4
951246-12	19-Jan-95	Soil	NAT-SS-1248-12-CTF	5.5±0.8	0.4
951246-13	19-Jan-95	Soil	NAT-SS-1249-13-CTF	3.5±0.7	0.4
951246-14	19-Jan-95	Soil	NAT-SS-1250-13-CTF	2.5±0.6	0.4
951246-15	19-Jan-95	Soil	NAT-SS-1251-14-CTF	2.8±0.6	0.4
951246-16	19-Jan-95	Soil	NAT-SS-1252-15-CTF	1.7±0.6	0.4
951246-17	19-Jan-95	Soil	NAT-SS-1253-18-CTF	0.7±0.5	0.4
951246-18	19-Jan-95	Soil	NAT-SS-1254-19-CTF	15±1	0.4
951246-19	19-Jan-95	Soil	NAT-SS-1255-19A-CTF	3.1±0.5	0.4
951246-20	19-Jan-95	Soil	NAT-SS-1256-20-CTF	14±1	0.4
951246-21	19-Jan-95	Soil	NAT-SS-1257-21-CTF	7.0±0.8	0.4
951246-22	19-Jan-95	Soil	NAT-SS-1258-22B-CTF	3.5±0.6	0.4
951246-23	19-Jan-95	Soil	NAT-SS-1259-23-CTF	1.7±0.4	0.4
951246-24	19-Jan-95	Soil	NAT-SS-1260-24-CTF	5.6±0.7	0.4
951246-25	19-Jan-95	Soil	NAT-SS-1261-25-CTF	32±2	0.4
951246-26	19-Jan-95	Soil	NAT-SS-1262-26-CTF	19±1	0.4
951246-27	19-Jan-95	Soil	NAT-SS-1263-27-CTF	8.3±0.9	0.4
951246-28	19-Jan-95	Soil	NAT-SS-1264-28-CTF	25±1	0.4
951246-29	19-Jan-95	Soil	NAT-SS-1265-29-CTF	0.6±0.3	0.4
951246-30	19-Jan-95	Soil	NAT-SS-1266-30-CTF	9.2±0.9	0.4
951246-31	19-Jan-95	Soil	NAT-SS-1267-OPA-CTF	1.9±0.5	0.4
951246-32	19-Jan-95	Soil	NAT-SS-1268-22A-CTF	20±1	0.4
951246-33	19-Jan-95	Soil	NAT-SS-1269-B1-CTF	1.1±0.4	0.4
951246-34	19-Jan-95	Soil	NAT-SS-1270-B2-CTF	0.3±0.3	0.4
951246-35	19-Jan-95	Soil	NAT-SS-1271-B3-CTF	2.7±0.5	0.4

BARRINGER LABORATORIES INC.

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MK-FERGUSON (Naturita)

PYL 4/28/95

WYL 5/1/95

B-15

22-Feb-95

Page: R-3

Job: 951246E

Status: Final

Analyte: Th-232

Fraction: Total

Method: USAEC

Units: pCi/g

Project: Naturita

Date Analyzed: 02/14-02/21

LLD: 0.4

Lab Id	Date Sampled	Matrix	Sample Id	Concentration $\pm 1\sigma$	LLD
951246-1	19-Jan-95	Soil	NAT-SS-1237-1-CTF	-0.4 $\pm$ 0.4	0.4
951246-2	19-Jan-95	Soil	NAT-SS-1238-2-CTF	-0.1 $\pm$ 0.5	0.4
951246-3	19-Jan-95	Soil	NAT-SS-1239-3-CTF	-0.3 $\pm$ 0.4	0.4
951246-4	19-Jan-95	Soil	NAT-SS-1240-4-CTF	0.2 $\pm$ 0.5	0.4
951246-5	19-Jan-95	Soil	NAT-SS-1241-5-CTF	0.4 $\pm$ 0.5	0.4
951246-6	19-Jan-95	Soil	NAT-SS-1242-6-CTF	0.3 $\pm$ 0.5	0.4
951246-7	19-Jan-95	Soil	NAT-SS-1243-7-CTF	0.1 $\pm$ 0.5	0.4
951246-8	19-Jan-95	Soil	NAT-SS-1244-8-CTF	-0.2 $\pm$ 0.4	0.4
951246-9	19-Jan-95	Soil	NAT-SS-1245-9-CTF	0.1 $\pm$ 0.5	0.4
951246-10	19-Jan-95	Soil	NAT-SS-1246-10-CTF	0.2 $\pm$ 0.5	0.4
951246-11	19-Jan-95	Soil	NAT-SS-1247-11-CTF	1.2 $\pm$ 0.6	0.4
951246-12	19-Jan-95	Soil	NAT-SS-1248-12-CTF	-0.2 $\pm$ 0.9	0.4
951246-13	19-Jan-95	Soil	NAT-SS-1249-13-CTF	-0.6 $\pm$ 0.4	0.4
951246-14	19-Jan-95	Soil	NAT-SS-1250-13-CTF	-0.4 $\pm$ 0.4	0.4
951246-15	19-Jan-95	Soil	NAT-SS-1251-14-CTF	0.6 $\pm$ 0.5	0.4
951246-16	19-Jan-95	Soil	NAT-SS-1252-15-CTF	-0.3 $\pm$ 0.4	0.4
951246-17	19-Jan-95	Soil	NAT-SS-1253-18-CTF	-0.4 $\pm$ 0.4	0.4
951246-18	19-Jan-95	Soil	NAT-SS-1254-19-CTF	1.5 $\pm$ 0.5	0.4
951246-19	19-Jan-95	Soil	NAT-SS-1255-19A-CTF	0.5 $\pm$ 0.4	0.4
951246-20	19-Jan-95	Soil	NAT-SS-1256-20-CTF	1.2 $\pm$ 0.4	0.4
951246-21	19-Jan-95	Soil	NAT-SS-1257-21-CTF	0.7 $\pm$ 0.4	0.4
951246-22	19-Jan-95	Soil	NAT-SS-1258-22B-CTF	0.9 $\pm$ 0.4	0.4
951246-23	19-Jan-95	Soil	NAT-SS-1259-23-CTF	1.1 $\pm$ 0.4	0.4
951246-24	19-Jan-95	Soil	NAT-SS-1260-24-CTF	0.9 $\pm$ 0.4	0.4
951246-25	19-Jan-95	Soil	NAT-SS-1261-25-CTF	2.6 $\pm$ 0.6	0.4
951246-26	19-Jan-95	Soil	NAT-SS-1262-26-CTF	1.1 $\pm$ 0.5	0.4
951246-27	19-Jan-95	Soil	NAT-SS-1263-27-CTF	0.9 $\pm$ 0.4	0.4
951246-28	19-Jan-95	Soil	NAT-SS-1264-28-CTF	1.6 $\pm$ 0.5	0.4
951246-29	19-Jan-95	Soil	NAT-SS-1265-29-CTF	0.2 $\pm$ 0.3	0.4
951246-30	19-Jan-95	Soil	NAT-SS-1266-30-CTF	1.4 $\pm$ 0.5	0.4
951246-31	19-Jan-95	Soil	NAT-SS-1267-OPA-CTF	0.4 $\pm$ 0.4	0.4
951246-32	19-Jan-95	Soil	NAT-SS-1268-22A-CTF	3.3 $\pm$ 0.7	0.4
951246-33	19-Jan-95	Soil	NAT-SS-1269-B1-CTF	0.2 $\pm$ 0.3	0.4
951246-34	19-Jan-95	Soil	NAT-SS-1270-B2-CTF	0.2 $\pm$ 0.3	0.4
951246-35	19-Jan-95	Soil	NAT-SS-1271-B3-CTF	0.4 $\pm$ 0.4	0.4

MORRISON KNUDSEN CORPORATION

ENVIRONMENTAL SERVICES DIVISION

Project UMTRA-NAT
Feature CONTAMINATED MATERIAL EXCAVATION
Item COBBLES-TO-FINES ANALYSIS

Contract No. 3885-67
Designed PYL
Checked WYL

Sheet C-1
File No. _____
Date 4/26/95
Date 5/1/95

APPENDIX C

COBBLES-TO-FINES CALCULATION SHEETS

COBBLES TO FINES CALCULATION SHEET

PYL 4/28/95

Site: Naturita
Sample/Grid I.D. NAT-SS-1237-000-CTF

Sheet 1 of 34
Date: 1-23-95

Fines	Cobbles	Moisture Content Fines
Wt. Sample & Bucket <u>1404.68</u>	Wt. Sample & Bucket <u>2540.89</u>	Wet Wt. Sample/Pan <u>651.7g</u>
Wt. Bucket <u>N/A</u>	Wt. Bucket <u>N/A</u>	Dry Wt. Sample/Pan <u>625.6g</u>
Wt. Sample <u>1404.68</u>	Wt. Sample <u>2540.89</u>	Tare Wt. Pan <u>1/A</u>
Adjusted	Adjusted	Wt. Water* <u>26.1g</u>
Dry Wt. (M _{coal})* <u>1343.68</u>	Dry Wt. (M _{coal})* <u>2502.78</u>	Wt. Soil** <u>625.6g</u>
		Percent Water(*/*) <u>4.2</u>

Note: Scale Tared To Bucket

- * Adjusted Dry Wt. of the Fines = Wt. Sample x (1 - % water)
- ** Adjusted Dry Wt. of the Cobbles = Wt. Sample x (1 - .015)

Mass Partition function (f) = M_{cob}/M_{coal} = 1.86

Radiological Analysis	²²⁶ Ra (pCi/g)	²³⁰ Th (pCi/g)	²³² Th (pCi/g)	COMMENTS
Cobbles (C _{cob})	1.0	0.6	$\frac{0}{-0.2}$	
On-Site Analysis Fines (C _{coal})	.92 *	N/A		
	1.7 **			
	N/A ***			
Vendor Analysis Fines (C _{coal})	0.6	0.8	$\frac{0}{-0.4}$	
Bulk Radionuclide Concentration (C _b)	0.9 #	0.7	0	C _b Calculated For INFORMATION ONLY; C _b is used for soil verification use.
	1.2 ##			
	/ ###			

- * Initial;
- ** Initial Corrected;
- *** 20 day (N/A for Test Pit or Running AVE.)
- Using Vendor;
- ## Using Initial Corrected;
- ### Using 20 day (N/A for Test Pits or Running AVE.)

²²⁶Ra Correction Factor: 1.8

Reviewed By: Wei yeh Lin Date: 5/1/95

PTL 4/28/95

COBBLES TO FINES CALCULATION SHEET

Site: Naturita
Sample/Grid I.D. NAT-SS-1238-0002-CTF

Sheet 2 of 35
Date: 1-23-95

Fines	Cobbles	Moisture Content Fines
Wt. Sample & Bucket <u>459.46</u>	Wt. Sample & Bucket <u>1500.34</u>	Wet Wt. Sample/Pan <u>653.4g</u>
Wt. Bucket <u>N/A</u>	Wt. Bucket <u>N/A</u>	Dry Wt. Sample/Pan <u>574.5g</u>
Wt. Sample <u>459.46 - 296.51 = 262.95</u>	Wt. Sample <u>1500.34</u>	Tare Wt. Pan <u>N/A</u>
Adjusted	Adjusted	Wt. Water* <u>78.9g</u>
Dry Wt. (M _{cof})* <u>396.51</u>	Dry Wt. (M _{cof})** <u>1477.83</u>	Wt. Soil** <u>574.5g</u>
Scale Tared to bucket		Percent Water(*/**) <u>13.7</u>

- * Adjusted Dry Wt. of the Fines = Wt. Sample x (1 - % water)
- ** Adjusted Dry Wt. of the Cobbles = Wt. Sample x (1 - .015)

Mass Partition function (f) = $M_{>ss}/M_{cof} = 3.73$

Radiological Analysis	²²⁶ Ra (pCi/g)	²³⁰ Th (pCi/g)	²³² Th (pCi/g)	COMMENTS
Cobbles (C _{ss})	1.2	0.7	0.6	
On-Site Analysis Fines (C _{cof})	1.2 * 2.2 ** N/A ***	N/A		
Vendor Analysis Fines (C _{cof})	1.3	1.6	0.9	
Bulk Radionuclide Concentration (C _b)	1.2 # 1.4 ## - ###	0.9	0.5	See CTF-1

- * Initial;
- ** Initial Corrected;
- *** 20 day (N/A for Test Pit or Running AVE.)
- # Using Vendor;
- ## Using Initial Corrected;
- ### Using 20 day (N/A for Test Pits or Running AVE.)

Ra Correction Factor: 1.8

Reviewed By: Wei Yeh Lin Date: 5/1/95

COBBLES TO FINES CALCULATION SHEET

PYL 4/28/95

Site: Naturita
Sample/Grid I.D. NAT-SS-1239-0003-CTF

Sheet 3 of 35
Date: 1-23-95

Fines	Cobbles	Moisture Content Fines
Wt. Sample & Bucket <u>1027.18</u>	Wt. Sample & Bucket <u>2096.10</u>	Wet Wt. Sample/Pan <u>679.1g</u>
Wt. Bucket <u>N/A</u>	Wt. Bucket <u>N/A</u>	Dry Wt. Sample/Pan <u>663.8g</u>
Wt. Sample <u>1027.18</u>	Wt. Sample <u>2096.10</u>	Tare Wt. Pan <u>N/A</u>
Adjusted	Adjusted	Wt. Water* <u>15.3g</u>
Dry Wt. (M _{cd})* <u>1003.55</u>	Dry Wt. (M _{cd})* <u>2064.66</u>	Wt. Soil** <u>663.8g</u>
<u>Scale found in bucket as expected</u>		Percent Water(*/**) <u>2.3</u>

- * Adjusted Dry Wt. of the Fines = Wt. Sample x (1 - % water)
** Adjusted Dry Wt. of the Cobbles = Wt. Sample x (1 - .015)

Mass Partition function (f) = M_{cd}/M_{cd} = 2.06

Radiological Analysis	²²⁶ Ra (pCi/g)	²³⁰ Th (pCi/g)	²³² Th (pCi/g)	COMMENTS
Cobbles (C _{cd})	0.8	0.7	0.0 -0.2	
On-Site Analysis Fines (C _{cd})	1.9 * 3.4 ** N/A ***	N/A		
Vendor Analysis Fines (C _{cd})	1.2	1.6	0.0 -0.3	
Bulk Radionuclide Concentration (C _b)	0.9 # 1.6 ## / ###	1.0	0.0	See CTF-1

- * Initial; ** Initial Corrected; *** 20 day (N/A for Test Pit or Running AVE.)
- Using Vendor; ## Using Initial Corrected; ### Using 20 day (N/A for Test Pits or Running AVE.)

²²⁶Ra Correction Factor: 1.8

Reviewed By: W. Yeh Lin Date: 5/1/95

PYL 4/28/95

COBBLES TO FINES CALCULATION SHEET

Site: Naturita

Sheet 4 of 35

Sample/Grid I.D. NAT-SS-1240-0004-CTE

Date: 1-23-95

Fines

Wt. Sample
& Bucket 671.56
Wt. Bucket N/A
Wt. Sample 671.56
Adjusted
Dry Wt. (M_{sed})^{*} 613.81

Cobbles

Wt. Sample
& Bucket 1877.44
Wt. Bucket N/A
Wt. Sample 1877.44
Adjusted
Dry Wt. (M_{sed})^{**} 1849.28

Moisture Content Fines

Wet Wt. Sample/Pan 518.5 g
Dry Wt. Sample/Pan 477.4 g
Tare Wt. Pan N/A
Wt. Water^{*} 41.1 g
Wt. Soil^{**} 477.4 g
Percent Water^(*/**) 8.6

Scale Tared to Bucket as before

* Adjusted Dry Wt. of the Fines = Wt. Sample x (1 - % water)

** Adjusted Dry Wt. of the Cobbles = Wt. Sample x (1 - .015)

Mass Partition function (f) = M_{sed}/M_{sed} = 3.01

Radiological Analysis	²²⁶ Ra (pCi/g)	²³⁰ Th (pCi/g)	²³² Th (pCi/g)	COMMENTS
Cobbles (C _{sed})	0.8	0.6	0.2	
On-Site Analysis Fines (C _{sed})	1.3 [*] 2.3 ^{**} N/A ^{***}	N/A		
Vendor Analysis Fines (C _{sed})	0.9	1.7	0.2	
Bulk Radionuclide Concentration (C _s)	0.8 [#] 1.2 ^{##} - ^{###}	0.9	0.2	See CTF-1

* Initial; ** Initial Corrected; *** 20 day (N/A for Test Pit or Running AVE.)
 * Using Vendor; ## Using Initial Corrected; ### Using 20 day (N/A for Test Pits or Running AVE.)

