



U.S. Department of Energy
Idaho Operations Office

Remedial Action Report for Operable Units 6-05 and 10-04, Phase III

August 2007

Idaho Cleanup Project

DOE/ID-11315
Revision 0
Project No. 23368

Remedial Action Report for Operable Units 6-05 and 10-04, Phase III

August 2007

**Prepared for the
U.S. Department of Energy
DOE Idaho Operations Office**

ABSTRACT

This Phase III remedial action report addresses the remediation of lead-contaminated soils found at the Security Training Facility STF-02 Gun Range at the Idaho National Laboratory Site.

Phase I, consisting of developing and implementing institutional controls at Operable Unit 10-04 sites and developing and implementing Idaho National Laboratory Site-wide plans for both institutional controls and ecological monitoring, was addressed in a previous report. Phase II will remediate sites contaminated with trinitrotoluene and Royal Demolition Explosive. Phase IV will remediate hazards from unexploded ordnance.

EXECUTIVE SUMMARY

The remedial design/remedial action for Operable Unit 6-05 (Waste Area Group 6) and Operable Unit 10-04 (Waste Area Group 10) at the Idaho National Laboratory Site—collectively called Operable Unit 10-04—has been divided into four phases. Phase I consisted of developing and implementing institutional controls at Operable Unit 10-04 sites and developing and implementing Idaho National Laboratory Site-wide plans for both institutional controls and ecological monitoring. Phase II will remediate sites contaminated with trinitrotoluene and Royal Demolition Explosive. Phase III remediated lead contamination at a gun range, and Phase IV will remediate hazards from unexploded ordnance.

This Phase III remedial action report addresses the remediation of lead-contaminated soils found at the Security Training Facility STF-02 Gun Range. Remediation of the gun range included excavating contaminated soils; physically separating copper and lead for recycling; returning to the site separated soils below the remediation goal; stabilizing contaminated soils, as required, and disposing of the separated soils that exceeded the remediation goal; encapsulating and disposing of creosote-contaminated railroad ties that were characteristic for lead; disposing of creosote-contaminated railroad ties and power poles that were not characteristic for lead; removing and disposing of the wooden building and asphalt pads found at the gun range; sampling and analyzing soil to guide the excavation and determine when the remediation goals had been achieved; backfilling and contouring the excavated area; and reseeding the impacted areas with native species. A recycling facility willing to accept the separated copper and lead could not be located; therefore, this waste stream was shipped off-Site for stabilization and disposal.

The remediation goal of 400 mg/kg for lead was achieved for the site; therefore, no institutional controls will be required for the area and the site will require no action beyond that which has been completed.

CONTENTS

ABSTRACT	iii
EXECUTIVE SUMMARY	v
ACRONYMS	xi
1. INTRODUCTION	1
1.1 Remedial Action Report Organization	2
1.2 Background	3
1.2.1 Site Background	3
1.2.2 Regulatory Background	3
1.3 Remedial Action Objectives	6
1.4 Selected Remedy	10
2. DISCUSSION OF REMEDIATION ACTIVITIES	13
2.1 Remedial Action Working Documents	13
2.2 Site Preparation and Mobilization	13
2.2.1 Personnel Training Requirements	13
2.2.2 Field Operations and Staging of Equipment and Supplies	14
2.2.3 Regulatory Compliance	15
2.2.4 Work Control Requirements at the Idaho National Laboratory Site	15
2.3 Remedial Action	21
2.3.1 Site Preparation	21
2.3.2 Asphalt Pad Removal	22
2.3.3 Removal of Upright Railroad Ties	23
2.3.4 Removal of Electrical Utilities	23
2.3.5 Shooting House Demolition	23
2.3.6 Removal of Test Stand and Burn Barrel	23
2.3.7 Excavation of Contaminated Soil	24
2.3.8 Mechanical Separation	26
2.3.9 Loading of Contaminated Soil	27
2.3.10 Removal of Fencing	27
2.3.11 Grading and Contouring	27
2.3.12 Revegetation	28
2.3.13 Demobilization	29

2.4	Sampling and Analysis.....	29
2.4.1	Preremediation Analytical Results.....	29
2.4.2	Grain-Size Distribution.....	32
2.4.3	Analytical Results Supporting the Remediation Action.....	33
2.4.4	Statistical Considerations.....	37
2.4.5	Confirmation Analyses.....	40
2.5	Occupational Safety and Health.....	41
2.5.1	Noise Surveillance.....	41
2.5.2	Personal Protective Equipment.....	41
2.5.3	Monitoring for Lead Exposure.....	41
2.6	Decontamination.....	42
2.7	Lessons Learned and Notable Practices.....	42
2.7.1	Transport of Contaminated Soil.....	42
2.7.2	In Situ Instrumentation.....	43
3.	COSTS.....	44
4.	MODIFICATIONS TO THE REMEDIAL ACTION WORK PLAN.....	45
5.	QUANTITIES AND TYPES OF WASTE GENERATED.....	46
5.1	Waste Minimization and Segregation.....	46
5.2	Packaging and Labeling.....	46
5.3	Waste Types.....	46
6.	PREFINAL INSPECTION.....	48
7.	SUMMARY AND VERIFICATION OF WORK PERFORMED.....	49
7.1	Summary of Work Performed.....	49
7.2	Verification of Work Performed.....	49
7.3	Performance Standards and Construction Quality Control.....	49
7.4	Institutional Controls.....	50
8.	CERTIFICATION THAT THE REMEDY IS OPERATIONAL AND FUNCTIONAL.....	51
9.	CONTACT INFORMATION.....	52
10.	REFERENCES.....	54

Appendix A—STF-02 Gun Range Photographic Record of Remediation Activities.....	A-1
Appendix B—Remedial Action Analytical Summaries	B-1
Appendix C—Remedial Action Prefinal Inspection Checklist.....	C-1
Appendix D—STF-02 Gun Range Site Contour Drawings.....	D-1
Appendix E—Shipping Manifest Data	E-1
Appendix F—Subcontractor Vendor Data Submittals.....	F-1

FIGURES

1. INL Site showing the location of the INL major facilities	4
2. Location of the INL Site over the Eastern Snake River Plain Aquifer.....	5
3. Map of Waste Area Group 10 sites	7
4. STF-02 Gun Range.....	9
5. INL 100-year land-use scenario	11
6. Location of gun range berms.....	25
7. STF-02 Gun Range preremediation analytical results.....	30
8. Experimental Organic-Cooled Reactor Pond preremediation analytical results	31
9. Experimental Organic-Cooled Reactor remediation support analytical results.....	34
10. Screening plant and stockpile sampling grids	36
11. Final stockpile sampling grids.....	38
12. Remediation support analytical results summary	39

TABLES

1. Compliance with applicable or relevant and appropriate requirements	16
2. STF-02 Gun Range remediation timeline.....	22
3. Soil test data	28
4. Nutrient application rate	28

5.	Grain-size distribution	32
6.	Total and toxicity characteristic leaching procedure lead results by fraction.....	32
7.	Experimental Organic-Cooled Reactor Pond lead analytical results.....	33
8.	Contaminated berm reexcavation analytical results	35
9.	Analytical results for contaminated grids between the berms	35
10.	Screening plant and stockpile location analytical results	36
11.	Confirmation sample correlation	41
12.	Phase III remedial design/remedial action costs.....	44
13.	Operable Unit 10-04 Phase III waste summary.....	47

ACRONYMS

ARAR	applicable or relevant and appropriate requirement
BEA	Battelle Energy Alliance, LLC
BORAX	Boiling Water Reactor Experiment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFA	Central Facilities Area
CFR	<i>Code of Federal Regulations</i>
CWI	CH2M-WG Idaho, LLC
DEQ	Idaho Department of Environmental Quality
DOE	U.S. Department of Energy
DOE-ID	U.S. Department of Energy Idaho Operations Office
EBR-I	Experimental Breeder Reactor I
EOCR	Experimental Organic-Cooled Reactor
EPA	U.S. Environmental Protection Agency
FFA/CO	<i>Federal Facility Agreement and Consent Order for the Idaho National Engineering Laboratory</i>
FR	<i>Federal Register</i>
HASP	health and safety plan
HAZWOPER	hazardous waste operations and emergency response
HEPA	high-efficiency particulate air
ICP	Idaho Cleanup Project
IDAPA	Idaho Administrative Procedures Act
INEEL	Idaho National Environmental and Engineering Laboratory
INEL	Idaho National Engineering Laboratory
INL	Idaho National Laboratory
LDR	land disposal restriction
MFC	Materials and Fuels Complex

NESHAP	National Emission Standards for Hazardous Air Pollutants
NIOSH	National Institute of Occupational Safety and Health
NRTS	National Reactor Testing Station
OSHA	Occupational Safety and Health Administration
OU	operable unit
PDD	program description document
PLN	plan
PPE	personal protective equipment
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
RD/RA	remedial design/remedial action
RI/FS	remedial investigation/feasibility study
ROD	record of decision
RTC	Reactor Technology Complex
STD	standard
STF	Security Training Facility
TCLP	toxicity characteristic leaching procedure
TSDF	treatment, storage, and disposal facility
USC	<i>United States Code</i>
WAG	waste area group
XRF	x-ray fluorescence

Remedial Action Report for Operable Units 6-05 and 10-04, Phase III

1. INTRODUCTION

This draft remedial action report for the Security Training Facility (STF) -02 Gun Range was prepared in accordance with the *Federal Facility Agreement and Consent Order for the Idaho National Engineering Laboratory* (FFA/CO) (DOE-ID 1991) between the U.S. Department of Energy Idaho Operations Office (DOE-ID), the U.S. Environmental Protection Agency (EPA), and the Idaho Department of Environmental Quality (DEQ)—hereafter referred to as the Agencies.

Under the current remediation strategy outlined in the FFA/CO, the location identified for the remedial action is designated as the STF-02 Gun Range within Waste Area Group (WAG) 6, Operable Unit (OU) 6-05, Experimental Breeder Reactor I (EBR-I)/Boiling Water Reactor Experiment (BORAX), and WAG 10, OU 10-04, Miscellaneous Sites, at the Idaho National Laboratory (INL) Site. The WAG 10 comprehensive remedial investigation/feasibility study (RI/FS) was originally defined in the FFA/CO as occurring under OU 10-04 and including the Snake River Plain Aquifer. Because of the intricacies presented by the Snake River Plain Aquifer, a separate remedial investigation was determined to be required to address the aquifer and any potential new sites identified that needed to be addressed. Subsequently, OU 10-08 was added to WAG 10 to address INL-wide groundwater issues and new sites that are passed on to WAG 10 by other groups. The OU 10-08 project will prepare the OU 10-08 comprehensive RI/FS and the record of decision (ROD) to address the groundwater issues and new sites. Therefore, these tasks will not be addressed under OU 10-04.

As required by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 *United States Code* [USC] § 9601 et seq.), the OU 10-04 remedial action will proceed in accordance with the *Record of Decision Experimental Breeder Reactor-I/Boiling Water Reactor Experiment Area and Miscellaneous Sites, Operable Units 6-05 and 10-04* (DOE-ID 2002a). The OU 10-04 ROD (DOE-ID 2002a) presented the selected remedies for 50 surface sites evaluated under the *Comprehensive Remedial Investigation/Feasibility Study for Waste Area Groups 6 and 10 Operable Unit 10-04* (DOE-ID 2001).

The remedial action for OU 10-04 is divided into four phases:

- Phase I consisted of developing and implementing institutional controls at OU 10-04 sites and developing and implementing INL Site-wide plans for both institutional controls and ecological monitoring
- Phase II will remediate sites contaminated with trinitrotoluene and Royal Demolition Explosive
- Phase III, the subject of this report, remediated lead contamination at the STF-02 Gun Range
- Phase IV will remediate hazards associated with unexploded ordnance.

A separate remedial action report has or will be prepared for each of the phases with the remedial action report for the final phase, presumably Phase IV, incorporating the information presented in the reports for the previous three phases, providing for one comprehensive remedial action report for OU 10-04. The scope and schedule for implementing these remediation phases were presented in the *Operable Units 6-05 and 10-04, Experimental Breeder Reactor-I/Boiling Water Reactor Experiment Area and Miscellaneous Sites, Remedial Design/ Remedial Action Scope of Work* (DOE-ID 2003).

This Phase III remedial action report addresses the remediation of lead-contaminated soil found at the STF-02 Gun Range. The remediation was conducted in accordance with the requirements delineated in the *Remedial Design/Remedial Action Work Plan for Operable Units 6-05 and 10-04, Phase III* (DOE-ID 2006a). The gun range berms, the surrounding soil, and the adjacent Experimental Organic-Cooled Reactor (EOCR) leach pond, were excavated to remove soil having lead contamination exceeding the 400-mg/kg remediation goal. Physical separation of the lead and copper fragments (e.g., bullets and casings) from the soil was performed, as feasible, to facilitate possible recycling of the lead and copper. As discussed in Section 2.3.8, a recycler was not found to accept this particular waste stream; therefore, the lead and copper fragments were shipped with the soil that did not meet the Resource Conservation and Recovery Act (RCRA) (42 USC § 6901 et seq.) criteria for direct disposal off-Site for stabilization prior to disposal.

In addition to the soil, creosote-contaminated railroad ties and power poles at the gun range were removed and sent to an approved facility for disposal. A wooden building used as a live-fire training shooting house and asphalt pads were removed and sent for disposal. Soil that met the remediation goal for lead remained at the STF-02 site where it was used to backfill the EOCR pond and contoured to match the surrounding terrain. The area impacted by the remediation activities was subsequently revegetated.

1.1 Remedial Action Report Organization

This remedial action report describes the remediation activities associated with Phase III of the OU 10-04 remedial action. The sections and appendixes within this report are briefly described below.

- The remainder of Section 1 describes the background and history of WAG 10 and provides an overview of the selected remedy for the STF-02 Gun Range
- Section 2 summarizes the remedial action activities
- Section 3 outlines the costs incurred during the remedial action
- Section 4 describes the modifications to the Remedial Design/Remedial Action (RD/RA) Work Plan (DOE-ID 2006a)
- Section 5 describes the waste streams generated during the remedial action
- Section 6 addresses the prefinal checklist
- Section 7 includes the summary and verification of the work performed
- Section 8 provides certification that the remedial action functions as designed and meets the remedial action goals and objectives
- Section 9 lists the references cited throughout this report
- Appendix A provides a photographic record of the remediation activities
- Appendix B provides analytical data summaries for the remedial action
- Appendix C provides the prefinal inspection checklist for the remedial action
- Appendix D provides contour drawings of the site
- Appendix E provides shipping manifest data
- Appendix F provides a compilation of the vendor data submittals from the subcontractor as required by the specification.

