Closure Report for CAU No. 416
Project Shoal Area

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Revision: 0

January 1998

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Environmental Restoration Division

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CLOSURE REPORT FOR CAU 416:  
PROJECT SHOAL AREA

Prepared for  
U. S. Department of Energy  
Nevada Operations Office  
Under Contract No. DE-AC08-96NV11718

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Revision: 0

Prepared by  
Bechtel Nevada  
Environmental Restoration Program

January 1998
CLOSURE REPORT FOR CAU 416:
PROJECT SHOAL AREA

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Nevada Environmental Restoration Project

Date: 1/9/98
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<tr>
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<tr>
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EXECUTIVE SUMMARY

This Closure Report provides the documentation for closure of the United States Department of Energy/Nevada Operations Office (DOE/NV) Project Shoal Area (PSA) Surface Corrective Action Unit (CAU) 416. CAU 416 consists of a mud pit (Corrective Action Site [CAS] 57-09-01), muckpile (CAS 57-06-01), and housekeeping site (CAS 57-98-01). The PSA is located approximately 48.3 kilometers (30 miles) southeast of Fallon, Nevada.

The closure of the PSA CAU 416 has been completed in accordance with the Nevada Division of Environmental Protection approved Streamlined Approach For Environmental Restoration Plan For Corrective Action Unit 416, Mud Pit, Project Shoal Area (DOE, 1997a), Record of Technical Change No. 1 For Streamlined Approach For Environmental Restoration Plan For Corrective Action Unit 416, Mud Pit, Project Shoal Area (DOE, 1997b), and Housekeeping Category Corrective Action Unit Workplan (DOE, 1996).

The mud pit was the result of drilling activities at the PSA in 1963. Investigation activities completed in 1996 determined drilling mud in the mud pit was impacted with petroleum hydrocarbons in excess of the State of Nevada 100 milligram per kilogram (mg/kg) Total Petroleum Hydrocarbon (TPH) Action Level (NAC, 1996). The mud pit closure activities consisted of excavation, transportation, and disposal of approximately 184 cubic meters (m³) (240 cubic yards [yd³]) of petroleum hydrocarbon impacted drilling mud and weathered granite, verification sampling and analysis, and regrading of the mud pit area. The impacted materials were disposed of in the Area 6 Hydrocarbon Landfill located at the Nevada Test Site (NTS). The verification samples collected from the bottom of the excavation area indicate the materials exceeding the Action Level were successfully removed.

The muckpile consists of broken granite from emplacement shaft and drift (tunnel) mining activities at the PSA in 1963. Approximately 5,000 m³ (6,535 yd³) of broken granite is stockpiled at the surface in an area of approximately 930 square meters (10,000 square feet). Analytical results of samples collected in weathered granite approximately 274 meters (m) (900 feet [ft]) northeast of the muckpile indicate constituents of concern (COC's) do not exceed regulatory action levels. Geological data from a site report (DRI, 1988) indicates the granite removed from the emplacement shaft and drift is similar in composition from the surface to the maximum depth of the shaft (402 m [1,320 ft]).

The housekeeping site consisted of approximately 20 used, empty, rusted, steel 0.9 liter (1 quart) oil cans. The oil cans were potentially from the site activities in the 1960's based upon the construction material and style of can. The cans were removed from the site and disposed of the Area 23 Landfill located at the NTS.

The DOE/NV requests the Nevada Division of Environmental Protection to issue a Notice of Completion and move the Project Shoal Area Surface CAU 416 (CAS 57-09-01, CAS 57-06-01, and CAS 57-98-01) from Appendix III to Appendix IV of the Federal Facility Agreement and
Consent Order because the following corrective action activities were completed as proposed:

- The impacted materials exceeding the 100 mg/kg TPH Action Limit were removed and properly disposed of from the mud pit (CAS 57-09-01).

- The process knowledge (analytical results from the weathered granite samples and site geological data) indicates no COC's exceed regulatory levels in the muckpile (CAS 57-06-01).

- The housekeeping site (CAS 57-98-01) was remediated.
1.0 INTRODUCTION

The U.S. Department of Energy, Nevada Operations Office (DOE/NV) operates the Nevada Test Site (NTS) and entered into a tri-lateral agreement with the state of Nevada and the U.S. Defense Special Weapons Agency. The tri-lateral agreement, which is entitled the Federal Facilities Agreement and Consent Order (FFACO), provides a framework for identifying, characterizing, remediating, and closing DOE/NV environmental sites in Nevada (NDEP, 1996). Two Corrective Action Units (CAUs) are identified for the DOE/NV Project Shoal Area (PSA) in the FFACO (CAU 416 and CAU 447). The PSA Surface is identified as CAU 416, and the PSA Subsurface is identified as CAU 447.

This Closure Report (CR) provides the documentation for the Streamlined Approach for Environmental Restoration (SAFER) closure of the PSA Surface CAU 416. The PSA is located approximately 48.3 kilometers (km) (30 miles [mi]) southeast of Fallon, Nevada, in the Sand Springs Range of Churchill County (see Figure 1). CAU 416 consists of a mud pit (Corrective Action Site [CAS] 57-09-01), muckpile (CAS 57-06-01), and housekeeping site (CAS 57-98-01).

Project Shoal was part of the Vela Uniform Program, a U.S. Department of Defense and U.S. Atomic Energy Commission (AEC) study to evaluate the effects of different geologic media (e.g., granite) on seismic waves produced by underground nuclear tests and to determine whether seismic waves from underground nuclear tests could be differentiated from seismic waves from naturally occurring earthquakes (DRI, 1988).

The Shoal event was a 12.5-kiloton device detonated on October 26, 1963. The device was placed in granite 369 meters (m) (1,211 feet [ft]) below the ground surface (DOE, 1997a). Emplacement of the device was accomplished by mining an approximate 3.6 m (12 ft) by 1.8 m (6 ft) shaft to approximately 402 m (1,320 ft). A drift (tunnel) was mined from the shaft approximately 320 m (1,050 ft) to the east (AEC, 1970). The muckpile (CAS 57-06-01) was the result of stockpiling the broken granite from the mining activities associated with the construction of the shaft. The muckpile is located approximately 46 m (150 ft) east of the shaft (see Figure 2). The shaft was permanently closed in 1996 by backfilling with materials from the muckpile. Approximately 2,445 cubic meters (m$^3$) (3,200 cubic yards [yd$^3$]) was used to backfill the shaft. Approximately 5,000 m$^3$ (6,535 yd$^3$) of broken granite remains at the surface in an area of approximately 930 square meters (m$^2$) (10,000 square ft [ft$^2$]).

The mud pit was constructed in a natural drainage area approximately 350 m (1150 ft) east of the emplacement shaft (Figure 2). The mud pit was used to contain drilling effluent and cuttings from the Post Shot Borehole PS-1 in 1963. During drilling activities for Post Shot Borehole PS-1, short-lived gaseous radionuclides (iodine-131, xenon 131m, and xenon-133) were brought to the surface through the drill rig effluent vent-line system (DOE, 1997a). The radionuclides were
FIGURE 1
LOCATION OF PROJECT SHOAL AREA
FIGURE 2
PROJECT SHOAL AREA SITE MAP
trapped by filters and were subsequently mixed with clean soil and buried in the mud pit (DOE, 1997a). Results from the 1996 characterization activities indicated that no radionuclides were detected above expected values for a granitic terrain; however, Total Petroleum Hydrocarbons (TPH) as diesel and oil were detected above the 100 mg/kg action level (NAC, 1996). The diesel and oil are suspected to have been used in the drilling mud. No other constituents were detected exceeding regulatory limits (DOE, 1997a).

The housekeeping site is located approximately 701 m (2,300 ft) southeast of the mudpit (Figure 2). The housekeeping site consisted of approximately 20 used, empty, rusted, steel 0.9 liter (1 quart) oil cans. The oil cans were potentially from the site activities in the 1960's based upon the construction material and style of can.

DOE/NV proposed to close the mud pit by excavating and disposing of the TPH impacted materials which exceeded the 100 milligram per kilogram (mg/kg) Action Level (NAC, 1996) in July 1997 (DOE, 1997a). The process knowledge to support closure in-place of the muckpile by no further action was proposed to be added to the SAFER Closure Plan in a Record of Technical Change in September 1997 (DOE, 1997b). Remediation of the housekeeping site using the Housekeeping Site Work Plan (DOE, 1996) with the documentation for closure to be included in the CR was proposed on August 13, 1997 (DOE, 1997c).

The Nevada Division of Environmental Protection (NDEP) approved the proposed activities in the SAFER Closure Plan on August 5, 1997 (NDEP, 1997a). The Record of Technical Change (DOE, 1997b) and proposal to remediate the housekeeping site using the Housekeeping Site Work Plan (DOE, 1996) were recorded as approved on September 19, 1997 (NDEP, 1997b).

The Field closure activities began on August 17, 1997 and were completed on August 27, 1997.

1.1 PURPOSE

The purpose of this CR is to:

- provide the information collected during the closure activities as proposed in the SAFER Plan (DOE, 1997a), Record of Technical Change (DOE, 1997b), and Housekeeping Site Work Plan (DOE, 1996).

- Obtain a Notice of Completion from the NDEP.

- Recommend the movement of CAU 416 from Appendix III to Appendix IV of the FFACO.
1.2 SCOPE

The following remedial actions implemented for the closure of the mud pit (CAS 57-09-01) were:

- Excavated and removed of impacted materials from the mud pit area which exceeded the 100 mg/kg TPH Action Level.
- Conducted verification sampling at the bottom of the excavation in the area of the mud pit to confirm TPH concentrations were below the 100 mg/kg Action Level.
- Transported and disposed of the excavated hydrocarbon impacted materials in the Area 6 Hydrocarbon Landfill located at the Nevada Test Site (NTS).
- Regraded the mud pit area using soil from the mud pit retention berm.

The scope of work for the muckpile (CAS 57-06-01) was to provide sufficient information to close the muckpile in-place with no further action. Remedial activities for the housekeeping site (CAS 57-98-01) consisted of removal and disposal of the debris (approximately 20 used steel oil cans). Closure activities and justifications for closure of the mud pit, muckpile, and housekeeping site are documented in the following sections and appendices.

1.3 CLOSURE REPORT CONTENTS

This CR is divided into the following sections:

- Section 1.0 - Introduction: Site background, purpose, scope, and report contents
- Section 2.0 - Closure Activities: Corrective action activities, deviations from SAFER Plan as approved, corrective action schedule as completed, and site plan
- Section 3.0 - Waste Disposition
- Section 4.0 - Closure Verification Results
- Section 5.0 - Conclusions
- Section 6.0 - References
- Appendix A - Laboratory Analytical Results, Granite Samples Near Muckpile
- Appendix B - Housekeeping Site Closure Verification Documentation
- Appendix C - Waste Disposal Documentation
Appendix D - Laboratory Analytical Results, Mud Pit Verification Samples

This report was developed using information and guidance from the following documents:


- **Corrective Action Investigation Plan for Project Shoal Area, CAU No. 416**, DOE, 1996.

- **Housekeeping Category Corrective Action Unit Workplan, Rev. 0**, DOE, August 1996.


- **Nevada Environmental Restoration Project, Industrial Sites, Quality Assurance Project Plan, Nevada Test Site, Revision 1**, DOE, 1996.


- **Record of Technical Change No. 1 For Streamlined Approach For Environmental Restoration Plan For Corrective Action Unit 416, Mud Pit, Project Shoal Area**, Rev. 1, DOE, August 8, 1997.