²²⁶Ra Correction Factor: 1.0

Reviewed By: Wen Yeh Lin Date: 5/1/95

PYL 4/28/95

COBBLES TO FINES CALCULATION SHEET

Site: Natunata
Sample/Grid I.D. NAT-SS-1241-0005-CTF

Sheet 5 of 35
Date: 1-23-95

Fines	Cobbles	Moisture Content Fines
Wt. Sample As-Received & Bucket <u>638.22</u>	Wt. Sample As-Received & Bucket <u>2054.50</u>	Wet Wt. Sample/Pan <u>680.0 g</u>
Wt. Bucket <u>N/A</u>	Wt. Bucket <u>N/A</u>	Dry Wt. Sample/Pan <u>594.6 g</u>
Wt. Sample <u>638.22</u>	Wt. Sample <u>2054.50</u>	Tare Wt. Pan <u>N/A</u>
Adjusted	Adjusted	Wt. Water* <u>95.4 g</u>
Dry Wt. (M _{cd})* <u>536.10</u>	Dry Wt. (M _{cd})* <u>2028.61</u>	Wt. Soil** <u>594.6 g</u>
Scale Tared to bucket as 4/28/95		Percent Water(*/*) <u>16.0</u>

* Adjusted Dry Wt. of the Fines = Wt. Sample x (1 - % water)

** Adjusted Dry Wt. of the Cobbles = Wt. Sample x (1 - .015)

Mass Partition function (f) = $M_{cd}/M_{cd} = 3.78$

Radiological Analysis	²²⁶ Ra (pCi/g)	²³⁰ Th (pCi/g)	²³² Th (pCi/g)	COMMENTS
Cobbles (C _{cd})	0.2	1.7	-0.1	
On-Site Analysis Fines (C _{cd})	4.7 *	N/A		
	8.5 **			
	N/A ***			
Vendor Analysis Fines (C _{cd})	5.6	7.8	0.4	
Bulk Radionuclide Concentration (C _b)	1.3 #	3.0	0.1	See CTF-1
	1.9 ##			
	/ ###			

* Initial;

*Using Vendor;

** Initial Corrected;

** Using Initial Corrected;

*** 20 day (N/A for Test Pit or Running AVE.)

*** Using 20 day (N/A for Test Pits or Running AVE.)

²²⁶Ra Correction Factor: 1.8

Reviewed By: W. Yeh Lin

Date: 5/1/95

PYL 4/28/95

COBBLES TO FINES CALCULATION SHEET

Site: Naturita
Sample/Grid I.D. NAT-SS-1242-000ce-CTE

Sheet 6 of 35
Date: 1-23-95

Fines

Wt. Sample /
& Bucket 553.18
Wt. Bucket N/A
Wt. Sample 553.18
Adjusted
Dry Wt. (M_{ce})^{*} 461.91

Scale Tared To Bucket 15 02/01/95

Cobbles

Wt. Sample /
& Bucket 1492.54
Wt. Bucket N/A
Wt. Sample 1492.54
Adjusted
Dry Wt. (M_{ce})^{**} 1470.15

Moisture Content Fines

Wet Wt. Sample/Pan 692.9 g
Dry Wt. Sample/Pan 594.6 g
Tare Wt. Pan N/A
Wt. Water^{*} 98.3 g
Wt. Soil^{**} 594.6 g
Percent Water(°/°) 16.5

- Adjusted Dry Wt. of the Fines = Wt. Sample x (1 - % water)
- Adjusted Dry Wt. of the Cobbles = Wt. Sample x (1 - .015)

Mass Partition function (f) = $M_{ce}/M_{ce} = 3.18$

Radiological Analysis	²²⁶ Ra (pCi/g)	²³⁰ Th (pCi/g)	²³² Th (pCi/g)	COMMENTS
Cobbles (C _{ce})	0.8	0.8	0.8	
On-Site Analysis Fines (C _{ce})	1.7 • 3.1 •• N/A •••	N/A		
Vendor Analysis Fines (C _{ce})	1.3	2.2	0.3	
Bulk Radionuclide Concentration (C _b)	0.9 # 1.4 ## — ###	1.1	0.7	See CTF - 1

- Initial; •• Initial Corrected; ••• 20 day (N/A for Test Pit or Running AVE.)
- Using Vendor; ## Using Initial Corrected; ### Using 20 day (N/A for Test Pits or Running AVE.)

²²⁶Ra Correction Factor: 1.8

Reviewed By: Wen Yeh Lin Date: 1/1/95

PYL 4/28/95

COBBLES TO FINES CALCULATION SHEET

Site: Naturita

Sample/Grid I.D. NAT-SS-1243-0007-CTF

Sheet 7 of 34

Date: 1-23-95

Fines

Wt. Sample/
Bucket 411.86
Wt. Bucket N/A
Wt. Sample 411.86
Adjusted
Dry Wt. (M_{co})^{*} 381.79

Cobbles

Wt. Sample
Bucket 1309.60
Wt. Bucket N/A
Wt. Sample 1309.60
Adjusted
Dry Wt. (M_{co})^{**} 1289.96

Moisture Content Fines

Wet Wt. Sample/Pan 549.0g
Dry Wt. Sample/Pan 511.5g
Tare Wt. Pan N/A
Wt. Water^{*} 37.5g
Wt. Soil^{**} 511.5g
Percent Water^(*) 7.3

Scale Tared to Bucket 12-22-95

* Adjusted Dry Wt. of the Fines = Wt. Sample x (1 - % water)

** Adjusted Dry Wt. of the Cobbles = Wt. Sample x (1 - .015)

Mass Partition function (f) = M_{cob}/M_{co} = 3.38

Radiological Analysis	²²⁶ Ra (pCi/g)	²³⁰ Th (pCi/g)	²³² Th (pCi/g)	COMMENTS
Cobbles (C _{co})	0.7	0.6	0.3	
On-Site Analysis Fines (C _{co})	3.8 *	N/A		
	6.8 **			
	N/A ***			
Vendor Analysis Fines (C _{co})	6.4	4.3	0.1	
Bulk Radionuclide Concentration (C _s)	2.0 #	1.4	0.3	See CTF-1
	2.1 ##			
	/ ###			

* Initial;

Using Vendor;

** Initial Corrected;

Using Initial Corrected;

*** 20 day (N/A for Test Pit or Running AVE.)

Using 20 day (N/A for Test Pits or Running AVE.)

*Ra Correction Factor: 1.8

Reviewed By: W. Yeh Lin

Date: 5/1/95

PYL 4/28/95

COBBLES TO FINES CALCULATION SHEET

Site: Naturita
Sample/Grid I.D. NAT-SS-1244-0008-CTF

Sheet 8 of 35
Date: 1-23-95

Fines

Wt. Sample 946.33
Wt. Bucket N/A
Wt. Sample 946.33
Adjusted
Dry Wt. (M_{co})^{*} 862.11

Cobbles

Wt. Sample 2768.06
Wt. Bucket N/A
Wt. Sample 2768.06
Adjusted
Dry Wt. (M_{co})^{**} 2726.54

Moisture Content Fines

Wet Wt. Sample/Pan 668.8g
Dry Wt. Sample/Pan 614.3g
Tare Wt. Pan N/A
Wt. Water^{*} 54.5g
Wt. Soil^{**} 614.3g
Percent Water (W₁)^{**} 8.9

* Adjusted Dry Wt. of the Fines = Wt. Sample x (1 - % water)
** Adjusted Dry Wt. of the Cobbles = Wt. Sample x (1 - .015)

Mass Partition function (f) = $M_{soil}/M_{co} = 3.16$

Radiological Analysis	²²⁶ Ra (pCi/g)	²³⁰ Th (pCi/g)	²³² Th (pCi/g)	COMMENTS
Cobbles (C _{co})	0.3	0.9	0.2	
On-Site Analysis Fines (C _{co})	5.0 9.0 N/A	N/A		
Vendor Analysis Fines (C _{co})	9.0	9.9	0.2	
Bulk Radionuclide Concentration (C _g)	2.4 2.4 —	3.1	0.2	See CTF-1

* Initial; ** Initial Corrected; *** 20 day (N/A for Test Pit or Running AVE.)
Using Vendor; ## Using Initial Corrected; ### Using 20 day (N/A for Test Pits or Running AVE.)

²²⁶Ra Correction Factor: 1.8

Reviewed By: Wen Yeh Lin Date: 5/1/95

COBBLES TO FINES CALCULATION SHEET

PYL 4/28/95

Site: Naturita
Sample/Grid I.D. NAT-SS-1245-0009-CTF

Sheet 9 of 34
Date: 1-23-95

Fines

Wt. Sample 653.28
~~Wt. Sample~~
~~Wt. Bucket~~
Wt. Bucket N/A
Wt. Sample 653.28
Adjusted
Dry Wt. (M_{co})^{*} 569.01

Cobbles

Wt. Sample 2075.05
~~Wt. Sample~~
~~Wt. Bucket~~
Wt. Bucket N/A
Wt. Sample 2075.05
Adjusted
Dry Wt. (M_{co})^{**} 2043.92

Moisture Content Fines

Wet Wt. Sample/Pan 675.5g
Dry Wt. Sample/Pan 598.5g
Tare Wt. Pan N/A
Wt. Water^{*} 77.0g
Wt. Soil^{**} 598.5g
Percent Water (°/°) 12.9

Scale Tared To Bucket 10/20/95

- * Adjusted Dry Wt. of the Fines = Wt. Sample x (1 - % water)
- ** Adjusted Dry Wt. of the Cobbles = Wt. Sample x (1 - .015)

Mass Partition function (f) = $M_{co}/M_{co} = 3.59$

Radiological Analysis	²²⁶ Ra (pCi/g)	²³⁰ Th (pCi/g)	²³² Th (pCi/g)	COMMENTS
Cobbles (C _{co})	1.1	0.5	0.3	
On-Site Analysis Fines (C _{co})	2.2 * 4.0 ** N/A ***	N/A		
Vendor Analysis Fines (C _{co})	1.8	3.8	0.1	
Bulk Radionuclide Concentration (C _b)	1.3 # 1.7 ## - ###	1.2	0.0	See CTF-1

- * Initial; ** Initial Corrected; *** 20 day (N/A for Test Pit or Running AVE.)
- Using Vendor; ## Using Initial Corrected; ### Using 20 day (N/A for Test Pits or Running AVE.)

²²⁶Ra Correction Factor: 1.8

Reviewed By: W. Yeh Lin Date: 5/1/95

PYL 4/28/95

COBBLES TO FINES CALCULATION SHEET

Site: Naturita
Sample/Grid I.D. NAT-SS-1246-0010-CTF

Sheet 10 of 34
Date: 1-23-95

Fines	Cobbles	Moisture Content Fines
Wt. Sample & Bucket <u>558.71</u>	Wt. Sample & Bucket <u>1859.01</u>	Wet Wt. Sample/Pan <u>652.9g</u>
Wt. Bucket <u>N/A</u>	Wt. Bucket <u>N/A</u>	Dry Wt. Sample/Pan <u>583.6g</u>
Wt. Sample <u>558.71</u>	Wt. Sample <u>1859.01</u>	Tare Wt. Pan <u>N/A</u>
Adjusted	Adjusted	Wt. Water* <u>69.3g</u>
Dry Wt. (M _{ced})* <u>492.22</u>	Dry Wt. (M _{ced})* <u>1831.12</u>	Wt. Soil** <u>583.6g</u>
<i>soak Tared to Bucket 2/2/95</i>		Percent Water(*100) <u>11.9</u>

- * Adjusted Dry Wt. of the Fines = Wt. Sample x (1 - % water)
- ** Adjusted Dry Wt. of the Cobbles = Wt. Sample x (1 - .015)

Mass Partition function (f) = $M_{ced}/M_{ced} = 3.72$

Radiological Analysis	²²⁶ Ra (pCi/g)	²³⁰ Th (pCi/g)	²³² Th (pCi/g)	COMMENTS
Cobbles (C _{ced})	1.1	1.9	0.2	
On-Site Analysis Fines (C _{ced})	3.5 *	N/A		
	6.3 **			
	N/A ***			
Vendor Analysis Fines (C _{ced})	7.1	8.6	0.2	
Bulk Radionuclide Concentration (C _b)	2.4 #	3.3	0.2	See LTF-1
	2.2 ##			
	- ###			

- * Initial;
- ** Initial Corrected;
- *** 20 day (N/A for Test Pit or Running AVE.)
- Using Vendor;
- ## Using Initial Corrected;
- ### Using 20 day (N/A for Test Pits or Running AVE.)

²²⁶Ra Correction Factor: 1.8

Reviewed By: Wen Yeh Lin Date: 5/1/95

PYL 4/28/95

COBBLES TO FINES CALCULATION SHEET

Site: Natusita
 Sample/Grid I.D. NAT-SS-1247-0011-CTF

Sheet 11 of 35
 Date: 1-23-95

Fines	Cobbles	Moisture Content Fines
Wt. Sample & Bucket _____	Wt. Sample & Bucket _____	Wet Wt. Sample/Pan <u>673.7 g</u>
Wt. Bucket _____	Wt. Bucket _____	Dry Wt. Sample/Pan <u>616.9 g</u>
Wt. Sample <u>529.1</u>	Wt. Sample <u>N/A</u>	Tare Wt. Pan <u>N/A</u>
Adjusted _____	Adjusted _____	Wt. Water* <u>616.9 g</u>
Dry Wt. (M _{ddl})° _____	Dry Wt. (M _{ddl})** _____	Wt. Soil** <u>56.6 g</u>
		Percent Water (*/**) <u>9.2</u>

* Adjusted Dry Wt. of the Fines = Wt. Sample x (1 - % water)

** Adjusted Dry Wt. of the Cobbles = Wt. Sample x (1 - .015)

Mass Partition function (f) = $M_{ddl}/M_{ddl} =$ _____

Radiological Analysis	²²⁶ Ra (pCi/g)	²³⁰ Th (pCi/g)	²³² Th (pCi/g)	COMMENTS
Cobbles (C _{ddl})	N/A	N/A	N/A	
On-Site Analysis Fines (C _{ddl})	3.1 *	N/A		
	5.6 **			
	N/A ***			
Vendor Analysis Fines (C _{ddl})	6.5	5.7	1.2	
Bulk Radionuclide Concentration (C _b)	#			
	##			
	###			

* Initial;

** Using Vendor;

*** Initial Corrected;

Using Initial Corrected;

*** 20 day (N/A for Test Pit or Running AVE.)

Using 20 day (N/A for Test Pits or Running AVE.)

²²⁶Ra Correction Factor: 1.8

Reviewed By: Wesley Linn

Date: 5/1/95

PYL 4/28/95

COBBLES TO FINES CALCULATION SHEET

Site: Naturita
Sample/Grid I.D. NAT-SS-1248-0012-CTF

Sheet 12 of 35
Date: 1-23-95

Fines

Wt. Sample/
& Bucket 771.69
Wt. Bucket N/A
Wt. Sample 771.69
Adjusted
Dry Wt. (M_{co})^{*} 656.94

Cobbles

Wt. Sample
& Bucket 1667.37
Wt. Bucket N/A
Wt. Sample 1667.37
Adjusted
Dry Wt. (M_{co})^{**} 1642.36

Moisture Content Fines

Wet Wt. Sample/Pan 671.0g
Dry Wt. Sample/Pan 583.6g
Tare Wt. Pan N/A
Wt. Water^{*} 87.4g
Wt. Soil^{**} 583.6g
Percent Water (1^{**}) 15.0

Scale Tared To Bucket at 02/01/95

- Adjusted Dry Wt. of the Fines = Wt. Sample x (1 - % water)
- Adjusted Dry Wt. of the Cobbles = Wt. Sample x (1 - .015)

Mass Partition function (f) = $M_{ss}/M_{co} =$ 2.50

Radiological Analysis	²²⁶ Ra (pCi/g)	²³⁰ Th (pCi/g)	²³² Th (pCi/g)	COMMENTS
Cobbles (C _{ss})	0.2	0.5	-0.8 ⁰	
On-Site Analysis Fines (C _{co})	2.4 [*] 4.3 ^{**} N/A ^{***}	N/A		
Vendor Analysis Fines (C _{co})	2.5	5.5	-0.2 ⁰	
Bulk Radionuclide Concentration (C _s)	0.9 [#] 1.4 ^{##} — ^{###}	1.9	0.0	See CTF-1

- Initial;
- Initial Corrected;
- 20 day (N/A for Test Pit or Running AVE.)
- Using Vendor;
- ## Using Initial Corrected;
- ### Using 20 day (N/A for Test Pits or Running AVE.)

²²⁶Ra Correction Factor: 1-8

Reviewed By: Wei Yeh Lin Date: 5-1-95

COBBLES TO FINES CALCULATION SHEET

PYL 4/28/95

Site: Naturita
Sample/Grid I.D. NAT-SS-1249-^{Lower}0013-CTF

Sheet 13 of 35
Date: 1-23-95

Fines	Cobbles	Moisture Content Fines
Wt. Sample <u>PC 2-1-95</u> & Bucket	Wt. Sample <u>PC 2-1-95</u> & Bucket	Wet Wt. Sample/Pan <u>663.2 g</u>
Wt. Bucket	Wt. Bucket	Dry Wt. Sample/Pan <u>504.1 g</u>
Wt. Sample <u>516.1</u>	Wt. Sample	Tare Wt. Pan <u>N/A</u>
Adjusted	Adjusted	Wt. Water* <u>159.1 g</u>
Dry Wt. (M _{ced})*	Wt. (M _{sed})*	Wt. Soil** <u>504.1 g</u>
		Percent Water(*/**) <u>31.6</u>

* Adjusted Dry Wt. of the Fines = Wt. Sample x (1 - % water)

** Adjusted Dry Wt. of the Cobbles = Wt. Sample x (1 - .015)

Mass Partition function (f) = M_{sed}/M_{ced} =

Radiological Analysis	²²⁶ Ra (pCi/g)	²³⁰ Th (pCi/g)	²³² Th (pCi/g)	COMMENTS
Cobbles (C _{sed})	N/A	N/A	N/A	
On-Site Analysis Fines (C _{ced})	2.2 * 4.0 ** N/A ***	N/A		
Vendor Analysis Fines (C _{ced})	1.7	3.5	-2.6°	
Bulk Radionuclide Concentration (C _b)	# ## ###			

* Initial;

** Initial Corrected;

*** 20 day (N/A for Test Pit or Running AVE.)

- Using Vendor;

Using Initial Corrected;

Using 20 day (N/A for Test Pits or Running AVE.)