1.2 Background

1.2.1 Site Background

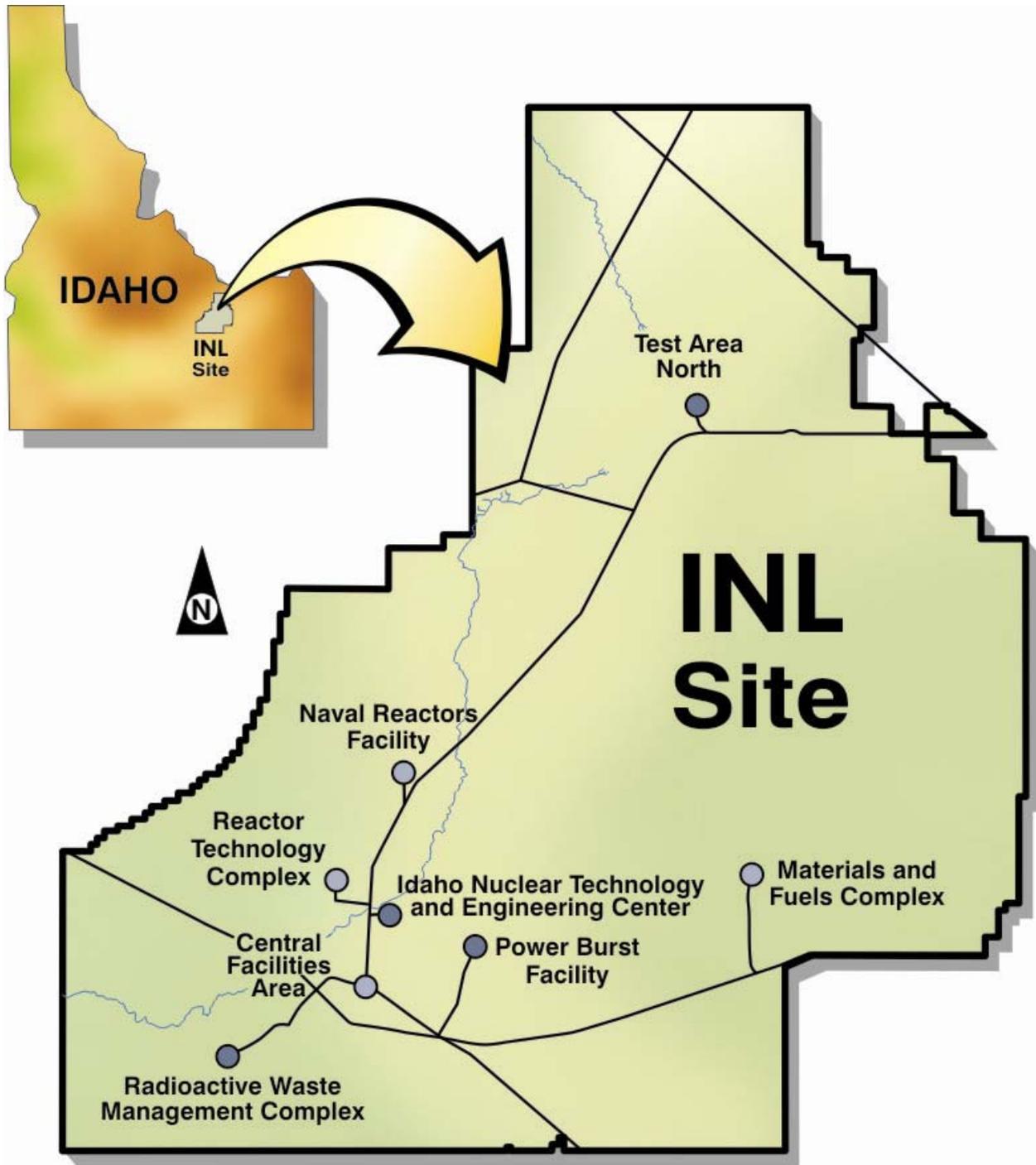
The INL Site is a government-owned, contractor-operated facility managed by DOE-ID located 51 km (32 mi) west of Idaho Falls, Idaho. The INL Site and major facilities are shown in Figure 1. The INL Site occupies 2,305 km² (890 mi²) of the northeastern portion of the Eastern Snake River Plain. As shown in Figure 2, the Snake River Plain Aquifer, which is classified as a sole source aquifer (56 *Federal Register* [FR] 50634), is located within the plain. The INL Site encompasses portions of five Idaho counties: (1) Butte, (2) Jefferson, (3) Bonneville, (4) Clark, and (5) Bingham. The STF-02 Gun Range is located in the south-central quadrant of the INL Site (see Figure 1).

The INL was originally established in 1949 as the National Reactor Testing Station (NRTS). It is managed by the Department of Energy (DOE) for the conduct of nuclear energy research and related activities. The NRTS was redesignated as the Idaho National Engineering Laboratory (INEL) in 1974 to reflect the broad scope of its engineering work being conducted. In 1997, the INEL was redesignated the Idaho National Engineering and Environmental Laboratory (INEEL) to emphasize the focus of the laboratory's mission at that time of environmental research. In 2005, a change in mission that began in 2002 culminated with the division of the INL into two distinct projects: (1) the INL for nuclear energy research to support national energy security and homeland security and (2) the Idaho Cleanup Project (ICP) to perform the large majority of the environmental cleanup at the INL Site and related work including reducing or eliminating risks to the Snake River Plain Aquifer and other resources posed by contamination and wastes left at the INL from past missions, while protecting workers, the public, the environment, national security interests, and the safety of future generations. The INL is managed by Battelle Energy Alliance, LLC (BEA) under a 10-year management and operating contract continuing through September 30, 2014, while the ICP is managed by CH2M-WG Idaho, LLC (CWI) under a 7-year cost-plus-incentives contract continuing through April 30, 2012. The goal of the ICP is to complete as much cleanup work as possible by 2012 to protect the Snake River Plain Aquifer.

The STF-02 Gun Range was used from 1983 to 1990 for security force practice maneuvers, including small arms target practice. Approximately five million rounds were fired, primarily into a main berm behind target posts toward the north end of the gun range. It was estimated that up to 61 tons of lead and 3.4 tons of copper may have been present at the site from bullets fired during target practice. The lead contamination was present as large fragments, as well as finely disseminated fragments in the soil. Based on soil analyses, lead was determined to pose an unacceptable risk to both human health and ecological receptors. To mitigate this risk, a remedial action was implemented to remove contaminated soil with lead concentrations exceeding the remedial action goal of 400 mg/kg and dispose of the removed soil at an approved treatment, storage, and disposal facility (TSDF) in accordance with all regulatory requirements. In addition, all aboveground structures and components were removed and disposed of appropriately, the remaining berms and soil were contoured to match the surrounding terrain, and the area was reseeded with native species.

1.2.2 Regulatory Background

The FFA/CO, and its associated Action Plan, is an agreement reached in 1991 between the Agencies listed in Section 1 to manage environmental cleanup in accordance with CERCLA and other federal and state requirements. Under the FFA/CO, and as shown in Figure 3, WAG 10 comprises miscellaneous surface sites and liquid disposal areas throughout the INL that are not included within other WAGs (WAGs 1 through 9). It also includes regional Snake River Plain Aquifer concerns that cannot be addressed on a WAG-specific basis.



G07-1889-02

Figure 1. INL Site showing the location of the INL major facilities.

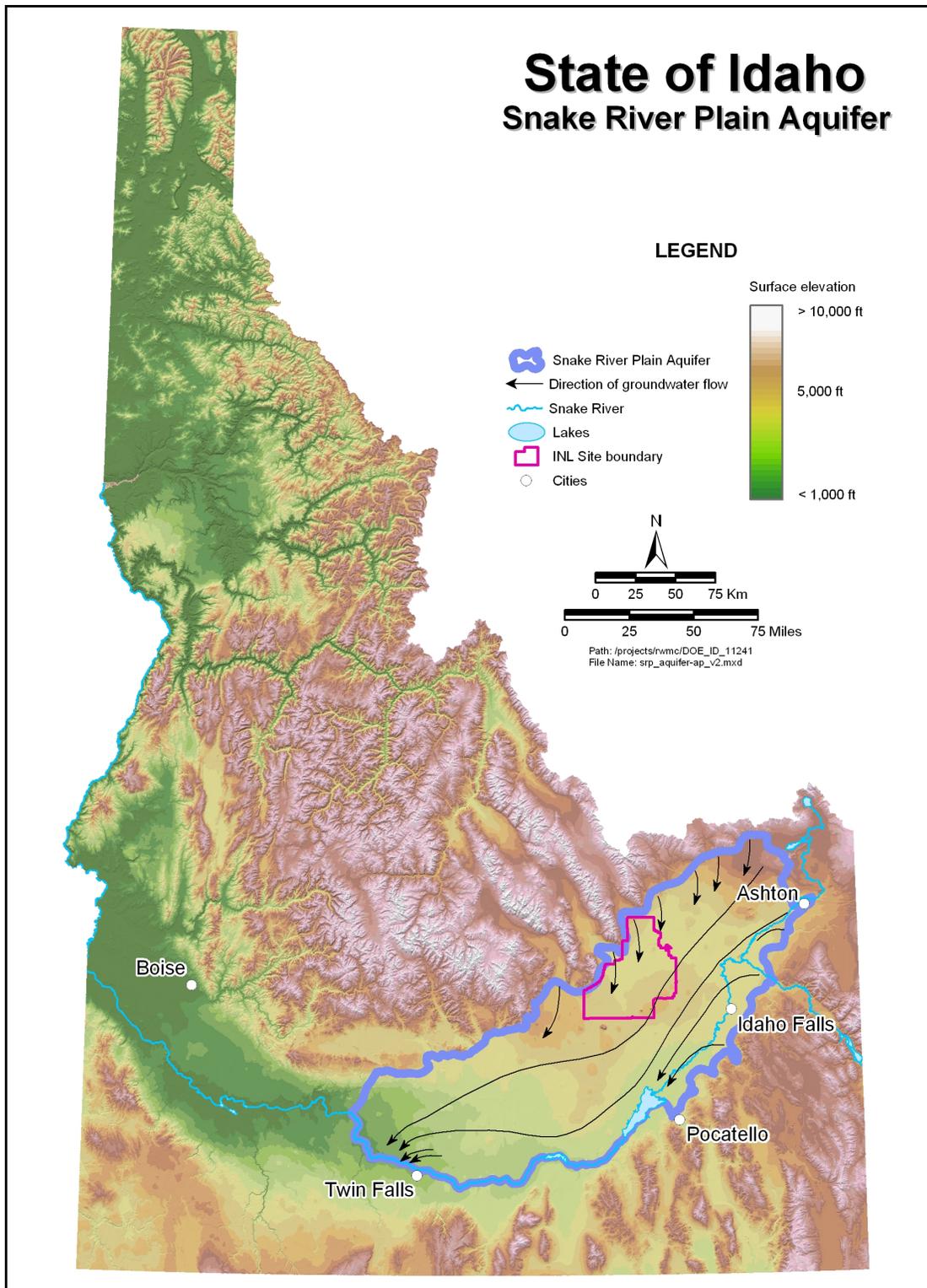


Figure 2. Location of the INL Site over the Eastern Snake River Plain Aquifer.

The STF area has been used since 1983 for security-force practice maneuvers including small arms target practice in a berm approximately 76 m (250 ft) northeast of the former STF-601 (see Figure 4). The berm was used from 1983 to 1990. It is estimated that 5 million rounds were fired into the berm including tracer rounds. None of the lead bullets that was fired into or that ricocheted away from the berm into the “kickout” areas has been picked up. Up to 61 tons of lead and 3.4 tons of copper may have been present at the STF-02 site.

During sampling conducted in support of the remedial investigation conducted at the STF-02 Gun Range, two locations within the EOCR leach pond were visually identified as having lead bullets and fragments, presumably from activities conducted at the gun range located immediately adjacent to the pond. These locations were samples and the resulting lead concentrations exceeded the 400-mg/kg remediation goal. As such, the EOCR leach pond was included with the STF-02 Gun Range for remediation of lead-contaminated soils. The pond was actually never used for its intended purpose; therefore, no other sources of contamination exist.

1.3 Remedial Action Objectives

The remedial action objectives (RAOs) for the STF-02 Gun Range were developed in accordance with 40 *Code of Federal Regulations* (CFR) 300, “National Oil and Hazardous Substances Pollution Contingency Plan,” and *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (EPA 1988) and through the consensus of DOE-ID, EPA, and DEQ participants. The RAOs are based on the results of both human health requirements and the ecological risk assessments and are specific to lead as the only contaminant of concern.

The RAOs specified for protecting human health are expressed both in terms of risk and exposure pathways because protection can be achieved by reducing contaminant levels and restricting or eliminating exposure pathways. The RAOs specified for protecting ecological receptors inhibit adverse effects from contaminated soil on resident populations of flora and fauna. The RAOs developed to protect human health and ecological receptors are as follows:

- Prevent exposure to soils contaminated with lead at concentrations greater than 400 mg/kg
- Prevent groundwater contamination
- Inhibit ecological receptor exposures to soil contaminated with lead, the contaminant of concern, primarily in concentrations in soils that result in a hazard quotient greater than or equal to 10.0.

The RAOs exclude naturally occurring elements and compounds that are not attributable to historic releases. Remediation goals were established to meet these objectives. The remediation goal for lead—to be protective of both human health and ecological receptors—is 400 mg/kg. A discussion pertaining to the applicability of the 400-mg/kg remediation goal based on the human health screening level being protective of ecological receptors is provided in Appendix K of the Comprehensive RI/FS for WAGs 6 and 10, OU 10-04 (DOE-ID 2001). The remediation goal can be satisfied by reducing the identified contaminant concentration in the soil to below 400 mg/kg. Removal of the contaminated media and metal debris from the STF-02 Gun Range will reduce further any potential groundwater risk.

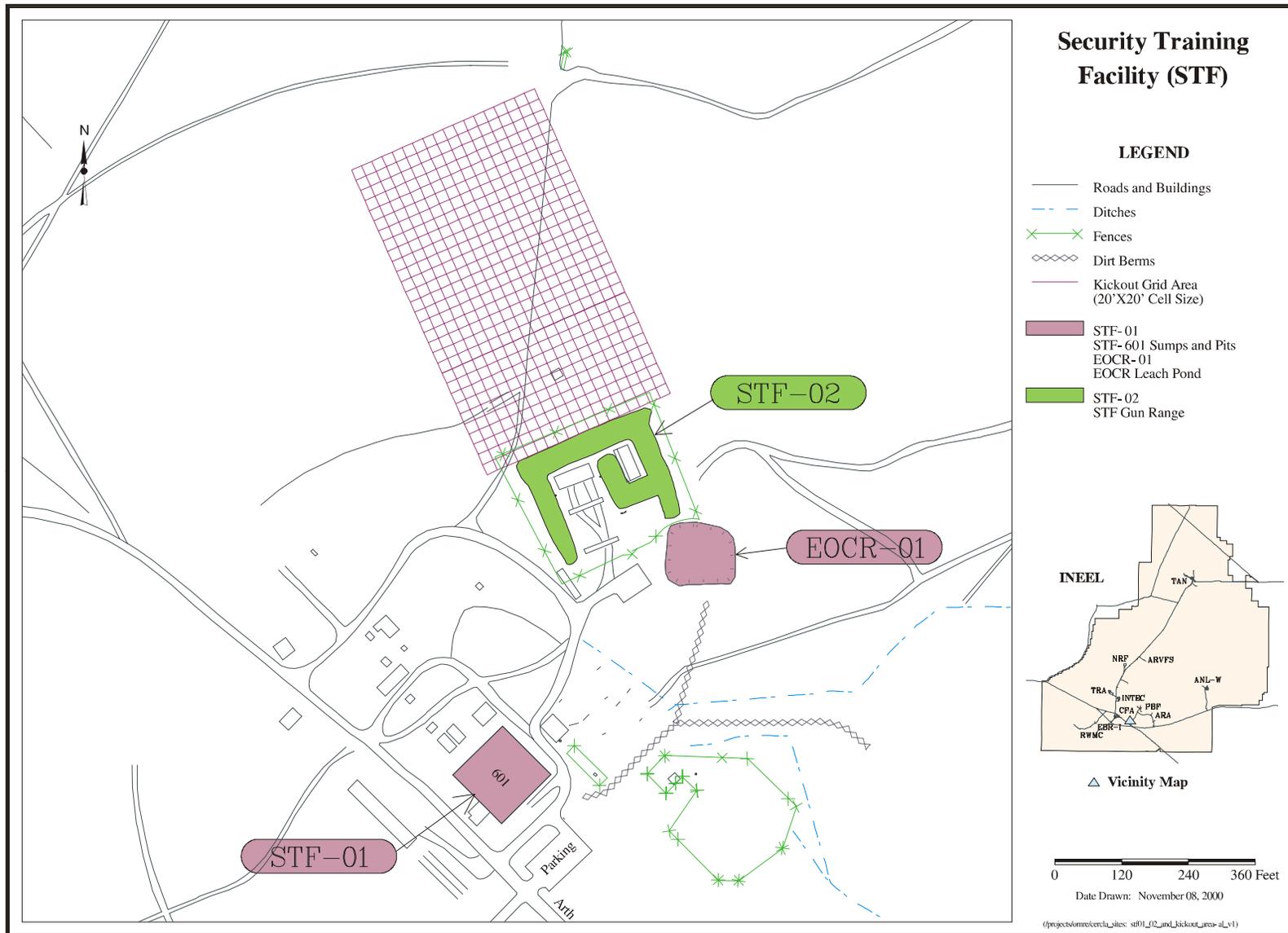


Figure 4. STF-02 Gun Range.

The *Idaho National Laboratory Comprehensive Land Use and Environmental Stewardship Report* (INL 2005) presents the INL project land use scenarios from 2005 through 2105. The INL is in the process of modernizing and optimizing its facility use to create an environment more conducive to research. The INL boundaries and the associated 890 mi² are anticipated to remain under federal government management and control at least until 2105, with portions of the INL (i.e., the Idaho Nuclear Technology and Engineering Center and the Radioactive Waste Management Complex) remaining as such in perpetuity.