- **Streamlined Approach For Environmental Restoration Plan For Corrective Action Unit 416, Mud Pit, Project Shoal Area**, Rev. 1, DOE, July 1997.
2.0 CLOSURE ACTIVITIES

This section of the CR details the specific activities involved in the closure of the PSA mud pit (CAS 57-09-01), the process knowledge to support closure in-place of the muckpile (CAS 57-06-01) with no further action, and the remedial activities to close the housekeeping site (CAS 57-98-01). This section also includes the rationale for any deviations from the approved SAFER Plan (DOE, 1997a) and a detailed schedule of site activities as completed.

2.1 DESCRIPTION OF CORRECTIVE ACTION ACTIVITIES

2.1.1 Mud Pit

Prior to excavating the hydrocarbon impacted materials in the mud pit, a site clearance for excavation was obtained by reviewing As-Built Engineering Drawings and contacting “Call Before You Dig.” Subsurface utilities were not identified in the area of the excavation activities.

All sample location stakes from the 1996 characterization activities were located at the site prior to excavation activities which facilitated demarcation of the excavation area in relation to the 1996 sample points. The soil was excavated to an approximate depth of 0.6 m (2.0 ft) to 0.9 m (3.0 ft) in an approximate area of 250 m² (2,700 ft²) between August 18, 1997 and August 25, 1997. A front end loader was used to excavate and stockpile the excavated material. A backhoe equipped with a bucket without excavating teeth was used to cut and scrape the bottom and edges of the excavation as a waste volume reduction activity. Confirmational sampling activities and analytical results are discussed in Section 4.0.

Two phases of excavation were required to remove the hydrocarbon impacted soils above the 100 mg/kg TPH Action Level. The first phase of excavation consisted of removing approximately 0.6 m (2.0 ft) of hydrocarbon impacted drilling mud and weathered granite followed by verification sampling and analysis. A second phase of excavation was required in the approximate northern one-third to one-half of the excavation area based upon analytical results of samples collected from the base of the excavation on August 19, 1997 (Figure 3). During the second phase of excavation, an additional approximate 0.3 m (1 ft) was removed and placed in the soil stockpile area as described previously.

All excavated soil was stockpiled approximately 30 m (100 ft) south of the mud pit (adjacent to the site access road) on two layers of 10 mil (0.01 inch [in]) plastic. At the end of each excavation day, the excavated soil was covered with 10 mil (0.01 in) plastic and weighted on the edges for stabilization and management purposes.
FIGURE 3
MUD PIT SAMPLING LOCATIONS AND EXCAVATION AREA
The excavation equipment buckets were cleaned after completion of the excavation and loading activities. Site personnel used brooms and hand sprayers containing Alconox™ and tap water to clean the equipment buckets. Approximately 7.6 liters (L) (2 gallons [gal]) of water was used to clean the equipment. The cleaning activities were conducted over the final end-dump truck loaded with the hydrocarbon impacted soil excavated from the mud pit area. The final end-dump truck contained approximately 15.3 m³ (20 yd³) of impacted soil. For the discussion regarding waste management and disposal, see Section 3.0.

On August 27, 1997, analytical results were received indicating TPH concentrations were below the 100 mg/kg Action Level at all sample locations. Upon receipt of the results, the retention dam located on the south side of the mud pit was removed and used for backfill in the mud pit area. The area was graded as proposed in the SAFER Plan (DOE, 1997a). The area immediately south of the retention dam was regraded to blend with the adjacent topography.

Water for dust suppression activities associated with the excavation and regrading activities was obtained from the City of Fallon through Stockman’s Equipment in Fallon, Nevada and the Kennecott Rawhide Mine located approximately 11.3 km (7 mi) south of the site (Figure 1). Approximately 15,140 L (4,000 gal) of water were used at the site. Dust suppression was accomplished through the use of the spray bars and hose on the water truck.

### 2.1.2 Muckpile

The PSA muckpile (CAS 57-06-01) consists of broken granite removed from the subsurface during the mining (construction) of the emplacement shaft and drifts (tunnels) in 1963. The broken granite was placed on the existing sloping topographic surface with a maximum relief from natural grade of approximately 5.5 m (18 ft) on the eastern perimeter. The muckpile tapers to meet natural grade on the western perimeter.

In 1996, approximately 2,445 m³ (3,200 yd³) of the muckpile were used to backfill the emplacement shaft. The emplacement shaft was backfilled because small collapse features were observed in the soil adjacent to the existing concrete cover which could pose a threat to the public, livestock, or wildlife at the site. Approximately 5,000 m³ (6,535 yd³) of broken granite remains at the surface in an area of approximately 930 m² (10,000 ft²). See Figure 2 for locations of the emplacement shaft and muckpile.

No remedial activities were taken at the muckpile in 1997. The following details the justification for no action:

- Process knowledge (DOE, 1997b) indicated that the muck pile was created prior to the testing of any nuclear devices at Project Shoal.
• The post-detonation investigation (drill back) operation was conducted at a distance of approximately 320 m (1,050 ft) east of the site and did not affect the broken rock material that comprises the muckpile (AEC, 1970).

• The emplacement shaft and drifts (tunnels) at Project Shoal were constructed by mining into the granitic rocks that comprise the bulk of the Sand Springs Range where the Project Shoal site is located. Based on geologic descriptions of cuttings generated during the drilling efforts near the emplacement shaft in identical rock types, it was determined that the mineral composition of these rocks did not contain metals in greater than background concentrations (DOE, 1997b).

• Samples (DP-15, DP-16, and DP-17) were collected from weathered granite equivalents of the muckpile (approximately 274 m [900 ft] northeast of the muckpile and 150 m [500 ft] north of the mud pit) during the September 1996 mud pit characterization activities (see Figure 2 for sample locations). The weathered granite samples were collected to provide analytical data regarding native background concentrations. Sample analytical results are summarized in Table 1 and are provided in Appendix A. The analytical results indicated no COC's were detected in excess of regulatory limits.

• Recontouring/regrading of the existing muckpile would be of minimal benefit as the resulting surface area would be significantly larger, and the existing native vegetation would be significantly impacted.

Considering the process knowledge presented above, DOE/NV recommends that the muckpile be closed in-place with no further action.

2.1.3 Housekeeping Site

The housekeeping site consisted of approximately 20 used, empty, rusted, steel 0.9 liter (1 quart) oil cans. The oil cans were probably generated during site activities in the 1960's based upon the construction material and style of can.

Closure activities consisted of removal and disposal of the empty oil cans and preparation of housekeeping documentation (Housekeeping Closure Verification Form in Appendix B). Copies of the photographs of the site before and after the remedial activities were completed and can be found in the Housekeeping Closure Verification Form (Appendix B). The oil cans were removed from the site on August 19, 1997. No discoloration of the soil adjacent to or below the cans was observed during removal activities. The cans were transported to the NTS for disposal on August 27, 1997. The cans were disposed of in the Area 23 Landfill located at the NTS.
### TABLE 1 - SAMPLE ANALYTICAL RESULTS, GRANITE SAMPLES NEAR MUCKPILE

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<th>Sample Location</th>
<th>Sample Number</th>
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<th>Matrix</th>
<th>Barium mg/kg</th>
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Notes:

*mg/kg = milligrams per kilogram

*pCi/g = pico Curies per gram

*ND = Not detected above laboratory/method limit
2.2 DEVIATIONS FROM SAFER PLAN AS APPROVED

No deviations from the approved SAFER Plan (DOE, 1997a) were implemented in the field for the mud pit closure activities.

A Record of Technical Change (DOE, 1997b) was submitted to the NDEP on September 3, 1997, to provide process knowledge in the CR for the closure in place of the muckpile (CAS 57-06-01) by no further action. Additionally, DOE/NV proposed in DOE, 1997c to remediate the housekeeping site (CAS 57-98-01) using the Housekeeping Site Work Plan (DOE, 1996) and provide the documentation in this CR. The Record of Technical Change (DOE, 1997b) and proposal to remediate the housekeeping site were recorded as approved on October 6, 1997 (NDEP, 1997b).

2.3 CORRECTIVE ACTION SCHEDULE AS COMPLETED

The project activities were completed as indicated in Figure 4.

The oil cans were removed from the housekeeping site on August 19, 1997. Transportation and disposal of the housekeeping site waste was completed on August 27, 1997.

The mud pit excavation and stockpiling activities were conducted from August 18, 1997 to August 25, 1997. The mud pit waste disposal activities were conducted on August 25 and 26, 1997. The verification samples were collected on August 19 and 25, 1997. Analytical results indicating the impacted materials exceeding the 100 mg/kg TPH action level were removed were received on August 27, 1997. Regrading and demobilization activities were completed on August 27, 1997.

2.4 SITE PLAN/SURVEY PLAT

A site plan reflecting the areas of closure activity addressed in this report is provided as Figure 2. As-Built surveys of the mud pit and muckpile areas were not proposed in the SAFER Plan (DOE, 1997a) or Record of Technical Change (DOE, 1997b) and were not implemented during or after field activities.
<table>
<thead>
<tr>
<th>Activity ID</th>
<th>Activity Description</th>
<th>Actual Start</th>
<th>Actual Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Mobilize to site</td>
<td>17AUG97</td>
<td>18AUG97</td>
</tr>
<tr>
<td>20</td>
<td>Excavate mud pit &amp; stockpile materials</td>
<td>18AUG97</td>
<td>18AUG97</td>
</tr>
<tr>
<td>25</td>
<td>Housekeeping site remediation</td>
<td>18AUG97</td>
<td>18AUG97</td>
</tr>
<tr>
<td>30</td>
<td>Phase 1 verification sampling</td>
<td>19AUG97</td>
<td>19AUG97</td>
</tr>
<tr>
<td>40</td>
<td>Phase 1 verification sample analysis</td>
<td>19AUG97</td>
<td>22AUG97</td>
</tr>
<tr>
<td>50</td>
<td>Analytical result receipt/data evaluation</td>
<td>22AUG97</td>
<td>22AUG97</td>
</tr>
<tr>
<td>60</td>
<td>Excavate mud pit &amp; stockpile materials</td>
<td>25AUG97</td>
<td>25AUG97</td>
</tr>
<tr>
<td>70</td>
<td>Phase 2 verification sampling</td>
<td>25AUG97</td>
<td>25AUG97</td>
</tr>
<tr>
<td>80</td>
<td>Load &amp; transport 6 loads of soil to NTS</td>
<td>25AUG97</td>
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<tr>
<td>90</td>
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<td>27AUG97</td>
</tr>
<tr>
<td>100</td>
<td>Load &amp; transport 6 loads of soil to NTS</td>
<td>26AUG97</td>
<td>26AUG97</td>
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<tr>
<td>110</td>
<td>Analytical result receipt/data evaluation</td>
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<td>27AUG97</td>
</tr>
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<td>120</td>
<td>Remove berm &amp; regrade area</td>
<td>27AUG97</td>
<td>27AUG97</td>
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<tr>
<td>125</td>
<td>Transport &amp; dispose of housekeeping waste</td>
<td>27AUG97</td>
<td>27AUG97</td>
</tr>
<tr>
<td>130</td>
<td>Demobilize from site</td>
<td>27AUG97</td>
<td>27AUG97</td>
</tr>
</tbody>
</table>
3.0 WASTE DISPOSITION

3.1 WASTE MANAGEMENT ACTIVITIES

The excavated soil from the mud pit was stockpiled on and covered with plastic approximately 30 m (100 ft) south of the mud pit and adjacent to the site access road. The soil was stockpiled on two layers of 10 mil (0.01 in) plastic, covered with 10 mil (0.01 in) plastic, and weighted on the edges for stabilization and management purposes. Excavation and stockpiling activities were conducted from August 18, 1997 to August 25, 1997.