Correction Factor: 1.8

Reviewed By: We Yeh Lin

Date: 5-1-95

PYL 4/28/95

COBBLES TO FINES CALCULATION SHEET

Site: Naturita
Sample/Grid I.D. NAT-SS-1250-V013-CTF

Sheet 14 of 35
Date: 1-23-95

Fines	Cobbles	Moisture Content Fines
Wt. Sample AC 2-1-95 & Bucket <u>552.70</u>	Wt. Sample AC 2-1-95 & Bucket <u>1302.65</u>	Wet Wt. Sample/Pan <u>658.7g</u>
Wt. Bucket <u>N/A</u>	Wt. Bucket <u>N/A</u>	Dry Wt. Sample/Pan <u>565.5g</u>
Wt. Sample <u>552.70</u>	Wt. Sample <u>1302.65</u>	Tare Wt. Pan <u>N/A</u>
Adjusted	Adjusted	Wt. Water* <u>93.2g</u>
Dry Wt. (M _{ced})* <u>461.50</u>	Dry Wt. (M _{ced})* <u>1203.11</u>	Wt. Soil** <u>565.5g</u>
<u>Scale Tared To Bucket AC 2-1-95</u>		Percent Water(*/*) <u>16.5</u>

- * Adjusted Dry Wt. of the Fines = Wt. Sample x (1 - % water)
- ** Adjusted Dry Wt. of the Cobbles = Wt. Sample x (1 - .015)

Mass Partition function (f) = $M_{ced}/M_{cob} = 2.78$

Radiological Analysis	²²⁶ Ra (pCi/g)	²³⁰ Th (pCi/g)	²³² Th (pCi/g)	COMMENTS
Cobbles (C _{ced})	0.5	0.9	-0.3 ⁰	
On-Site Analysis Fines (C _{ced})	1.4 * 2.5 ** N/A ***	N/A		
Vendor Analysis Fines (C _{ced})	0.9	2.5	-0.4 ⁰	
Bulk Radionuclide Concentration (C _b)	0.6 # 1.0 ## / ###	1.3	0.0	see CTF-1

* Initial; ** Initial Corrected; *** 20 day (N/A for Test Pit or Running AVE.)
Using Vendor; ## Using Initial Corrected; ### Using 20 day (N/A for Test Pits or Running AVE.)

²²⁶Ra Correction Factor: 1.8

Reviewed By: We Yeh Lin Date: 5/1/95

COBBLES TO FINES CALCULATION SHEET

PYL 4/28/95

Site: Naturita
Sample/Grid I.D. NAT-SS-1251-004-CTF

Sheet 15 of 35
Date: 1-23-95

Fines	Cobbles	Moisture Content Fines
Wt. Sample AC 2-1-95 & Bucket <u>619.99</u>	Wt. Sample AC 2-1-95 & Bucket <u>1696.60</u>	Wet Wt. Sample/Pan <u>651.3 g</u>
Wt. Bucket <u>N/A</u>	Wt. Bucket <u>N/A</u>	Dry Wt. Sample/Pan <u>583.2 g</u>
Wt. Sample <u>619.99</u>	Wt. Sample <u>1696.60</u>	Tare Wt. Pan <u>N/A</u>
Adjusted	Adjusted	Wt. Water* <u>68.1 g</u>
Dry Wt. (M _{cd})* <u>547.45</u>	Dry Wt. (M _{cd})* <u>1671.15</u>	Wt. Soil** <u>583.2 g</u>
<u>Scale Tared To Bucket</u>	<u>AC 2-1-95</u>	Percent Water(*/**) <u>11.7</u>

* Adjusted Dry Wt. of the Fines = Wt. Sample x (1 - % water)

** Adjusted Dry Wt. of the Cobbles = Wt. Sample x (1 - .015)

*** Mass Partition function (f) = $M_{cd}/M_{cd} = 3.05$

Radiological Analysis	²²⁶ Ra (pCi/g)	²³⁰ Th (pCi/g)	²³² Th (pCi/g)	COMMENTS
Cobbles (C _{cd})	0.8	0.3	-0.1	
On-Site Analysis Fines (C _{cd})	1.7 * 3.1 ** N/A ***	N/A		
Vendor Analysis Fines (C _{cd})	2.0	2.8	0.6	
Bulk Radionuclide Concentration (C _b)	1.1 # 1.4 ## / ###	0.9	0.1	Sec. CTF-1

* Initial; ** Initial Corrected; *** 20 day (N/A for Test Pit or Running AVE.)
Using Vendor; ## Using Initial Corrected; ### Using 20 day (N/A for Test Pit or Running AVE.)

²²⁶Ra Correction Factor: 1.8

Reviewed By: Wei Yeh Lin Date: 5/1/95

PYL 4/28/95

COBBLES TO FINES CALCULATION SHEET

Site: Naturita
Sample/Grid I.D. NAT-SS-1252-0015-CTF

Sheet 16 of 34
Date: 1-23-95

Fines	Cobbles	Moisture Content Fines
Wt. Sample AC 2-1-95 Bucket <u>676.66</u>	Wt. Sample AC 2-1-95 Bucket <u>1940.80</u>	Wet Wt. Sample/Pan <u>674.3g</u>
Wt. Bucket <u>N/A</u>	Wt. Bucket <u>N/A</u>	Dry Wt. Sample/Pan <u>624.5g</u>
Wt. Sample <u>676.66</u>	Wt. Sample <u>1940.80</u>	Tare Wt. Pan <u>N/A g</u>
Adjusted	Adjusted	Wt. Water* <u>49.8g</u>
Dry Wt. (M _{ced})* <u>622.53</u>	Dry Wt. (M _{ced})* <u>1911.69</u>	Wt. Soil** <u>624.5g</u>
Scale Tare to Bucket	AC 2-1-95	Percent Water(*/*) <u>8.0</u>

- * Adjusted Dry Wt. of the Fines = Wt. Sample x (1 - % water)
- ** Adjusted Dry Wt. of the Cobbles = Wt. Sample x (1 - .015)

Mass Partition function (f) = $M_{cob}/M_{ced} =$ 3.07

Radiological Analysis	²²⁶ Ra (pCi/g)	²³⁰ Th (pCi/g)	²³² Th (pCi/g)	COMMENTS
Cobbles (C _{cob})	1.1	1.7	-0.1 ⁰	
On-Site Analysis Fines (C _{ced})	5.8 • 10.4 ** N/A ***	N/A		
Vendor Analysis Fines (C _{ced})	0.7	1.7	-0.3 ⁰	
Bulk Radionuclide Concentration (C _b)	1.0 # 3.4 ## - ###	1.7	0.0	See CTF-1

- * Initial;
- ** Initial Corrected;
- *** 20 day (N/A for Test Pit or Running AVE.)
- Using Vendor;
- ## Using Initial Corrected;
- ### Using 20 day (N/A for Test Pits or Running AVE.)

²²⁶Ra Correction Factor: 1.8

Reviewed By: W. Yeh Lin Date: 5/1/95

PYL 4/28/95

COBBLES TO FINES CALCULATION SHEET

Site: Naturita
Sample/Grid I.D. NAT-SS-1253-0018-CTF

Sheet 17 of 35
Date: 1-23-95

Fines	Cobbles	Moisture Content Fines
Wt. Sample AC 2-1-95 Bucket <u>304.52</u>	Wt. Sample AC 2-1-95 Bucket <u>1241.33</u>	Wet Wt. Sample/Pan <u>664.6g</u>
Wt. Bucket <u>N/A</u>	Wt. Bucket <u>N/A</u>	Dry Wt. Sample/Pan <u>611.9g</u>
Wt. Sample <u>304.52</u>	Wt. Sample <u>1241.33</u>	Tare Wt. Pan <u>N/A</u>
Adjusted	Adjusted	Wt. Water* <u>52.7g</u>
Dry Wt.(M _{cof})* <u>278.33</u>	Dry Wt.(M _{cof})* <u>1222.71</u>	Wt. Soil** <u>611.9g</u>
Scale Error To Bucket	AC 2-1-95	Percent Water(*/**) <u>8.6</u>

- * Adjusted Dry Wt. of the Fines = Wt. Sample x (1 - % water)
- ** Adjusted Dry Wt. of the Cobbles = Wt. Sample x (1 - .015)

Mass Partition function (f) = $M_{cob}/M_{cof} = 4.39$

Radiological Analysis	²²⁸ Ra (pCi/g)	²³⁰ Th (pCi/g)	²³² Th (pCi/g)	COMMENTS
Cobbles (C _{cob})	0.8	0.3	-0.4 ⁰	
On-Site Analysis Fines (C _{cof})	1.6 2.9 N/A	N/A		
Vendor Analysis Fines (C _{cof})	0.5	0.7	-0.4 ⁰	
Bulk Radionuclide Concentration (C _b)	0.7 1.2 ---	0.4	0.0	See CTF-1

- * Initial;
- ** Initial Corrected;
- *** 20 day (N/A for Test Pit or Running AVE.)
- Using Vendor;
- ## Using Initial Corrected;
- ### Using 20 day (N/A for Test Pits or Running AVE.)

*Ra Correction Factor: 1.8

Reviewed By: W. Yeh Lin

Date: 5/1/95

PYL 4/28/95

COBBLES TO FINES CALCULATION SHEET

Site: Naturita
Sample/Grid I.D. NAT-SS-1254-0019-CTF

Sheet 18 of 35
Date: 1-23-95

Fines	Cobbles	Moisture Content Fines
Wt. Sample AC 2-1-95 & Bucket <u>705.81</u>	Wt. Sample AC 2-1-95 & Bucket <u>779.05</u>	Wet Wt. Sample/Pan <u>630.7 g</u>
Wt. Bucket <u>N/A</u>	Wt. Bucket <u>N/A</u>	Dry Wt. Sample/Pan <u>555.6 g</u>
Wt. Sample <u>705.81</u>	Wt. Sample <u>779.05</u>	Tare Wt. Pan <u>N/A</u>
Adjusted	Adjusted	Wt. Water* <u>95.1 g</u>
Dry Wt. (M _{ced})* <u>585.12</u>	Dry Wt. (M _{ced})** <u>727.96</u>	Wt. Soil** <u>555.6 g</u>
<i>Scale Tipped To Bucket</i>	<i>AC 2-1-95</i>	Percent Water (*1**) <u>17.1</u>

- * Adjusted Dry Wt. of the Fines = Wt. Sample x (1 - % water)
- ** Adjusted Dry Wt. of the Cobbles = Wt. Sample x (1 - .015)

Mass Partition function (f) = $M_{>60}/M_{<60} = \underline{1.24}$

Radiological Analysis	²²⁶ Ra (pCi/g)	²³⁰ Th (pCi/g)	²³² Th (pCi/g)	COMMENTS
Cobbles (C _{>60})	1.1	0.9	-0.2 ⁰	
On-Site Analysis Fines (C _{<60})	9.1 *	N/A		
	16.4 **			
	N/A ***			
Vendor Analysis Fines (C _{<60})	16	15	1.5	
Bulk Radionuclide Concentration (C _B)	7.8 #	7.2	0.7	See CTF-1
	7.9 ##			
	/ ###			

- * Initial;
- ** Initial Corrected;
- *** 20 day (N/A for Test Pit or Running AVE.)
- # Using Vendor;
- ## Using Initial Corrected;
- ### Using 20 day (N/A for Test Pits or Running AVE.)

*Ra Correction Factor: 1.8

Reviewed By: Wei Yeh Lin Date: 5/1/95

PYL 4/28/95

COBBLES TO FINES CALCULATION SHEET

Site: Naturita

Sheet 19 of 35

Sample/Grid I.D. NAT-SS-255-0019A-CTF

Date: 1-23-95

Fines	Cobbles	Moisture Content Fines
Wt. Sample AC 2-1-95 & Bucket <u>502.09</u>	Wt. Sample AC 2-1-95 & Bucket <u>674.65</u>	Wet Wt. Sample/Pan <u>659.6g</u>
Wt. Bucket <u>N/A</u>	Wt. Bucket <u>N/A</u>	Dry Wt. Sample/Pan <u>569.2g</u>
Wt. Sample <u>502.09</u>	Wt. Sample <u>674.65</u>	Tare Wt. Pan <u>N/A</u>
Adjusted	Adjusted	Wt. Water* <u>90.4g</u>
Dry Wt. (M _{sed})* <u>422.76</u>	Dry Wt. (M _{sed})* <u>664.53</u>	Wt. Soil** <u>569.2g</u>
Scale Tared To Bucket AC 2-1-95		Percent Water(*/**) <u>15.28</u>

* Adjusted Dry Wt. of the Fines = Wt. Sample x (1 - % water)

** Adjusted Dry Wt. of the Cobbles = Wt. Sample x (1 - .015)

Mass Partition function (f) = $M_{>60}/M_{<60}$ = 1.57

Radiological Analysis	²²⁶ Ra (pCi/g)	²³⁰ Th (pCi/g)	²³² Th (pCi/g)	COMMENTS
Cobbles (C _{>60})	1.0	0.6	-0.2	
On-Site Analysis Fines (C _{<60})	2.8 * 5.0 ** N/A ***	N/A		
Vendor Analysis Fines (C _{<60})	4.2	3.1	0.5	
Bulk Radionuclide Concentration (C _b)	2.2 # 2.6 ## / ###	1.6	0.2	See CTF-1

* Initial;

* Using Vendor;

** Initial Corrected;

** Using Initial Corrected;

*** 20 day (N/A for Test Pit or Running AVE.)

*** Using 20 day (N/A for Test Pits or Running AVE.)

*Ra Correction Factor: 1.8

Reviewed By: W. Yeh Lim

Date: 5/1/95

PYL 4/28/95

COBBLES TO FINES CALCULATION SHEET

Site: NATURALIA

Sheet 20 of 35

Sample/Grid I.D. NAT-SS-1256-0020-CTF

Date: 1-24-95

Fines

Wt. Sample 688.4g
Wt. Bucket N/A
Wt. Sample 688.4g
Adjusted
Dry Wt. (M_{co})^{*} 564.3g

Cobbles

Wt. Sample 2860.81g
Wt. Bucket N/A
Wt. Sample 2860.81g
Adjusted
Dry Wt. (M_{co})^{**} 2817.9g

Moisture Content Fines

Wet Wt. Sample/Pan 653.4g
Dry Wt. Sample/Pan 557.1g
Tare Wt. Pan N/A
Wt. Water^{*} 96.3g
Wt. Soil^{**} 557.1g
Percent Water(°/°°) 17.3

Scale Tared To Bucket At 2-1-95

* Adjusted Dry Wt. of the Fines = Wt. Sample x (1 - % water)

** Adjusted Dry Wt. of the Cobbles = Wt. Sample x (1 - .015)

Mass Partition function (f) = M_{co}/M_{co} = 4.95

Radiological Analysis	²²⁶ Ra (pCi/g)	²³⁰ Th (pCi/g)	²³² Th (pCi/g)	COMMENTS
Cobbles (C _{co})	0.6	1.0	0.4	
On-Site Analysis Fines (C _{co})	10.4 18.7 N/A	N/A		
Vendor Analysis Fines (C _{co})	3.4	14	1.2	
Bulk Radionuclide Concentration (C _o)	1.1 3.6 -	3.2	0.5	See CTF-1

* Initial;

** Initial Corrected;

*** 20 day (N/A for Test Pit or Running AVE.)

* Using Vendor;

** Using Initial Corrected;

*** Using 20 day (N/A for Test Pits or Running AVE.)

*Ra Correction Factor: 1.8

Reviewed By: W. Yeh Lin

Date: 5/1/95

PTL 4/28/95

COBBLES TO FINES CALCULATION SHEET

Site: Naturita

Sheet 21 of 35

Sample/Grid I.D. NAT-SS-1257-0021-CTF

Date: 1-23-95

Fines	Cobbles	Moisture Content Fines
Wt. Sample AC 2-1-95 Bucket <u>570.04</u>	Wt. Sample AC 2-1-95 Bucket <u>1656.84</u>	Wet Wt. Sample/Pan <u>723.0 g</u>
Wt. Bucket <u>N/A</u>	Wt. Bucket <u>N/A</u>	Dry Wt. Sample/Pan <u>648.1 g</u>
Wt. Sample <u>570.04</u>	Wt. Sample <u>1656.84</u>	Tare Wt. Pan <u>N/A</u>
Adjusted <u>AC 2-1-95</u>	Adjusted <u>-</u>	Wt. Water* <u>74.9 g</u>
Dry Wt.(M _{coal})* <u>503.94</u>	Dry Wt.(M _{coal})* <u>1631.99</u>	Wt. Soil** <u>648.1 g</u>
Scale Tared To Bucket	AC 2-1-95	Percent Water(*100) <u>11.6</u>

- * Adjusted Dry Wt. of the Fines = Wt. Sample x (1 - % water)
- ** Adjusted Dry Wt. of the Cobbles = Wt. Sample x (1 - .015)

Mass Partition function (f) = $M_{coal}/M_{coal} = 3.24$

Radiological Analysis	²²⁶ Ra (pCi/g)	²³⁰ Th (pCi/g)	²³² Th (pCi/g)	COMMENTS
Cobbles (C _{coal})	0.1	0.6	0.0	
On-Site Analysis Fines (C _{coal})	2.7 * 4.9 ** N/A ***	N/A		
Vendor Analysis Fines (C _{coal})	3.6	7.0	0.7	
Bulk Radionuclide Concentration (C _g)	0.9 # 1.2 ## ###	2.1	0.2	Sec. CTF-1

- * Initial;
- ** Initial Corrected;
- *** Using Vendor;
- ## Using Initial Corrected;
- 20 day (N/A for Test Pit or Running AVE.)
- ### Using 20 day (N/A for Test Pits or Running AVE.)