Currently the entire area comprising the INL remains under administrative control with access to the INL restricted. Within this area, the current land use consists of industrial areas connected with transportation corridors, vegetated desert and rangelands, wetland and surface water drainage areas, and barren lands. Portions of the vegetated lands are used for grazing, controlled hunting, and ecological preservation. No INL land is used for agricultural or residential purposes.

It is anticipated that over the next 10 years, new on-Site development will occur, major facility decontamination and decommissioning will take place, and specific environmental remediation will be completed. The new development is expected to occur within the existing Core Infrastructure Area of the INL, with specific development taking place at the Materials and Fuels Complex (MFC), the Reactor Technology Complex (RTC), and the Science and Technology Campus. In addition, a new transportation corridor is being considered between the RTC and MFC facilities. The INL facility infrastructure will be reduced over these 10 years with the footprint reductions occurring within existing operations areas. Included in this scenario is the transformation of existing operations areas to decommissioned and institutionally controlled areas.

The 30-year land use scenario is anticipated to be consistent with the 10-year forecast. Specific changes beyond the 10-year horizon include completion of a number of critical environmental remediation efforts. New Development Areas (i.e., RTC and MFC) will continue to serve as the operational staging areas for current and new development within the Core Infrastructure Area. For the 100-year scenario, the INL land use is consistent with that of the 30-year scenario. The decommissioned and controlled areas will be the primary focus of the INL long-term stewardship functions. These activities will be coupled with Site-wide administrative controls and the operational areas of RTC and MFC. A determination concerning the proposed transportation corridor will have been made by this time. If the corridor is constructed, it will be maintained consistent with existing infrastructure. Figure 5 shows the proposed INL land use for the 100-year scenario through the year 2105.

Achieving the remedial action objectives specified for the STF-02 Gun Range enables release of the area for use in meeting the long-term objectives for the INL projected land use scenarios. Any residual contamination does not preclude the use of the STF-02 site for any of the proposed scenarios. By achieving the 400-mg/kg remediation goal for lead, the land is available for free-release under the residential use scenario.

1.4 Selected Remedy

Based on consideration of CERCLA requirements, the detailed analysis of alternatives, and public comments, the Agencies selected removal (including physical separation to segregate the metal fragments and bullets), on-site stabilization, and disposal as the remedy for the STF-02 site. Removal of the contaminated soil was to have included physical segregation of lead fragments and bullets from the soil with the segregated lead to be sent for recycling. As a secondary benefit of the physical segregation operation, copper fragments similarly would be removed from the soil and sent for recycling. Performance standards were implemented as design criteria to ensure that the selected remedy remained protective of human health and the environment.

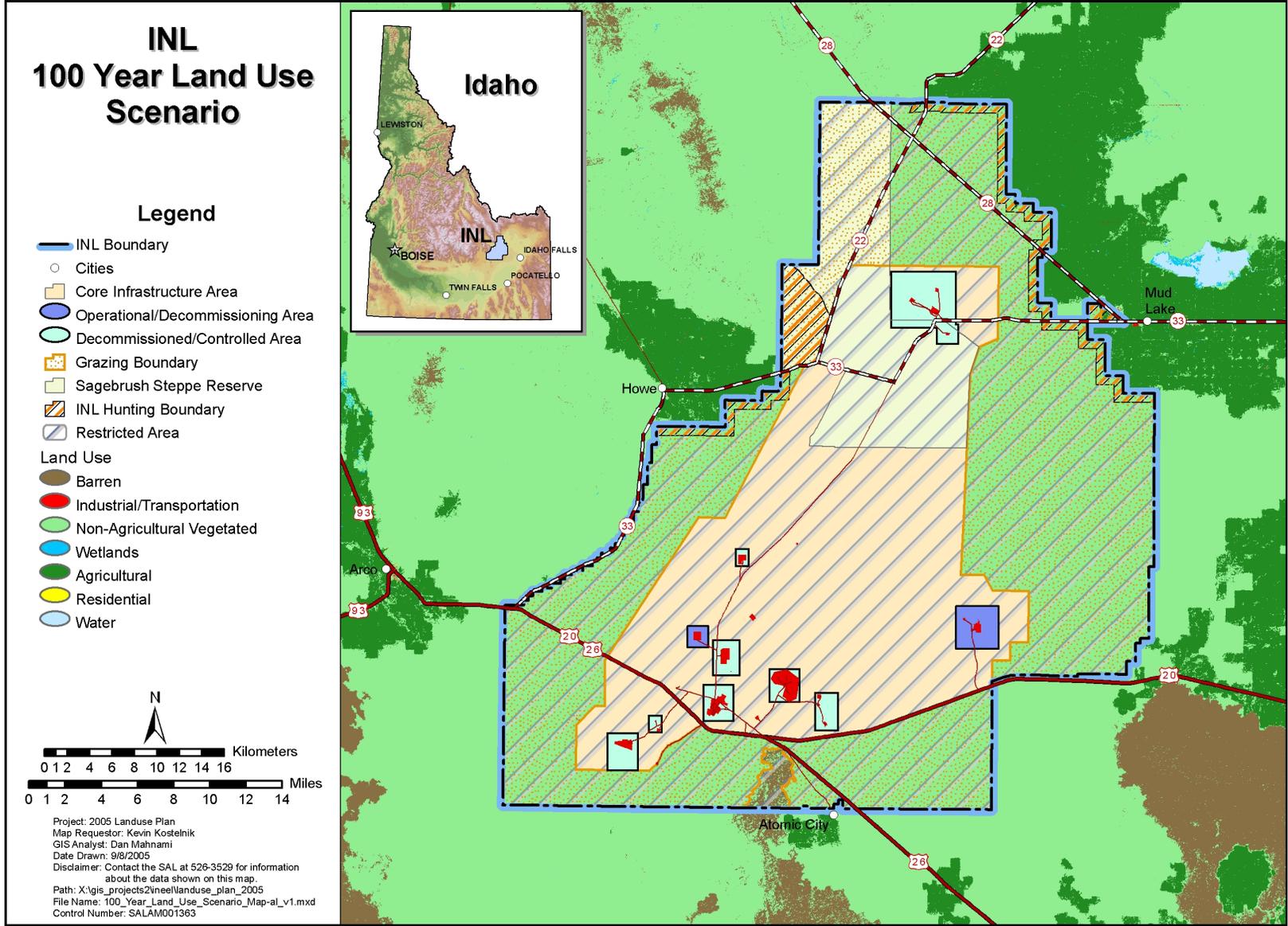


Figure 5. INL 100-year land-use scenario.

Soil exceeding the remediation goal of 400 mg/kg for lead was required to meet the “Land Disposal Restrictions” (LDR) (IDAPA 58.01.05.011) and “Alternative LDR Treatment Standards for Contaminated Soil” (40 CFR 268.49). Based on the initial analytical characterization results, soil exceeding the Phase III remediation goal was assumed to also exceed the 5.0-mg/L toxicity characteristic concentration presented in 40 CFR 261.24, thereby requiring stabilization prior to disposal at an approved facility. Soil with lead concentrations higher than 400 mg/kg was shipped to the Clean Harbors Grassy Mountain facility west of Salt Lake City for stabilization and disposal.

2. DISCUSSION OF REMEDIATION ACTIVITIES

2.1 Remedial Action Working Documents

The Phase III RD/RA Work Plan (DOE-ID 2006a) lists the design criteria for the remediation of the STF-02 Gun Range site, describes the remedial design and how it was implemented for the remedial action, and serves as the guidance document for the OU 10-04 Phase III remedial action. The following documents were included as appendixes to the Phase III RD/RA Work Plan:

- Design drawings detailing the preremediation conditions (e.g., topography and fencing at the STF-02 site) as well as the work to be performed during the remedial action
- Technical specifications providing the general terms and conditions required for completion of the remedial action
- Air emissions modeling results presenting a summary of the required air emission results to satisfy project applicable or relevant and appropriate requirements (ARARs)
- A waste management plan describing the management and disposal of waste generated during Phase III activities
- An operations and maintenance plan describing the operations and maintenance requirements including institutional controls, should the need arise, for the STF-02 Gun Range.

In addition, three separate documents were included with the Phase III RD/RA Work Plan, *Phase III*:

- The *Field Sampling Plan for the Operable Units 6-05 and 10-04 Remedial Action, Phase III* (DOE-ID 2006b) describing the sampling and analyses required during Phase III activities
- The *Quality Assurance Project Plan for Waste Area Groups 1, 2, 3, 4, 5, 6, 7, 10, and Deactivation, Decontamination, and Decommissioning* (DOE-ID 2006c) describing the necessary steps required to ensure project data quality
- Plan (PLN) -2128, “Miscellaneous Sites Cleanup Project Health and Safety Plan,” describing the possible hazards and the required steps to protect the health and safety of project workers.

2.2 Site Preparation and Mobilization

Site preparation and mobilization efforts performed prior to commencement of the remedial action are discussed in the sections below.

2.2.1 Personnel Training Requirements

Before fieldwork commenced, task-site workers were required to have the following training as specified in Section 6 of the Miscellaneous Sites Health and Safety Plan (HASP) (PLN-2128):

- Site-specific training as required by the HASP
- 40-hour hazardous waste operations and emergency response (HAZWOPER)
- Hazardous waste operations 24-hour “on-the-job” training
- 8-hour HAZWOPER site supervisor, as necessary

- Radiological Worker I or II (personnel operating the x-ray fluorescence [XRF] spectrometer)
- Hearing conservation
- Respirator qualification and fit test, as necessary
- Personal protective equipment training
- Project-specific HASP training
- Environmental Safety, Health, and Quality Assurance access training
- Hantavirus awareness training
- Heat and cold stress training
- Project-specific job safety analysis training
- Pre-job briefing and post-job review training
- Fire extinguisher training (at least one trained person on the job site)
- Medic first-aid training (at least two trained personnel on the job site)
- Basic industrial ergonomics training
- Pre-job briefings performance evaluation, as necessary
- Point-of-contact for field personnel, as necessary
- Excavation competent person (person conducting daily excavation inspections)
- Unexploded ordnance recognition training.

Specific to the remediation of lead-contaminated soils at the STF-02 Gun Range, all task-site workers were required to be qualified as trained lead workers with those having the potential to come into direct contact with soil during the remedial action being monitored for lead exposure in accordance with RCRA standards. Occasional site workers (e.g., samplers) were required to have undergone lead awareness training. Certifications of training and training updates were maintained in the training database on the INL Intranet.

2.2.2 Field Operations and Staging of Equipment and Supplies

A field office trailer was established immediately adjacent to the task site with electrical power obtained from a nearby power pole and an electrical generator maintained onsite if needed. No phone connections were available; therefore, communications contact was maintained through the use of cellular phones. Temporary restroom and wash facilities were established near the trailer for workers in accordance with the Occupational Safety and Health Administration (OSHA) standard “Hazardous Waste Operations and Emergency Response” (29 CFR 1910.120/1926.65). Flammable materials storage was provided in the office trailer with personal protective equipment (PPE) stocked for the field team members including leather gloves, safety glasses with side shields, sunscreen (as needed), hardhats, reflective vests, hearing protection for use in high noise areas, and respiratory protection.

Equipment required to perform the work was staged at the job site as required during the various stages of the remedial action. Equipment included, but was not limited to, the following:

- Appropriate signage
- Excavator

- Water truck
- Front-end loader
- Road grader
- Crawler dozer
- Backhoe
- Screening plant
- Wheel roller
- Dump trucks
- Tractor
- Tiller
- Seeder
- Chip spreader
- X-ray fluorescence spectrometer
- Sampling supplies
- Absorbent material for containers
- Roll-on/roll-off containers with haul trucks
- Intermodal (i.e., roll-on/roll-off containers with hard lids and gasket seals) containers with haul trucks.

2.2.3 Regulatory Compliance

The OU 10-04 Phase III remedial action conformed to the ARARs as outlined in Section 4.2 of the Phase II RD/RA Work Plan. Table 1 summarizes the compliance strategy for each of the ARARs.

2.2.4 Work Control Requirements at the Idaho National Laboratory Site

In compliance with CWI procedures and requirements for conducting fieldwork, the following items were required to be completed prior to commencement of the remedial action:

- Standard (STD) -101, “ICP Integrated Work Control Process,” planned work order package
- Including the project on the Central Facilities Area (CFA) plan-of-the-week schedule for information
- Project approval for work on the Miscellaneous Sites Cleanup Project plan-of-the-week
- Formal pre-job briefing for the work order package
- Subsurface investigation to identify underground electrical utilities
- Job safety analyses to identify critical procedural safety requirements including personal protective equipment and task-specific training
- Environmental checklist
- Field sampling plan

Table 1. Compliance with applicable or relevant and appropriate requirements.

Category	Citation	Compliance Strategy
<i>Chemical-Specific ARARs</i>		
Idaho Ground Water Quality Rule	“Ground Water Quality Standards” (IDAPA ^a 58.01.11.200)	<p>The Clean Water Act is not applicable to the remediation of the STF-02 site based on the following: EPA representatives met with DOE-ID staff at the INL Site on August 27, 2003, to evaluate storm water compliance and the potential to discharge storm water to waters of the United States (Ryan 2003). Based on their evaluation of the Idaho Nuclear Technology and Engineering Center, the Radioactive Waste Management Complex, and Test Area North sites, the EPA concluded that these areas do not have a reasonable potential to discharge storm water to waters of the United States. The applicability of the Clean Water Act to the INL also has been evaluated based on the recent U.S. Supreme Court decision in <i>Rapanos et Ux., et al. v. United States</i> (2006) issued June 19, 2006. Under the standard enunciated by Justices Scalia and Kennedy in this decision, the Clean Water Act has no regulatory jurisdiction over the Big Lost River and Birch Creek. This is because they lack any “significant nexus” of surface water flow connecting them to the Snake River and other traditionally defined “navigable waters of the United States.” In light of this, the Clean Water Act would no longer be among the “applicable Federal laws” that would apply to CERCLA activities at the INL Site.</p>
<i>Action-Specific ARARs</i>		
Rules for the Control of Air Pollution in Idaho	“Rules for Control of Fugitive Dust” (IDAPA 58.01.01.650) and “General Rules” (IDAPA 58.01.01.651)	<p>Dust suppression methods were used to minimize fugitive dust including use of water sprays, use of tarps, keeping vehicle speeds to a minimum, and implementing dust suppression work controls during periods of high wind.</p>
	<p>“Toxic Substances” (IDAPA 58.01.01.161) “Toxic Air Pollutants Non-Carcinogenic Increments” (IDAPA 58.01.01.585) and “Toxic Air Pollutants Carcinogenic Increments” (IDAPA 58.01.01.586)</p>	<p>Air emissions were monitored in accordance with the requirements set forth in the project HASP (PLN-2128), and dust-suppression measures were used to minimize the generation of fugitive dust.</p>

Table 1. (continued).

Category	Citation	Compliance Strategy
NESHAP	“Compliance with Rules and Regulations” (IDAPA 58.01.01.500.02)	Portable equipment used for soil excavation and screening complied with the appropriate INL Site plans and procedures and were used in accordance with the project HASP.
	“Standards for Process Sources” (40 CFR 63.543[a])	Air emissions were monitored in accordance with the requirements set forth in the project HASP, and dust-suppression measures were used to minimize the generation of fugitive dust. The calculated air emissions will be included in the INL Site annual NESHAP report, which determines the effective dose equivalent from INL Site activities to members of the public.
RCRA—Standards Applicable to Generators of Hazardous Waste	“Identification and Listing of Hazardous Waste” (IDAPA 58.01.05.005) and “Requirements for Recyclable Materials” (40 CFR 261.6[a][b])	No materials were recycled.
	“Standards Applicable to Generators of Hazardous Waste” (IDAPA 58.01.05.006) and “Hazardous Waste Determination” (40 CFR 262.11)	<p>Hazardous waste determinations were developed based on an evaluation of sampling data and process knowledge to determine disposition of the waste. Waste types included the following:</p> <ul style="list-style-type: none"> • Industrial • Hazardous contaminated debris • Lead-contaminated soils • Lead-contaminated light poles and railroad ties • Lead recycle (not used) • Unexpended ammunition.

Table 1. (continued).