Approximately 7.6 L (2 gal) of rinsate were generated from cleaning the excavation equipment buckets on August 26, 1997. The excavation equipment was cleaned with brooms and a light spray of Alconox™ and tap water from a hand sprayer. The cleaning activities were conducted over the final end-dump truck loaded with the last hydrocarbon impacted soil excavated from the mud pit area. The final end-dump truck contained approximately 15.3 m³ (20 yd³) of impacted soil and the plastic used to underlay and cover the excavated soil stockpile.

To eliminate the cleaning of the end-dump trucks (and the generation of additional equipment rinsate), 10 mil (0.01 in) plastic was placed in each end dump truck prior to loading with soil. The trucks were also covered with a tarpaulin to comply with U.S. Department of Transportation regulations and requirements prior to transportation of the soil from the site to the Area 6 Hydrocarbon Landfill located at the NTS.

The used oil cans from the housekeeping site were removed from the site, placed in a plastic bag, and stored in a site vehicle on August 19, 1997. The housekeeping waste was transported to the NTS on August 27, 1997.

3.2 WASTE DISPOSAL

Mud pit waste disposal activities were conducted on August 25 and 26, 1997. Twelve approximately 15.3 m³ (20 yd³) loads of hydrocarbon impacted materials (drill cuttings, soil, weathered granite, and the plastic used to underlay and cover the soil stockpile) were disposed in the Area 6 Hydrocarbon Landfill located at the NTS. The total weight of material transported from the mud pit and disposed of in the Area 6 Hydrocarbon Landfill was approximately 294,800 kilograms (649,922 pounds). Copies of the Bills of Ladings, Weight Tickets, and Material Clearances (radiological green tags) required for disposal at the Area 6 Hydrocarbon Landfill can be found in Appendix C.

The used oil cans from the housekeeping site were disposed of in the NTS Area 23 Landfill on August 27, 1997. A copy of the Housekeeping Closure Verification Form and Material Clearance (radiological green tag) can be found in Appendix B.
4.0 CLOSURE VERIFICATION RESULTS

Closure verification results are applicable for the mud pit and housekeeping site. The process knowledge (analytical results of granite samples collected near the muckpile and site geological data) for the closure of the muckpile is presented in Section 2.1.3. Two phases of excavation and verification sampling activities were required to remove the hydrocarbon impacted drilling mud and weathered granite from the mud pit area.

4.1 MUD PIT

4.1.1 First Phase Of Verification Sampling/Analysis

After removal of the hydrocarbon contaminated material from the mud pit, nine samples were collected from the bottom of the excavation area at eight sample points. Two samples were collected at the same location (Sample PSA-V04 is a field duplicate of Sample PSA-V03). The eight sample points were collected at the approximate locations of the 1996 direct-push characterization samples that exceeded the 100 mg/kg Action Level (DOE, 1997a). See Figure 3 for the locations of the 1996 characterization sample points and the verification sample points.

The verification samples were collected on August 19, 1997, from the exposed surface in the excavated area in accordance with the SAFER Plan (DOE, 1997a). Samples were collected using clean stainless-steel trowels. The samples were placed in 250 milliliter (8 ounce) glass jars, sealed, labeled, and stored in an ice-filled cooler pending delivery to the analytical laboratory. The samples were hand-carried to NEL Laboratories in Reno, Nevada, to be analyzed for TPH by method SW 846-8015 Modified. A 24-hour turn-around on the analyses was requested; however, problems with the laboratory equipment resulted in a 48-hour turn-around. The results were received and evaluated on August 22, 1997.

Analytical results are summarized in Table 2 and are provided in Appendix D. TPH concentrations for the nine verification samples ranged from below 15 mg/kg to 170 mg/kg. Five samples (PSA-V03, PSA-V04 [field duplicate of PSA-V03], PSA-V05, PSA-V06, and PSA-V09) exceeded the action level of 100 mg/kg. Results for these samples ranged from 110 mg/kg to 170 mg/kg TPH. The location of the samples exceeding the 100 mg/kg action level was confined to the approximate northern half of the excavation area (Figure 3).

4.1.2 Second Phase Of Verification Sampling/Analysis

The second phase of excavation activities was initiated in the approximate northern half of the excavation area on August 25, 1997, after receipt and evaluation of the results indicating the 100 mg/kg TPH action level was exceeded. Approximately 0.3 m (1 ft) of additional material
<table>
<thead>
<tr>
<th>SAMPLE NUMBER</th>
<th>DIRECT PUSH LOCATION</th>
<th>TPH RESULTS (mg/kg)</th>
<th>CRDL (^3) (mg/kg)</th>
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<tbody>
<tr>
<td></td>
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<td>DIESEL(^1)</td>
<td>OIL(^2)</td>
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<tr>
<td>PSA-V01</td>
<td>DP-1</td>
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<td>53</td>
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<tr>
<td>PSA-V02</td>
<td>DP-4</td>
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<td>ND</td>
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</tr>
<tr>
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<td>DP-7</td>
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<tr>
<td>PSA-V03)</td>
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<td>DP-2</td>
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</tr>
<tr>
<td>PSA-V09(^5)</td>
<td>DP-6</td>
<td>48</td>
<td>110</td>
</tr>
</tbody>
</table>

Notes:
1 Diesel and fuel oil are C\(_{10-24}\) range hydrocarbons
2 Waste and lubricating are >C\(_{24}\) range hydrocarbons
3 Contract-Required Detection Limit
4 ND= Not detected above the laboratory/method limits
5 Sample PSA-V09 collected approximately 3 meters (10 feet) southeast of DP-6
was removed from the northern portion of the excavation area encompassed by sample points PSA-V03, PSA-V04 (field duplicate of PSA-V03), PSA-V05, PSA-V06, and PSA-V09.

Following removal of the additional material, the sample locations which exceeded the 100 mg/kg TPH action level were resampled. The sample locations can be found in Figure 3. Five additional verification samples (PSA-V10, PSA-V11 [field duplicate of PSA-V10], PSA-V12, PSA-V13, and PSA-V14) were collected in the same manner as described in Section 4.1. The samples were hand-carried to NEL Laboratories in Reno, Nevada, for analysis on August 25, 1997. The analytical results were received on August 27, 1997.

The analytical results are summarized in Table 3 and are provided in Appendix B. TPH concentrations for the five samples were below 15 mg/kg.

The results of the analyses confirmed that the excavation of the additional material was successful in removing materials in the mud pit that exceeded the 100 mg/kg TPH action level, and that no further excavation was necessary.

4.2 HOUSEKEEPING SITE

Verification results of the remediation activities consisted of taking photographs of the site before and after removal of the oil cans and preparation of the Housekeeping Closure Verification Form. Copies of the photographs are provided in the Housekeeping Closure Verification Form located in Appendix B.
TABLE 3 - SAMPLE ANALYTICAL RESULTS, SECOND PHASE OF VERIFICATION SAMPLES

<table>
<thead>
<tr>
<th>SAMPLE NUMBER</th>
<th>DIRECT PUSH LOCATION</th>
<th>TPH RESULTS (mg/kg)</th>
<th>CRDL (mg/kg)</th>
</tr>
</thead>
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<tr>
<td></td>
<td></td>
<td>DIESEL&lt;sup&gt;1&lt;/sup&gt;</td>
<td>OIL&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td>PSA-V10</td>
<td>DP-2</td>
<td>ND&lt;sup&gt;4&lt;/sup&gt;</td>
<td>ND</td>
</tr>
<tr>
<td>PSA-V11</td>
<td>DP-2</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>(duplicate of PSA-V10)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PSA-V12</td>
<td>DP-5</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>PSA-V13</td>
<td>DP-7</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>PSA-V14&lt;sup&gt;5&lt;/sup&gt;</td>
<td>DP-6</td>
<td>ND</td>
<td>ND</td>
</tr>
</tbody>
</table>

Notes:
1 Diesel and fuel oil are C<sub>10-24</sub> range hydrocarbons
2 Waste and lubricating are >C<sub>24</sub> range hydrocarbons
3 Contract-Required Detection Limit
4 ND= Not Detected above the laboratory/method limits
5 Sample PSA-V14 collected approximately 3 meters (10 feet) southeast of DP-6
5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

The closure of the PSA mud pit (CAS 57-09-01) was completed in accordance with the approved Streamlined Approach For Environmental Restoration Plan For Corrective Action Unit 416, Mud Pit, Project Shoal Area (DOE, 1997a) by excavation and disposal of the hydrocarbon impacted materials exceeding the 100 mg/kg TPH action level. The mud pit excavation area was backfilled, and the area was regraded using the clean soils from the retention berm.

The process knowledge was provided to substantiate the petition for closure in-place of the PSA muckpile (CAS 57-06-01) as proposed in the Record of Technical Change No. 1 For Streamlined Approach For Environmental Restoration Plan For Corrective Action Unit 416, Mud Pit, Project Shoal Area (DOE, 1997b). The process knowledge regarding the composition of the muckpile indicates that no COC’s exceed regulatory action levels.

The housekeeping site was remediated in accordance with the approved the Houskeeping Site Work Plan (DOE, 1996) by removal and disposal of the debris and preparation of the Housekeeping Closure Verification Form.

5.2 RECOMMENDATIONS

The DOE/NV provides the following recommendations since the closure activities were completed as proposed:

- A Notice of Completion be provided by the NDEP to DOE/NV for the closure of the three CASs in CAU 416 (PSA mud pit [CAS 57-09-01], muckpile [CAS 57-06-01], and housekeeping site [CAS 57-98-01]).

- CAU 416 be moved from Appendix III to Appendix IV of the FFACO.
6.0 REFERENCES

U.S. Atomic Energy Commission, see AEC


U.S. Department of Energy, see DOE


Desert Research Institute, see DRI


Nevada Administrative Code, see NAC


Nevada Division of Environmental Protection, see NDEP


APPENDIX A

LABORATORY ANALYTICAL RESULTS
GRANITE SAMPLES NEAR MUCKPILE
CERTIFICATE OF ANALYSIS

IT Las Vegas
4330 South Valley View
Suite 114
Las Vegas, NV 89103-4047

Attention: Mr. Kurt Schmidt

IT Las Vegas Project Number: Project Shoal
Quanterra, St. Louis Project Number: 317.55
SDG Number: 12173
Date Received: September 17, 1996
Number of Samples: Twenty-six (26)
Sample type: Water and Soil

INTRODUCTION

The following samples from the Nevada Test Site were received at Quanterra, St. Louis for TCLP Volatiles, TCLP Semi-Volatiles, TCLP Metals, Total Barium, Chromium, Gamma, Rad-Screen, Tritium, Total Petroleum Hydrocarbon (Diesel and Gasoline), and Gross Alpha/Beta.

Reviewed and Approved

Allen M. Field
Quanterra Project Manager
PAGE 2 of 4
October 13, 1996

IT Las Vegas Project Number : Project Shoal
Quanterra, St. Louis Project Number : 317.55

The samples were labeled as follows:

<table>
<thead>
<tr>
<th>CLIENT ID</th>
<th>LAB ID</th>
<th>Matrix</th>
</tr>
</thead>
<tbody>
<tr>
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<td>12173-001</td>
<td>Soil</td>
</tr>
<tr>
<td>PSS00002</td>
<td>12173-002</td>
<td>Soil</td>
</tr>
<tr>
<td>PSS00008</td>
<td>12173-003</td>
<td>Soil</td>
</tr>
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</table>

**ANALYTICAL RESULTS/METHODOLOGY**

The analytical results are presented in the enclosed Certificate of Analysis and EDD Disk. This report includes information on client identification numbers, lab identification numbers, preparation date, analysis date, results, units, and results for quality control samples.