²²⁶Ra Correction Factor: 1.8

Reviewed By: Wei Yeh Lin Date: 5-1-95

COBBLES TO FINES CALCULATION SHEET

PTL 4/28/95

Site: Naturita

Sheet 22 of 31

Sample/Grid I.D. NAT-SS-1268-0022A-CTF

Date: 1-24-95

Fines	Cobbles	Moisture Content Fines
Wt. Sample AC 2-1-95 & Bucket <u>1029.60</u>	Wt. Sample AC 2-1-95 & Bucket <u>399.41</u>	Wet Wt. Sample/Pan <u>696.7g</u>
Wt. Bucket <u>N/A</u>	Wt. Bucket <u>N/A</u>	Dry Wt. Sample/Pan <u>628.9g</u>
Wt. Sample <u>1029.60</u>	Wt. Sample <u>399.41</u>	Tare Wt. Pan <u>N/A</u>
Adjusted	Adjusted	Wt. Water* <u>67.8g</u>
Dry Wt. (M _{coal})* <u>918.40</u>	Dry Wt. (M _{coal})** <u>393.42</u>	Wt. Soil** <u>628.9g</u>
<i>Scale Tared To Bucket AC 2-1-95</i>		Percent Water(*1**) <u>10.8</u>

* Adjusted Dry Wt. of the Fines = Wt. Sample x (1 - % water)

** Adjusted Dry Wt. of the Cobbles = Wt. Sample x (1 - .015)

Mass Partition function (f) = $M_{>60}/M_{coal}$ = 0.43

Radiological Analysis	²²⁶ Ra (pCi/g)	²³⁰ Th (pCi/g)	²³² Th (pCi/g)	COMMENTS
Cobbles (C _{coal})	0.6	0.9	0.4	
On-Site Analysis Fines (C _{coal})	19.8 *	N/A		
	35.6 **			
	N/A ***			
Vendor Analysis Fines (C _{coal})	29	20	3.3	
Bulk Radionuclide Concentration (C _b)	20.5 #	14.3	2.4	See CTF-1
	25.1 ##			
	###			

* Initial;

** Initial Corrected;

*** 20 day (N/A for Test Pit or Running AVE.)

Using Vendor;

Using Initial Corrected;

Using 20 day (N/A for Test Pits or Running AVE.)

²²⁶Ra Correction Factor: 1.8

Reviewed By: W. Yeh Lin

Date: 5-11-95

COBBLES TO FINES CALCULATION SHEET

PYL 4/28/95

Site: Naturita
Sample/Grid I.D. NAT-SS-1258-0022B-CTF

Sheet 23 of 35
Date: 1-24-95

Fines	Cobbles	Moisture Content Fines
Wt. Sample <u>AC 2-1-95</u> <u>& Bucket</u>	Wt. Sample <u>AC 2-1-95</u> <u>& Bucket</u>	Wet Wt. Sample/Pan <u>677.3 g</u>
Wt. Bucket	Wt. Bucket	Dry Wt. Sample/Pan <u>638.9 g</u>
Wt. Sample <u>7</u>	Wt. Sample <u>N/A</u>	Tare Wt. Pan <u>N/A</u>
Adjusted	Adjusted	Wt. Water* <u>38.4 g</u>
Dry Wt. (M _{cell})*	Dry Wt. (M _{cell})*	Wt. Soil** <u>638.9 g</u>
<u>Scale Tared To Bucket AC 2-1-95</u>		Percent Water(*100) <u>6.0</u>

- * Adjusted Dry Wt. of the Fines = Wt. Sample x (1 - % water)
** Adjusted Dry Wt. of the Cobbles = Wt. Sample x (1 - .015)

Mass Partition function (f) = M_{cob}/M_{cell} =

Radiological Analysis	²²⁶ Ra (pCi/g)	²³⁰ Th (pCi/g)	²³² Th (pCi/g)	COMMENTS
Cobbles (C _{cob})	N/A	N/A	N/A	
On-Site Analysis Fines (C _{cell})	2.8 *	N/A		
	5.0 **			
	N/A ***			
Vendor Analysis Fines (C _{cell})	3.3	3.5	0.9	
Bulk Radionuclide Concentration (C _b)	#			
	##			
	###			

- * Initial; ** Initial Corrected; *** 20 day (N/A for Test Pit or Running AVE.)
sing Vendor; ## Using Initial Corrected; ### Using 20 day (N/A for Test Pits or Running AVE.)

²²⁶Ra Correction Factor: 1.8

Reviewed By: W2 Yeh Lin Date: 5/1/95

COBBLES TO FINES CALCULATION SHEET

PYL 4/28/95

Site: Naturita
Sample/Grid I.D. NAT-SS-1259-0023-CTF

Sheet 24 of 35
Date: 1-24-95

Fines	Cobbles	Moisture Content Fines
Wt. Sample AC 2-1-95 & Bucket <u>436.45</u>	Wt. Sample 2-1-95 & Bucket <u>1286.00</u>	Wet Wt. Sample/Pan <u>657.0 g</u>
Wt. Bucket <u>N/A</u>	Wt. Bucket <u>N/A</u>	Dry Wt. Sample/Pan <u>549.9 g</u>
Wt. Sample <u>436.45</u>	Wt. Sample <u>1286.00</u>	Tare Wt. Pan <u>N/A</u>
Adjusted	Adjusted	Wt. Water* <u>107.1 g</u>
Dry Wt. (M _{cof})* <u>351.34</u>	Dry Wt. (M _{cof})* <u>1216.71</u>	Wt. Soil** <u>549.9 g</u>
<u>Scale Tared to Bucket AC 2-1-95</u>		Percent Water (*1**) <u>19.5</u>

* Adjusted Dry Wt. of the Fines = Wt. Sample x (1 - % water)

** Adjusted Dry Wt. of the Cobbles = Wt. Sample x (1 - .015)

Mass Partition function (f) = $M_{cob}/M_{cof} = 3.61$

Radiological Analysis	²²⁶ Ra (pCi/g)	²³⁰ Th (pCi/g)	²³² Th (pCi/g)	COMMENTS
Cobbles (C _{cob})	1.0	1.4	0.4	
On-Site Analysis Fines (C _{cof})	1.4 * 2.5 ** N/A ***	N/A		
Vendor Analysis Fines (C _{cof})	0.6	1.7	1.1	
Bulk Radionuclide Concentration (C _b)	0.9 # 1.3 ## / ###	1.5	0.6	See CTF-1

* Initial;

** Initial Corrected;

*** 20 day (N/A for Test Pit or Running AVE.)

Using Vendor;

Using Initial Corrected;

Using 20 day (N/A for Test Pits or Running AVE.)

*Ra Correction Factor: 1.8

Reviewed By: W. Yeh Lin

Date: 5/1/95

COBBLES TO FINES CALCULATION SHEET

PRC 4/28/95

Site: Naturita
Sample/Grid I.D. NAT-SS-1260-0024-CTF

Sheet 25 of 35
Date: 1-24-95

Fines	Cobbles	Moisture Content Fines
Wt. Sample At 2-1-95 & Bucket <u>796.60</u>	Wt. Sample At 2-1-95 & Bucket <u>2367.42</u>	Wet Wt. Sample/Pan <u>687.5 g</u>
Wt. Bucket <u>N/A</u>	Wt. Bucket <u>N/A</u>	Dry Wt. Sample/Pan <u>571.1 g</u>
Wt. Sample <u>796.60</u>	Wt. Sample <u>2367.42</u>	Tare Wt. Pan <u>N/A</u>
Adjusted	Adjusted	Wt. Water* <u>116.4 g</u>
Dry Wt. (M _{ddl})* <u>634.09</u>	Dry Wt. (M _{ddl})* <u>2331.91</u>	Wt. Soil** <u>571.1 g</u>
<i>Scale Tared To Bucket</i>	<i>At 2-1-95</i>	Percent Water(*/**) <u>20.4</u>

* Adjusted Dry Wt. of the Fines = Wt. Sample x (1 - % water)

** Adjusted Dry Wt. of the Cobbles = Wt. Sample x (1 - .015)

*** Mass Partition function (f) = $M_{ddl}/M_{ddl} = 3.68$

Radiological Analysis	²²⁶ Ra (pCi/g)	²³⁰ Th (pCi/g)	²³² Th (pCi/g)	COMMENTS
Cobbles (C _{ddl})	0.7	0.6	0.4	
On-Site Analysis Fines (C _{ddl})	5.1 * 9.2 ** N/A ***	N/A		
Vendor Analysis Fines (C _{ddl})	6.7	5.6	0.9	
Bulk Radionuclide Concentration (C _b)	2.0 # 2.5 ## / ###	1.7	0.5	See LTF-1

* Initial;

** Initial Corrected;

*** 20 day (N/A for Test Pit or Running AVE.)

Using Vendor;

Using Initial Corrected;

Using 20 day (N/A for Test Pits or Running AVE.)

*Ra Correction Factor: 1.8

Reviewed By: Wen Yeh Lin

Date: 5/1/95

PYL 4/28/95

COBBLES TO FINES CALCULATION SHEET

Site: Naturita
Sample/Grid I.D. NAT-SS-1261-0025-CTF

Sheet 26 of 35
Date: 1-24-94

Fines	Cobbles	Moisture Content Fines
Wt. Sample Wt. Sample & Bucket <u>784.01</u>	Wt. Sample Wt. Sample & Bucket <u>2260.22</u>	Wet Wt. Sample/Pan <u>680.6 g</u>
Wt. Bucket <u>N/A</u>	Wt. Bucket <u>N/A</u>	Dry Wt. Sample/Pan <u>554.6 g</u>
Wt. Sample <u>784.01</u>	Wt. Sample <u>2260.22</u>	Tare Wt. Pan <u>N/A</u>
Adjusted	Adjusted	Wt. Water* <u>126.0 g</u>
Dry Wt. (M _{sed})* <u>606.04</u>	Dry Wt. (M _{sed})* <u>2236.32</u>	Wt. Soil** <u>554.6 g</u>
<i>Scale Tared To Bucket 2-195</i>		Percent Water(*/**) <u>22.7</u>

- * Adjusted Dry Wt. of the Fines = Wt. Sample x (1 - % water)
- ** Adjusted Dry Wt. of the Cobbles = Wt. Sample x (1 - .015)

Mass Partition function (f) = M_{sed}/M_{cob} = 3.67

Radiological Analysis	²²⁶ Ra (pCi/g)	²³⁰ Th (pCi/g)	²³² Th (pCi/g)	COMMENTS
Cobbles (C _{sed})	0.4	0.9	0.0	
On-Site Analysis Fines (C _{sed})	28.8 *	N/A		
	51.8 **			
	N/A ***			
Vendor Analysis Fines (C _{sed})	35	32	2.6	
Bulk Radionuclide Concentration (C _b)	7.8 #	7.6	0.6	Sec. CTF-1
	11.4 ##			
	- ###			

- * Initial;
- ** Initial Corrected;
- *** 20 day (N/A for Test Pit or Running AVE.)
- Using Vendor;
- ## Using Initial Corrected;
- ### Using 20 day (N/A for Test Pits or Running AVE.)

*Ra Correction Factor: 1.8

Reviewed By: 1. 4ch Lin

Date: 5/1/94

PYL 4/28/95

COBBLES TO FINES CALCULATION SHEET

Site: NATURITA

Sheet 27 of 35

Sample/Grid I.D. NAT-SS-1262-0026-CTF

Date: 1-24-95

Fines	Cobbles	Moisture Content Fines
Wt. Sample AC 2-1-95 & Bucket <u>515.89</u>	Wt. Sample AC 2-1-95 & Bucket <u>1586.44</u>	Wet Wt. Sample/Pan <u>651.8</u> g
Wt. Bucket <u>N/A</u>	Wt. Bucket <u>N/A</u>	Dry Wt. Sample/Pan <u>516.7</u> g
Wt. Sample <u>515.89</u>	Wt. Sample <u>1586.44</u>	Tare Wt. Pan <u>N/A</u>
Adjusted	Adjusted	Wt. Water* <u>135.1</u> g
Dry Wt. (M _{ced})* <u>381.24</u>	Dry Wt. (M _{ced})* <u>1562.64</u>	Wt. Soil** <u>516.7</u> g
<u>Scale Tared To Bucket</u>	<u>AC 2-1-95</u>	Percent Water(*/**) <u>26.1</u>

* Adjusted Dry Wt. of the Fines = Wt. Sample x (1 - % water)

** Adjusted Dry Wt. of the Cobbles = Wt. Sample x (1 - .015)

Mass Partition function (f) = $M_{ced}/M_{ced} = 4.10$

Radiological Analysis	²²⁶ Ra (pCi/g)	²³⁰ Th (pCi/g)	²³² Th (pCi/g)	COMMENTS
Cobbles (C _{ced})	0.5	0.9	0.8	
On-Site Analysis Fines (C _{ced})	<u>12.4</u> * <u>22.3</u> ** <u>N/A</u> ***	N/A		
Vendor Analysis Fines (C _{ced})	21	19	1.1	
Bulk Radionuclide Concentration (C _b)	<u>4.5</u> # <u>4.8</u> ## <u>1</u> ###	4.4	0.9	See CTF-1

* Initial;

** Initial Corrected;

*** 20 day (N/A for Test Pit or Running AVE.)

Using Vendor;

Using Initial Corrected;

Using 20 day (N/A for Test Pits or Running AVE.)

*Ra Correction Factor: 1.8

Reviewed By: Wei Yeh Lin

Date: 5/1/95

COBBLES TO FINES CALCULATION SHEET

PYL 4/28/95

Site: Naturita
Sample/Grid I.D. NAT-SS-1263-0027-CTF

Sheet 28 of 35
Date: 1-24-95

Fines	Cobbles	Moisture Content Fines
Wt. Sample AC 2-1-95 & Bucket <u>605.23</u>	Wt. Sample AC 2-1-95 & Bucket <u>1877.80</u>	Wet Wt. Sample/Pan <u>688.1 g</u>
Wt. Bucket <u>N/A</u>	Wt. Bucket <u>N/A</u>	Dry Wt. Sample/Pan <u>606.6 g</u>
Wt. Sample <u>605.23</u>	Wt. Sample <u>1877.80 AC</u>	Tare Wt. Pan <u>N/A</u>
Adjusted	Adjusted	Wt. Water* <u>81.5 g</u>
Dry Wt. (M _{co}) [*] <u>524.13</u>	Dry Wt. (M _{co}) ^{**} <u>1849.63</u>	Wt. Soil** <u>606.6 g</u>
<u>Scale Tared To Bucket</u>	<u>AC 2-1-95</u>	Percent Water(*/*) <u>13.4</u>

- * Adjusted Dry Wt. of the Fines = Wt. Sample x (1 - % water)
** Adjusted Dry Wt. of the Cobbles = Wt. Sample x (1 - .015)

Mass Partition function (f) = $M_{co}/M_{co} = 3.53$

Radiological Analysis	²²⁶ Ra (pCi/g)	²³⁰ Th (pCi/g)	²³² Th (pCi/g)	COMMENTS
Cobbles (C _{co})	1.0	0.1	0.4	
On-Site Analysis Fines (C _{co})	3.7 * 6.7 ** N/A ***	N/A		
Vendor Analysis Fines (C _{co})	8.0	8.3	0.9	
Bulk Radionuclide Concentration (C _b)	2.5 # 7.3 ## / ###	1.9	0.5	See CTF-1

- * Initial; ** Initial Corrected; *** 20 day (N/A for Test Pit or Running AVE.)
Using Vendor; ## Using Initial Corrected; ### Using 20 day (N/A for Test Pits or Running AVE.)

²²⁶Ra Correction Factor: 1.8

Reviewed By: Wei yeh Lin Date: 1-11/95

COBBLES TO FINES CALCULATION SHEET

PYL 4/28/95

Site: Naturita
Sample/Grid I.D. NAT-SS-1264-0028-CTF

Sheet 29 of 35
Date: 1-24-95

Fines	Cobbles	Moisture Content Fines
Wt. Sample AC 2-1-95 & Bucket <u>420.02</u>	Wt. Sample AC 2-1-95 & Bucket <u>1249.11</u>	Wet Wt. Sample/Pan <u>660.6 g</u>
Wt. Bucket <u>N/A</u>	Wt. Bucket <u>N/A</u>	Dry Wt. Sample/Pan <u>576.8 g</u>
Wt. Sample <u>420.02</u>	Wt. Sample <u>1249.11</u>	Tare Wt. Pan <u>N/A</u>
Adjusted	Adjusted	Wt. Water* <u>83.2 g</u>
Dry Wt. (M _{ced})* <u>359.54</u>	Dry Wt. (M _{ced})* <u>1230.37</u>	Wt. Soil** <u>576.8 g</u>
<i>Scale Tared To Bucket AC 2-1-95</i>		Percent Water(*1**) <u>14.4</u>

- * Adjusted Dry Wt. of the Fines = Wt. Sample x (1 - % water)
- ** Adjusted Dry Wt. of the Cobbles = Wt. Sample x (1 - .015)

Mass Partition function (f) = $M_{ced}/M_{ced} = \underline{3.42}$

Radiological Analysis	²²⁶ Ra (pCi/g)	²³⁰ Th (pCi/g)	²³² Th (pCi/g)	COMMENTS
Cobbles (C _{ced})	1.9	0.9	0.6	
On-Site Analysis Fines (C _{ced})	13.5 * 24.3 ** N/A ***	N/A		
Vendor Analysis Fines (C _{ced})	22	25	1.6	
Bulk Radionuclide Concentration (C _b)	6.4 # 7.0 ## / ###	6.4	0.8	See CTF-1

- * Initial;
- ** Initial Corrected;
- *** 20 day (N/A for Test Pit or Running AVE.)
- # Using Vendor;
- ## Using Initial Corrected;
- ### Using 20 day (N/A for Test Pits or Running AVE.)