Category	Citation	Compliance Strategy
RCRA—Standards Applicable to Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Units	“Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities” (IDAPA 58.01.05.008) and “Purpose, Scope, and Applicability” (40 CFR 264.1[j][1-13])	Analysis of waste was performed in accordance with RCRA requirements. The INL Site controls precluded unauthorized access to the waste. The Site was routinely inspected during management self-assessments. Training was conducted in accordance with the project HASP (PLN-2128).
	“Standards for Owners and Operators of Hazardous Waste, Treatment, Storage, and Disposal Facilities” (IDAPA 58.01.05.008) and “Disposal or Decontamination of Equipment, Structures, and Soils” (40 CFR 264.114)	Equipment decontamination was conducted in accordance with the project HASP, waste management procedures outlined in the RD/RA Work Plan (Appendix B), and PDD-1029, “Pollution Prevention Program.”
	“Standards for Owners and Operators of Hazardous Waste, Treatment, Storage, and Disposal Facilities” (IDAPA 58.01.05.008) and (40 CFR 264.171-177)	Hazardous waste generated was stored in compatible containers and the integrity of the storage containers was maintained. Waste Disposal Services conducted weekly inspections. No free liquids were generated during the remedial action requiring secondary containment. The container storage area was graded to provide runoff away from the containers.
	“Standards for Owners and Operators of Hazardous Waste, Treatment, Storage, and Disposal Facilities” (IDAPA 58.01.05.008) and “Staging Piles” (40 CFR 264.554)	Staging piles were established within the area of contamination. Measures taken to preclude the spread of contamination included the use of tarps placed over the waste piles and two dust-suppression techniques: water spray during soil excavation and loading activities. The areas surrounding the staging piles were graded to provide runoff away from the piles. The staging piles have been removed prior to the winter months. The soil underlying the staging piles has been sampled demonstrating that no contamination exceeding the remediation goals for lead remains. No staging piles originating from the STF-02 remediation project remain on-Site.

Table 1. (continued).

Category	Citation	Compliance Strategy
Resource Conservation and Recovery Act—Land Disposal Restrictions	<p>“Definitions for Purposes of Sections 790 through 799” (IDAPA 58.01.01.11) and “Applicability of Treatment Standards” (40 CFR 268.40[a][b][e])</p> <p>“Land Disposal Restrictions” (IDAPA 58.01.05.011) and “Treatment Standards for Hazardous Debris” (40 CFR 268.45[a-d])</p> <p>“Land Disposal Restrictions” (IDAPA 58.01.05.011) and “Universal Treatment Standards” (40 CFR 268.48[a])</p> <p>“Land Disposal Restrictions” (IDAPA 58.01.05.011) and “Alternative LDR Treatment Standards for Contaminated Soil” (40 CFR 268.49)</p>	<p>All soil exceeding the remediation goal of 400 mg/kg for lead was assumed in this report to exceed the 5.0-mg/L toxicity characteristic concentration, thereby requiring stabilization prior to disposal at an approved facility.</p> <p>All soil exceeding the remediation goal of 400 mg/kg for lead was assumed in this report to exceed the 5.0-mg/L toxicity characteristic concentration, thereby requiring stabilization prior to disposal at an approved facility.</p>
Clean Water Act of 1977 (33 USC § 1251 et seq.)	<p>“Storm Water Discharges (Applicable to State NPDES Programs, see § 123.25) (40 CFR 122.26)</p>	<p>The STF-02 Gun Range was located outside the area of the designated INL Site storm water corridor. Storm water discharges and sediment from remedial activities at STF-02 did not have the potential to impact the Big Lost River or its tributaries. As such, a storm water pollution prevention plan was not required.</p>
<i>Location-Specific ARARs</i>		
National Historic Preservation Act	<p>“Historic Properties Owned or Controlled by Federal Agencies” (17 USC § 470h-2)</p> <p>“Identification of Historic Properties” (36 CFR 800.4)</p> <p>“Assessment of Adverse Effects” (36 CFR 800.5)</p>	<p>Cultural and archaeological resources surveys were performed prior to the remedial action. The surveys showed that no cultural or archaeological resources were within 100 m of the facility. No cultural or archaeological resources were encountered during the remedial action.</p>

Table 1. (continued).

Category	Citation	Compliance Strategy
Native American Graves Protection and Repatriation Act	“Ownership” (25 § USC 3002 et seq.) and “Custody” (43 CFR 10.6) “Repatriation” (25 § USC 3005 et seq.) and “Repatriation” (43 CFR 10.10)	Cultural and archaeological resources surveys were performed prior to the remedial action. The surveys showed that no cultural or archaeological resources were within 100 m of the facility. No cultural or archaeological resources were encountered during the remedial action.

Acronyms

ARAR = applicable or relevant and appropriate requirement

CFR = *Code of Federal Regulations*

EPA = Environmental Protection Agency

HASp = health and safety plan

IDAPA = Idaho Administrative Procedures Act

INL = Idaho National Laboratory

LDR = land disposal restriction

NESHAP = National Emission Standards for Hazardous Air Pollutants

OU = operable unit

PDD = program description document

RD/RA = remedial design/remedial action

STF = Security Training Facility

USC = *United States Code*

- Hazard assessment determination
- Health and safety plan
- Spill prevention and control measures
- Cultural resources survey.

Prior to commencement of work, general activities required each day included plan-of-the-day meetings to review the day's work activities, daily equipment inspections, and calibration of instrumentation as required. In addition, as part of the closeout of the work package, a formal post-job review was conducted.

2.3 Remedial Action

Appendix A provides a photographic record of the remedial activities conducted at the STF-02 Gun Range. The remedial action commenced on October 12, 2006, with the mobilization of equipment and was completed on November 29, 2006, when revegetation was completed and equipment was demobilized from the site. Table 2 summarizes the progression of the work activities. The Phase III remedial action consisted of the following activities:

- Site preparation including establishing work areas and mobilizing equipment
- Removal of asphalt pads at the STF-02 Gun Range
- Removal of upright railroad ties used to hold targets
- Removal of electrical power poles and electrical equipment
- Demolition of the STF-02 Shooting House
- Removal of a test stand and burn barrel located in the EOOR pond
- Excavation of contaminated soil at the EOOR pond and gun range
- Mechanical separation of lead contaminated soil
- Loading of contaminated soil for off-Site shipment for stabilization and disposal
- Removal of fencing
- Grading and contouring of the site
- Revegetation
- Demobilization.

2.3.1 Site Preparation

Site preparation commenced with clearing and grubbing by ICP personnel of the area immediately surrounding the STF-02 Gun Range, as well as the area between the range berms. Upon mobilization to the STF-02 site, a support zone was established including an office trailer, restroom facilities, "lay-down" areas for temporary storage of equipment and waste, vehicle parking area, and an electrical generator if needed. Electrical power was available from an adjacent power pole with the generator never being required. As work in the area progressed, the haul road leading from the personal vehicle parking area into the task site was filled with soil obtained from one of the uncontaminated berms and graded to enable haul trucks ready access to the loading area.

Table 2. STF-02 Gun Range remediation timeline.

Activity	Start Date	Completion Date
Complete Record of Decision	—	November 5, 2002
Establish Scope of Work	—	February 1, 2003
Complete Remedial Design/Remedial Action Report		
Revision 0	—	September 14, 2005
Revision 1	—	September 19, 2006
Complete Explanation of Significant Differences	—	March 24, 2006
Mobilize	October 12, 2006	October 12, 2006
Remove electrical utilities	October 12, 2006	October 12, 2006
Excavate clean berms to pond	October 16, 2006	October 24, 2006
Remove and dispose of asphalt	October 17, 2006	October 17, 2006
Excavate pond hot spots	October 19, 2006	October 19, 2006
Demolish STF-02 Shooting House	October 19, 2006	October 23, 2006
Excavate and screen contaminated soil	October 24, 2006	October 30, 2006
Remove clean berm material and contour area	November 1, 2006	November 29, 2006
Ship contaminated soil off-Site for treatment and disposal	November 2, 2006	November 29, 2006
Excavate hot spots	November 10, 2006	November 29, 2006
Reseed and fertilize	November 27, 2006	November 29, 2006
Demobilize	November 29, 2006	November 29, 2006
Complete Prefinal Inspection	January 10, 2007	January 10, 2007
Complete Confirmation Sampling	January 25, 2007	January 25, 2007
Complete Draft Remedial Action Report	March 22, 2007	March 22, 2007
Complete Draft Final Remedial Action Report	May 2007	May 2007

The fenced area surrounding the gun range was enlarged to allow equipment to move freely in and around the berms. For the EOGR pond, the fence was removed from the west side of the berm to allow access to the pond from the gun range with the fence on the south side of the pond moved farther south to allow equipment access within the defined work zone. The exclusion zone was established within the work zone surrounding those berm soils and soil within the EOGR pond previously determined to exceed the lead remediation goal of 400 mg/kg. The exclusion zone was modified as appropriate during the various remediation stages to preclude entry by unauthorized personnel into areas of potential lead contamination. Signs were emplaced delineating the construction and exclusion zones with appropriate entry and exit points established.

2.3.2 Asphalt Pad Removal

Prior to removal of the pads, the area was visually examined for the presence of spent and unspent ammunition, which was collected and placed in a container for disposal. The three asphalt pads within the gun range plus an asphalt parking pad located immediately to the south of the gun range were removed using conventional earth-moving equipment. The asphalt was loaded into an end dump truck using a front-end loader and transported to the CFA landfill for disposal.

2.3.3 Removal of Upright Railroad Ties

Based on sampling conducted during the RI/FS for WAGs 6 and 10, OU 10-04, upright railroad ties used to hold practice targets at the gun range were determined to be characteristic for lead. As such, the railroad ties had to be shipped off-Site to an approved TSDF for encapsulation and disposal. The railroad ties were removed using conventional heavy equipment. The ties were temporarily stockpiled on a tarp and kept covered to await loading for transport to the TSDF. The railroad ties were loaded into two roll-on/roll-off containers provided by the TSDF and transported to the facility.

2.3.4 Removal of Electrical Utilities

Based on results of the subsurface investigation, none of the electrical lines within the gun range was determined to be active. The bang board and power poles were removed using conventional heavy equipment. Electrical lines were cut a minimum of 1 ft below the surface and abandoned in place. Waste materials were loaded and transported to the CFA landfill for disposal.

2.3.5 Shooting House Demolition

The STF-02 Shooting House was demolished using an excavator to remove the wood siding, roof, and railroad ties that formed the foundation and were used in the interior walls of the structure to stop bullets. The siding consisted of plywood with roofing materials including fiberglass panels and plywood. The plywood along with the joists and wall studs was sent to the CFA landfill where it could be chipped into wood mulch. Many of the railroad ties used in the foundation were decaying and were removed using a front-end loader, segregated from soil, and loaded for transport along with the fiberglass panels for disposal at the CFA landfill. The railroad ties used in the interior walls of the structure were visually examined for evidence of bullet penetrations. Those identified as having bullets were segregated with the upright railroad ties that had been used to hold targets and held for shipment off-Site to an approved TSDF for encapsulation and disposal. Those railroad ties with no evidence of bullets were sent to the CFA landfill for disposal. The sand that had filled the void between the plywood and the railroad ties in the interior walls was allowed to fall to the dirt floor of the shooting house where it was collected, along with a 3-in. cut of the soil underlying the shooting house, and added to the contaminated soil in the main berm for inclusion with the soils that would undergo physical separation through the screening plant.

2.3.6 Removal of Test Stand and Burn Barrel

The test stand and burn barrel located in the EOCR leach pond was identified in July 2000 as new site MISC-33 under OU 10-08. The barrel and test stand consisted of a drum inside a stainless steel cylinder and an apparatus constructed of metal and stainless steel. The annulus between the drum and the stainless steel cylinder contained soil. The actual drum contained ashes, thermocouples, graduated cylinders, beakers, stainless steel blocks, pipettes, crucibles, and other items generated during a series of experiments conducted in the test drum. As a result of the new site identification and subsequent *Track 1 Decision Documentation Package – Site 003 (MISC-33) Operable Unit 10-08, Experimental Test Drum in EOCR-01 Leach Pond* (DOE-ID 2002b), a Track 2 investigation was performed to assess the potential contaminants of concern at the STF-02 site (DOE-ID 2005a).

As discussed in the *Track 2 Summary Report for Operable Unit 10-08 Sites MISC-033, CFA-10A, TRA-60, and TRA-63* (DOE-ID 2005a), sampling of the soil was performed to determine whether the drum contents, soil within the annulus, and soils surrounding the drum and stainless steel cylinder contained lead and nitroaromatics at concentrations that precluded its disposal as industrial (nonhazardous) waste. All contaminants were below the detection limits for the analytical methods employed with the exception of lead from the ash sample collected within the annulus, which had a

maximum concentration of 32.2 mg/kg. Based on the recommendation provided in the Track 2 Summary Report (DOE-ID 2005a), the test stand and burn barrel were determined to be disposable as industrial waste. Subsequently, the test stand and burn barrel were removed from the pond and shipped to the CFA landfill for disposal.

2.3.7 Excavation of Contaminated Soil

Prior to excavation of contaminated soils, the entire gun range was walked down and visually examined for small arms ammunition. This activity was performed at the request of the off-Site TSDf to mitigate the chance that unspent ammunition may be incorporated into soil destined for treatment. Spent cartridges and unspent ammunition were collected by hand to be sent for disposal. In addition, soil undergoing physical separation by screening was visually examined during the process with any unspent ammunition removed.

The primary source of contaminated soil at the STF-02 Gun Range was found in the Berm B with minor quantities also located in Berm C and the area between the berms. Figure 6 shows the location of each of the berms (A through E) at the gun range. Although preremediation sampling did not identify any areas of contamination within the EOcr pond exceeding the remediation goal of 400 mg/kg for lead, two spots were visually identified as having spent shotgun shells as well as other small arms ammunition. These two spots were initially isolated during the beginning stages of remediation and removed as activities progressed with additional samples collected to confirm that the lead concentrations were below the remediation goal.

Berms A, D, E, and much of C were identified during the preremediation sampling effort as having lead concentrations below the remediation goal of 400 mg/kg. Therefore, soil from Berms A, D, and E, as well as the portion of Berm C that was below the remediation goal, was used to backfill the EOcr pond. The soil in the berms was too compact for a front-end loader to directly load the soil from the berm and transport it to the pond. Therefore, an excavator was used to cut into the berms, placing the soil in a temporary staging pile immediately adjacent to the berm. The front-end loader was then able to load and move the soil from this temporary staging pile to the pond where it was emplaced in 8-in. lifts. After each 8-in. lift, a roller compacted the fill using three to four passes after which the next lift was emplaced in the pond.

The contaminated soil from Berm B along with that from the portion of Berm C that exceeded the remediation goal was located in the face and along the top of the berms. The face and top of the berms were removed using the excavator again, staging the soil in a temporary stockpile immediately adjacent to the berm from which the soil was being excavated. The front-end loader was able to scoop soil from this temporary stockpile and place it in the screening plant for segregation by size. The excavated area of each of the berms was sampled and analyzed using both a hand-held XRF spectrometer and conventional analytical methodology to determine whether additional excavation was required to meet the remediation goal of 400 mg/kg for lead. Any grid determined to exceed the remediation goal was excavated a second time followed by the collection of a second analytical sample to determine whether the goal had been achieved. The second excavation spanned the contaminated grid plus all the adjacent grids known to be below the remediation goal to ensure that contaminated soil exceeding the 400 mg/kg remediation goal for lead was removed. All excavated soil from the berms was passed through the screening plant.