The following table is a list of the analyses requested and the methods used for the above samples:
QUALITY CONTROL

Method blanks and laboratory control samples were analyzed with the samples listed above for each parameter. Duplicates, matrix spike and matrix spike duplicate were performed as indicated above and as requested by the client.

NONCONFORMANCE

Metals

The was a nonconformance associated with SDG 12173. The digestion batch for waters of which sample PSS00030 (12173-024) was associated was digested containing 21 analytical samples, one more than the twenty sample limit. Do to a QC requirement of another sample within the batch two laboratory control samples were also analyzed, within the batch.

COMMENTS

Login 12173 was received at a temperature of 2/2/2°C.

Analytical Notes

Metals

The relative percent difference for chromium in sample PSS00022 (12173-013) was 25.1% and above the 20% limit. The associated data was flagged with an asterisk.
IT Las Vegas Project Number : Project Shoal
Quanterra, St. Louis Project Number : 317.55

**QUALIFIERS/DEFINITIONS**

<p>| * | Values outside of QC limits. |
| B | Results were between the PQL and the IDL. |
| U | Results are less than the IDL. |
| J | An estimated value. |
| ND | Parameter was analyzed for but not detected. |
| UG/L | Micrograms per Liter. |
| MG/L | Milligrams per Liter. |
| pCi/L | Picocuries per liter. |
| NA | Not applicable. |
| %REC | Percent Recovery. |
| DUP | Duplicate. |
| QCBLK | Laboratory Method Blank. |
| QCLCS | Laboratory Control Sample. |
| Qual. | Qualifier. |
| LCL | Lower Control Limits. |
| UCL | Upper Control Limits. |
| PQL | Practical Quantitation Limit. |
| MDA | Minimum Detectable Activity. |</p>
<table>
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<tr>
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<th>CAS Number</th>
<th>Blank Sample</th>
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<th>Analyses Date</th>
<th>Result Unit</th>
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<th>Detection Dilution</th>
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**Method:** EPA 6010  
**Matrix:** Soil  
**Client ID:** PSS000220UP  

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**Sample Date:** 09/16/96  
**Receipt Date:** 09/17/96  
**Report Date:** 10/19/96  
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# Lab Report

**Quanterra**  
21 October 1996

**II-Las Vegas**  
4330 S Valley View  
Suite 114  
Las Vegas, NV 89103

**Project:** 317.55  
**Category:** GAMMA SCAN  
**Method:** EPA 901.1

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ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Project Name/No.: 1990/960412/3/080210
Samples Shipment Date: 7/16/96

Sample Team Members: Kavanna Schmidt, Joe
Lab Destination: Quanterra

Profit Center No.: 36630
Lab Contact: Allen Field
Project Manager: P Gretsky
Project Contact/Phone: Schmidt/4-1743
Carrier/Waybill No.: Fed Ex 8/790568874
Required Report Date: 10/17/96

ONE CONTAINER PER LINE

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Special Instructions: Perform Full Laboratory QC on Sample P5500022

Possible Hazard Identification: Non-hazard, Flammable, Skin Irritant, Poison B, Unknown
Sample Disposal: Return to Client

Turnaround Time Required: Normal

QC Level: I

Project Specific (Specify): CLP Data Packages

Comments:
Gross A/B 6m 7110/ Ba, Cr - F2A6010 Tritium EERF01

COPY FOR LAB USE ONLY

COPY FOR LAB USE ONLY
SAMPLE COLLECTION LOG

PROJECT NAME: Shored Muroit Characterization
SAMPLE NO.: P5500022
SAMPLE LOCATION: DP-15 (BACKGROUND LOCATION)
SAMPLE TYPE: SOIL - SHALLOW
COMPOSITE: YES
COMPOSITE TYPE: SPATIAL OF DP-15
DEPTH OF SAMPLE: 0-2 ft
WEATHER: Partty Slow, Temp Cool, Breezy

CONTAINERS USED | AMOUNT COLLECTED
--- | ---
8 oz amber glass | 8 oz amber glass
16 oz amber glass | 16 oz amber glass

COMMENTS:

See FAQ dated 09/16/96 for further details.
See attached MAP for location of DP-15 soil borings.
P5500022 will be analyzed for gross 0/B/3A/GammaSpec.

At Quanterra, St Louis

Soil has collected through direct push drilling method.

After the oxies completed pushing, they removed the six-inch stainless steel sampling sleeves from the bottom of the sampling rods in the presence of the IT geologist. The ends of each sleeve were looked at to discern the soil within: the visual classification of soils from DP-15.

After the soil was described, each end was capped. They remained capped until they were composited according to ITCL SOP-0004. They were then put in sample strips and put on ice. A rad tech scanned and wiped the equipment.

Samples after they were pulled from the boring. Sufficient sample volume has been returned at Research DP-15 for Sample P5500022 and duplicate sample P5500023.

See sample collection log for P5500023. Gregg drilling pushed at 9/14/96 a total of 9 times in a 2 ft by 2 ft square to a depth of 2 ft before refusal. This location is approx. 500 ft upgradient of the small impoundment.

PREPARED BY: Antone Wohlen 09/16/96
SAMPLE COLLECTION LOG

PROJECT NAME: Shoe Muffit Characterization
SAMPLE NO.: 03500023
SAMPLE LOCATION: DP-15 (Duplicate of 03500022) (Background Location)
SAMPLE TYPE: Soil - Shallow
COMPOSITE: Yes
COMPOSITE TYPE: Spatial of DP-15
DEPTH OF SAMPLE: 0-2 FT
WEATHER: Partly sunny, temp 40°F

CONTAINERS USED

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COMMENTS:

See FOAL dated 9/16/96 for further details.
See attachment map for location of DP-15 soil borings.
P3500023 All at Analyzed at Geosol 1/1984.

At Guantana, ST. Ckx. P3500023 is a duplicate sample of P3500022. A shallow soil sample was collected at DP-15 with sufficient volume to fill 10-oz jars for P3500022 and P3500023. This soil was composited according to ITN-SQP-OILAY and put into sample jars for the previously mentioned samples. Soil was collected through direct-push boring method. After the drillers completed pushing, they removed the six-inch stainless steel sampling sleeves from the bottom of the sampling rods in the presence of the IT geologist. The ends of each sleeve were looked at to observe the soil within. See the visual classification of soils from DP-15. After the soil was disposed, each rod was capped. They remained capped until the specimens were composited according to ITN-SQP-OILAY. They were then put in sample jars. A red tool scanner and update the equipment and samples after they were pulled from the roofs.

Prepared by: Richard Miller 9/16/96
## SAMPLE COLLECTION LOG

**PROJECT NAME:** Shoal Mound Characterization  
**SAMPLE NO.:** P560026  
**SAMPLE LOCATION:** DP-16  
**SAMPLE TYPE:** Soil - shallow  
**COMPOSITE:** Yes  
**COMPOSITE TYPE:** Spatial of DP-16  
**DEPTH OF SAMPLE:** 0-3 ft  
**WEATHER:** Partly sunny, temp 90's, breezy

<table>
<thead>
<tr>
<th>CONTAINERS</th>
<th>AMOUNT COLLECTED</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-oz amber glass</td>
<td>8-oz</td>
</tr>
<tr>
<td>16-oz amber glass</td>
<td>16-oz</td>
</tr>
</tbody>
</table>

**COMMENTS:**  
See FAD dated 9/6/96 for further details.  
See attached map for location of DP-16 soil borings.  
P560026 will be analyzed for Gross H, No. Gama/Dim, Ba, Cat.  
At X:\\G:\\W:\\P:\\1996 at June 9/16/96  
Soil was collected through direct-push drilling method.  
After, the drillers completed washing, they removed the  
six-inch stainless steel sampling sleeves from the bottom of  
the sampling rods in the presence of the 1st geologist. The  
ends of each sleeve were locked at to describe the soil.  
Nothing else.  
**WEATHER:** The visual classification of soils from DP-16.  
After the soil was described, back she was capped. They  
Remained capped until they were composited according to  
ITW-SOF-0604. They were then put in sample stabilization  
Containers. A Rad. Co. Tech. scanned and wiped the  
Equipment and samples after they were pulled from the  
Boring. Nothing above background was detected.  
Geeks drilling completed 2 pushes to 4-ft only.  
Use from 0 to 3 ft for sample P560026. This  
location is approx. 500 ft upstream from the Shoal  
Improvements.

**PREPARED BY:** Andrew Velarde 9/16/96
# SAMPLE COLLECTION LOG

**PROJECT NAME:** Shoal Mudpit Characterization

**SAMPLE NO.:** P5500027

**SAMPLE LOCATION:** DP-17 (Background location)

**SAMPLE TYPE:** Soil - Shallow

**COMPOSITE:** Yes

**COMPOSITE TYPE:** Spatial of DP-17

**DEPTH OF SAMPLE:** 0-3 ft.

**WEATHER:** Party sunny, temp 70's

<table>
<thead>
<tr>
<th>CONTAINERS USED</th>
<th>AMOUNT COLLECTED</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-oz Amare glass</td>
<td>8-oz</td>
</tr>
<tr>
<td>16-oz Amare glass</td>
<td>16-oz</td>
</tr>
</tbody>
</table>

**COMMENTS:**

- Sed. FAD. dated 09/6/96 for further details.
- The attached map for location of DP-17 soil subst. #2.
- P5500027 will be analyzed for gross 0/18, Gamma spec. by C. C. at Quintana, St. Louis.
- Soil was collected through Diner-Push drilling method.
- After the Diner was recovered, they removed the 5/8-in. stainless steel sample sleeves from the bottom of the sampling tube in the presence of the 21st geocert. The ends of each sleeve were locked or to describe the soil within.
- The visual classification of soils from DP-17 #5/11/96.
- After the soil was described, each end was capped. They remained capped until they were composited according to ITIN-SEP-0004.
- They were then put in the sample jars and put on ice.
- A R&D Co. Tech. removed and shipped the equipment and samples.
- After they were placed from the Rising, nothing above background was detected.
- GEES probing completed 2 pushes to 4 ft. Only used from 0 to 3 ft for sample P5500027. This location is approx. 300 ft upstream from the Shoal improvement.

**PREPARED BY:** A. Main Hedges 9/16/96
APPENDIX B

HOUSEKEEPING SITE CLOSURE
VERIFICATION DOCUMENTATION
FFACO CORRECTIVE ACTION SITE
HOUSEKEEPING CLOSURE VERIFICATION FORM

Closure Verification Date: August 19, 1997
CAS Number: 57-98-01
CAU Number: 416
General Location: Project Shoal Area
Latitude: 39° 11' 56"
Longitude: 118° 22' 35"
Elevation: 5198 ft
Northing: 4,338,653.629 (UTM)
Easting: 546,682.546 (UTM)

Coordinate/Elevation Data Obtained from Garmin 40 Global Position System: Accuracy is within 300 ft Horizontal - Vertical Varies with Locality

Site Access Route:
From US 50 turn south on SR 839 approximately 4.9 miles to corrals (on east side of road). Continue 0.1 mile on SR 839, turn west on dirt road and proceed approximately 3.9 miles. Site is approximately 120 feet to the south of the road.