²²⁶Ra Correction Factor: 1.8

Reviewed By: We. Yeh Lin Date: 5/1/95

COBBLES TO FINES CALCULATION SHEET

PYL 4/28/95

Site: Naturita
Sample/Grid I.D. NAT-SS-1265-0029-CTF

Sheet 30 of 35
Date: 1-24-95

Fines	Cobbles	Moisture Content Fines
Wt. Sample AC 2-1-95 & Bucket <u>422.06</u>	Wt. Sample AC 2-1-95 & Bucket <u>955.23</u>	Wet Wt. Sample/Pan <u>690.1</u> g
Wt. Bucket <u>N/A</u>	Wt. Bucket <u>N/A</u>	Dry Wt. Sample/Pan <u>637.8</u> g
Wt. Sample <u>422.06</u>	Wt. Sample <u>955.23</u>	Tare Wt. Pan <u>N/A</u>
Adjusted	Adjusted	Wt. Water* <u>52.3</u> g
Dry Wt. (M _{coal})* <u>387.45</u>	Dry Wt. (M _{soil})** <u>940.90</u>	Wt. Soil** <u>637.8</u> g
<i>Scale Tared To Bucket</i>	<i>AC 2-1-95</i>	Percent Water(*/**) <u>8.2</u>

- * Adjusted Dry Wt. of the Fines = Wt. Sample x (1 - % water)
- ** Adjusted Dry Wt. of the Cobbles = Wt. Sample x (1 - .015)

Mass Partition function (f) = M_{soil}/M_{coal} = 2.43

Radiological Analysis	²²⁶ Ra (pCi/g)	²³⁰ Th (pCi/g)	²³² Th (pCi/g)	COMMENTS
Cobbles (C _{soil})	0.3	1.4	0.6	
On-Site Analysis Fines (C _{coal})	<u>.79</u> * <u>1.4</u> ** <u>N/A</u> ***	N/A		
Vendor Analysis Fines (C _{coal})	1.2	0.6	0.2	
Bulk Radionuclide Concentration (C _b)	<u>0.6</u> # <u>0.6</u> ## <u>/</u> ###	1.2	0.5	See CTF-1

- * Initial; ** Initial Corrected; *** 20 day (N/A for Test Pit or Running AVE.)
- * Using Vendor; ** Using Initial Corrected; *** Using 20 day (N/A for Test Pits or Running AVE.)

²²⁶Ra Correction Factor: 1.8

Reviewed By: Wen Yeh Lin Date: 5/1/95

COBBLES TO FINES CALCULATION SHEET

PTL 4/28/95

Site: Naturita
Sample/Grid I.D. NAT-65-1266-1030-CTF

Sheet 31 of 35
Date: 1-24-95

Fines	Cobbles	Moisture Content Fines
Wt. Sample <u>AC 2-1-95</u> & Bucket <u>277.93</u>	Wt. Sample <u>AC 2-1-95</u> & Bucket <u>885.10</u>	Wet Wt. Sample/Pan <u>664.7 g</u>
Wt. Bucket <u>N/A</u>	Wt. Bucket <u>N/A</u>	Dry Wt. Sample/Pan <u>542.3 g</u>
Wt. Sample <u>277.93</u>	Wt. Sample <u>885.10</u>	Tare Wt. Pan <u>N/A</u>
Adjusted	Adjusted	Wt. Water* <u>122.4 g</u>
Dry Wt. (M _{sed})* <u>215.12</u>	Dry Wt. (M _{sed})** <u>871.82</u>	Wt. Soil** <u>542.3 g</u>
<i>Scale Tared to Bucket</i>	<i>AC 2-1-95</i>	Percent Water(*/**) <u>22.6</u>

* Adjusted Dry Wt. of the Fines = Wt. Sample x (1 - % water)

** Adjusted Dry Wt. of the Cobbles = Wt. Sample x (1 - .015)

Mass Partition function (f) = $M_{sed}/M_{cob} = 4.05$

Radiological Analysis	²²⁶ Ra (pCi/g)	²³⁰ Th (pCi/g)	²³² Th (pCi/g)	COMMENTS
Cobbles (C _{cob})	1.4	0.5	0.8	
On-Site Analysis Fines (C _{sed})	6.5 *	N/A		
	11.7 **			
	N/A ***			
Vendor Analysis Fines (C _{sed})	10	9.2	1.4	
Bulk Radionuclide Concentration (C _b)	3.1 #	2.2	0.9	See CTF-1
	3.4 ##			
	— ###			

* Initial;

* Using Vendor;

** Initial Corrected;

** Using Initial Corrected;

*** 20 day (N/A for Test Pit or Running AVE.)

*** Using 20 day (N/A for Test Pits or Running AVE.)

²²⁶Ra Correction Factor: 1.8

Reviewed By: W. Y. Lin

Date: 5/1/95

PYL 4/28/95

COBBLES TO FINES CALCULATION SHEET

Site: Naturita

Sheet 32 of 35

Sample/Grid I.D. NAT-SS-1267-OP-A-CTF (CTF-16)

Date: 1-24-95

Fines	Cobbles	Moisture Content Fines
Wt. Sample AC 2-1-95 & Bucket <u>1235.33</u>	Wt. Sample AC 2-1-95 & Bucket <u>3191.52</u>	Wet Wt. Sample/Pan <u>581.8 g</u>
Wt. Bucket <u>N/A</u>	Wt. Bucket <u>N/A</u>	Dry Wt. Sample/Pan <u>523.4 g</u>
Wt. Sample <u>1235.33</u>	Wt. Sample <u>3191.52</u>	Tare Wt. Pan <u>N/A</u>
Adjusted	Adjusted	Wt. Water* <u>58.4 g</u>
Dry Wt. (M _{ddl})* <u>1096.97</u>	Dry Wt. (M _{ddl})* <u>3143.65</u>	Wt. Soil** <u>523.4 g</u>
<i>Scale Tared to Bucket</i>	<i>AC 2-1-95</i>	Percent Water(*100) <u>11.7</u>

* Adjusted Dry Wt. of the Fines = Wt. Sample x (1 - % water)

** Adjusted Dry Wt. of the Cobbles = Wt. Sample x (1 - .015)

Mass Partition function (f) = : M_{ddl}/M_{ddl} = 2.87

Radiological Analysis	²²⁶ Ra (pCi/g)	²³⁰ Th (pCi/g)	²³² Th (pCi/g)	COMMENTS
Cobbles (C _{ddl})	0.2	0.6	0.6	
On-Site Analysis Fines (C _{ddl})	.99 * 1.8 ** N/A ***	N/A		
Vendor Analysis Fines (C _{ddl})	1.7	1.9	0.4	
Bulk Radionuclide Concentration (C _b)	0.6 # 0.6 ## — ###	0.9	0.5	Sec. CTF-1

* Initial;

** Initial Corrected;

*** 20 day (N/A for Test Pit or Running AVE.)

Using Vendor;

Using Initial Corrected;

Using 20 day (N/A for Test Pits or Running AVE.)

*Ra Correction Factor: 1.8

Reviewed By: W. Yeh Lin

Date: 5/1/95

PYL 4/28/95

COBBLES TO FINES CALCULATION SHEET

Site: Naturita

Sample/Grid I.D. NAT-BK9-1269-B1-CTF

Sheet 33 of 35

Date: 1-24-95

Fines	Cobbles	Moisture Content Fines
Wt. Sample AC 2-1-95 & Bucket <u>337.23</u>	Wt. Sample AC 2-1-95 & Bucket <u>1301.20</u>	Wet Wt. Sample/Pan <u>653.6 g</u>
Wt. Bucket <u>N/A</u>	Wt. Bucket <u>N/A</u>	Dry Wt. Sample/Pan <u>603.5 g</u>
Wt. Sample <u>337.23</u>	Wt. Sample <u>1301.20</u>	Tare Wt. Pan <u>N/A</u>
Adjusted	Adjusted	Wt. Water* <u>50.1 g</u>
Dry Wt.(M _{coal})* <u>309.24</u>	Dry Wt.(M _{coal})** <u>1291.68</u>	Wt. Soil** <u>603.5 g</u>
<i>Scale Tared To Bucket</i>	<i>AC 2-1-95</i>	Percent Water(*/*/*) <u>8.3</u>

* Adjusted Dry Wt. of the Fines = Wt. Sample x (1 - % water)

** Adjusted Dry Wt. of the Cobbles = Wt. Sample x (1 - .015)

Mass Partition function (f) = $M_{\text{coal}}/M_{\text{c}} =$ 4.14

Radiological Analysis	²²⁶ Ra (pCi/g)	²³⁰ Th (pCi/g)	²³² Th (pCi/g)	COMMENTS
Cobbles (C _{coal})	0.2	0.5	0.5	
On-Site Analysis Fines (C _{coal})	1.1 * 2.0 ** N/A ***	N/A		
Vendor Analysis Fines (C _{coal})	0.6	1.1	0.2	
Bulk Radionuclide Concentration (C _b)	0.3 # 0.6 ## / ###	0.6	0.4	

* Initial;

** Initial Corrected;

*** 20 day (N/A for Test Pit or Running AVE.)

Using Vendor;

Using Initial Corrected;

Using 20 day (N/A for Test Pits or Running AVE.)

3a Correction Factor: 1.8

Reviewed By: Wei Yeh Lin

Date: 5/1/95

COBBLES TO FINES CALCULATION SHEET

PYL 4/28/95

Site: NATURITA
Sample/Grid I.D. NAT-BK9-1270-B2-CTE

Sheet 34 of 35
Date: 1-24-95

Fines	Cobbles	Moisture Content Fines
Wt. Sample AC 2-1-95 & Bucket <u>742.51</u>	Wt. Sample AC 2-1-95 & Bucket <u>1465.14</u>	Wet Wt. Sample/Pan <u>652.3 g</u>
Wt. Bucket <u>N/A</u>	Wt. Bucket <u>N/A</u>	Dry Wt. Sample/Pan <u>584.0 g</u>
Wt. Sample <u>742.51</u>	Wt. Sample <u>1465.14</u>	Tare Wt. Pan <u>N/A</u>
Adjusted	Adjusted	Wt. Water* <u>68.3 g</u>
Dry Wt.(M _{ced})* <u>655.64</u>	Dry Wt.(M _{ced})* <u>1443.16</u>	Wt. Soil** <u>584.0 g</u>
<i>Scale Tared To Bucket</i>	<i>AC 2-1-95</i>	Percent Water(*/**) <u>11.7</u>

- * Adjusted Dry Wt. of the Fines = Wt. Sample x (1 - % water)
** Adjusted Dry Wt. of the Cobbles = Wt. Sample x (1 - .015)

Mass Partition function (f) = $M_{ced}/M_{ced} = 2.20$

Radiological Analysis	²²⁶ Ra (pCi/g)	²³⁰ Th (pCi/g)	²³² Th (pCi/g)	COMMENTS
Cobbles (C _{ced})	0.4	0.8	0.2	
On-Site Analysis Fines (C _{ced})	.88 1.6 N/A	N/A		
Vendor Analysis Fines (C _{ced})	1.0	0.3	0.2	
Bulk Radionuclide Concentration (C _b)	0.6 0.8 /	0.6	0.2	

- * Initial; ** Initial Corrected; *** 20 day (N/A for Test Pit or Running AVE.)
* Using Vendor; ** Using Initial Corrected; *** Using 20 day (N/A for Test Pits or Running AVE.)

²²⁶Ra Correction Factor: 1.8

Reviewed By: Wen Yeh Lin Date: 5/1/95

COBBLES TO FINES CALCULATION SHEET

PYC 4/28/95

Site: Naturita
Sample/Grid I.D. NAT-BKg-1271-B3-CTF

Sheet 35 of 35
Date: 1-24-95

Fines	Cobbles	Moisture Content Fines
Wt. Sample <i>AC 2-1-95</i> - & Bucket <u>741.44</u>	Wt. Sample <i>AC 2-1-95</i> - & Bucket <u>1966.68</u>	Wet Wt. Sample/Pan <u>650.7 g</u>
Wt. Bucket <u>N/A</u>	Wt. Bucket <u>N/A</u>	Dry Wt. Sample/Pan <u>576.4 g</u>
Wt. Sample <u>741.44</u>	Wt. Sample <u>1966.68</u>	Tare Wt. Pan <u>N/A g</u>
Adjusted	Adjusted	Wt. Water* <u>74.3 g</u>
Dry Wt. (M _{ced})* <u>645.79</u>	Dry Wt. (M _{ced})* <u>1937.18</u>	Wt. Soil** <u>576.4 g</u>
<i>Scale Tared To Bucket</i>	<i>AC 2-1-95</i>	Percent Water(*/**) <u>12.9 %</u>

- * Adjusted Dry Wt. of the Fines = Wt. Sample x (1 - % water)
- ** Adjusted Dry Wt. of the Cobbles = Wt. Sample x (1 - .015)

***s Partition function (f) = $M_{\text{ced}}/M_{\text{ced}} = 3.00$

Radiological Analysis	²²⁶ Ra (pCi/g)	²³⁰ Th (pCi/g)	²³² Th (pCi/g)	COMMENTS
Cobbles (C _{ced})	0.4	0.6	0.1	
On-Site Analysis Fines (C _{ced})	1.8 * 3.2 ** N/A ***	N/A		
Vendor Analysis Fines (C _{ced})	2.0	2.7	0.4	
Bulk Radionuclide Concentration (C _b)	0.8 # 1.1 ## / ###	1.1	0.2	

- * Initial;
- ** Initial Corrected;
- *** 20 day (N/A for Test Pit or Running AVE.)
- # Vendor;
- ## Using Initial Corrected;
- ### Using 20 day (N/A for Test Pits or Running AVE.)

²²⁶Ra Correction Factor: 1.8

Reviewed By: W. Yeh Lin Date: 5/1/95

SOIL BACKGROUND Ra-226 DATA

Date	5-13-96	# of pages	1
To	B. Poratto	From	J. Turner
Co./Dept.	TAC	Co.	RAC
Phone #		Phone #	845-5668
Fax #	845-5686	Fax #	

4/23-24/1996 20 DAY COUNT

Ra-226		Th-232	
NO.	DATA	NO.	DATA
1	5.42	1	1.12
2	3.23	2	1.22
3	3.17	3	1.28
4	4.07	4	1.35
5	2.82	5	1.00
6	2.87	6	1.52
7	2.05	7	0.84
8	2.11	8	1.02
9	1.92	9	0.77
10	1.65	10	2.03
11	1.03	11	0.96
12	2.18	12	1.07
13	2.08	13	0.8
14	1.48	14	1.18
15	0.62	15	1.6
16	2.12	16	0.5
17	1.47	17	1.19
18	1.34	18	1.66
19	2.16	19	1.54
20	1.85	20	1.21
21	1.31	21	0.62
22	1.17	22	0.95
23	1.93	23	0.48
24	0.93	24	1.34
25	0.64	25	1.83
26	1.43	26	1.57
27	3.92	27	1.02
28	1.31	28	1.42
29	2.52	29	0.78
30	2.31	30	0.55
Ra AVG	2.14	Th AVG	1.15
1 STDEV	1.14	1 STDEV	0.43
Ra-226 BKG	2.14	Th-232 BKG	1.15

Ra-226
 range: 0.64 to 5.42
 average: 2.14

$$MDA = 1.4 - 1.5$$

ECOLOGICAL SIGNIFICANCE OF RIPARIAN PLANT COMMUNITIES

ECOLOGICAL SIGNIFICANCE OF RIPARIAN PLANT COMMUNITIES ALONG THE SAN MIGUEL RIVER NEAR THE NATURITA COLORADO UMTRA PROJECT SITE

Supplemental standards for radiologically contaminated soils are being considered for approximately 11.5 acres of riparian plant communities along the San Miguel River near the Naturita Uranium Mill Tailings Remedial Action (UMTRA) Project site in Montrose County, Colorado. Of this 11.5 acres, approximately 1.0 acre qualifies for wetlands as defined by the US Army Corps of Engineers. As shown below, the ecological benefits of applying supplemental standards to these riparian areas would be significant. The purpose of this analysis is to provide an overview of the importance of these riparian areas for possible use in a supplemental standards application to the Nuclear Regulatory Commission and the State of Colorado. It is anticipated that supplemental standards based on the following condition may apply at these sites;

"Remedial actions to satisfy the cleanup standards for land and ground water, notwithstanding reasonable measures to limit damage, would directly produce health and environmental harm that is clearly excessive compared to the health and environmental benefits, now or in the future. A clear excess of health and environmental harm is harm that is long-term, manifest, and grossly disproportionate to health and environmental benefits that may reasonably be anticipated" (40 CFR 192.21).

The riparian plant communities consist of willow dominated areas adjacent to and parallel to the river. This willow dominated area ranges from a few to 75 feet wide. Back from the river, this plant community changes to areas dominated by willow, cottonwood saplings and other woody species which then gives way to stands of mature cottonwoods. These plant communities have been described in the biological assessment prepared for the Naturita site (DOE, 1996) and will not be repeated here. The riparian areas under consideration for supplemental standards contain all three plant community types as listed above; one of the largest cottonwood gallery forests along this section of the San Miguel River is included in these areas.

Riparian areas are among the most productive biological systems on earth (EPA, 1990). This is especially evident in the arid southwest where the belt of dense green vegetation along the San Miguel River contrasts markedly with the surrounding upland vegetation. It is estimated that riparian areas comprise less than 1 % of the land area in the western United States (EPA, 1990). This estimate is consistent with information from the BLM which indicates that about 0.7 % of the land in the region of the Naturita site consists of riparian habitat (BLM, 1984). Many of the riparian areas in the west are in poor condition. For example, the BLM estimates that over 60 % of the nonwooded and 50 % of the wooded riparian plant communities in the Grand Junction resources area are in poor condition (BLM, 1985). The riparian areas being considered for supplemental standards are in good to excellent condition. They have been only lightly grazed by horses and a dense growth of herbaceous and woody vegetation is in evidence.