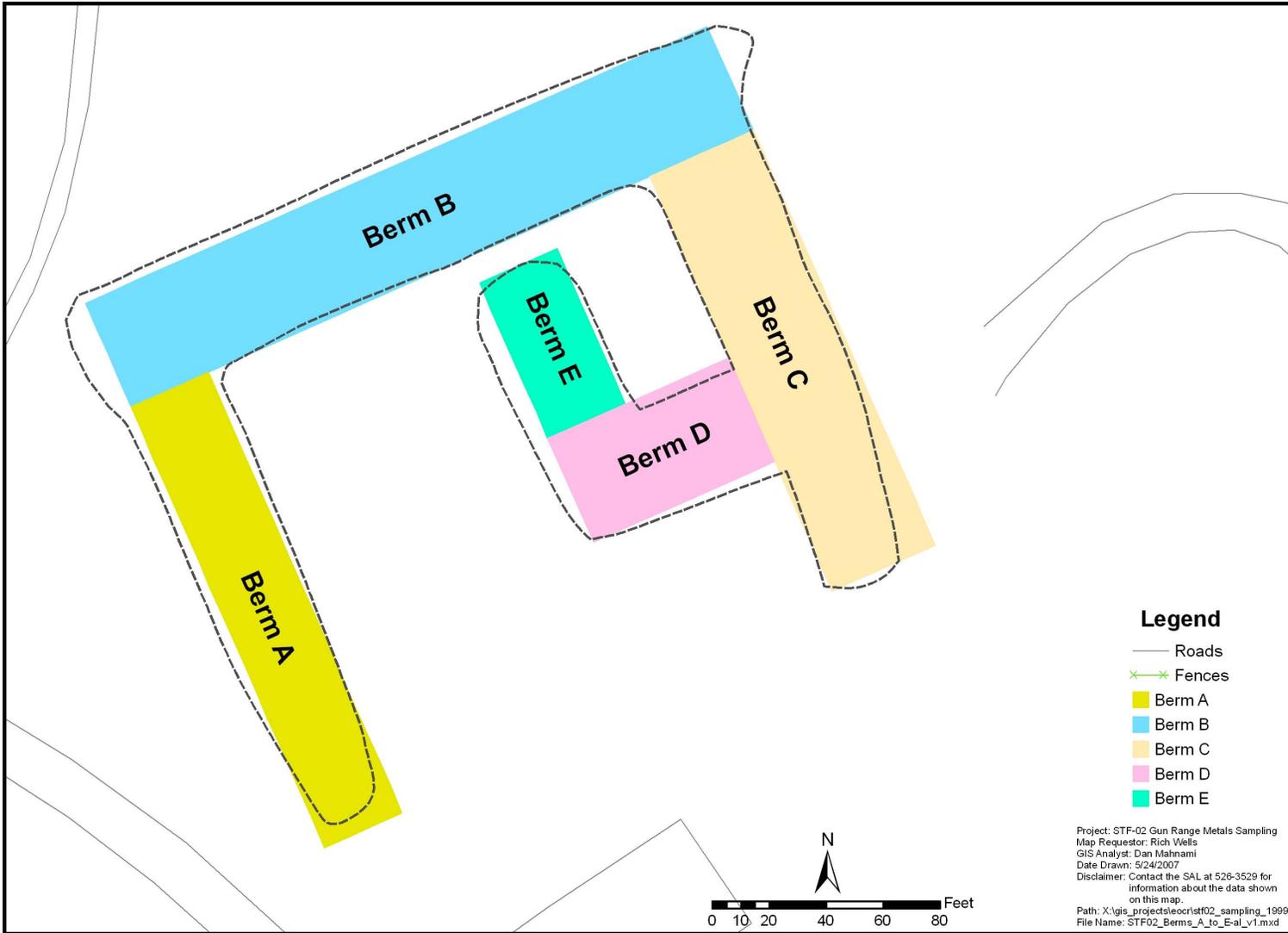


Figure 6. Location of gun range berms.

Three grid locations between the berms were identified as having lead contamination above the remediation goal of 400 mg/kg. Excavation boundaries for these locations were established using the centers of adjacent grids where the known lead concentrations were below the remediation goal. This resulted in a minimum 20 × 20-ft area that was excavated with the soil placed in the contaminated soil stockpile destined for treatment and disposal at the off-Site TSDF. The excavated area was resampled and analyzed for lead to ensure that the remediation goal was achieved.

Following the completion of all screening activities, the footprints of the screening plant and the stockpiles were surveyed using a global positioning system device to aid in establishing excavation areas following the removal of the screening plant and stockpiles. The screening plant was moved off-Site and the stockpiled soil loaded for off-Site shipment for disposal. The impacted areas were subsequently excavated and sampled to ensure that no soil with lead contamination in excess of the 400 mg/kg remediation goal remained on the STF-02 site. Sample grid locations were established in accordance with the field sampling plan and an iterative process followed whereby, when additional lead contamination was encountered based on analytical results, additional excavation was performed. This process continued until the remediation goal was achieved for the entire area with the final excavated soils loaded directly into an intermodal container for off-Site shipment.

2.3.8 Mechanical Separation

Based on the sieve analyses performed during the preremediation sampling effort, using a combination of a 3/4-in. sieve and a 3/8-in. sieve was determined to be sufficient to segregate the majority of the bullets from the larger (greater than 3/4 in.) aggregate and the smaller (less than 3/8 in.) sediment. The segregation of lead from the soil was accomplished using a conventional screening plant outfitted with 3/4- and 3/8-in. screens. The material was segregated into three working stockpiles from which larger stockpiles were formed when a working stockpile became too large for the screening plant setup. Contaminated soil was removed from the berm using an excavator because the soil in the berm was too compacted for a front-end loader to operate efficiently. The excavator would place the soil in a location immediately adjacent to the berm from which the front-end loader was able to obtain soil for loading into the screening plant. Water was used as a dust suppressant during screening operations to mitigate personnel exposure to lead contamination.

The primary reason for screening the contaminated soil was to segregate the bullets from the soil with the end outcome being to ship the lead off-Site for recycling. Unfortunately, the off-Site recycler determined after obtaining a sample of the material proposed for recycling that it was not fiscally viable to recycle the material. Therefore, the fraction less than 3/4 in. and greater than 3/8 in. that contained the majority of the lead contamination was combined with other contaminated soil and shipped off-Site for treatment and disposal.

Two secondary reasons existed for performing the segregation. The first was that preliminary analytical results obtained from the preremediation samples indicated that the greater than 3/4-in. fraction consisting primarily of large aggregate may not exceed the 400-mg/kg remediation goal for lead and could be returned to the area for backfill and contouring rather than shipping off-Site for disposal. Analytical results obtained from the greater than 3/4-in. stockpile did not support this assertion and the material was shipped off-Site for treatment and disposal. The second was that the off-Site disposal facility requested that the soils destined for treatment and disposal be visually examined for any unspent rounds (see Section 2.3.7), which would be removed during the screening operation.

The soil remaining in Berms 2 and 3, which was below the lead remediation goal of 400 mg/kg, was used to backfill the excavated areas in the gun range with the remaining soil contoured to match the surrounding terrain.

2.3.9 Loading of Contaminated Soil

Contaminated soil was loaded into intermodal containers for off-Site shipment to the approved TSDF. For the majority of the operation, two loading locations were established in the support zone immediately adjacent to the exclusion zone. The disposal facility's drivers would back a haul truck with the intermodal container on a trailer into a loading location, off-load the intermodal container, and leave the area prior to the loading operation. The remediation subcontractor would subsequently open the intermodal container, load contaminated soil into the container using a front-end loader, and close the container ensuring the integrity of the lid's seal. Following this operation, the driver was allowed back into the support zone to load the intermodal container back onto the trailer and transport the tractor/trailer to the scale located at CFA for weighing, and ultimately to the off-Site TSDF. If during the weighing operation the truck either exceeded the 80,000-lb total weight limit or was significantly underweight, the tractor/trailer was returned to the job site where soil was either removed or added as appropriate. The truck was returned to CFA to reweigh prior to continuing to the disposal facility. A total of 96 shipments of contaminated soil were made consisting of a total weight of 3,149,808 lb (1,574.9 tons).

2.3.10 Removal of Fencing

Fencing surrounding the STF-02 gun range and EOCR pond was used to establish the work zone, and fencing along the north and west sides of the gun range was moved farther out to allow for equipment movement. The fence between the EOCR pond and the gun range was removed at the beginning of the project to allow equipment to remove the two contaminated spots within the pond and to move backfill soil into the pond where it was subsequently compacted in lifts as the pond was filled. The gate on the south fence of the gun range was removed along with the gate posts and fencing. T-posts were reused to form the support zone fence slightly to the south of the original fence from which yellow and black construction rope was hung and entry and exit points into the support zone were established.

Following the completion of all remediation activities, all fencing materials were removed from the site. Fence posts were located in areas where lead concentrations were at or near background levels and did not exceed the 400 mg/kg remediation goal. T-posts that were in good condition were sent for reuse on the INL Site while those that were not acceptable were sent for recycle along with the wire that formed the three-strand fence around the facility.

2.3.11 Grading and Contouring

Following removal of soils exceeding the remediation goal of 400 mg/kg for lead, the remaining soil at the site was contoured to match the surrounding terrain. Topsoil was obtained from Rye Grass Flats and spread to a minimum depth of 6 in. across the area impacted by the remediation activities. An analysis of the topsoil was performed in accordance with the Phase III RD/RA Work Plan. Results of the soil test are provided in Table 3.

Table 3. Soil test data.

Parameter	Result
pH	8.1
Salts	0.7 mmhos/cm
Sodium	0.3 meq/100 g
Cation exchange capacity	20.8 meq/100 g
Excess lime	1.3%
Organic matter	1.83%
Organic nitrogen	70 lb/acre
Nitrate-nitrogen	13 ppm
Phosphorus	7 ppm
Potassium	590 ppm
Calcium	13.9 meq/100 g
Magnesium	4.6 ppm
Sulfate-sulfur	4 ppm
Zinc	0.6 ppm
Iron	4.8 ppm
Manganese	2.0 ppm
Copper	1.6 ppm
Boron	0.90 ppm

2.3.12 Revegetation

Site restoration included reseeding those areas affected by the field activities including the gun range, the EOCR pond, adjacent staging areas, and Rye Grass Flats, from which topsoil was obtained. After preparation of a seedbed using a disc to till the top 7.6 cm (3 in.) of the surface, seed was drilled to a maximum depth of 1.3 cm (0.5 in.) at a rate of 12.5 lb/acre for the seed mixture. The seeding was performed on November 29 and 30, 2006, meeting the prescribed window of October 1 through November 30, 2006.

Based on the soil analysis results, a fertilizer application rate of 221 lb/acre was determined to be appropriate to amend the soil. Table 4 provides the application rate for the recommended nutrients. To maintain soil moisture levels, wood chip mulch was placed using a modified manure spreader on the reseeded areas in accordance with the specification at a rate of 15 tons/acre.

Table 4. Nutrient application rate.

Nutrient	Rate (lb/acre)
Nitrogen	110
P ₂ O ₅ – Phosphate	70
Sulfate-Sulfur	40
Zinc	8
Manganese	3

2.3.13 Demobilization

Final demobilization from the STF-02 Gun Range was completed on November 30, 2006. Equipment was decontaminated in accordance with the *Miscellaneous Sites Cleanup Project Health and Safety Plan* (PLN-2128), and equipment was visually surveyed and decontaminated as necessary prior to release for use on other jobs. The construction trailer was removed, and all waste material had been disposed of at appropriate facilities. Metal T-posts in good condition were sent for reuse, while other metal (e.g., bent T-posts and wire) was sent for recycle.

2.4 Sampling and Analysis

The results from the preresmediation sampling conducted during August 2006, the grain-size distribution analyses, and the analyses performed to support the remedial action are discussed in the sections below. Sampling and analysis were performed in accordance with the requirements delineated in the *Field Sampling Plan for the Operable Units 6-05 and 10-04 Remedial Action, Phase III* (DOE-ID 2006b) and complied with the quality assurance/quality control requirements specified in the *Quality Assurance Project Plan for Waste Area Groups 1, 2, 3, 4, 5, 6, 7, 10, and Deactivation, Decontamination, and Decommissioning* (DOE-ID 2006c). Appendix B provides summaries of the analytical data.

2.4.1 Preresmediation Analytical Results

Preresmediation sampling was performed during August 2006 to refine the contamination boundaries for the project and to provide characterization data to determine whether the lead contamination was associated with a particular grain-size fraction. A 10 × 10-ft grid system was established for both the gun range and the EOCR pond.

For Berms A, D, and E, samples were collected from the 0 to 6-in. depth at every fourth grid location, as were samples from the top and back sides of Berms B and C. From the face of Berms B and C, samples were collected from both the 0 to 6-in. and 6 to 24-in. depth intervals at every grid location. Based on these samples, Berms A, D, and E were determined to not contain lead at concentrations exceeding the 400-mg/kg remediation goal. Similarly, lead concentrations for the samples collected from the back sides of Berms B and C were below this level. For Berm B, nearly the entire face and the top were determined to exceed the remediation goal. For Berm C, the end of the berm closest to Berm B also exceeded the remediation goal with the portion of the berm farther away from Berm B being below the remediation goal for lead.

Of the samples collected from the 0 to 6-in. depth at the “F” grid locations between Berms A, B, and E, and to the south of Berm D, several immediately adjacent to Berm B were determined to have lead concentrations above the 400 mg/kg limit (Grids F17, F18, F47, F75, F76, F103, F104, F135, F136, and F159). In addition, six other grid locations were determined to exceed the remediation goal and were delineated for remediation following completion of the berms (Grids F30, F83, F127, F133, F134, and F156). Samples were collected from the 0 to 6-in. depth at the “G” grid locations between Berms B, C, D, and E, demonstrating that the soil in this area was below the remediation goal. Figure 7 summarizes the preresmediation analytical results for the STF-02 Gun Range grid locations. Highlighting indicates locations exceeding the lead remediation goal of 400 mg/kg.

Samples were collected from all the grid locations within the EOCR pond with the exception of those that resided on top of the basalt with insufficient soil available to sample. None of the samples collected from locations within the pond exceeded the 400 mg/kg remediation goal for lead. Figure 8 summarizes the preresmediation analytical results for the EOCR pond grid locations.



Figure 7. STF-02 Gun Range prerediation analytical results.

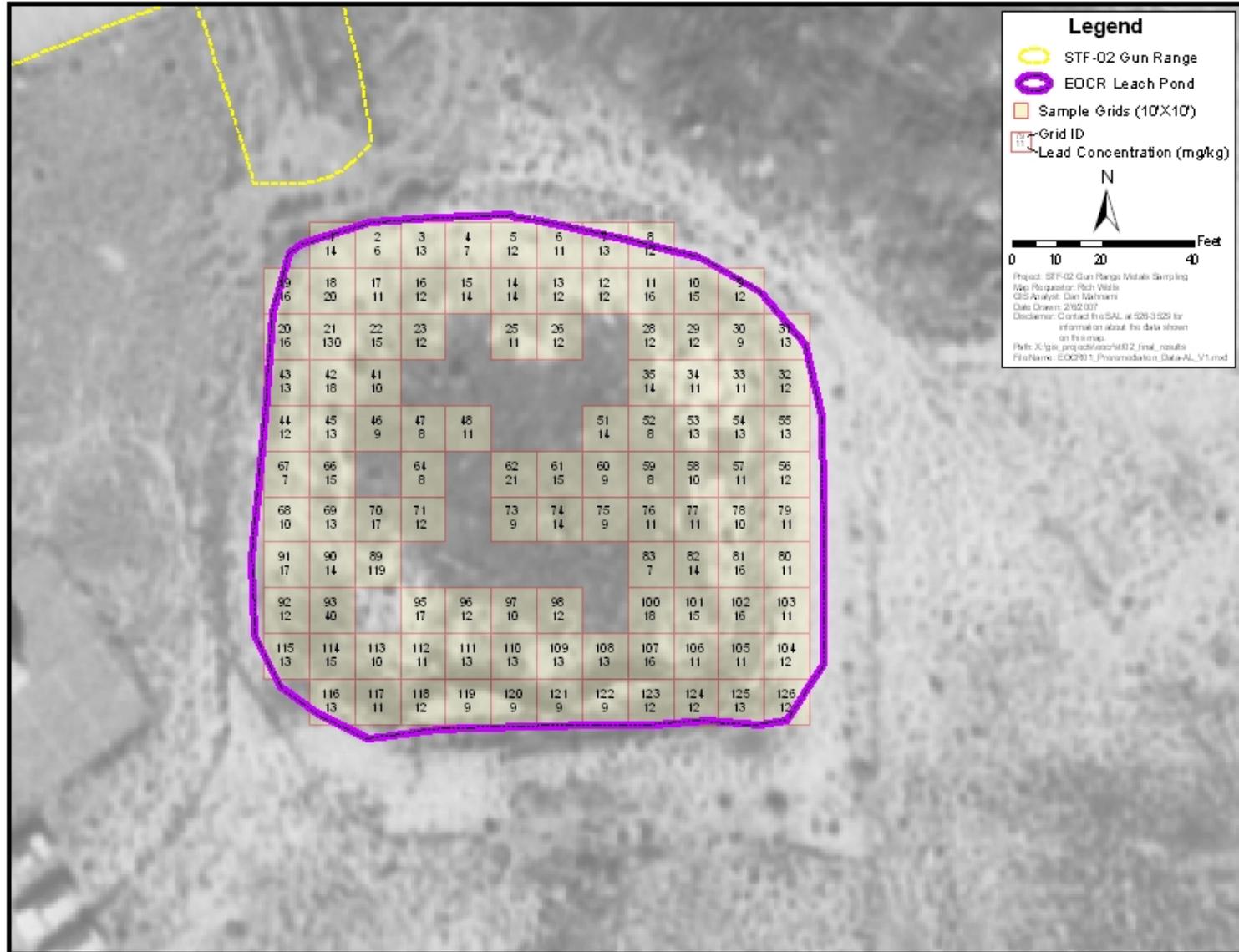


Figure 8. Experimental Organic-Cooled Reactor Pond prerediation analytical results.