<table>
<thead>
<tr>
<th>Waste Item(s) Originally at Site</th>
<th>Apparent Waste Type*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Empty quart steel oil cans</td>
<td>Ordinary (Debris)</td>
</tr>
</tbody>
</table>

Waste Item(s) Originally at Site
Apparent Waste Type*

CAS Status Prior To Cleanup
CAS Status After Cleanup

* Ordinary, Scrap Metal, Asbestos, PCB, Salvageable, Hazardous, Radioactive, Mixed, Unknown, Other

Current Site Description/Observations:
IT Corp. field staff identified approximately six oil cans at the site on March 12, 1996, BN Environmental Remediation (ER) staff verified that the oil cans (and approx. 14 more in the same general area) were still present...
FFACO CORRECTIVE ACTION SITE
HOUSEKEEPING CLOSURE VERIFICATION FORM

Current Site Description/Observations (continued):
on August 19, 1997. ER staff retrieved the cans on August 19, 1997 (approximately 20) for
disposal at the solid waste landfill located at the Nevada Test Site.

☒ No Further Action Required at Corrective Action Site

CAS Status Prior To Cleanup

CAS Status After Cleanup

Dave Madsen
Corrective Action Coordinator/Designee

(Signature) 1/12/98

Date

Page 2 of 2

CAU 416, CAS 57-98-01
Material Clearance

DATE: 8-19-97 NO. A 5647

Reynolds Electrical & Engineering Co., Inc.
Radiological Control Department-Ramatrol

MONITOR:  McCloskey
ORGANIZATION: BN RP
SURVEY LOCATION: PROJECT SHOAL
FROM: PROJECT SHOAL - FALLON NV
TO: NTS

☑ UNRESTRICTED
☐ OFF-SITE
☐ ON-SITE
☐ SALVAGE
☐ EXCESS

THIS MATERIAL HAS BEEN SURVEYED FOR RADIOACTIVITY AND MEETS DOE STANDARDS FOR RELEASE TO PUBLIC USE

INITIAL

☐ CONTROLLED

DESCRIPTION:

BAG OF OLD RUSTY OIL CANS PICKED UP FROM PROJECT SHOAL AREA VIC FALLON NV.

CAS 4110 CAS 57-98-01

REMARKS: Exp 8-29-97
APPENDIX C

WASTE DISPOSAL DOCUMENTATION
AREA 6 HYDROCARBON LANDFILL ACCEPTANCE CHECKLIST

SOURCE OF MATERIAL

a. Generator:
   Brady # P-0087
   YES  NO
   
   c. Location:

PACKAGE WILL INCLUDE THE FOLLOWING ITEMS

a. Characterization letter
b. Analytical results
c. Process knowledge
d. Is the package complete?
 e. Basic description

SCHEDULE A DATE AND TIME FOR DISPOSAL

a. Date scheduled:
   c. End date:
   8/25/97 = 6 loads x ~48,000 lb = 288,000#
   8/26/97 = 6 loads = 326,900#

AT THE LANDFILL, THE GENERATOR MUST HAVE

a. Bill of Lading
b. Rad certification
c. Weight ticket

COMPLETE PACKAGE

a. Enter weight into database
   c. Enter into billing log
   8/29/97  

Signature/Date: Cal Stewart 8-29-97
REYNOLDS ELECTRICAL & ENGINEERING CO., INC.
RADIATION CONTROL DEPARTMENT-RAMATROL

Material Clearance

MONITOR: McCloskey
ORGANIZATION: BN RP
SURVEY LOCATION: Project Shoal
FROM: Project Shoal
TO: NTS

☐ UNRESTRICTED
☐ OFF-SITE
☐ ON-SITE
☐ SALVAGE
☐ EXCESS

THIS MATERIAL HAS BEEN SURVEYED FOR RADIOACTIVITY AND MEETS DOE STANDARDS FOR RELEASE TO PUBLIC USE

☐ CONTROLLED

DESCRIPTION: 

Hydrocarbon impacted soil from project shoal fallon nv.

CAU 416

Waste tracking # BN0087

6 loads of soil

REMARKS: Exp. 9-20-97

RE-1581 (06/93)

U.S. GPO:1994-584-657

DATE: 8/26/97 No. A 5791

REYNOLDS ELECTRICAL & ENGINEERING CO., INC.
RADIATION CONTROL DEPARTMENT-RAMATROL

Material Clearance

MONITOR: McCloskey
ORGANIZATION: BN RP
SURVEY LOCATION: Shoal Mudpit
FROM: Project Shoal Site
TO: NTS

☐ UNRESTRICTED
☐ OFF-SITE
☐ ON-SITE
☐ SALVAGE
☐ EXCESS

THIS MATERIAL HAS BEEN SURVEYED FOR RADIOACTIVITY AND MEETS DOE STANDARDS FOR RELEASE TO PUBLIC USE

☐ CONTROLLED

DESCRIPTION: 

Hydrocarbon (Petroleum) Impacted Soil
From Project Shoal Mud Pit - CAU 416

BN Tracking # BN0087

6 loads DN

Equipment to be transported location tag # A5793
on 8/29/97

REMARKS: Exp 9-20-97

RE-1581 (06/93)

U.S. GPO:1994-584-657
**STATE OF NEVADA**

PUBLIC WEIGHMASTER'S CERTIFICATE OF WEIGHT AND MEASURE

This is to certify that the following described merchandise was weighed by a Public Weighmaster as prescribed by the Public Weighmaster Law, NRS, Chapter 582.

67340 BU 81204 8-25-97

GROSS: [ ]

TARE: [ ]

NET: [ ]

CUSTOMERS NAME: R (KVCIC)

ADDRESS: ANSONED SOIL

COMMUNITY: ANSONED SOIL

COMMODITY: ANSONED SOIL

EQUIPMENT NO. [ ]

TRUCK LICENSE NO. [ ]

TRAILER LICENSE NO. [ ]

DRIVER NO. [ ]

DRIVER ON [ ]

DRIVER OFF [ ]

SMELEY'S

1715 RENO HIGHWAY PHONE 721-443-5666

FALCON, NEVADA 89468

SHIPPER: [ ]

RECEIVER: [ ]

BY [ ]

J.H. SMITTHEN - OWNER

---

**INFORM STRAIGHT BILL OF LADING**

**Original — Not Negotiable — Domestic**

**Carrier**

**Agent's No.**

**Consignment**

£8/25 1997 from [CITATION SITE] (30 MILES OF FALLON NV)

Consignment to: REITEL, NEVADA (FOR THE NV)

Destination: NEVADA TEST SITE (NTS) State of NV Zip Code 89468 County of NYE

Routing: [ ]

Collect On Delivery and remit to:

Street [ ] City [ ] State [ ]

**Description of Articles, Special Marks, and Exceptions**

<table>
<thead>
<tr>
<th>No.</th>
<th>Description of Articles, Special Marks, and Exceptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>20 yd³ load soil with petroleum hydrocarbons (does not exceed 1000 mg/L) for disposal at NTS Area C Hydrocarbon level 7% BH Trace #8110067</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Weight (Net)</th>
<th>(lbs. 1000s)</th>
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<tr>
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</table>

<table>
<thead>
<tr>
<th>Date of Shift</th>
<th>(Day, Month)</th>
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<tbody>
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<table>
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<tr>
<th>Country of Origin</th>
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<table>
<thead>
<tr>
<th>Quantity (CBM)</th>
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</table>

**Shipment Prepared by**

<table>
<thead>
<tr>
<th>Signature of Consignee</th>
</tr>
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<tbody>
<tr>
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</table>

**Shipped by**

<table>
<thead>
<tr>
<th>Signature of Carrier</th>
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<tbody>
<tr>
<td></td>
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</table>

**Received at Destination**

<table>
<thead>
<tr>
<th>Signature of Consignee</th>
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<tr>
<td></td>
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</table>

**Charges Authorized**

<table>
<thead>
<tr>
<th>Amount Chars.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

**Bill of Lading**

This Bill of Lading is to be signed by the shipper and agent of the carrier naming same.
**STATE OF NEVADA**

**PUBLIC WEIGHMASTER'S CERTIFICATE OF WEIGHT AND MEASURE**

This is to certify, that the following described merchandise was weighed by a Public Weighmaster as prescribed by the Public Weighmaster Law, NRS, Chapter 682.

**GROSS: 79980 LB 6132A 6-25-97**

**DATE: 6/25/97**

**No. 68179**

**FEE: 7.00**

---

**UNIFORM STRAIGHT BILL OF LADING**

*Original—Not Negotiable—Domestic*

**SHIPPER:**

**RECEIVER:**

**CUSTOMER'S NAME:**

**ADDRESS:**

**COMMODITY:**

**NO. OF UNITS:**

**EQUIPMENT NO.:**

**TRUCK LICENSE NO.:**

**TRAILER LICENSE NO.:**

**DRIVER ON:**

**DRIVER OFF:**

**DRIVER:**

**SMEDLEY'S PUBLIC WEIGHMASTER**

---

**UNIFORM STRAIGHT BILL OF LADING**

*Original—Not Negotiable—Domestic*

**Carrier:**

**Agent's No.:**

**Consigned to:**

**Destination:**

**Routing:**

**Collect On Delivery:**

**$**

**Region:**

**Street:**

**City:**

**State:**

---

**LOAD #2**

—2072 cu. yd. soil with petroleum hydrocarbons (does not exceed 100 mgy TPH) to disposal at the NTS Area 6, Hydrocarbon Landfill, BN: Fac. # BN0057.

**Signature:**

**Shipper, Per:**

**Per:**

---

**Bill of Lading**
# STATE OF NEVADA

## PUBLIC WEIGHMASTER’S CERTIFICATE OF WEIGHT AND MEASURE

This is to certify, That the following described merchandise was weighed by a Public Weighmaster as prescribed by the Public Weighmaster Law, NRS, Chapter 562.

**79980 LB 8132A 8-25-97**

**DATE**

8/25/97

**CUSTOMER NAME**

RJ McVairn

**COMMODITY**

Concrete

**NO. OF UNITS**: 1

**EQUIPMENT NO.**

TRUCK LICENSE NO.

**TRAILER LICENSE NO.**

**DRIVER NAME**

RJ McVairn

**SHIPPER**: Ralph Belthie

**RECEIVER**: NV Test Site

**SMEDLEY’S**

1533 Reno Highway Phone (702) 472-1503

FALLON, NEVADA 89406

**SMEDLEY’S PUBLIC WEIGHMASTER**

JH Britten - Owner

---

## UNIFORM STRAIGHT BILL OF LADING

**ORIGINAL—NOT NEGOTIABLE—DOMESTIC**

<table>
<thead>
<tr>
<th>Carrier</th>
<th>Agent's No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Shipper**

Belthie

**RECEIVER**

NV Test Site

**Consignee**

Nevada Test Site

**State**

NV

**Zip Code**

89406

**Destination**

Nevada Test Site

**Vehicle**

Carrier McVairn

**C.O.D. charge**

$ and remit to:

**Collect On Delivery**

$ and remit to:

**Street**

Description of Articles, Serial Marks, and Endorsements

1. 20 yd³ load soil with petroleum hydrocarbon (does not exceed 600 ppm)

**City**

**State**

**Agent of Carrier**

**Signature of Consignee**

**Per**

**Signature here acknowledges only the amount prepaid.**

**Agent or Carrier**

Per

**Charges Advanced**

$ and remit to:

**Shipper**

Per

**This Bill of Lading is to be signed by the shipper and agent of the carrier issuing same.**

**Bill of Lading**

Per
STATE OF NEVADA

PUBLIC WEIGHMASTER'S CERTIFICATE OF WEIGHT AND MEASURE

No. 68180

DATE: 6/25/97

SHIPLER:

T X L

RECEIVER:

W J T S L H T

COMMODITY: Cond. Soil

NO. OF UNITS:

EQUIPMENT NO.