Diversity of vegetation, both in terms of species and plant form, are important characteristics of riparian areas in good condition. Some of the benefits of this vegetation include slowing the flow of flood waters and providing a protective cover

against the erosive force of water; shielding the soil from wind and sunlight which reduces the drying out of the soil via evaporation; binding the soil with their root systems; and filtering out sediment from the river water during times of flood. These factors can strongly influence how the watershed functions in terms of flood control, water flow, water temperature, and increased subsurface storage in the shallow alluvial ground water (EPA, 1990).

The vegetation, especially in riparian areas in good condition such as along the San Miguel river, provide for the most productive aquatic life and terrestrial wildlife habitat in the arid west. The benefits to aquatic life include increasing the amount of aquatic habitat through a decrease in evaporation and improving habitat conditions through maintaining in cooler water in the summer and reducing icing in the winter (EPA, 1990). In addition, slow moving backwater areas and shallow water areas are often associated with riparian areas. These areas are often highly productive in terms of aquatic macroinvertebrates and macrophytes and provide nursery areas for fish.

The importance of riparian areas to wildlife has been well documented. Riparian areas are generally much more productive both in terms of the number of species and the density of wildlife. Warren and Schwalbe (1985) studied lizard use of riparian areas and adjacent upland habitat along the Colorado River and determined that there were and estimated 120 lizards per acre in the riparian plant communities and 12 per acre in the upland habitat. Szaro and Jakle (1985) studies breeding birds in riparian areas in New Mexico and Arizona and estimated that there were 336 to 446 birds per 100 acres in the riparian habitat and 101 to 137 birds per 100 acres in the upland desert shrub habitat. Much higher breeding bird densities (600 to 2000 birds per 100 acres) have been documented for other riparian areas in Arizona and Colorado (Johnson and Carothers, 1982). Breeding bird studies have taken place in the upland and riparian habitats associated with the Naturita UMTRA Project site from 1986 to 1996 and of the 87 species of birds recorded, 71 have been recorded from the riparian plant communities. Breeding bird surveys have been conducted in the riparian plant communities in the area of the Naturita site downstream to the Calamity bridge five times from 1886 to 1995. The number of acres surveyed was 47 and the average number of breeding pairs was 65 or 130 birds (DOE, 1994; 1996). In addition, the number of cliff swallows that nest under Calamity Bridge was assumed to be 20 which means there were an estimated 150 birds per 47 acres or about 310 birds per 100 acres. This estimate is in close agreement with the breeding bird density estimates of Szaro and Jakle (1985).

Nesting birds-of prey have not been recorded in the 47 acres of riparian habitat studied in the site area although the potential for their occurrence in the area exists. Various species of owls, such as those listed in the Naturita environmental assessment (DOE, 1994), may occur but nocturnal surveys to detect their presence have not been conducted. Birds surveys in the areas proposed for supplemental standards have not taken place and birds-of-prey such as the Coopers hawk could nest in these areas.

The riparian habitat under consideration also provided potential habitat for endangered species. The bald eagle is known to hunt along the river in the site area in the winter and the large cottonwoods in the riparian habitat provide perch sites for this species (DOE, 1996). The willow flycatcher (probably the southwestern subspecies) was recorded from the site area during the nesting season of 1986. During surveys in

subsequent years up to and including 1995, this species has not been recorded from the site area. However, this species was recorded along the San Miguel River in the area of Uravan in 1995 and the US Fish and Wildlife Service considers all willow dominated habitat along the river including the site area as potential habitat for this endangered subspecies.

If the area proposed for supplemental standards were remediated, recovery would likely take a few to many years depending on the type of habitat. The willow habitat would likely recover in a few years while recovery of a mature cottonwood stand would take much longer. The wildlife that would use the cleared areas would likely end up using marginal habitat reducing their chances for survival and perish.

In summary, the riparian areas being considered for supplemental standards are in good to excellent condition and important in terms of the hydrology of the river, attenuating the effects of floods, improving water quality, improving aquatic life habitat, and providing for a diverse and productive assemblage of wildlife including potential habitat for endangered species.

REFERENCES

BLM (Bureau of Land Management), 1994. "San Juan/San Miguel Resource Management Plan and Environmental Impact Statement," BLM, Montrose, Colorado.

BLM (Bureau of Land Management), 1985. "Grand Junction Resource Area Resource Management Plan and Environmental Impact Statement," BLM, Grand Junction, Colorado

DOE (US Department of Energy), 1994. "Environmental Assessment of Remedial Action at the Naturita Uranium Processing Site Near Naturita, Colorado, DOE/EA-0464, REV. 5, DOE UMTRA Project Office, Albuquerque Operations, Albuquerque, New Mexico.

DOE (US Department of Energy), 1996. "Biological assessment of Remedial Action at the Abandoned Uranium Mill Tailings Site Near Naturita, Colorado, DOE/AL/62350-225, REV.0, DOE UMTRA Project Office, Albuquerque Operations, Albuquerque, New Mexico.

EPA (US Environmental Protection Agency), 1990. "Livestock Grazing on Western Riparian Areas", Prepared for the EPA by the Northwest Resource Information Center, Inc., Eagle Idaho.

Johnson, R.R. and S.W. Carothers, 1982. "Riparian Habitat and Recreation: Interrelationships and Impacts in the Southwest and Rocky Mountain Region," Eisenhower Consortium for Western Environmental Forestry Research, Bulletin 12, University of Arizona, Tucson, Arizona.

Szaro, R.C. and M.D. Jakle, 1985. "Avian Use of a Desert Riparian Island and its Adjacent Scrub Habitat," in *The Condor*, Vol. 87, pp. 511-519.

Warren P.L. and C.R. Schwalbe, 1985. "Herpetofauna in Riparian Habitats Along the Colorado River in the Grand Canyon," In *Riparian Ecosystems and Their Management; Reconciling Conflicting Use*, US Forest Service, Rocky Mountain Forest and Range Experiment Station, General Technical report RM-120, Fort Collins, Colorado.

RADIOLOGICAL DATA COLLECTED ALONG GAS PIPELINE

ENGINEERS
AND
CONSTRUCTORS

MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

HEADQUARTERS OFFICE
1500 WEST 3RD STREET
CLEVELAND, OHIO U.S.A. 44113-1406
PHONE: (216) 523-5600/TELEX: 985542

REPLY TO: MK-FERGUSON COMPANY
REMEDIAL ACTIONS
CONTRACTOR-UMTRA PROJECT
P.O. BOX 9136
ALBUQUERQUE, NEW MEXICO U.S.A. 87119

May 28, 1996

96-3050-0418

Mr. Woody Woodworth
Site Manager
U.S. Department of Energy
Uranium Mill Tailings Remedial Action Project
2155 Louisiana N.E., Suite 4000
Albuquerque, NM 87110

SUBJECT: Radiological Data Along Gas Line - Process Site
Naturita, CO

REFERENCE: Contract No. DE-AC04-83AL18796

Dear Mr. Woodworth:

Enclosed for your information and transmittal to the NRC are data collected along the high-pressure gas line. This is in partial response to NRC's open issue No. 25 of the draft TER. A drawing showing the grid system where the samples were taken is also enclosed.

If you have any questions, please contact Ralph Waddington of my staff.

Sincerely,
MK-FERGUSON COMPANY

C.R. Spencer
Construction Engineering Manager

Enclosure

cc : E. Artiglia, TAC

1701KZ

MATCHLINE N 48,984 (FOR CONTINUATION, SEE SHEET G)

KEY MAP

REFERENCE DRAWINGS

NAT-SV-0000 PLAN OF SOIL VERIFICATION GRID SYSTEM

LEGEND

SAMPLE GRID NO.
A-37-19
A - SHEET NO. (SEE KEY
MAP ABOVE)
37 - 50M x 50M GRID
19 - 10M x 10M SUBGRID

50M x 50M GRID

U. S. DEPARTMENT OF ENERGY	
ALBUQUERQUE, NEW MEXICO	
NATURAL PROCESSING SITE NATURALIA, COLORADO	
SOIL VERIFICATION GRID SYSTEM SHEET D	
PROJECT NO.	DE-AC04-83AL18798
DATE	NAT-SV-0004
MORGAN HANSEN CORPORATION NATURALIA PROJECT 100 HANSEN DR. S.W. ALBUQUERQUE, NM 87102	

Acquisition Start:
Live time(s):

NAT
Apr/24/1996
500.000

7:48:03AM

% Dead time: 0.060

Sample Gross counts:

ROI #1 1425

ROI #2 204

Background:

Background has been subtracted

Background filename: c:\windows\aptec\bk100001.csv

File date: 4/24/96

File time: 7:09:28 AM

Bkg. Gross counts:

ROI #1 368

ROI #2 148

Isotope

pCi/g

Th-232

1.11

Bi efficiency: 0.0486

Tl efficiency: 0.0059

ROI Ratio: 0.919

Correction factor: 1.8

Corrected Ra-226: 27.45

Data entry:

Initial? Y

Sample: NAT-SS-3033

MCARD: 1

Count date: 04/24/96

Sample date: 4/23/96

Seal date: DATE?

pCi: 7061.432

Mass (grams): 463

Ra-226 pCi/g: 15.25

Sample depth: 0'-1'

User: WOOD

Comments: SUP.STANDARDS VP068 D-30-5

Analyst: WJW

Reviewed by: _____

COPY

Acquisition Start: NAT
Live time(s): Apr/24/1996 7:56:36AM
500.000

% Dead time: 0.081

Sample Gross counts:
ROI #1 1938
ROI #2 215

Background:
Background has been subtracted

Background filename: c:\windows\aptec\bk100001.csv

File date: 4/24/96
File time: 7:09:28 AM

Bkg. Gross counts:
ROI #1 368
ROI #2 148

Isotope pCi/g
Th-232 1.07

Bi efficiency: 0.0486
Tl efficiency: 0.0059 **ROI Ratio:** 0.919
Correction factor: 1.8 **Corrected Ra-226:** 33.1

Data entry:
Initial? Y
Sample: NAT-SS-3034
MCard: 1
Count date: 04/24/96
Sample date: 4/23/96
Seal date: DATE?
pCi: 10593.036
Mass (grams): 576
Ra-226 pCi/g: 18.39
Sample depth: 1'-2'
User: WOOD
Comments: SUP. STANDARDS VP068 D-30-5
Analyst: M. M. M.
Reviewed by: _____

COPY

Acquisition Start:
Live time(s):

NAT
Apr/24/1996
500.000

8:05:03AM

% Dead time:

0.072

Sample Gross counts:

ROI #1

1698

ROI #2

227

Background:

Background has been subtracted

Background filename:

c:\windows\lptec\bk100001.csv

File date:

4/24/96

File time:

7:09:28 AM

Bkg. Gross counts:

ROI #1

368

ROI #2

148

Isotope

Th-232

pCi/g

1.23

Bi efficiency:

0.0486

Tl efficiency:

0.0059

ROI Ratio: 0.919

Correction factor:

1.8

Corrected Ra-226: 26.94

Data entry:

Initial?

Y

Sample:

NAT-SS-3035

MCard:

1

Count date:

04/24/96

Sample date:

4/23/96

Seal date:

DATE?

pCi:

8830.142

Mass (grams):

590

Ra-226 pCi/g:

14.97

Sample depth:

2'-3'

User:

WOOD

Comments:

SUP. STANDARDS VP068 D-30-5

Analyst: WMA

Reviewed by: _____

Acquisition Start: NAT
Live time(s): Apr/23/1996 4:40:04PM
500.000

% Dead time: 0.045

Sample Gross counts:

ROI #1 1052

ROI #2 202

Background:

Background has been subtracted

Background filename: c:\windows\aptec\bk100001.csv

File date: 4/23/96

File time: 3:16:54 PM

Bkg. Gross counts:

ROI #1 371

ROI #2 129

Isotope

pCi/g

Th-232

1.73

Bi efficiency: 0.0486

Tl efficiency: 0.0059 ROI Ratio: 0.919

Correction factor: 1.8 Corrected Ra-226: 20

Data entry:

Initial? Y

Sample: NAT-SS-3029D304

MCard: 1

Count date: 04/23/96

Sample date: 4/23/96

Seal date: DATE?

pCi: 4311.184

Mass (grams): 388

Ra-226 pCi/g: 11.11

Sample depth: 0-1'

User: MILLER

Comments: SUPPLEMENTAL STANDARD VP-068

Analyst: MM dsm

Reviewed by: _____

COPY

Acquisition Start: NAT
Live time(s): Apr/24/1996 7:29:55AM
500.000

% Dead time: 0.086

Sample Gross counts:
ROI #1 2186
ROI #2 199

Background:
Background has been subtracted

Background filename: c:\windows\lptec\bk100001.csv

File date: 4/24/96

File time: 7:09:28 AM

Bkg. Gross counts:
ROI #1 368
ROI #2 148

Isotope pCi/g
Th-232 .92

Bi efficiency: 0.0486

Tl efficiency: 0.0059 ROI Ratio: 0.919

Correction factor: 1.8 Corrected Ra-226: 43.81

Data entry:
Initial? Y

Sample: NAT-SS-3031

MCARD: 1

Count date: 04/24/96

Sample date: 4/23/96

Seal date: DATE?

pCi: 12437.933

Mass (grams): 511

Ra-226 pCi/g: 24.34

Sample depth: 2'-3'

User: WOOD

Comments: SUP.STANDARDS VP068 D-30-4

Analyst: WJH

Reviewed by: _____

COPY

<u>Acquisition Start:</u>	NAT	7:39:26AM
Live time(s):	Apr/24/1996	
	500.000	
% Dead time:	0.031	
<u>Sample Gross counts:</u>		
ROI #1	591	
ROI #2	196	
<u>Background:</u>		
Background has been subtracted		
Background filename:	c:\windows\aptec\bk100001.csv	
File date:	4/24/96	
File time:	7:09:28 AM	
<u>Bkg. Gross counts:</u>		
ROI #1	368	
ROI #2	148	
<u>Isotope</u>	<u>pCi/g</u>	
Th-232	.77	
Bi efficiency:	0.0486	
Tl efficiency:	0.0059	ROI Ratio: 0.919
Correction factor:	1.8	Corrected Ra-226: 3.95
<u>Data entry:</u>		
Initial?	Y	
Sample:	NAT-SS-3032	
MCARD:	1	
Count date:	04/24/96	
Sample date:	4/23/96	
Seal date:	DATE?	
pCi:	1256.197	
Mass (grams):	573	
Ra-226 pCi/g:	2.19	
Sample depth:	3'-4'	
User:	WOOD	
Comments:	SUP. STANDARDS VP068 D-30-4	

Acquisition Start: NAT
Live time(s): Apr/23/1996 4:17:11PM
500.000

% Dead time: 0.055

Sample Gross counts:
ROI #1 1274
ROI #2 214

Background:
Background has been subtracted

Background filename: c:\windows\lptec\bk100001.csv

File date: 4/23/96
File time: 3:16:54 PM

Bkg. Gross counts:
ROI #1 371
ROI #2 129

Isotope pCi/g
Th-232 1.23

Bi efficiency: 0.0486
Tl efficiency: 0.0059 ROI Ratio: 0.919
Correction factor: 1.8 Corrected Ra-226: 16.45

Data entry:
Initial? Y

Sample: NATSS3027D22-24
MCard: 1
Count date: 04/23/96
Sample date: 4/23/96
Seal date: DATE?
pCi: 5792.746
Mass (grams): 634
Ra-226 pCi/g: 9.14
Sample depth: 2'-3'
User: WOOD
Comments: SUP.STANDARDS VP068
Analyst: [Signature]
Reviewed by: _____

COPY

4:05:36PM

Reviewed by: _____

Acquisition Start: NAT
Live time(s): Apr/23/1996 3:38:30PM
500.000

% Dead time: 0.039

Sample Gross counts:
ROI #1 851
ROI #2 196

Background:
Background has been subtracted

Background filename: c:\windows\lptec\bk100001.csv

File date: 4/23/96
File time: 3:16:54 PM

Bkg. Gross counts:
ROI #1 371
ROI #2 129

Isotope pCi/g
Th-232 1.27

Bi efficiency: 0.0486
Tl efficiency: 0.0059 ROI Ratio: 0.919
Correction factor: 1.8 Corrected Ra-226: 10.93

Data entry:
Initial? Y
Sample: NAT-SS3025D2224
MCard: 1
Count date: 04/23/96
Sample date: 4/23/96
Seal date: DATE?
pCi: 2938.365
Mass (grams): 484
Ra-226 pCi/g: 6.07
Sample depth: 0-1'
User: MILLER
Comments: SUPPLEMENTAL STANDARDS VP-068
Analyst: dfm
Reviewed by: _____

COPY

Acquisition Start: NAT
Live time(s): Apr/23/1996 3:29:51PM
500.000

% Dead time: 0.071

Sample Gross counts:
ROI #1 1704
ROI #2 172

Background:
Background has been subtracted

Background filename: c:\windows\lptec\bk100001.csv

File date: 4/23/96
File time: 3:16:54 PM

Bkg. Gross counts:
ROI #1 371
ROI #2 129

Isotope pCi/g
Th-232 .7

Bi efficiency: 0.0486
Tl efficiency: 0.0059 **ROI Ratio:** 0.919

Correction factor: 1.8 **Corrected Ra-226:** 29.04

Data entry:
Initial? Y

Sample: NAT-SS3024D2218
MCARD: 1

Count date: 04/23/96
Sample date: 4/23/96
Seal date: DATE?

pCi: 9083.597
Mass (grams): 563
Ra-226 pCi/g: 16.13
Sample depth: 3'-4'