2.4.2 Grain-Size Distribution

To determine whether the lead contamination resided within a specific grain-size fraction and to assess the efficacy with which screening would separate lead bullets from the soil, a single sample was collected from Berm B consisting of the sample material collected from across the berm face that was left over after analytical aliquots had been taken. This sample, consisting of approximately 15 gal of material, was submitted for grain-size distribution analysis with each of the subsequent fractions undergoing total and toxicity characteristic leaching procedure (TCLP) lead analyses in accordance with SW-846 Methods 1311, 3010A, and 6010B (EPA 1992a, 1992b, 1996a). Table 5 summarizes the results of the grain-size distribution analysis with Table 6 summarizing the analytical data for the total and TCLP lead analyses of the fractions.

Table 5. Grain-size distribution.

Fraction	Weight Retained (g)	Weight Passing (g)	% Retained	% Passing	Fragments (g)
+ ¾ in.	2,263.07	83,968.47	2.6	97.4	None
- ¾ in./+ 3/8 in.	5,137.84	78,650.63	6.2	91.2	8,059.75
- 3/8 in./+ No. 4 (4.75 mm)	5,171.18	73,479.45	6.0	85.2	1,069.69
- No. 4 (4.75 mm) /+ No. 10 (2.00 mm)	4,278.18	69,201.27	4.9	80.3	21.67
- No. 10 (2.00 mm) /+ No. 50 (300 µm)	27,878.13	41,323.14	32.4	47.9	None
- No. 50 (300 µm) /+ No. 200 (75 µm)	38,952.98	2,370.16	45.2	2.7	None
- No. 200 (75 µm)	2,370.16	0	2.7	0	None

Table 6. Total and toxicity characteristic leaching procedure lead results by fraction.

Fraction	Total Lead (mg/kg)		TCLP Lead (mg/L)	
	Sample No. 1	Sample No. 2	Sample No. 1	Sample No. 2
+ ¾ in.	25.1	136	0.347	0.451
- ¾ in./+ 3/8 in.	2,030	50.5	1.07	2.56
- 3/8 in./+ No. 4 (4.75 mm)	4,310	5,440	107	73.1
- No. 4 (4.75 mm)/+ No. 10 (2.00 mm)	159	257,000	380	558
- No. 10 (2.00 mm) /+ No. 50 (300 µm)	867	3,130	378	208
- No. 50 (300 µm) /+ No. 200 (75 µm)	1,410	1,350	20.2	7.82
- No. 200 (75 µm)	4,780	4,780	31.6	29.6

As can be seen from the total and TCLP analytical data for the individual grain-size fractions, the only fraction that could possibly be segregated and meet the remediation goal for lead was the greater than 3/4 in. that consisted primarily of large aggregate. The other fractions exceeded the remediation goal with the less than 3/4-in. and greater than 3/8-in. fraction being below the lead toxicity characteristic concentration of 5 mg/L. Based on these analytical data, screening the soil during remediation was determined to have the potential effect of reducing the quantity of soil requiring shipment off-Site for treatment and disposal.

2.4.3 Analytical Results Supporting the Remediation Action

During the remediation action, analytical results were obtained for the EOCR pond, the gun range berms, and the area between the berms including the hot spots identified during the preremediation sampling. The sections below summarize the results for these sampling activities.

2.4.3.1 EOCR Pond. The two locations within the EOCR pond visually identified as potentially having elevated concentrations of lead were sampled after being excavated. The analytical results are summarized in Table 7, with locations shown in Figure 9. The results demonstrate that lead concentrations for the soils in the two locations are well below the 400-mg/kg remediation goal.

Table 7. Experimental Organic-Cooled Reactor Pond lead analytical results.

Grid Number	Sample ID No.	XRF Data (mg/kg)	Laboratory Data (mg/kg)
EOCR #1	GR1F0101LD	<28.9	6.6
EOCR #2	GR1F0201LD	<32.7	15.17
EOCR #2 (field duplicate)	GR1F0202LD	N/A	18.43

XRF = X-ray fluorescence

2.4.3.2 Contaminated Berms. Following excavation of the areas of Berms B and C identified during the preremediation sampling effort as having lead contamination in excess of the remediation goal of 400 mg/kg, all grid locations of the excavated area were sampled and analyzed by both the XRF spectrometer and the classical SW-846 Laboratory Method 6020 (EPA 1994) to determine whether the remediation goal had been achieved for the soil remaining in the berm.

Based on the first round of sampling, the lead remediation goal was determined to have been achieved for the soils remaining in Berm C with two grid locations (B-87 and B-90) within Berm B as being questionable. Although the initial analysis of the sample collected from the B-90 grid following the first excavation indicated that the remediation goal may have been achieved for the location, the sample was reanalyzed by XRF following a more detailed sample preparation yielding a maximum lead concentration of 432.7 mg/kg. Based on this result for the B-90 grid and the results for B-87, these two locations were excavated a second time with the second round of samples collected from the two grids. The second sample round demonstrated that the remediation goal had been achieved. Table 8 summarizes the analytical results for these two grid locations for both the first and second round of remediation support samples. A summary of all the remedial action support analytical results collected from the contaminated berms is provided in Appendix B.



Figure 9. Experimental Organic-Cooled Reactor remediation support analytical results.

Table 8. Contaminated berm reexcavation analytical results.

Grid No.	XRF Results (mg/kg)			Sample No.	Lab Result (mg/kg)
	Run #1	Run #2	Run #3		
B-87 (first excavation)	276.2	237.2	781.8	GR1F7201LD	621.38
B-87 (first excavation)	N/A	N/A	N/A	GR1F7202LD (field duplicate)	779.75
B-87 (second excavation)	<33.3	<33.9	<26.9	GR1F9001LD	6.22
B-90 (first excavation)	252.3	245.3	239.7	GR1F6701LD	303.33
B-90 (second excavation)	<33.1	<35.8	<32.9	GR1F8901LD	7.79

XRF = X-ray fluorescence

2.4.3.3 Area Between the Berms. As discussed in Section 2.4.1, six grid areas between the berms were identified during the prerediation sampling as having lead concentrations in excess of the 400-mg/kg remediation goal. These areas were excavated to remove the contaminated soil and sampled to demonstrate whether the remediation goal had been achieved. Table 9 summarizes the prerediation and post-excavation analytical results for these six grid locations between the berms.

Table 9. Analytical results for contaminated grids between the berms.

Grid No.	Prerediation Lead Results (mg/kg)	Post-Excavation Lead Results (mg/kg)			Lab
		XRF #1	XRF #2	XRF #3	
F-30	46,100	<35.8	<32.8	<36.5	6.73
F-83	509	40.2	<31.4	<36.9	14.75
F-127	808	<31.3	<32.0	<29.3	14.13
F-133	951	106.1	107.4	99.5	95.15
F-134	1,130	70.4	48.3	60.8	N/A
F-156	3,130	<34.9	<29.6	<36.3	12.62

XRF = X-ray fluorescence

2.4.3.4 Sampling Beneath the Screening Plant and Stockpile Locations. Following the completion of all soil screening activities, the subsequent removal of the stockpiles formed from the screened soils and excavation of 6 in. from these locations, the grids potentially impacted by the screening and stockpiling activities were sampled to determine whether any additional excavation was required to achieve the remediation goal of 400 mg/kg for lead. Figure 10 shows the grid locations with soils that were potentially impacted by the screening plant operations and the stockpiles formed from the soils sent through the plant. Samples were analyzed by both the XRF spectrometer and the classical SW-846 laboratory method to determine whether the remediation goal had been achieved for the remaining soil. Based on the first round of sampling, the lead remediation goal was determined to have been achieved for all the locations. Three of the grid locations (Grids F-84, F-86, and F-87) were potentially suspect based on the XRF data. These grid locations were reexcavated with a new stockpile formed. Table 10 summarizes the analytical results for the three grid locations for the sampling performed after the initial excavation versus the sampling performed after the second excavation. Because Grid F-85 was potentially impacted by the excavation activity, it was included for reanalysis. For Grid F-87, a third excavation was required to achieve the remediation goal, as shown by the analytical results presented in the table.

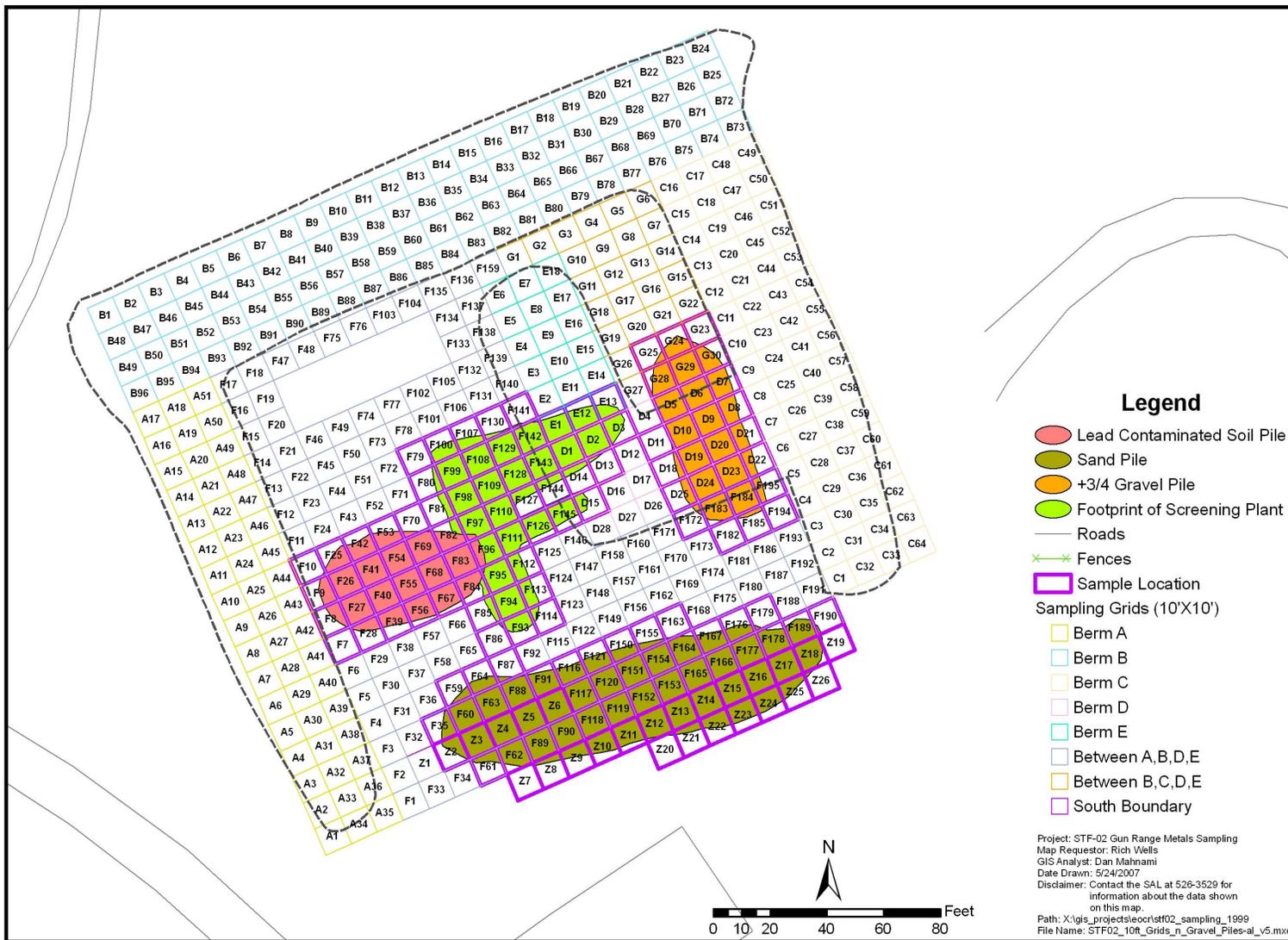


Figure 10. Screening plant and stockpile sampling grids.

Table 10. Screening plant and stockpile location analytical results.

	Remediation Step	XRF #1	XRF #2	XRF #3	Lab
F-84	Initial Excavation	215.3	1,040	747.3	173.23
	Second Excavation	<40.2	47.3	<34.3	16.0
F-85	Initial Excavation	<37.5	<33.7	<40.1	38.96
	Second Excavation	<37.3	<36.9	<34.5	43.41
F-86	Initial Excavation	81.1	160.1	58.8	226.58
	Second Excavation	<38.6	56.4	67.1	14.37
F-87	Initial Excavation	187.6	170.7	222.3	294.76
	Second Excavation	187.6	187.5	238.4	N/A
	Third Excavation	<30.9	45.2	<33.5	21.96

Figure 11 shows the grid locations with soils that were potentially impacted by this new stockpile. Figure 12 summarizes the analytical results for the remediation support samples collected during the course of the STF-02 remedial action. If a grid had multiple samples collected as a result of additional excavation required, the analytical result from the final sample collected from that grid is presented in the figure because that result is representative of the remaining soil.

2.4.4 Statistical Considerations

Lead concentrations were measured on a 10 × 10 grid using two methods: XRF and standard laboratory analysis following SW-846 protocol. As well as for estimating the average concentration and planning the required samples for confirmation in attaining remediation goals, the data were used to compare results from the two methods.

A total of 258 locations were measured for lead contamination. For the majority of locations, three XRF measurements were taken and one sample was sent for laboratory analysis. In addition, 14 field duplicates were collected and submitted for laboratory analysis. Five of the samples were submitted for reanalysis by the laboratory because results were inconsistent with the XRF measurements. Two locations were reexcavated based on elevated lead concentrations.

Substantial censoring issues were associated with the XRF data given that 52% of the locations had three results below the instrument's detection limit. For all analyses, the maximum XRF result was used, with a "U" flag attached if all XRF values were nondetects. This is a conservative approach for estimating the mean concentration, but not for estimating the variance. To assess the impact, the between-location variance was compared to the within-location variance. The median within-location variance for locations with three detectable results was approximately 440 mg/kg, while the between-location variance for locations with three detectable results was approximately 2,500 mg/kg. Although not insignificant, the within-location variance is only 20% of the between-location variance. The variance among the maximum XRF results is expected to account for the measurement variance within locations.

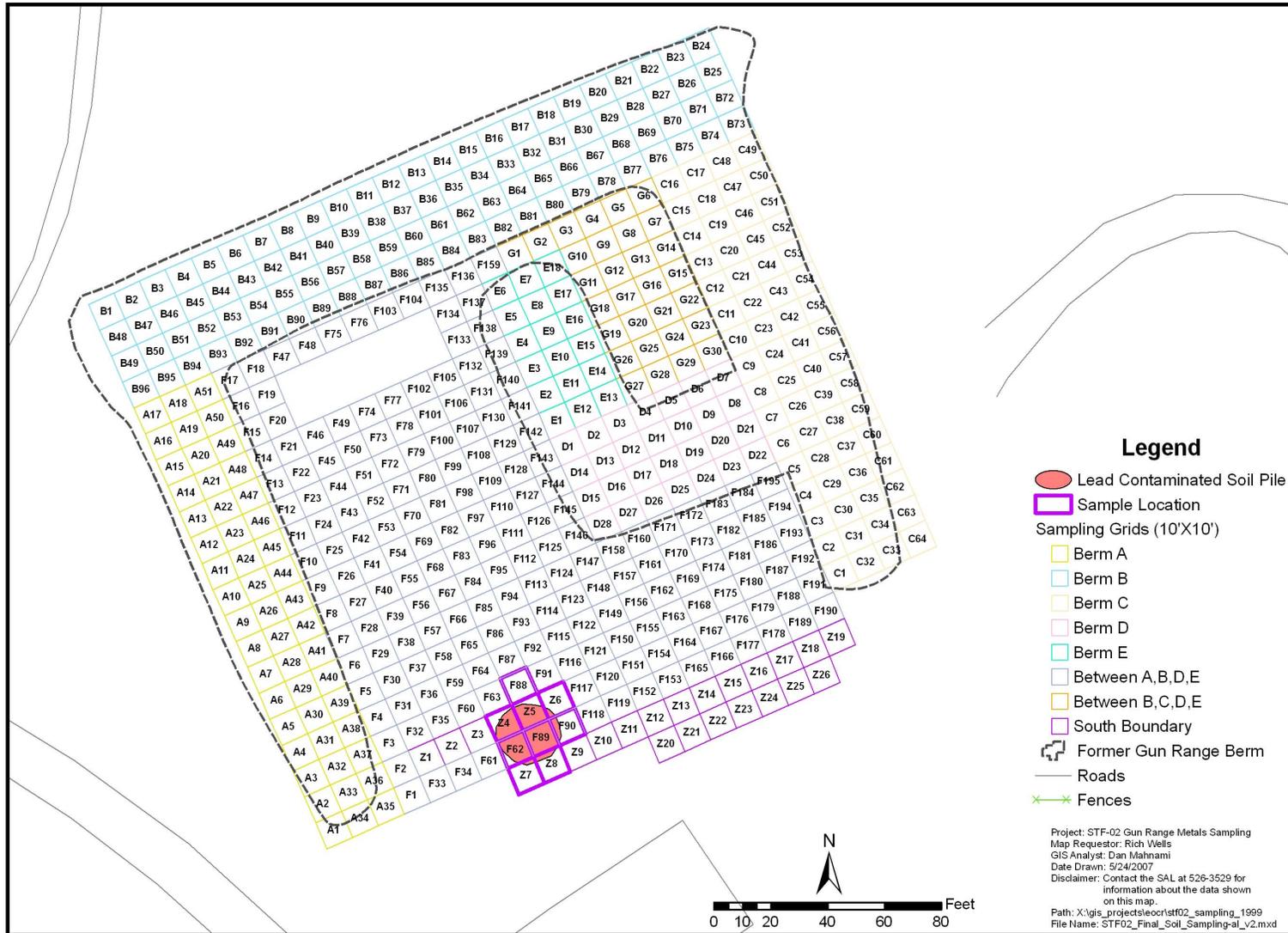


Figure 11. Final stockpile sampling grids.