TRUCK LICENSE NO.

TRAILER LICENSE NO.

DRIVER ON

DRIVER OFF

DRIVER

John

Smedley's

Public Weighmaster

(Handwritten text on the form includes details such as dates, amounts, and signatures, but the specific content is not legible in the image provided.)

UNIFORM STRAIGHT BILL OF LADING Original—Not Negotiable—Domestic

Carrier

Agent's No.

RECEIVED, Subject to the classifications and terms in effect on the date of the issue of the Bill of Lading,

CAU-442

at 8/25/97 from

Shore Site (300th SE of Fallon, NV)

Mail or street address of consignee—For purposes of notification only:

Consignee: Bectel Nevada (5261 Deleuze)

Destination: Nevada Test Site State of NV Zip Code 89455 County of NV

Routing: Delivering Carrier Malone Vehicle RS 06 Car Initial No. 06

Collect On Delivery $ and remit to:

Street

City

State

1. 20yd³ load of soil with petroleum

(SUBSTANTIAL AMOUNT OF CONCENTRATED OIL FILTERS, TRANSMISSION FLUID, AND OIL BASED CLEANER)

Signature of Consignee

(Signature of Consignee)

Changes: $ to be paid by

Shipper

Agent

Per

This Bill of Lading is to be issued by the shipper and agent of the carrier issuing same.

Agent, Per

Shipper, Per
**STATE OF NEVADA**

PUBLIC WEIGHMASTER'S CERTIFICATE OF WEIGHT AND MEASURE

This is to certify, that the following described merchandise was weighed by a Public Weighmaster as prescribed by the Public Weighmaster Law, NRS, Chapter 852.

<table>
<thead>
<tr>
<th>Gross</th>
<th>85760 LB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tare</td>
<td>817A</td>
</tr>
<tr>
<td>Net</td>
<td>8-25-97</td>
</tr>
</tbody>
</table>

**UNIFORM STRAIGHT BILL OF LADING Original—Not Negotiable—Domestic**

**SHIPPER:** Bechtel Nevada (52 De/un)

**RECEIVED:** at 8/25/97 from SMOKE SITE (500 SE of Fallon, NV)

**Consignee:** BECHTEL NEVADA (52 De/un)

**State:** NV

**Zip Code:** 89412

**County:** Nye

**路由:** Nevada Test Site

**Collect On Delivery:** $7,000

**COMMODITY:** Contaminated Soil

**NO OF UNITS:**

<table>
<thead>
<tr>
<th>Equipment No.</th>
<th>Truck License No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Shippment No.:**

<table>
<thead>
<tr>
<th>Driver On</th>
<th>Driver Off</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Collect On Delivery:**

$7,000 and remit to: Smedley's

**Agent:** Sandy Barnum

**J.H. SMITHE—OWNER**
<table>
<thead>
<tr>
<th>Equipment No.</th>
<th>Truck License No.</th>
<th>Trailer License No.</th>
<th>Driver On</th>
<th>Driver Off</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Smedley's
1750 Reno Highway, Reno, Nevada 89504

Shipper: Belchle

Receiver: N.M. Test Site

Sandy Brown
J.H. Smitten - Owner

UNIFORM STRAIGHT BILL OF LADING

Original - Not Negotiable - Domestic

Carrier

Agent's No.: COD

CONSIGNED TO: Belchle, Nevada (For DOE/ NV)

Destination: Nevada Test Site

Vehicle: Convoy

Route:

Collect On Delivery

Shiner's

No. | Description of Articles, Special Marks, and Exceptions |
---|------------------------------------------------------|
1  | 20yd³ load of 881 with polonium-210, 140yg/96.5gc, and selenate-210, 120yg/96.5gc, for disposal, NTS Area A. |

Bill of Lading

Agent of Carrier

Prepared by

Shipper, Per

Agent, Per

1
UNIFORM STRAIGHT BILL OF LADING Original—Not Negotiable—Domestic

**Shipper's #**

**Carrier**

**Agent's No.**

**RECEIVED, subject to the classifications and limits in effect on the date of the issue of the Bill of Lading,**

**CAV 416**

**BILL OF LADING**

**Date:** 8/26/97

**From:** SHIN SAN (30 mi. SE of Fallon, NV)

**Consignee:** BAECHTEL, Nevada (FOR DODAV)

**Destination:** Nevada Test Site, State of NV, Zip Code __________ County of __________

**Routing:** Nevada Test Site, Delivering: Melville, or Car Initial No.

**Collect On Delivery**

$ ____________ and remit to:

**C. D. B. charge to be paid by**

<table>
<thead>
<tr>
<th>Shipper</th>
<th>Consignee</th>
</tr>
</thead>
</table>

**Subject to Section 7 of conditions, if the shipper's signature is not made on this bill of lading, the consignee will not be liable to the carrier for the charges contained herein.**

**The carrier shall not deliver the goods without payment of charges and all other due charges.**

**The carrier shall not make delivery of the shipment without payment of all due and other charges.**

**Signature of Consignee:**

**Charges Advanced:**

$ ____________

**Permanent post-office address of shipper:**

**Shipper, Per:** BAECHTEL

**Agent, Per:**

**Bill of Lading**

---

LOAD #: 7

R. GRANELL

**Note:** This Bill of Lading is to be signed by the shipper and agents of the carrier issuing same.
UNIFORM STRAIGHT BILL OF LADING Original—Not Negotiable—Domestic

Shipment Date: B/26/97

CONTAINERIZED

No. of Units: 4

Net Tare: 63300#

SHIIPPER: Belfelt

RECEIVER: Nevada Test Site

DEALER: J. H. Smiten

Whites

1715 Reno Highway Phone (702) 425 5500 Fallon, Nevada 89406

GROSS: 103650 LBS 7000A 8-26-97

C. O. D. charge to be paid by: Shipper

C. O. D. charges are subject to state or local sales tax.

Collect On Delivery and remit to:

Vehicle or Car Initial No.

Collect On Delivery and remit to:

Street

City

State

1

20yd.3 load of Petroleum, hydrocarbon sludge (does not exceed 1000 lb/yr TPH)

For disposal at NTS Area G Hydrocarbon Landfill - BN Trailing & BN-0087

1

Load # B

(Signature)

Shipper, Per

Agent, Per

(These Bill of Lading is to be signed by the shipper and agent of the carrier issuing same)
**UNIFORM STRAIGHT BILL OF LADING**

*Original—Not Negotiable—Domestic*

**Shipper:** Bolchtle
**Receiver:** Nevada Test Site

---

**SMEDLEY'S**

1730 RENO HIGHWAY PHONE (771) 473-1500
FALLON, NEVADA 89406

**SHIPPER'S**

**RECEIVER'S**

**CASH**

**DATE:** 8/26/97

**CUSTOMERS NAME:** Bolchtle

**ADDRESS:** Nevada Test Site

**CARRIER**

**Agent's No.:**

**Consignee:** Nevada Test Site (Ft. Dev. NV)

**State:** NV

**Zip Code:** 89072

**County:** Nye

---

**Description of Arrows, Special Marks, and Exceptions:**

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 yd³ load of petroleum hydrocarbon soil (do not exceed 1000 lb. TPH)</td>
</tr>
</tbody>
</table>
UNIFORM STRAIGHT BILL OF LADING

Original—Not Negotiable—Domestic

Carrier

RECEIVED, subject to the classifications and tariffs in effect on the date of issue of this Bill of Lading,

Shipped at 8/6 1997 from SHOALS SITE (50 MILES SE of Fallon, NV)

Consigned to RECHTEI, NEVADA (FOR DOE/NV)

Destination NEVADA TEST SITE, State of NV, Zip Code 89414, County of NYE

Routing

Collect On Delivery

and remit to:

C. O. D. charge to be paid by Shipper or Consignee

Subject to Section 7 of conditions, if this shipment is to be delivered to the consignee without recourse on the carrier, the consignee shall sign the following statement:

The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

Signature of Consignee:

If charges are to be prearranged, write or stamp here, "TO BE PREPAID."

Received

To be applied to the prearranged charges on the property described herein.

Agent or Cashier

Charges Advanced

Shipper, Per

Agent, Per

#10

(1) Weight in pounds (2) Size in cubic feet (3) Number of Units

IN HD, RB, TRUCK, CB, BAR, or CONT. (4) Name of Consignee

A 20 yd³ load of petroleum hydrocarbon soil (does not exceed 1000 myr/lq yd)

For disposal at NV Test Area 6 Hydrocarbon Landfill—BN #0087

Load #9

[Signature]

NOTE: The size and number of units are required to state specifically where the freight or delivered value of the property.

This Bill of Lading is to be signed by the shipper and agent of the carrier issuing same.

[Signature]

(08/06/97)
STATE OF NEVADA  

PUBLICATION CERTIFICATE OF WEIGHT AND MEASURE

This is to certify, That the following described merchandise was weighed by a Public Weighmaster as prescribed by the Public Weighmaster Law, NRS Chapter 582

GROSS: 82647.02
TARE: 4961.07
NET: 77685.95

CUSTOMER NAME: R.B. Transit

EQUIPMENT NO.: 60
TRUCK LICENSE NO.: 60
TRAILER LICENSE NO.: 60
DRIVER ON / DRIVER OFF: 80

SHIPPER: R.B. Transit

RECEIVER: Nevada Test Site

by: Dana Luczak

J.M. EMYPE - OWNER

---

INFORM, STRAIGHT BILL OF LADING Original - Not Negotiable - Domestic

Shipped to: BUCHTEL NEVADA (FOR DOE/NV)

Consignment: Nevada Test Site

Routing: SMEDLEY'S OIL WELL BILL OF LADING, Original - Not Negotiable - Domestic

C. O. D. charge:  

Shipper to be paid by: 

Agent's No.

Agent's Name: 

Bill of Lading

for delivery of petroleum hydrocarbon soil (disposal point location, site 204, AT sites 397, 597, 1016, and 1307, 96 feet from property line, 23 feet from mineral rights)

Received ___ at ___ from ___. Reproduction of this receipt by any unauthorized means is strictly prohibited.

(Shipper's signature)

Agent of Carrier

Per: 

(Permit number)

(Stated in parcel, parcel description and street)

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(Stated in parcel, parcel description and street)
**Bill of Lading**

**State of Nevada**

No. 68202

PUBLIC WEIGHTMASTER'S CERTIFICATE OF WEIGHT AND MEASURE

This is to certify, that the following - described merchandise was weighed by a Public
Weightmaster as prescribed by the Public Weightmaster Law, NRS, Chapter 982

82900 LB 7-21A 8-26-97

GROSS 57800

TARE 7800

NET 49100

CUSTOMER'S NAME: R B Transit

CONTAINER:

---

TRUCK LICENSE NO: 05

TRAILER LICENSE NO: 

DRIVER ON: 28

---

SMEDLEY'S

1791 RENO HIGHWAY PHONE 252-425-1099

FALLON, NEVADA 89406

SHIPPER: R B Transit

RECEIVER: Nevada Test Site

BY: Emma Scott

---

PUBLIC WEIGHTMASTER

J. H. SMITHE - OWNER

---

UNIFORM STRAIGHT BILL OF LADING

Original—Not Negotiable—Domestic

**Carrier**

RECEIVED, subject to the conditions and terms as set forth on the face of this Bill of Lading.

at 

B876A 9-7 from SHIP SITE (30 mi SE of Fallon, NV)

Copsigned to: RECHTEL NEVADA (PO BOX NV)

Destination: NEVADA TEST SITE State of NV Zip Code 89406 County of LINNE

Routing: 

Collect On Delivery and remit to:

---

Street 

<table>
<thead>
<tr>
<th>No.</th>
<th>Description of Material, Special Mark, and Expiration (Sub 170C)</th>
<th>Weight (Sub 170C)</th>
<th>Units of Measure</th>
<th>Check/Call</th>
<th>Shipper</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4,910 lb. Load of petroleum hydrocarbons</td>
<td>1600 lbs (1000 LBS)</td>
<td>Disposal at site</td>
<td>20043</td>
<td></td>
</tr>
</tbody>
</table>

---

![Signature](Signature.png)

Bill of Lading
APPENDIX D

LABORATORY ANALYTICAL RESULTS
MUD PIT VERIFICATION SAMPLES
CLIENT: International Technology Corporation  
4330 S. Valley View #114  
Las Vegas, Nevada 89103  
ATTN: Kurt Schmidt

PROJECT NAME: Project Shoal  
PROJECT NUMBER: 771060.07.03  
PURCHASE ORDER: 081597BC  
NEL ID: R9708050-01/09

Attached are the analytical results for samples in support of the above referenced project.