User: MILLER

Comments: SUPPLEMENTAL STANDARD VP-068

Analyst: dfm
Reviewed by: _____

COPY

Acquisition Start: NAT
Live time(s): Apr/23/1996 2:45:55PM
500.000

% Dead time: 0.089

Sample Gross counts:
ROI #1 2190
ROI #2 219

Background:
Background has been subtracted

Background filename: c:\windows\aptec\bk100001.csv

File date: 4/23/96
File time: 1:04:58 PM

Bkg. Gross counts:
ROI #1 361
ROI #2 131

Isotope pCi/g
Th-232 1.28

Bi efficiency: 0.0486
Tl efficiency: 0.0059 ROI Ratio: 0.919
Correction factor: 1.8 Corrected Ra-226: 34.91

Data entry:
Initial? Y

Sample: NAT-SS-D-22-18 SS 3023
MCard: 1

Count date: 04/23/96
Sample date: 4/23/96
Seal date: DATE?

pCi: 12276.339
Mass (grams): 633
Ra-226 pCi/g: 19.39
Sample depth: 2'-3'

User: MILLER
Comments: VP-068 SUPPLEMENTAL STANDARD

Analyst: dfm
Reviewed by: _____

COPY

Acquisition Start: NAT
Live time(s): Apr/23/1996 2:28:27PM
500.000

% Dead time: 0.077

Sample Gross counts:
ROI #1 1855
ROI #2 222

Background:
Background has been subtracted

Background filename: c:\windows\aptec\bk100001.csv

File date: 4/23/96
File time: 1:04:58 PM

Bkg. Gross counts:
ROI #1 361
ROI #2 131

Isotope pCi/g
Th-232 1.32

Bi efficiency: 0.0486
Tl efficiency: 0.0059 ROI Ratio: 0.919

Correction factor: 1.8 Corrected Ra-226: 28.21

Data entry:
Initial? Y

Sample: NAT-SS-D-22-18 # SS-3021

MCard: 1

Count date: 04/23/96
Sample date: 4/23/96
Seal date: DATE?

pCi: 9904.391
Mass (grams): 632
Ra-226 pCi/g: 15.67
Sample depth: 0-1'

User: MILLER

Comments: SUPPLEMENTAL STANDARD VP-068

Analyst: dfm
Reviewed by: _____

COPY

Acquisition Start: NAT
Live time(s): Apr/23/1996 2:12:06PM
500.000

% Dead time: 0.047

Sample Gross counts:
ROI #1 1125
ROI #2 169

Background:
Background has been subtracted

Background filename: c:\windows\aptec\bk100001.csv

File date: 4/23/96
File time: 1:04:58 PM

Bkg. Gross counts:
ROI #1 361
ROI #2 131

Isotope **pCi/g:**
Th-232 .6

Bi efficiency: 0.0486
Tl efficiency: 0.0059 **ROI Ratio:** 0.919

Correction factor: 1.8 **Corrected Ra-226:** 15.75

Data entry:
Initial? Y

Sample: NAT-SS-D-22-13

MCard: 1

Count date: 04/23/96
Sample date: 4/23/96
Seal date: DATE?

pCi: 5119.994
Mass (grams): 585
Ra-226 pCi/g: 8.75
Sample depth: 2'-3'

User: MILLER

Comments: SUPPLEMENTAL STANDARD VP-068

Analyst: afm
Reviewed by: _____

COPY

SS-3020

Acquisition Start: NAT
Live time(s): Apr/23/1996 2:03:32PM
500.000

% Dead time: 0.054

Sample Gross counts:
ROI #1 1305
ROI #2 220

Background:
Background has been subtracted

Background filename: c:\windows\lptec\bk100001.csv

File date: 4/23/96
File time: 1:04:58 PM

Bkg. Gross counts:
ROI #1 361
ROI #2 131

Isotope pCi/g
Th-232 1.48

Bi efficiency: 0.0486
Tl efficiency: 0.0059 ROI Ratio: 0.919
Correction factor: 1.8 Corrected Ra-226: 19.78

Data entry:
Initial? Y

Sample: NAT-SS-D-22-13 SS-3019
MCard: 1
Count date: 04/23/96
Sample date: 3/23/96
Seal date: DATE?
pCi: 6054.853
Mass (grams): 551
Ra-226 pCi/g: 10.99
Sample depth: 1'-2'
User: MILLER
Comments: SUPPLEMENTAL STANDARDS VP-068 D-22-13
Analyst: afm
Reviewed by:

COPY

Acquisition Start: NAT
Live time(s): Apr/23/1996 1:54:52PM
500.000

% Dead time: 0.154

Sample Gross counts:
ROI #1 4090

ROI #2 247

Background:
Background has been subtracted

Background filename: c:\windows\aptec\bk100001.csv

File date: 4/23/96

File time: 1:04:58 PM

Bkg. Gross counts:
ROI #1 361

ROI #2 131

Isotope pCi/g
Th-232 1.8

Bi efficiency: 0.0486

Tl efficiency: 0.0059 ROI Ratio: 0.919

Correction factor: 1.8 Corrected Ra-226: 77.61

Data entry:
Initial? Y

Sample: NAT-SS-D-22-13 55-3018

MCard: 1

Count date: 04/23/96

Sample date: 4/23/96

Seal date: DATE?

pCi: 25438.597

Mass (grams): 590

Ra-226 pCi/g: 43.12

Sample depth: 0-1'

User: MILLER

Comments: SUPPLEMENTAL STANDARD VP-068

Analyst: dfm

Reviewed by: _____

COPY

Acquisition Start:

Live time(s):

% Dead time:

Sample Gross counts:

ROI #1

ROI #2

Background:

Background has been subtracted

Background filename:

File date:

File time:

Bkg. Gross counts:

ROI #1

ROI #2

Isotope

Th-232

Bi efficiency:

Tl efficiency:

Correction factor:

Data entry:

Initial?

Sample:

MCARD:

Count date:

Sample date:

Seal date:

pCi:

Mass (grams):

Ra-226 pCi/g:

Sample depth:

User:

Comments:

Analyst: _____

Reviewed by: _____

NAT

Apr/17/1996

500.000

0.035

745

219

355

147

pCi/g

1.17

0.0486

0.0059

ROI Ratio: 0.919

1.8

Corrected Ra-226: 7.24

Y

3013 dlm 4-17-96
NATSS301QD31-16

1

04/17/96

4/17/96

DATE?

2274.052

565

4.02

0-6" LAYER

MILLER

SUPPLEMENTAL STANDARD VP-068 D-31-16

COPY

Acquisition Start: NAT
Live time(s): Apr/17/1996 4:19:23PM
500.000

% Dead time: 0.032

Sample Gross counts:
ROI #1 630
ROI #2 222

Background:
Background has been subtracted

Background filename: c:\windows\aptec\bk100002.csv

File date: 4/17/96
File time: 3:07:18 PM

Bkg. Gross counts:
ROI #1 355
ROI #2 147

Isotope **pCi/g**
Th-232 1.17

Bi efficiency: 0.0486
Tl efficiency: 0.0059 **ROI Ratio:** 0.919
Correction factor: 1.8 **Corrected Ra-226:** 4.42

Data entry:
Initial? Y

Sample: NATSS3012D31-11
MCard: 1
Count date: 04/17/96
Sample date: 4/17/96
Seal date: DATE?
pCi: 1447.084
Mass (grams): 589
Ra-226 pCi/g: 2.46
Sample depth: 0-6" LAYER
User: MILLER
Comments: SUPPLEMENTAL STANDARD VP-068 D-31-11

Analyst: dfm
Reviewed by: _____

COPY

Acquisition Start: NAT
Live time(s): Apr/17/1996 4:10:41PM
500.000

% Dead time: 0.049

Sample Gross counts:
ROI #1 1143
ROI #2 221

Background:
Background has been subtracted

Background filename: c:\windows\aptec\bk100002.csv

File date: 4/17/96
File time: 3:07:18 PM

Bkg. Gross counts:
ROI #1 355
ROI #2 147

Isotope pCi/g
Th-232 1.12

Bi efficiency: 0.0486
Tl efficiency: 0.0059 **ROI Ratio:** 0.919
Correction factor: 1.8 **Corrected Ra-226:** 14.97

Data entry:
Initial? Y

Sample: NATSS3011D22-23
MCard: 1
Count date: 04/17/96
Sample date: 4/17/96
Seal date: DATE?
pCi: 5056.15
Mass (grams): 608
Ra-226 pCi/g: 8.32
Sample depth: 1'-2' LAYER
User: MILLER
Comments: SUPPLEMENTAL STANDARD VP-068 D-22-23

Analyst: dfn
Reviewed by: _____

COPY

Acquisition Start: NAT
Live time(s): Apr/17/1996 4:02:06PM
500.000

% Dead time: 0.063

Sample Gross counts:
ROI #1 1463
ROI #2 210

Background:
Background has been subtracted

Background filename: c:\windows\aptec\bk100002.csv

File date: 4/17/96
File time: 3:07:18 PM

Bkg. Gross counts:
ROI #1 355
ROI #2 147

Isotope pCi/g
Th-232 .97

Bi efficiency: 0.0486
Tl efficiency: 0.0059 ROI Ratio: 0.919
Correction factor: 1.8 Corrected Ra-226: 22.23

Data entry:
Initial? Y

Sample: NATSS3010D22-23
MCard: 1
Count date: 04/17/96
Sample date: 4/17/96
Seal date: DATE?
pCi: 7374.4
Mass (grams): 597
Ra-226 pCi/g: 12.35
Sample depth: 0'-1' LAYER
User: MILLER
Comments: SUPPLEMENTAL STANDARD VP-068 D-22-23
Analyst: dfm
Reviewed by: _____

COPY

Acquisition Start: NAT
Live time(s): Apr/17/1996 3:53:22PM
500.000

% Dead time: 0.047

Sample Gross counts:
ROI #1 1056
ROI #2 195

Background:
Background has been subtracted

Background filename: c:\windows\aptec\bk100002.csv

File date: 4/17/96
File time: 3:07:18 PM

Bkg. Gross counts:
ROI #1 355
ROI #2 147

Isotope pCi/g
Th-232 .78

Bi efficiency: 0.0486
Tl efficiency: 0.0059 ROI Ratio: 0.919
Correction factor: 1.8 Corrected Ra-226: 14.64

Data entry:
Initial? Y

Sample: NATSS3009D30-15
MCard: 1
Count date: 04/17/96
Sample date: 4/17/96
Seal date: DATE?
pCi: 4613.016
Mass (grams): 567
Ra-226 pCi/g: 8.14
Sample depth: 1'-18" LAYER
User: MILLER
Comments: SUPPLEMENTAL STANDARD VP-068 D-30-15
Analyst: afm
Reviewed by: _____

COPY

Acquisition Start:**Live time(s):****NAT**
Apr/17/1996
500.000**3:44:37PM****% Dead time:****0.036****Sample Gross counts:****ROI #1****840****ROI #2****177****Background:****Background has been subtracted****Background filename:****c:\windows\aptec\bk100002.csv****File date:****4/17/96****File time:****3:07:18 PM****Bkg. Gross counts:****ROI #1****355****ROI #2****147****Isotope****Th-232****pCi/g****.5****Bi efficiency:****0.0486****Tl efficiency:****0.0059****ROI Ratio: 0.919****Correction factor:****1.8****Corrected Ra-226: 10.51****Data entry:****Initial?****Y****Sample:****NATSS3008D30-15****MCARD:****1****Count date:****04/17/96****Sample date:****4/17/96****Seal date:****DATE?****pCi:****3212.321****Mass (grams):****550****Ra-226 pCi/g:****5.84****Sample depth:****0'-1' LAYER****User:****MILLER****Comments:****SUPPLEMENTAL STANDARD VP-068 D-30-15****Analyst:***dfm***Reviewed by:****COPY**

Acquisition Start:
Live time(s):

NAT
Apr/17/1996
500.000

3:35:48PM

% Dead time:

0.047

Sample Gross counts:

ROI #1

1089

ROI #2

243

Background:

Background has been subtracted

Background filename:

c:\windows\lptec\bk100002.csv

File date:

4/17/96

File time:

3:07:18 PM

Bkg. Gross counts:

ROI #1

355

ROI #2

147

Isotope

Th-232

pCi/g

1.63

Bi efficiency:

0.0486

Tl efficiency:

0.0059

ROI Ratio: 0.919

Correction factor:

1.8

Corrected Ra-226: 15.09

Data entry:

Initial?

Y

Sample:

NATSS3007D30-10

MCard:

1

Count date:

04/17/96

Sample date:

4/17/96

Seal date:

DATE?

pCi:

4534.913

Mass (grams):

541

Ra-226 pCi/g:

8.38

Sample depth:

1'-18" LAYER

User:

MILLER

Comments:

SUPPLEMENTAL STANDARD VP-068 D-30-10

Analyst: dfm

Reviewed by: _____

COPY

<u>Acquisition Start:</u>	NAT	3:27:04PM
<u>Live time(s):</u>	Apr/17/1996	
	500.000	
<u>% Dead time:</u>	0.082	
<u>Sample Gross counts:</u>		
ROI #1	2008	
ROI #2	263	
<u>Background:</u>		
Background has been subtracted		
<u>Background filename:</u>	c:\windows\lptec\bk100002.csv	
<u>File date:</u>	4/17/96	
<u>File time:</u>	3:07:18 PM	
<u>Bkg. Gross counts:</u>		
ROI #1	355	
ROI #2	147	
<u>Isotope</u>	<u>pCi/g</u>	
Th-232	1.8	
<u>Bi efficiency:</u>	0.0486	
<u>Tl efficiency:</u>	0.0059	ROI Ratio: 0.919
<u>Correction factor:</u>	1.8	Corrected Ra-226: 33.07
<u>Data entry:</u>		
Initial?	Y	
<u>Sample:</u>	NATSS3006D30-10	
<u>MCard:</u>	1	
<u>Count date:</u>	04/17/96	
<u>Sample date:</u>	4/17/96	
<u>Seal date:</u>	DATE?	
<u>pCi:</u>	10859.61	
<u>Mass (grams):</u>	591	
<u>Ra-226 pCi/g:</u>	18.37	
<u>Sample depth:</u>	0'-1' LAYER	
<u>User:</u>	MILLER	
<u>Comments:</u>	SUPPLEMENTAL STANDARD VP-068 D30-10	
<u>Analyst:</u>		
<u>Reviewed by:</u>		

Acquisition Start:
Live time(s):

NAT
Apr/17/1996
500.000

3:18:10PM

% Dead time: 0.058

Sample Gross counts:
ROI #1

1414

ROI #2 219

Background:
Background has been subtracted

COPY

Background filename: c:\windows\aptec\bk100002.csv

File date: 4/17/96

File time: 3:07:18 PM

Bkg. Gross counts:
ROI #1

355

ROI #2 147

Isotope pCi/g
Th-232 1.13

Bi efficiency: 0.0486

Tl efficiency: 0.0059 ROI Ratio: 0.919

Correction factor: 1.8 Corrected Ra-226: 21.42

Data entry:
Initial? Y

Sample: NAT-SS3005D30-9

MCard: 1

Count date: 04/17/96

Sample date: 4/17/96

Seal date: DATE?

pCi: 6972.194

Mass (grams): 586

Ra-226 pCi/g: 11.9

Sample depth: 1'-18"

User: MILLER

Comments: SUPPLEMENTAL STANDARD VP-068 D-30-9

Analyst: dfm

Reviewed by: _____

Acquisition Start:
Live time(s):

NAT
Apr/18/1996
500.000

4:55:11PM

% Dead time:

0.000

Sample Gross counts:

ROI #1

1552

ROI #2

258

Background:

Background has been subtracted

Background filename:

c:\windows\aptec\bk100001.csv

File date:

4/18/96

File time:

3:44:16 PM

Bkg. Gross counts:

ROI #1

339

ROI #2

139

Isotope

pCi/g

Th-232

1.73

Bi efficiency:

0.0486

Tl efficiency:

0.0059

ROI Ratio: 0.919

Correction factor:

1.8

Corrected Ra-226: 22.04

Data entry:

Initial?