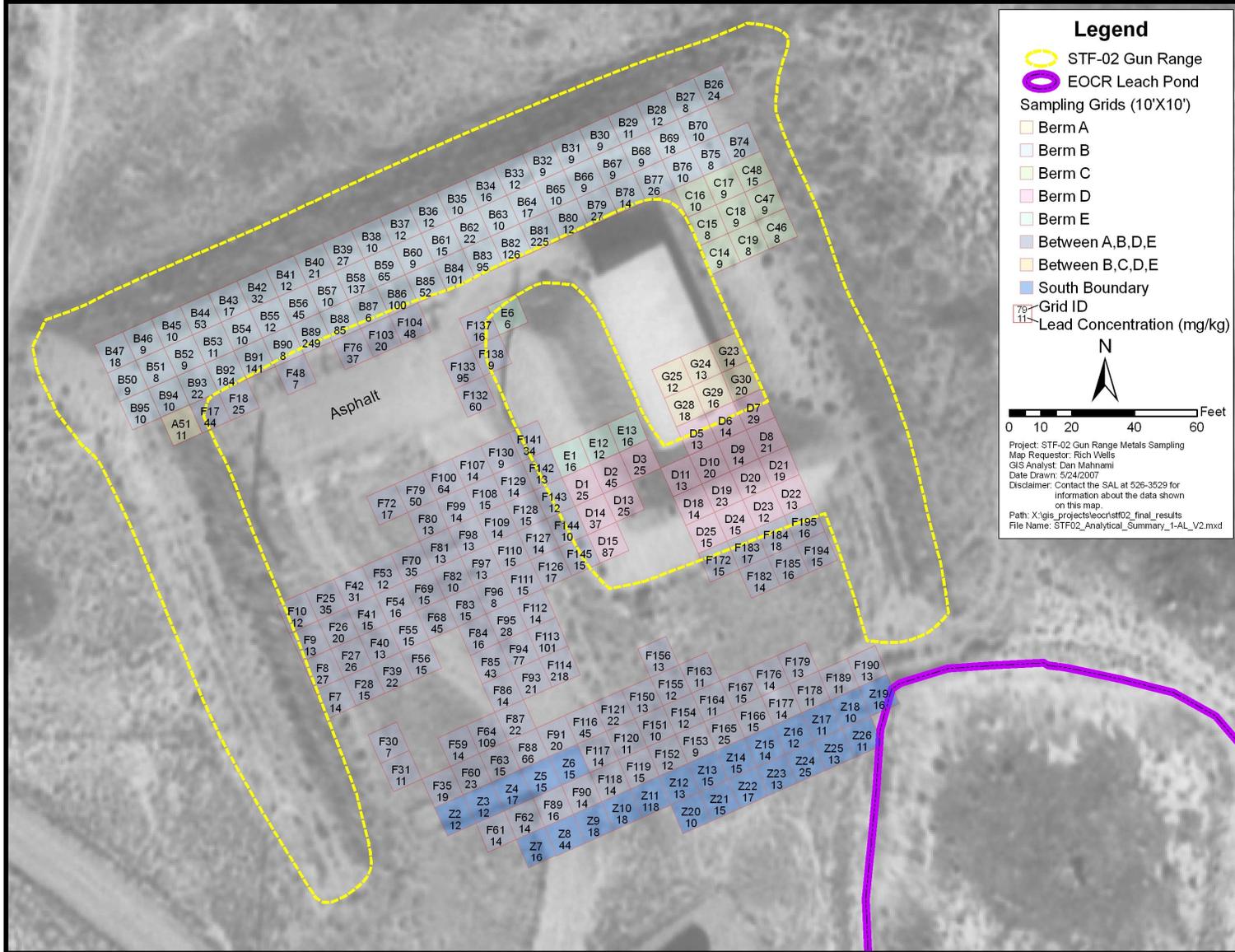


Figure 12. Remediation support analytical results summary.

Only nine laboratory results were censored. For both data sets, an imputation method based on quantile-quantile regression was used to estimate the censored values to calculate the upper confidence limit as described below.

The three XRF concentrations per location were not very strongly correlated (Spearman rank correlation ~ 0.4), although the correlation was significantly greater than 0. The laboratory data were also not strongly (although, again significantly) correlated with any of the XRF concentrations or the maximum XRF concentration (Spearman rank correlation ~ 0.4 to 0.5). Using only detected values, the correlation was 0.7 , an expected increase when the truncated values are removed.

The XRF results were assumed to be comparable to the laboratory data. At first glance, the XRF concentrations are greater than those generated by the laboratory. A modified sign test (Helsel 2005) is most appropriate for these paired data that have so many nondetects. For each record, a value of -1 , 0 , or 1 is assigned based on whether the laboratory result was greater than, tied to, or less than the maximum XRF result. Fully half the records were assumed tied. The laboratory result was less than the detection limit of a nondetected maximum XRF result. The p -value for the modified test was 0.9 . Although 12 of the laboratory results were greater than the maximum XRF concentration and 103 were lower, the 121 ties indicate that the methods are comparable.

The distribution of the data was troublesome. For all the data as well as for just the detected results, the distribution was neither normal nor lognormal. In the end, a lognormal distribution was assumed for estimating censored values and upper confidence limits.

The censored values were estimated using an imputation of values based on quantile-quantile regression assuming a lognormal distribution. Quantile-quantile regression models the ordered data values on quantiles of the assumed distribution (in this case, lognormal). The model-fitted values estimate the censored values.

The upper confidence limits are presented on a natural logarithmic scale because back-transformation introduces bias. The 95% upper confidence limit for the XRF data is 3.5 and for the laboratory data is 3 . The remediation goal on the natural logarithmic scale is 6 . Based on either data set, a sample size of 3 is required to confirm that the remediation goal has been met with 95% confidence. In accordance with Section 3.7.4 of the *Field Sampling Plan for the Operable Units 6-05 and 10-04 Remedial Action, Phase III* (DOE-ID 2006b), if the calculated number of confirmation samples is less than 10 , then 10 samples will be submitted for confirmation analyses.

2.4.5 Confirmation Analyses

The locations for confirmation samples were randomly selected from the 244 discrete grids within the STF-02 Gun Range. The samples were submitted to an independent off-Site laboratory for total lead analyses in accordance with SW-846 Method 3050B/6020 (EPA 1996b, 1994). Table 11 summarizes the correlation of the on-Site laboratory analytical data versus that generated by the off-Site laboratory for the selected grid locations. The calculated correlation coefficient (R) for the two data sets is 0.95 indicating an excellent correlation. For the on-Site laboratory, the 95% upper confidence limit calculated using ProUCL Version 3.0 (EPA 2004) is 68.6 , assuming a gamma distribution of the data. For the off-Site laboratory, the 95% limit is 91.6 mg/kg, again assuming a gamma distribution of the data.

Table 11. Confirmation sample correlation.

Grid	Total Lead Analytical Results (mg/kg)	
	On-Site Laboratory	Off-Site Laboratory
F132	60.3	85.3
B60	8.85	7.97
B59	65.1	109
B37	11.6	10.8
D18	13.6	16
F64	109.3	108
Z24	25.1	27.3
F88	65.8	91.1
Z10	16.8	21.7
F107	14.3	13.9

2.5 Occupational Safety and Health

Monitoring of personnel industrial hygiene was conducted during the STF-02 Gun Range remedial actions and is discussed in the sections below.

2.5.1 Noise Surveillance

Personnel who operated heavy equipment and personnel working near the heavy equipment could have been exposed to average noise levels above 84 decibels for a 10-hour time-weighted average. Working in excess of the 84-dB time-weighted average noise level exceeds the OSHA standard, “Occupational Noise Exposure” (29 CFR 1910.95), requiring the project to implement the company’s Hearing Conservation Program. Employees at the task site wore acceptable hearing protection when working in and around heavy equipment generating noise levels in excess of the 84-dB requirement.

2.5.2 Personal Protective Equipment

In addition to wearing hearing protection, personnel entering the exclusion zone were required to wear safety footwear, hard hats, eye protection (i.e., safety glasses with side shields as a minimum), and leather gloves. When working in dust-generating conditions that had not yet been evaluated for potential lead exposure by an industrial hygienist, personnel in the exclusion zone who were not working in heavy equipment cabs equipped with high-efficiency particulate air (HEPA) filters wore appropriate respiratory protection and Tyvek suits. Full-face respirators were selected, maintained, and inspected daily in accordance with 29 CFR 1910.134. When collecting samples, leather gloves were replaced with either neoprene or latex gloves. Personal protective equipment was worn at all times except in designated areas (e.g., break areas, office area, and designated pathways).

2.5.3 Monitoring for Lead Exposure

Lead exposure monitoring for remediation of the STF-02 Gun Range began on October 19, 2006, and ended on November 9, 2006. Testing was conducted for the first 3 days of each distinct phase of work (e.g., demolition and removal, excavation, stockpiling, screening, and vehicle loading) to ensure that adequate measures were taken to mitigate exposure to lead particles. Work phases were monitored in

accordance with 29 CFR 1926.62(d)(7) with sampling performed in accordance with the established exposure monitoring plan, which followed the OSHA 29 CFR 1926.62 lead standard. All necessary training was documented and maintained in accordance with 29 CFR 1926.62 and 29 CFR 1926.21.

Air sampling and analysis was performed in accordance with National Institute of Occupational Safety and Health (NIOSH) Analytical Method 7082, “Lead by Flame AAS” (NIOSH 1994). Sampling consisted of both personnel and area samples collected to reflect any exposure over the duration of work activities. Representative samples were collected from the work area and the employee determined to be at the highest risk of exposure in accordance with 29 CFR 1926.62(d)(3)(ii). Personnel were notified in person the day of receipt of monitoring results with an explanation of posted results in accordance with 29 CFR 1926.62(d)(8)(i) and in writing within the prescribed 5-day timeframe.

Engineered exposure controls consisted of working upwind of an area when it was outside the exclusion zone and the use of water was unavailable for dust suppression. Only personnel directly involved in operations were allowed in the area. During loading operations, truck drivers would off-load the intermodal containers adjacent to the exclusion zone and then leave the area, with the site subcontractor responsible for opening, loading, and resealing the container. Afterward, the driver was allowed to return to load the container back onto the truck for transport. Respirators were used in accordance with the established respiratory program with employees using respirator protection, complying with the respirator standard requirements outlined in 29 CFR 1910.134.

All area and personal sampling results were below both the OSHA lead permissible exposure limit of $50 \mu\text{g}/\text{m}^3$ (29 CFR 1910.1025) and the action level of $30 \mu\text{g}/\text{m}^3$ with all sample results reported as nondetectable for lead. The main contributing factors for low lead exposure levels included good work practices such as positioning personnel upwind from visible dust and limiting the number of personnel in high-risk areas for lead exposure in addition to wet weather conditions and low wind that provided favorable working conditions.

2.6 Decontamination

Equipment was subject to decontamination prior to removal from the exclusion zone. Contaminated equipment was identified by visual examination for the presence of dirt. Decontamination was performed in accordance with requirements set forth in Section 10.4 of PLN-2128, “Miscellaneous Sites Cleanup Project Health and Safety Plan.” To limit the generation of secondary waste, dry decontamination methods were used to remove contamination amenable to those methods. Equipment was decontaminated in the exclusion zone. Decontamination was performed as required and all equipment was released from the STF-02 site without incident.

2.7 Lessons Learned and Notable Practices

During the course of the STF-02 Gun Range remediation, a proactive lessons learned approach was taken to further increase the efficiency of operations. In addition, and as a result of some of the lessons learned, notable practices were implemented during the OU 10-04 Phase III remedial action from which other similar remedial actions could benefit.

2.7.1 Transport of Contaminated Soil

Intermodal containers were used for remediation of the STF-02 Gun Range because of their potential capability to mitigate release of contaminated soil with their hard lids equipped with gasket seals. However, lessons learned from the STF-02 project suggest instead using end dump trucks for a more cost-effective approach for two reasons. The end dump trucks can be customized to mitigate release

of contaminants by outfitting the trucks with liners and appropriately sealed end gates. The intermodal containers had to be off-loaded from the trailer prior to loading because they are too high to be reached by a front-end loader when on the trailer. The off-loading and subsequent loading operations require additional time and manpower to accomplish. Also, opening the container's lid if performed at the height while the container is on the trailer is inherently dangerous.

The second reason for using end dump trucks for future remediation activities over intermodal containers is the weight of material that can be hauled. A truck/trailer with an intermodal weighs an average of 45,000 lb versus an end dump truck weighing in at 33,000 lb. With an over-the-road weight limit of 80,000 lb, an intermodal can be loaded with only up to 35,000 lb of contaminated soil versus 57,000 lb for an end dump truck. Using intermodals resulted in an increase of shipments required by approximately 60% and additional costs incurred not only for the shipments but for the overtime required for loading the additional trucks to meet the project's schedule.

2.7.2 In Situ Instrumentation

The use of in situ instrumentation such as the hand-held XRF spectrometer used on this project greatly enhanced the rate with which the field crew was able to excavate contaminated soil. The field instrumentation provided timely characterization data to field and project management personnel enabling the team to make decisions about where additional excavation was required. The iterative process of excavation, analysis, and subsequent excavation minimized the quantity of contaminated soil requiring shipment for off-Site treatment and disposal, thereby leading to reduced cost for the overall project. The near real-time data provided by the field instrumentation minimized any downtime for field personnel, which would have been experienced waiting for analytical results obtained by laboratory-based methods. This approach ultimately led to the completion of all field work in 7 weeks.

3. COSTS

Total project costs for the OU 10-04 Phase III remediation activities incurred for the STF-02 Gun Range are provided in Table 12. These costs include the ICP contractor’s project management, materials, and labor costs associated with the remediation, as well as the subcontracted field work and disposal fees. No long-term monitoring or maintenance of institutional controls is projected to be required to meet the ARARs associated with the STF-02 Gun Range. Future reporting pertaining to STF-02 consisting of 5-year reviews will be performed under the purview of the ICP Long-Term Stewardship organization.

Table 12. Phase III remedial design/remedial action costs.

Activity	Cost
Phase III Remedial Design	\$93,872
Remediation Technical Support Activities	\$40,845
Phase III Sampling and Analysis	\$155,609
Phase III Fieldwork	\$281,158
Phase III Disposal Costs ^a	\$427,855
Phase III Prefinal Inspection	\$783
Phase III Final Report ^b	\$35,000
Phase III Remedial Design/Remedial Action Total Cost	\$1,035,122

a. Costs associated with disposal of the Phase III waste were incurred by Waste Disposal Services and were not directly accrued by the Waste Area Group 10, Operable Unit 10-04, Project.

b. Preparation of the final report is in progress. Final costs are not yet available, but estimated to be an additional \$5K above the \$30K already expended.