Samples submitted for this project were not sampled by NEL Laboratories. Samples were received by NEL in good condition, under chain of custody on 8/19/97, and analyzed as received.

Where applicable we have included the following quality control data; a method blank, used to document contamination resulting from the analytical process, a Laboratory Control Spike (LCS), used to document laboratory performance, and Surrogates, organic compounds which are similar to the target analyte(s) in chemical composition and behavior in the analytical process, but which are not normally found in environmental samples.

Surrogate results were determined following a new calibration curve on 8/23/97. TPH results were not affected.

Should you have any questions or comments, please feel free to contact our Client Services department (702) 348-2522.

Eileen M. Ferguson  
Laboratory Manager  

[Signature]

Date 8/26/97
**NEL LABORATORIES**

CLIENT: International Technology Corporation  
PROJECT NAME: Project Shoal  
PROJECT NUMBER: 771060.07.03  

METHOD: TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS BY EPA 8015M, September 1994  
SAMPLE MATRIX: SOIL

<table>
<thead>
<tr>
<th>CLIENT ID</th>
<th>DATE SAMPLED</th>
<th>NEL ID</th>
<th>RESULTS</th>
<th>REPORTING LIMIT</th>
<th>Surrogate Recovery</th>
<th>EXTRACTED</th>
<th>ANALYZED</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSA-V01</td>
<td>8/19/97</td>
<td>R9708050-01</td>
<td>C&lt;sub&gt;10-26&lt;/sub&gt;</td>
<td>21</td>
<td>15 mg/kg</td>
<td>104%</td>
<td>8/20/97</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&gt;C&lt;sub&gt;24&lt;/sub&gt;</td>
<td>53</td>
<td>15 mg/kg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PSA-V02</td>
<td>8/19/97</td>
<td>R9708050-02</td>
<td>C&lt;sub&gt;10-26&lt;/sub&gt;</td>
<td>ND</td>
<td>15 mg/kg</td>
<td>79%</td>
<td>8/20/97</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&gt;C&lt;sub&gt;24&lt;/sub&gt;</td>
<td>ND</td>
<td>15 mg/kg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PSA-V03</td>
<td>8/19/97</td>
<td>R9708050-03</td>
<td>C&lt;sub&gt;10-26&lt;/sub&gt;</td>
<td>62</td>
<td>15 mg/kg</td>
<td>115%</td>
<td>8/20/97</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&gt;C&lt;sub&gt;24&lt;/sub&gt;</td>
<td>120</td>
<td>15 mg/kg</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Surrogate used was n-triacontane, acceptance limits 65-135%.

**QUALITY CONTROL DATA (Total for Diesel Range):**

<table>
<thead>
<tr>
<th>Sample ID</th>
<th>Result</th>
<th>Acceptable Range</th>
<th>Surrogate Recovery</th>
<th>Acceptable Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method Blank, 082097-E2-BLK</td>
<td>ND</td>
<td>&lt; 15 mg/kg</td>
<td>92%</td>
<td>65-135%</td>
</tr>
<tr>
<td>LCS, 082097-E2-LCS</td>
<td>85%</td>
<td>65-135%</td>
<td>107%</td>
<td>65-135%</td>
</tr>
<tr>
<td>MS, R9708050-06 MS</td>
<td>76%</td>
<td>65-135%</td>
<td>107%</td>
<td>65-135%</td>
</tr>
<tr>
<td>MSD, R9708050-06 MSD</td>
<td>79%</td>
<td>65-135%</td>
<td>105%</td>
<td>65-135%</td>
</tr>
</tbody>
</table>

ND - Not Detected

*This report shall not be reproduced except in full, without the written approval of the laboratory.*
**NEL LABORATORIES**

CLIENT: International Technology Corporation  
PROJECT NAME: Project Shoal  
PROJECT NUMBER: 771060.07.03  
ANALYST: RA

**METHOD:** TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS BY EPA 8015M,  
September 1994  
SAMPLE MATRIX: SOIL

<table>
<thead>
<tr>
<th>CLIENT ID</th>
<th>DATE SAMPLED</th>
<th>NEL ID</th>
<th>RESULTS mg/kg</th>
<th>REPORTING LIMIT</th>
<th>Surrogate Recovery</th>
<th>EXTRACTED</th>
<th>ANALYZED</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSA-V04</td>
<td>8/19/97</td>
<td>R9708050-04</td>
<td>38</td>
<td>15 mg/kg</td>
<td>91%</td>
<td>8/20/97</td>
<td>8/21/97</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C_{10-24}</td>
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<tr>
<td></td>
<td></td>
<td>&gt;C_{24}</td>
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<tr>
<td>PSA-V05</td>
<td>8/19/97</td>
<td>R9708050-05</td>
<td>44</td>
<td>15 mg/kg</td>
<td>119%</td>
<td>8/20/97</td>
<td>8/21/97</td>
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<tr>
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<td>C_{10-24}</td>
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<td></td>
<td></td>
<td>&gt;C_{24}</td>
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</tr>
<tr>
<td>PSA-V06</td>
<td>8/19/97</td>
<td>R9708050-06</td>
<td>51</td>
<td>15 mg/kg</td>
<td>108%</td>
<td>8/20/97</td>
<td>8/22/97</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C_{10-24}</td>
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<tr>
<td></td>
<td></td>
<td>&gt;C_{24}</td>
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<tr>
<td>PSA-V06</td>
<td>8/19/97</td>
<td>R9708050-06</td>
<td>47</td>
<td>15 mg/kg</td>
<td>97%</td>
<td>8/20/97</td>
<td>8/22/97</td>
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<td>DUP.</td>
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<tr>
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<td>C_{10-24}</td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td>&gt;C_{24}</td>
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</tr>
</tbody>
</table>

*Surrogate used was n-triacontane, acceptance limits 65-135%.

**QUALITY CONTROL DATA (Total for Diesel Range):**

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<tr>
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<th>Surrogate Recovery</th>
<th>Acceptable Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method Blank, 082097-E2-BLK</td>
<td>ND</td>
<td>&lt; 15 mg/kg</td>
<td>92%</td>
<td>65-135%</td>
</tr>
<tr>
<td>LCS, 082097-E2-LCS</td>
<td>85%</td>
<td>65-135%</td>
<td>107%</td>
<td>65-135%</td>
</tr>
<tr>
<td>MS, R9708050-06 MS</td>
<td>76%</td>
<td>65-135%</td>
<td>107%</td>
<td>65-135%</td>
</tr>
<tr>
<td>MSD, R9708050-06 MSD</td>
<td>79%</td>
<td>65-135%</td>
<td>105%</td>
<td>65-135%</td>
</tr>
</tbody>
</table>

ND - Not Detected

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NEL LABORATORIES

CLIENT: International Technology Corporation
PROJECT NAME: Project Shoal
PROJECT NUMBER: 771060.07.03

ANALYST: RA

METHOD: TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS BY EPA 8015M,
September 1994
SAMPLE MATRIX: SOIL

<table>
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<th>EXTRACTED</th>
<th>ANALYZED</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSA-V07</td>
<td>8/19/97</td>
<td>R9708050-07</td>
<td>C_{10-24}</td>
<td>33 mg/kg</td>
<td>15 mg/kg</td>
<td>115%</td>
<td>8/20/97</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&gt;C_{24}</td>
<td>92 mg/kg</td>
<td>15 mg/kg</td>
<td></td>
<td>8/22/97</td>
</tr>
<tr>
<td>PSA-V08</td>
<td>8/19/97</td>
<td>R9708050-08</td>
<td>C_{10-24}</td>
<td>ND</td>
<td>15 mg/kg</td>
<td>76%</td>
<td>8/20/97</td>
</tr>
<tr>
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<td></td>
<td></td>
<td>&gt;C_{24}</td>
<td>ND</td>
<td>15 mg/kg</td>
<td></td>
<td>8/22/97</td>
</tr>
<tr>
<td>PSA-V09</td>
<td>8/19/97</td>
<td>R9708050-09</td>
<td>C_{10-24}</td>
<td>48 mg/kg</td>
<td>15 mg/kg</td>
<td>109%</td>
<td>8/20/97</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&gt;C_{24}</td>
<td>110 mg/kg</td>
<td>15 mg/kg</td>
<td></td>
<td>8/22/97</td>
</tr>
</tbody>
</table>

*Surrogate used was n-triacontane, acceptance limits 65-135%.

QUALITY CONTROL DATA (Total for Diesel Range):

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<tr>
<td>MS, R9708050-06 MS</td>
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</tr>
<tr>
<td>MSD, R9708050-06 MSD</td>
<td>79%</td>
<td>65-135%</td>
<td>105%</td>
<td>65-135%</td>
</tr>
</tbody>
</table>

ND - Not Detected

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4 of 4
**INTERNATIONAL ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD**

**Project Name/No.:** 171/060.07.03

**Sample Team Members:** R. CHERRY

**Profit Center No.:** 96637/0

**Project Manager:** R. DECHLER

**Purchase Order No.:** 08/5978C

**Required Report Date:** 10/19/97

**Lab Destination:** Newman Edison, L.P.

**Lab Contact:** T. Ferguson

**Project Contact/Phone:** 514-267-3700

**Carrier/Waybill No.:** A04

---

### ONE CONTAINER PER LINE

<table>
<thead>
<tr>
<th>Sample</th>
<th>Description/Type</th>
<th>Date/Time Collected</th>
<th>Container Type</th>
<th>Sample Volume</th>
<th>Preservative</th>
<th>Requested Testing Program</th>
<th>Condition on Receipt</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSA-V01</td>
<td>Soil - DRY</td>
<td>8-19-97</td>
<td>SO2</td>
<td>8oz</td>
<td>ICE/COOL</td>
<td>TPH BY 8/01-00</td>
<td>9/70/0050-01</td>
</tr>
<tr>
<td>PSA-V02</td>
<td></td>
<td>8-19-97</td>
<td>CRYO</td>
<td>8oz</td>
<td></td>
<td></td>
<td>9/70/0050-00</td>
</tr>
<tr>
<td>PSA-V03</td>
<td></td>
<td>8-19-97</td>
<td>CIPriv.</td>
<td>8oz</td>
<td></td>
<td></td>
<td>9/70/0050-03</td>
</tr>
<tr>
<td>PSA-V04</td>
<td></td>
<td>8-19-97</td>
<td>CIPriv.</td>
<td>8oz</td>
<td></td>
<td></td>
<td>9/70/0050-04</td>
</tr>
<tr>
<td>PSA-V05</td>
<td></td>
<td>8-19-97</td>
<td>CIPriv.</td>
<td>8oz</td>
<td></td>
<td></td>
<td>9/70/0050-05</td>
</tr>
<tr>
<td>PSA-V06</td>
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<td>8-19-97</td>
<td>CIPriv.</td>
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<td></td>
<td></td>
<td>9/70/0050-06</td>
</tr>
<tr>
<td>PSA-V07</td>
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<td>8-19-97</td>
<td>CIPriv.</td>
<td>8oz</td>
<td></td>
<td></td>
<td>9/70/0050-07</td>
</tr>
</tbody>
</table>