Y

Sample:

NAT-SS-3004

MCard:

1

Count date:

04/18/96

Sample date:

4-17-96

Seal date:

DATE?

pCi:

7750.285

Mass (grams):

633

Ra-226 pCi/g:

12.24

Sample depth:

0'-1'

User:

STEVE

Comments:

SUP STANDARD 0'-1' LAYER D-30-9

Analyst: SH

Reviewed by: _____

COPY

Acquisition Start: NAT
Live time(s): Apr/18/1996 4:46:29PM
500.000

% Dead time: 0.054

Sample Gross counts:
ROI #1 1254
ROI #2 212

Background:
Background has been subtracted

Background filename: c:\windows\aptec\bk100001.csv

File date: 4/18/96
File time: 3:44:16 PM

Bkg. Gross counts:
ROI #1 339
ROI #2 139

Isotope **pCi/g**
Th-232 1.33

Bi efficiency: 0.0486
Tl efficiency: 0.0059 **ROI Ratio:** 0.919
Correction factor: 1.8 **Corrected Ra-226:** 21.35

Data entry:
Initial? Y

Sample: NAT-SS-3003
MCard: 1
Count date: 04/18/96
Sample date: 4-17-96
Seal date: DATE?
pCi: 5954.48
Mass (grams): 502
Ra-226 pCi/g: 11.86
Sample depth: 1'-2'
User: STEVE
Comments: SUP STANDARD 1'-2' LAYER D-30-4

COPY

Analyst: SH

Reviewed by: _____

Acquisition Start:**Live time(s):**NAT
Apr/18/1996
500.000

4:37:42PM

% Dead time:

0.061

Sample Gross counts:**ROI #1**

1394

ROI #2

219

Background:

Background has been subtracted

Background filename:

c:\windows\aptec\bk100001.csv

File date:

4/18/96

File time:

3:44:16 PM

Bkg. Gross counts:**ROI #1**

339

ROI #2

139

Isotope**Tb-232****pCi/g**

1.13

Bi efficiency:

0.0486

Tl efficiency:

0.0059

ROI Ratio: 0.919**Correction factor:**

1.8

Corrected Ra-226: 19.15**Data entry:****Initial?**

Y

Sample:

NAT-SS3002D30-4

MCard:

1

Count date:

04/18/96

Sample date:

4/17/96

Seal date:

DATE?

pCi:

6892.462

Mass (grams):

648

Ra-226 pCi/g:

10.64

Sample depth:

0'-1'

User:

WOOD

Comments:

SUP STANDARDS 0'-1' LAYER

Analyst:**Reviewed by:**

COPY

Acquisition Start: NAT
Live time(s): Apr/18/1996 8:53:39AM
500.000

% Dead time: 0.105

Sample Gross counts:
ROI #1 2611
ROI #2 258

Background:
Background has been subtracted

Background filename: c:\windows\aptec\bk100003.csv

File date: 4/18/96
File time: 8:42:16 AM

Bkg. Gross counts:
ROI #1 381
ROI #2 157

Isotope pCi/g
Th-232 1.6

Bi efficiency: 0.0486
Tl efficiency: 0.0059 **ROI Ratio:** 0.919

Correction factor: 1.8 **Corrected Ra-226:** 46.66

Data entry:
Initial? Y

Sample: NATSS3001D30-3
MCard: 1

Count date: 04/18/96
Sample date: 4/17/96
Seal date: DATE?

pCi: 15008.498
Mass (grams): 579
Ra-226 pCi/g: 25.92
Sample depth: 1'-2" LAYER
User: MILLER

Comments: SUPPLEMENTAL STANDARD D-30-3 VP-068
Analyst: dfm
Reviewed by: _____

COPY

Acquisition Start: NAT
Live time(s): Apr/17/1996 2:07:26PM
500.000

% Dead time: 0.142

Sample Gross counts:
ROI #1 3833
ROI #2 299

Background:
Background has been subtracted

Background filename: c:\windows\aptec\bk100002.csv

File date: 4/17/96
File time: 12:41:06 PM

Bkg. Gross counts:
ROI #1 340
ROI #2 141

Isotope pCi/g
Th-232 2.32

Bi efficiency: 0.0486
Tl efficiency: 0.0059 **ROI Ratio:** 0.919
Correction factor: 1.8 **Corrected Ra-226:** 67.6

Data entrv:
Initial? Y

Sample: NAT-SS3000D30-3
MCard: 1
Count date: 04/17/96
Sample date: 4/17/96
Seal date: DATE?
pCi: 23510.137
Mass (grams): 626
Ra-226 pCi/g: 37.56
Sample depth: 0'-1' LAYER
User: MILLER
Comments: SUPPLEMENTAL STANDARD D-30-3

COPY

Analyst: dfm

Reviewed by: _____

VP-068

**RADIOLOGICAL DATA COLLECTED DURING EXCAVATION OF URANIUM UNDER
FORMER MILL SITE**

JACOBS ENGINEERING GROUP INC., ALBUQUERQUE OPERATIONS

TO: E. Artiglia, Technical Manager, TAC *E. Artiglia*
THROUGH: A. Holm, Deputy Technical Manager, TAC
FROM: M. Brennan, Senior Health Physicist, TAC *M. Brennan*
DATE: JUL 28 1997
SUBJECT: Review of Trip to Naturita, Including a Meeting with CDPHE
Contract No. DE-AC04-91AL62350

At DOE's request for health physics support, I examined the uranium issue at the Naturita UMTRA site. This included a site visit from 06/30/97 through 07/03/97. The following is a summary of my evaluation of site conditions and issues regarding uranium found on-site. Scott Williams, the Rust Site Health Physics Manager, accompanied me and was most cooperative in providing site resources for this evaluation. His time and efforts are very much appreciated.

Scott and I spent a considerable amount of time walking over the site (in the exclusion zone) on July 1, 1997. We carried a sodium iodide type gamma detection instrument and a G-M type beta/gamma instrument (primarily beta sensitive). It became evident that some areas on the site showed both elevated gamma and beta levels whereas other locations having elevated beta counts showed little or no increase in gamma levels. Where gamma rates were elevated, the soil tended to have a gray to reddish appearance as might be indicative of mill tailings. Areas having elevated beta count rates in the absence of gamma anomalies often had a yellowish appearance, or in some areas green to brownish shading to the soil. The elevated beta in the absence of gamma was very suggestive of the presence of uranium as product, rather than ore. Although the uranium isotopes are alpha emitters, ^{238}U decays to ^{234}Th which decays to ^{234}Pa which in turn yields ^{234}U . These two non-uranium isotopes are beta emitters, ^{234}Pa having a very high energy beta decay spectrum (Avg. = 819 keV, Max. = 2281 keV).

In walking over the site with this instrumentation, it appeared that this alleged uranium material is dispersed across the center portion of the site. However, the significant concentrations appear to be primarily in the vicinity of the river berm (within about 50 meters of the river) and a few areas within and / or just below the toe of the slope leading up to the highway. The flat area between has some visible signs of the material, but does not appear to generally have large areas or significant concentrations present. Based on these findings, three areas were chosen for further investigation. In each of the three areas, a systematic sample was collected as would be done for verification purposes (9 plug composite collected within a 100 m^2 grid). After this collection we walked over the grid with the beta counter and collected soil from each area where elevated count rates occurred. From this collection a biased composite sample was generated. Along with the biased sample an estimate of the area of the grid having elevated beta count rates was generated. The samples were counted for ^{226}Ra and for ^{238}U at

the on-site laboratory. After drying, they were recounted for ^{238}U . The ^{226}Ra values noted herein are uncorrected initial counts based upon wet mass which means that final radium activity in these samples will tend to be somewhat higher (probably twice these quoted values). Background ^{226}Ra for the Naturita site is estimated to be about 1.5 pCi/g. Attachment A is a figure providing general locations of these areas along with other important information.

Area 1 is along the toe of the highway slope, in the vicinity of where the sulfate roasters formerly stood. This area, although intensely excavated, continued to show signs of both the yellowish soil and some locations with dark green deposits. It is above the current water table and all materials collected were dry. The samples collected from this grid showed background levels of ^{226}Ra and somewhat elevated ^{238}U values. For ^{238}U , the dry weight concentrations were 45.0 and 36.6 pCi/g for the biased and systematic samples respectively (see Table below). The area represented by the biased sample was estimated to be about 25 m².

Area 2 is north of the first area, and somewhat lower. Most of this area is at the water table with many spots having standing water. Probably close to 10% of the chosen test grid in this area was under water. There was visible yellow coloration of the soil over a large portion of this grid. The biased sample collected in this area represents about 50 m² and was evaluated to have about 508 pCi/g of ^{238}U and 3.4 pCi/g, ^{226}Ra . The systematic sample was 179 pCi/g, ^{238}U while ^{226}Ra was at background.

Area 3 is directly east of the first two, just west of the San Miguel River (about 10 meters west of the berm adjacent to the river). Some of the soil in this grid area had a brown to greenish hue to it, some had more of a yellowish caste but most of it appeared rather ordinary. About 20% of this grid appeared from beta measurement to be contaminated although some of this area appeared no different visibly from clean river bottom soils. The systematic sample was estimated to contain about 32.5 pCi/g, ^{238}U and 3.0 pCi/g, ^{226}Ra . The biased sample was determined to have a concentration of 83.2 pCi/g, ^{238}U and a ^{226}Ra concentration of 3.3 pCi/g. This area was above the water table, however standing water was nearby and very close to the elevation of this grid.

On July 2, 1997, State of Colorado personnel (Wendy Naugle and Paul Oliver), R. Cornish of the DOE, and J. Innis with MK Ferguson accompanied S. Williams and I on a site visit to examine the issues pertaining to uranium and the areas in question. Although this exercise provided some insight, the State has continuing concerns regarding uranium being left at or below the water table. They feel that adapting the thorium protocol for use with uranium is inadequate. Since thorium decays to radon (via decay to radium), the issue is radon emanation and the presence of water reduces the radon flux. In the case of uranium, however, the issue is that uranium at or below the water table may be dissolved and become a ground water issue. They are concerned that this may be the source of elevated levels of uranium in downgradient wells.

On July 3, 1997, S. Williams and I returned to the site to collect several more samples which are to be sent off-site for soil pH and to determine the chemical form of the uranium. It is hoped that by determining the chemical form and soil pH we can better predict its probable mobility within the ground water system. We purposely sought samples of differing visible character since the uranium may be chemically variable. An initial radiological screening was done on the wet samples for uranium and radium. From Area 1, we collected a sample consisting of the deep green material. This turned out to be fairly low: 11.3 pCi/g of ^{238}U and 1.5 pCi/g ^{226}Ra (uncorrected for ingrowth). From Area 2, the yellowish material was collected. The initial sample results for ^{238}U indicated about 616 pCi/g and 4.3 pCi/g for ^{226}Ra . The brown to yellowish-green material from Area 3 was sampled. The ^{238}U value was 24.7 and the ^{226}Ra concentration initially measured to be 2.7 pCi/g. A beta count rate measurement was made in the field and gave a value of about 1400 counts per minute (cpm).

TABLE: Radium and Uranium Concentrations for Test Grids Naturita Processing Site

	AREA 1		AREA 2		AREA 3	
	Bias.	Sys.	Bias.	Sys.	Bias.	Sys.
WET						
^{226}Ra	0.6	1.1	3.4	0.9	3.3	3.0
Corrected	1.1	2.1	6.3	1.6	6.3	5.6
^{238}U	32.3	31.9	418	124	68.2	17.4
DRY						
^{238}U	45.0	36.6	508	179	83.2	32.5
TOT U	93.7	76.2	1060	373	173	67.6
TOT U bulk	25.4	20.8	279	98.8	46.2	18.5
TOT U wavg	6.3	N/A	140	N/A	9.2	N/A

NOTES: Concentrations are in units of pCi/g
 Ingrowth factor for ^{226}Ra = 1.88, Uranium in cobbles assumed 1.0 pCi/g
 Bias. = Biased Sample, Sys. = Systematic Sample, TOT U = Total Uranium
 Bulk refers to overall concentration in cobbly soil
 Wavg refers to an area weighted average for biased sampling

Two additional samples were collected. (1) Near the top of the slope above Area 1, an area was very prominent due to its bright yellow coloration. Upon closer examination the material appears to have precipitated out on the surface. In fact, the area was still wet just underneath this yellow superficial crust. A survey with the beta measuring instrument did not reveal particularly elevated readings. The initial uranium estimate is 3.5 pCi/g and the radium value is at background. This material could be a sulfate compound since sulfuric acid was utilized in the uranium extraction process at this site. (2) A sample of material observed along the berm adjacent to the river during the walkover with the State personnel was also collected. It was bright yellow like the material just described from near the highway. In this case, it was very radioactive. A field measurement for beta was over 138,000 cpm. The on-site uranium measurement indicates 12620 pCi/g, ^{238}U . The estimated ^{226}Ra concentration by contrast is 927 pCi/g. In visual appearance, this material resembles carnotite, an ore of uranium. If this is "synthetic carnotite"

it actually takes the form of sodium uranyl vanadate. Merritt's treatise "The Extractive Metallurgy of Uranium" indicates that this was an intermediate product and was typically processed further to separate the vanadium from the uranium.

The areas where elevated uranium measurements were found consist of very cobbly soils. Comparing total unadjusted uranium concentrations to the excavation criteria of 35 pCi/g, all three of the test grids might be assumed to require excavation. However, the fines which is responsible for the elevated uranium values represents only 26.3% of the total mass of the cobbly soil. After adjusting the measured ^{238}U concentrations to reflect total uranium, then determining bulk uranium concentrations, only the second test area exceeded the total uranium standard of 35 pCi/g. The adjusted values, based upon the systematic soil collections were 20.8, 98.8 and 18.5 pCi/g, for Areas 1, 2 and 3 respectively. Based on the biased samples, further adjusted for area weighted averaging, the same conclusions were derived: Area 2 continued to fail the cleanup criteria. The biased, adjusted total uranium concentrations were determined to be 6.3, 140 and 9.2 pCi/g for test grids 1, 2 and 3 respectively (see Table above).

One other observation should be noted. In the hillside above the first test grid there is a region indicated to be contaminated. It appears to be in relatively undisturbed rock although this material is fractured and effected by weathering. Visual contamination is evident in fractures and other cracks in this strata. There are also several feet of similar material above and below this layer, exposed but apparently not contaminated. Above all this "undisturbed" rock is a considerable amount of cobbly soil which may have resulted from ancient stream deposition or more recently by human activities (or a combination of these). The contaminated layer is well above the current water table. It is unclear as to why a contaminated layer exists between two uncontaminated but otherwise similarly appearing layers of native rock. Without further evaluation, it is difficult to speculate as to whether the contamination pinches out as further into the slope or broadens out in extent.

Based upon the information gathered, the following observations and recommendations are offered.

Considering that field measurements were found to have elevated beta count rates with nominal gamma count rates, and material collected from these locations had elevated uranium concentrations with near background levels of radium, it is clear that the material of concern is not ore. This information, along with the locations of this uranium material on the Naturita site, leads to the conclusion that most if not all of this material is directly resultant from site operations.

In examining the distribution and apparent concentrations of uranium by visual indicators and the use of beta sensitive radiation detection equipment, the primary area of concern appears to exist along the toe of the highway slope north of the area where the processing buildings, including the roasters, once existed. Test Area 2 has been excavated to the water table (actually to one

foot below the water table at the time of excavation). From looking at old site maps, this area appears to have been a topographic low during the period of active site operations. It received drainage from across the highway as well as from the road itself. Furthermore, due to its proximity to the milling operation as well as being topographically low, it may very well have received contaminated runoff from the processing area, both due to rain and snowmelt on the one hand and resultant from leaks or spillage during operations on the other. As such, it is believed that this area is rather unique and is not indicative of conditions over most of the site. There is also some uranium near the river. However, this is not expected to result in large volumes of contaminated material requiring burial in the disposal cell.

After examining the data it appears that using the extant uranium cleanup and verification procedure, in conjunction with cobbles to fines corrections where they are applicable, should result in minimal excavation and expedite remediation. The procedure only calls for 10 % of the grids to be verified in the former mill yard and subpile areas, unless grids are found that fail the criteria. Then comprehensive sampling occurs only to establish the boundaries of the local problem after which sampling returns to 10 % of the grids. Three of the worst areas found thus far were utilized as test grids and only one of these appears problematic after adjusting the results for consideration of the cobbly nature of the soil. Although attempting to apply area weighted averaging might reduce the volume slightly, it made no difference in the outcome for the three test grids studied. Furthermore, properly performing this averaging would require carefully walking over entire grids with a beta detector, indicating areas where elevated beta values exist, estimating the area and collecting soil for analysis. This could become time and labor intensive and is therefore not justifiable at this point in time.

The problem that the State continues to have with uranium is due to elevated uranium levels in the ground water. As has been indicated, Area 2 is a unique location. While this location may have the highest average concentrations of uranium left on site, I am not convinced that this is the primary source of down gradient ground water contamination. Based upon site observations, distribution of uranium in ground water across the site and down gradient, and generalized effective ground water velocities, I believe Area 2 is a minor component of the overall uranium source term. Furthermore, I don't believe there is a significant discreet source for the uranium. It is evident that there are some locations with elevated uranium values, particularly in proximity to the former mill site. It seems far more plausible, however, that the majority of uranium presently on-site is ubiquitous in nature, distributed across the former subpile and to some extent, the former mill site, at low concentrations. If this is so then remediation of the mill site and former tailings pile areas for radium may remove far more of the total source term for uranium than attempting to remediate uranium far below the water table at one or a couple isolated locations.

The presence of uranium itself does not innately constitute a ground water problem. The chemical form of the uranium and soil pH (as well as that of the ground water) may be significant parameters of the equation. The analyses to be undertaken for the five samples will provide very useful information. It is, however, suggested that several water samples be collected from Area 2. At a minimum, a couple surface collections and a couple from one or more boreholes would be valuable. If this were a primary source of ground water contamination, the water should have very significant levels of uranium present.

Without further information, no specific recommendation can be made regarding the contaminated rock in the slope below the road. If significant excavation into the slope going to the west occurs then the potential exists for destabilization of the highway above. The highway right of way has already been considered for supplemental standards. The same approach may become necessary for this area, either as a part of the highway right of way or separately, to protect the highway's integrity.

The area found near the road having yellow precipitation (appears to be a seep) needs to be further investigated. While not a radiological concern directly, if the material being deposited is a sulfate or other sulfur bearing compound this could be indicative of either an active source of acid leakage or indicative of ground water passing through an area which has had significant acid leakage (or spillage) in the past. If either is true, ground water having low pH entering the UMTRA Project site could pose a problem for increased mobilization of uranium into the shallow alluvial aquifer.

The area along the berm (dike) adjacent to the river is still to be remediated for radium. This area may contain at least some localized concentrations, possibly very elevated levels of uranium as evidenced by the material found which resembles "synthetic carnotite." Proper analyses and other radiological considerations should be utilized in the management and remediation of these areas.

All data and supporting documentation is on file in my office for future reference. If you have any questions about the information, inferences or conclusions noted herein, please let me know at your convenience.

MB:LL
Attachment

cc: D. Heydenburg, TAC
J. Lommler, TAC
L. Maez, TAC
C. Pomatto, TAC
Document Control

ATTACHMENT A

Figure: Locations of Test Grid Areas, Seep and other Features Superimposed over Uranium Concentrations in Ground Water in the Alluvium, Processing Site - Naturita CO.