**Special Instructions:** MS/MS0 FROM PSA-V06

**Possible Hazard Identification:**
- Non-hazard
- Flammable
- Skin Irritant
- Poison B
- Unknown

**Sample Disposal:**
- RCRA
- RQ

**Return to Client:**
- No

**Disposal by Lab:**
- No

**Archive:**
- No

**GC Level:**
- I

**Project Specific (specify):**
- RRA

**Analysis Request Form**

1. **Relinquished by:**
   - Signature/Affiliation
   - Date: 8/19/97
   - Time: 10:45

2. **Relinquished by:**
   - Signature/Affiliation
   - Date: 8/19/97
   - Time: 10:46

3. **Relinquished by:**
   - Signature/Affiliation
   - Date: 8/19/97
   - Time: 10:47

**Comments:**
- Fax Results to: K. Schmidt @ 702-774-1794
- Custody Seal Intact? Y N
- Condition when received: good
- Temp: 80

---

**Analysis Group:**
- 08/5978C

**Bill to:**
- IT Corporation
  - 4830 S. Valley View #114
  - Las Vegas, NV 89108

**Report to:**
- S. Schmidt
  - Fax 702-774-1794
<table>
<thead>
<tr>
<th>Sample Number</th>
<th>Description/Type</th>
<th>Date/Time Collected</th>
<th>Container Type</th>
<th>Sample Volume</th>
<th>Pre-19 servative</th>
<th>Requested Testing Program</th>
<th>Condition</th>
<th>Disposal Record No.</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSA-V08</td>
<td>Soil - Dry</td>
<td>8-9-97</td>
<td>Box 1</td>
<td>8 oz</td>
<td>THB &amp; ROOM</td>
<td>R9708050-08</td>
<td>USE ONLY</td>
<td></td>
<td>FOR LAB</td>
</tr>
<tr>
<td>PSA-V09</td>
<td>Soil - Dry</td>
<td>8-9-97</td>
<td>Box 1</td>
<td>8 oz</td>
<td>THB &amp; ROOM</td>
<td>R9708050-08</td>
<td>USE ONLY</td>
<td></td>
<td>FOR LAB</td>
</tr>
<tr>
<td>Last Line BAC</td>
<td></td>
<td>8-19-97</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>FOR LAB</td>
</tr>
</tbody>
</table>

Reference Document No. 522355
Project No. 771060 07 03 0000
Samples Shipment Date 8-19-97
CLIENT: International Technology Corporation  
4330 S. Valley View #114  
Las Vegas, Nevada 89103  
ATTN: Kurt Schmidt

PROJECT NAME: Project Seal  
PROJECT NUMBER: 771060.07.03

PURCHASE ORDER: 081597BC  
NEL ID: R9708065-01/05

Attached are the analytical results for samples in support of the above referenced project.

Samples submitted for this project were not sampled by NEL Laboratories. Samples were received by NEL in good condition, under chain of custody on 8/25/97, and analyzed as received.

Where applicable we have included the following quality control data: a method blank, used to document contamination resulting from the analytical process, a Laboratory Control Spike (LCS), used to document laboratory performance, and Surrogates, organic compounds which are similar to the target analyte(s) in chemical composition and behavior in the analytical process, but which are not normally found in environmental samples.

Should you have any questions or comments, please feel free to contact our Client Services department (702) 348-2522.

Eileen M. Ferguson  
Laboratory Manager  
8/28/97
NEL LABORATORIES

CLIENT: International Technology Corporation
PROJECT NAME: Project Shoal
PROJECT NUMBER: 771060.07.03

ANALYST: RA

METHOD: TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS BY EPA 8015M, September 1994
SAMPLE MATRIX: SOIL

<table>
<thead>
<tr>
<th>CLIENT ID</th>
<th>DATE SAMPLED</th>
<th>NEL ID</th>
<th>RESULTS</th>
<th>REPORTING LIMIT</th>
<th>Surrogate Recovery</th>
<th>EXTRACTED DATE</th>
<th>ANALYZED</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSA-V10</td>
<td>8/25/97</td>
<td>R9708065-01 C_{10-24} &gt;C_{24}</td>
<td>ND</td>
<td>15 mg/kg</td>
<td>97%</td>
<td>8/26/97</td>
<td>8/26/97</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ND</td>
<td>15 mg/kg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PSA-V11</td>
<td>8/25/97</td>
<td>R9708065-02 C_{10-24} &gt;C_{24}</td>
<td>ND</td>
<td>15 mg/kg</td>
<td>103%</td>
<td>8/26/97</td>
<td>8/26/97</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ND</td>
<td>15 mg/kg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PSA-V12</td>
<td>8/25/97</td>
<td>R9708065-03 C_{10-24} &gt;C_{24}</td>
<td>ND</td>
<td>15 mg/kg</td>
<td>96%</td>
<td>8/26/97</td>
<td>8/26/97</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ND</td>
<td>15 mg/kg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PSA-V12 Duplicate</td>
<td>8/25/97</td>
<td>R9708065-03D C_{10-24} &gt;C_{24}</td>
<td>ND</td>
<td>15 mg/kg</td>
<td>102%</td>
<td>8/26/97</td>
<td>8/26/97</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ND</td>
<td>15 mg/kg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PSA-V13</td>
<td>8/25/97</td>
<td>R9708065-04 C_{10-24} &gt;C_{24}</td>
<td>ND</td>
<td>15 mg/kg</td>
<td>98%</td>
<td>8/26/97</td>
<td>8/26/97</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ND</td>
<td>15 mg/kg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PSA-V14</td>
<td>8/25/97</td>
<td>R9708065-05 C_{10-24} &gt;C_{24}</td>
<td>ND</td>
<td>15 mg/kg</td>
<td>97%</td>
<td>8/26/97</td>
<td>8/26/97</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ND</td>
<td>15 mg/kg</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Surrogate used was n-triacontane, acceptance limits 65-135%.

QUALITY CONTROL DATA (Total for Diesel Range):

<table>
<thead>
<tr>
<th>Sample ID</th>
<th>Result</th>
<th>Acceptable Range</th>
<th>Surrogate Recovery</th>
<th>Acceptable Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method Blank, 082697-E1-BLK</td>
<td>ND</td>
<td>&lt; 15 mg/kg</td>
<td>88%</td>
<td>65-135%</td>
</tr>
<tr>
<td>LCS, 082697-E1-LCS</td>
<td>83%</td>
<td>65-135%</td>
<td>81%</td>
<td>65-135%</td>
</tr>
<tr>
<td>MS, R9708065-03 MS</td>
<td>81%</td>
<td>65-135%</td>
<td>96%</td>
<td>65-135%</td>
</tr>
<tr>
<td>MSD, R9708065-03 MSD</td>
<td>81%</td>
<td>65-135%</td>
<td>92%</td>
<td>65-135%</td>
</tr>
</tbody>
</table>

ND - Not Detected

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2 of 2
**ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD**

<table>
<thead>
<tr>
<th>Sample Number</th>
<th>Description/Type</th>
<th>Date/Time Collected</th>
<th>Container Type</th>
<th>Sample Volume</th>
<th>Pre-Serv</th>
<th>Requested Testing Program</th>
<th>Condition on Receipt</th>
<th>Disposal Record No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSA-V10</td>
<td>Soil</td>
<td>7/25/97</td>
<td>1500</td>
<td>7 oz</td>
<td>ICED/</td>
<td>TPH by 8015 M</td>
<td></td>
<td>R9708065-01</td>
</tr>
<tr>
<td>PSA-V11</td>
<td>Soil</td>
<td>7/25/97</td>
<td>1500</td>
<td>7 oz</td>
<td></td>
<td></td>
<td></td>
<td>R9708065-02</td>
</tr>
<tr>
<td>PSA-V12</td>
<td>Soil</td>
<td>7/25/97</td>
<td>1445</td>
<td>7 oz</td>
<td></td>
<td></td>
<td></td>
<td>R9708065-03</td>
</tr>
<tr>
<td>PSA-V13</td>
<td>Soil</td>
<td>7/25/97</td>
<td>1430</td>
<td>7 oz</td>
<td></td>
<td></td>
<td></td>
<td>R9708065-04</td>
</tr>
<tr>
<td>PSA-V14</td>
<td>Soil</td>
<td>7/25/97</td>
<td>1520</td>
<td>7 oz</td>
<td></td>
<td></td>
<td></td>
<td>R9708065-05</td>
</tr>
</tbody>
</table>

**Possible Hazard Identification:** 
- Non-hazard: 
- Flammable: 
- Skin Irritant: 
- Poison B: 
- Unknown: 

**Special Instructions:** MS/MS on SAMPLE PSA-V12.

**Comments:** FAX RESULTS TO K. SCHIENAT 702 794-7944
DISTRIBUTION LIST
<table>
<thead>
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<th>Distribution List</th>
<th>Controlled Copies</th>
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<tr>
<td><strong>Bureau of Federal Facilities</strong>&lt;br&gt;Division of Environmental Protection&lt;br&gt;333 W. Nye Lane, Room 13B&lt;br&gt;Carson City, NV 89706-0866</td>
<td></td>
</tr>
<tr>
<td>P. J. Liebendorfer</td>
<td>2</td>
</tr>
<tr>
<td>D. A. Garrepy</td>
<td>1</td>
</tr>
<tr>
<td><strong>U.S. Department of Energy, Nevada Operations Office</strong>&lt;br&gt;P. O. Box 98518, 505&lt;br&gt;Las Vegas, NV 89193-8518</td>
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<tr>
<td>S. D. Bonnell</td>
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<table>
<thead>
<tr>
<th><strong>Uncontrolled Copies</strong></th>
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<tbody>
<tr>
<td><strong>U.S. Department of Energy, Nevada Operations Office</strong>&lt;br&gt;P. O. Box 98518, 505&lt;br&gt;Las Vegas, NV 89193-8518</td>
</tr>
<tr>
<td>Monica A. Sanchez</td>
</tr>
<tr>
<td>Peter A. Sanders</td>
</tr>
<tr>
<td>Public Reading Room</td>
</tr>
<tr>
<td>Technical Information Resource Center</td>
</tr>
<tr>
<td><strong>U. S. Department of Energy,</strong>&lt;br&gt;<strong>Office of Scientific and Technical Information</strong>&lt;br&gt;P. O. Box 62&lt;br&gt;Oak Ridge, TN 37831</td>
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<tr>
<td><strong>Bechtel Nevada</strong>&lt;br&gt;P. O. Box 98521, M/S NLV008&lt;br&gt;Las Vegas, NV 89193-8521</td>
</tr>
<tr>
<td>Correspondence Control</td>
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<tr>
<td>D. K. Cowser</td>
</tr>
<tr>
<td>D. D. Madsen</td>
</tr>
<tr>
<td>K. A. Mobley</td>
</tr>
<tr>
<td>S. J. Nacht</td>
</tr>
</tbody>
</table>
DISTRIBUTION LIST (continued)

IT Corporation
P. O. Box 93838, M/S 439
Las Vegas, NV 89193-3838

R. Deshler
T. White