Costs associated with the implementation and performance of the OU 10-04 Phase III remedial action were significantly below the costs outlined in the *Record of Decision Experimental Breeder Reactor-I/Boiling Water Reactor Experiment Area and Miscellaneous Sites, Operable Units 6-05 and 10-04* (DOE-ID 2002a). The total cost projected in the record of decision was \$2,600,000 as compared to the actual cost of \$1,035,122. The actual cost was 39.8% of the estimate. Significant cost savings were realized for the remedial design with an estimate of \$438,000 provided in the ROD versus \$93,872 actual costs. This is attributed to \$344,128 in cost savings realized for preparation of the RD/RA Work Plan and associated documents.

Total costs incurred for the remedial action including sampling and analysis, fieldwork, and disposal costs were \$864,622 as compared to the estimate in the ROD of \$1,929,000. The remedial action cost savings is largely attributed to treatment and disposal costs being less than projected (\$427,855 versus \$870,770 from the ROD) and fieldwork consisting of excavation, loading for transport, soil screening, backfill, reseeding, and sampling and analysis activities being less (\$461,548 versus \$737,211). These two activities account for \$718,578 of the overall cost savings realized for the project.

4. MODIFICATIONS TO THE REMEDIAL ACTION WORK PLAN

Modifications to the STF-02 Gun Range remedial action work plan dealt with the disposal of waste. The Waste Management Plan provided in Appendix B to the *Remedial Design/Remedial Action Work Plan for Operable Units 6-05 and 10-04, Phase III* (DOE-ID 2006a) specified that the lead and copper debris segregated from the soil through the screening plant would be sent off-Site for recycling. A sample of the material designated for recycling was provided to the off-Site recycling subcontractor. After analysis of the material, recycling the material was determined to not be cost effective. The recycling facility determined that the lead and copper fragments would require further segregation from the soil than the screening plant would provide. To pursue recycling of the lead and copper fragments would have required a much more intensive separation method (e.g., soil washing) resulting in added costs to the project and the generation of additional waste streams requiring disposal. Therefore, the material was shipped off-Site for encapsulation and disposal.

The waste management plan also designated creosote-treated railroad ties as being shipped off-Site for encapsulation and disposal. The reason behind requiring encapsulation of the railroad ties was that many of the ties contained lead bullets from target practice. Those railroad ties with visual evidence of lead (e.g., bullet holes) were shipped for encapsulation and disposal. The railroad ties identified as not having any lead (e.g., those used for the foundation of the shooting house) were acceptable for disposal at the CFA landfill.

5. QUANTITIES AND TYPES OF WASTE GENERATED

Waste generated during the OU 10-04 Phase III remedial activities was managed in accordance with the requirements delineated in the Waste Management Plan provided in Appendix B to the Phase III RD/RA Work Plan. The ICP Waste Disposal Services was responsible for managing all waste generated during the Phase III remediation activities. Waste management was performed in accordance with resident procedures.

5.1 Waste Minimization and Segregation

Waste minimization during the STF-02 Gun Range remediation activities was achieved primarily through design and planning to maintain efficient operations. To achieve this goal, waste streams were segregated primarily by the field activity being conducted at the time. Those items that could be recycled or reused were segregated from those requiring disposal. Waste types generated included conditional industrial waste, recyclable/reusable materials, and RCRA hazardous waste. Appropriate waste containers were provided for the waste streams and maintained inside the work area until removed for either storage or disposal.

5.2 Packaging and Labeling

Containers for storing hazardous waste met the requirements of 40 CFR 264, Subpart I, "Use and Management of Containers." Waste was packaged in accordance with the criteria set forth in *Idaho National Engineering and Environmental Laboratory Waste Acceptance Criteria* (DOE-ID 2005b). The types of containers used included the following:

- 208-L (55-gal) open-top drums
- 76-L (20-gal) open-top drums
- Intermodal containers.

Bulk waste destined for disposal at the CFA landfill was shipped in an end-dump truck. All containers were labeled in accordance with resident procedures and all state, federal, and local regulations.

For contaminated soil shipped off-Site for treatment and disposal, the containers of choice were intermodal containers fitted with a liner. Each container had a lightweight rigid lid with a rubber gasket to provide a tight seal between the lid and the container. The lid was hinged for ease of opening by an individual allowing the lid to swing out of the way to one side of the container remaining off the ground.

5.3 Waste Types

Table 13 summarizes the waste streams that were generated during the OU 10-04, Phase III, remediation of the STF-02 Gun Range. Appendix E provides a summary of the shipping manifests for the contaminated soil that was sent off-Site for treatment and disposal. A total of 96 shipments were made to Clean Harbors Environmental Services consisting of 3,149,808 lb of soil and lead/copper fragments requiring encapsulation and disposal. The EPA Region 8 has instituted a policy requiring periodic verification of the continued acceptability on facilities that previously have been found acceptable under the CERCLA Off-Site Rule. Verifications of continued acceptability are conducted when a request for Off-Site Rule status is received and the previous verification was conducted more than 60 days previously. The verifications of continued acceptability are valid for a period of 60 days. A verification of

continued acceptability was completed on the Clean Harbors Grassy Mountain facility on October 30, 2006, and was valid until December 30, 2006. With shipments to this facility completed in November 2006, the shipments were in full compliance with the Off-Site Rule.

Table 13. Operable Unit 10-04 Phase III waste summary.

Waste Stream	Disposal Site	Disposal Status
Contaminated soil (characteristic)	Clean Harbors	Disposed of on November 2, 2006
STF-612 Wooden Building	CFA landfill	Disposed of on October 2, 2006
Asphalt Pads	CFA landfill	Disposed of on October 2, 2006
Creosote-treated railroad ties (characteristic)	Clean Harbors	Disposed of on November 2, 2006
Creosote-treated railroad ties	CFA landfill	Disposed of on October 2, 2006
Lead and copper fragments	Clean Harbors	Disposed of on November 2, 2006
Miscellaneous debris	CFA landfill	Disposed of on November 2, 2006
Metal t-posts in good condition	INL reuse	Sent for reuse on November 2, 2006
Scrap Metal	INL recycle	Sent to recycle on November 2, 2006
Unspent rounds and shell casings	Clean Harbors	Disposed of on October 2, 2006

CFA = Central Facilities Area
 INL = Idaho National Laboratory

6. PREFINAL INSPECTION

The prefinal inspection of the WAG 10, OU 10-04, Phase III, STF-02 Gun Range remediation site was conducted on January 11, 2007, in accordance with the prefinal inspection checklist. The project had most items completed with the exception of the final confirmation sample analyses and validation. Progress was accepted as satisfactory by the Agency representatives in attendance. In the time since the completion of the prefinal inspection, the final confirmation sample analyses and validation activities have been completed and the results included herein. No further actions are necessary.

7. SUMMARY AND VERIFICATION OF WORK PERFORMED

7.1 Summary of Work Performed

The OU 10-04, Phase III, remediation of the STF-02 Gun Range has been completed in accordance with the *Remedial Design/Remedial Action Work Plan for Operable Units 6-05 and 10-04, Phase III* (DOE-ID 2006a). The remedial action for the site included the following activities:

- Removal of the test stand and burn barrel located in the EOCR leach pond
- Removal of the three asphalt pads located within the gun range as well as the asphalt pad located just south of the gun range boundary
- Removal of the aboveground electrical utilities and abandonment of belowground inactive electrical lines
- Demolition of the shooting house
- Excavation and screening of contaminated soil
- Packaging and transporting remedial action waste
- Treatment and disposal of soil that exceeds the toxicity characteristic concentration for lead
- Sampling and analysis of soil to guide the remedial action and confirm that the remedial action objectives have been achieved
- Backfilling the EOCR leach pond with berm soils that did not exceed the 400-mg/kg remedial action goal for lead
- Contouring the remaining soils to match the surrounding terrain
- Backfilling the affected area with topsoil followed by reseeded with native species.

7.2 Verification of Work Performed

Verification of the work performed was documented throughout the duration of the project. The subcontract technical representative and the subcontractor's job site supervisor maintained daily logsheets that detailed each day's work activities including pre-job briefings, number and names of personnel on the job site and their functions, and ongoing tasks being undertaken at the job site. Periodic management assessments were conducted during the remedial action to verify that work was being completed in accordance with the Phase III RD/RA Work Plan and the planned work order and that the work was on schedule.

A prefinal inspection of the STF-02 Gun Range was conducted with the Agencies on January 11, 2007, to verify that the work outlined in the Phase III RD/RA Work Plan was accomplished. Results of the prefinal inspection are presented in Appendix B. Drawings detailing the contours prior to, during, and after the remedial action are provided in Appendix D.

7.3 Performance Standards and Construction Quality Control

For the STF-02 Gun Range, contaminated soil exceeding the remediation goal of 400 mg/kg for lead was removed in accordance with the requirements delineated in the *Record of Decision Experimental Breeder Reactor-1/Boiling Water Reactor Experiment Area and Miscellaneous Sites, Operable Unit 6-05 and 10-04* (DOE-ID 2002a), as propagated in the Phase III RD/RA Work Plan. Removal and disposal of

soil contaminated with lead mitigated the human health risk associated with this site as well as reduced the ecological risk associated with lead. The 95% upper confidence limit for lead from the sampling results was 3.5 based on the XRF data and 3.0 based on the laboratory data presented on a natural logarithmic scale because of bias introduced by back-transformation. This is compared to the remedial action goal of 6 (400 mg/kg) on a natural logarithmic scale, indicating that the remedial action was successful. The data set for the STF-02 Gun Range site was analyzed following the EPA guidance provided in *Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites* (EPA 2002). The upper confidence limit was calculated using the ProUCL, Version 3.0, software package. Based on comparison of the postremediation lead concentration to the remediation goal, as prescribed by the Phase III Field Sampling Plan, the remediation of the STF-02 Gun Range is successful.

7.4 Institutional Controls

In accordance with the OU 10-04 ROD (DOE-ID 2002a), institutional controls will not be required at STF-02 following remediation if the remedial action goals are achieved. Based on the postremediation lead concentrations being below the remediation goal of 400 mg/kg, institutional controls at the STF-02 site are not required.

8. CERTIFICATION THAT THE REMEDY IS OPERATIONAL AND FUNCTIONAL

As stated in the OU 10-04 ROD (DOE-ID 2002a), the remedial action objectives and the remedial action goals were established to reduce or eliminate the risk to human health and the environment. Given that the remedial action objectives were achieved by evidence that lead concentrations at the STF-02 Gun Range have been reduced below the remedial action goal of 400 mg/kg, institutional controls will not be required at the site. This report certifies that the remedy selected in the *Record of Decision–Experimental Breeder Reactor-1/Boiling Water Reactor Experiment Area and Miscellaneous Sites, Operable Unit 6-05 and 10-04* (DOE-ID 2002a) and detailed in the Phase III RD/RA Work Plan has been completed and the remedy is operational and functional.

9. CONTACT INFORMATION

The OU 10-04 Phase III remedial action was completed by CH2M-WG Idaho, LLC, the primary contractor for the Idaho Cleanup Project, operating under DOE-ID Contract DE-AC07-05ID14516. The potentially responsible parties used the following contractor for the Phase III remedial action:

Primary Contact Name and Title: Lance G. Peterson, President
Company Name: Phenix of Idaho, Inc.
Address: 3655 Professional Way
P.O. Box 1626
Idaho Falls, ID 83403-1626
Phone Number: (208) 524-6488

The following laboratories provided analytical services for the potentially responsible parties:

Company Name: General Engineering Laboratories, LLC
Address: 2040 Savage Road
Charleston, SC 29407
Phone Number: (843) 556-8171

Company Name: CH2M-WG Idaho, LLC
Analytical Laboratories Department
Address: P.O. Box 1625
Scoville, ID 83415
Phone Number: (208) 526-3060

The project manager for the potentially responsible parties was:

Name: Richard P. Wells
Company Name: CH2M-WG Idaho, LLC
Address: P.O. Box 1625, MS 3940
Idaho Falls, ID 83415-3940
Phone Number: (208) 526-2920

The project manager for DOE-ID was:

Name: R. Mark Shaw
Organization: U.S. Department of Energy Idaho Operations Office
Address: P.O. Box 1625, MS 1222
Idaho Falls, ID 83415-1222
Phone Number: (208) 526-6442

The project manager for the EPA was:

Name: Matt Wilkening
Organization: U.S. Environmental Protection Agency, Region 10
Address: 1435 North Orchard St.
Boise, ID 83706
Phone Number: (208) 378-5760

The project manager for the DEQ was:

Name:	Margaretha English
Organization:	Idaho Department of Environmental Quality
Address:	1410 N. Hilton Boise, ID 83706
Phone Number:	(208) 373-0306

10. REFERENCES

- 29 CFR 1910.95, Title 29, “Labor,” Part 1910, “Occupational Safety and Health Standards,” Subpart G, “Occupational Health and Environmental Control,” Section 95, “Occupational Noise Exposure,” *Code of Federal Regulations*, Office of the Federal Register.
- 29 CFR 1910.120, Title 29, “Labor,” Part 1910, “Occupational Safety and Health Standards,” Subpart H, “Hazardous Materials,” *Code of Federal Regulations*, Office of the Federal Register.
- 29 CFR 1910.134, Title 29, “Labor,” Part 1910, “Occupational Safety and Health Standards,” Subpart I, “Personal Protective Equipment,” Section 134, “Respiratory Protection,” *Code of Federal Regulations*, Office of the Federal Register.
- 29 CFR 1910.1025, Title 29, “Labor,” Part 1910, “Occupational Safety and Health Standards,” Section 1025, “Lead,” *Code of Federal Regulations*, Office of the Federal Register.
- 29 CFR 1926.21, Title 29, “Labor,” Part 1926, “Safety and Health Regulations for Construction,” Subpart C, “General Safety and Health Provisions,” Section 21, “Safety Training and Education,” *Code of Federal Regulations*, Office of the Federal Register.
- 29 CFR 1926.62, Title 29, “Labor,” Part 1926, “Safety and Health Regulations for Construction,” Subpart D, “Occupational Health and Environmental Controls,” Section 62, “Lead,” *Code of Federal Regulations*, Office of the Federal Register.
- 29 CFR 1926.65, Title 29, “Labor,” Part 1926, “Safety and Health Regulations for Construction,” Subpart D, “Occupational Health and Environmental Controls,” Section .65, “Hazardous Waste Operations and Emergency Response,” *Code of Federal Regulations*, Office of the Federal Register.
- 40 CFR 261.24, Title 40, “Protection of Environment,” Part 261, “Identification and Listing of Hazardous Waste,” Section 24, “Toxicity Characteristic,” *Code of Federal Regulations*, Office of the Federal Register.
- 40 CFR 264, Title 40, “Protection of Environment,” Part 264, “Standards for Owners and Operators of Hazardous Waste Treatment Storage and Disposal Facilities,” Subpart I, “Use and Management of Containers,” *Code of Federal Regulations*, Office of the Federal Register.
- 40 CFR 268.49, Title 40, “Protection of Environment,” Part 268, “Land Disposal Restrictions,” Section 49, “Alternative LDR Treatment Standards for Contaminated Soil,” *Code of Federal Regulations*, Office of the Federal Register.
- 42 USC § 6901 et seq., 1976, “Resource Conservation and Recovery Act (Solid Waste Disposal Act),” *United States Code*, October 21, 1976.
- 42 USC § 9601 et seq., 1980, “Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA/Superfund),” *United States Code*, December 11, 1980.
- 56 FR 50634, 1991, “Sole Source Designation of the Eastern Snake River Plain Aquifer, Southern Idaho; Final Determination, U.S. Environmental Protection Agency,” *Federal Register*, U.S. Environmental Protection Agency, October 7, 1991.

- DOE-ID, 2006a, *Remedial Design/Remedial Action Work Plan for Operable Units 6-05 and 10-04, Phase III*, DOE/NE-ID-11202, Rev. 1, U.S. Department of Energy Idaho Operations Office.
- DOE-ID, 2006b, *Field Sampling Plan for the Operable Units 6-05 and 10-04 Remedial Action, Phase III*, DOE/NE-ID-11212, Rev. 1, U.S. Department of Energy Idaho Operations Office.
- DOE-ID, 2006c, *Quality Assurance Project Plan for Waste Area Groups 1, 2, 3, 4, 5, 6, 7, 10, and Deactivation, Decontamination, and Decommissioning*, DOE/ID-10587, Rev. 9, U.S. Department of Energy Idaho Operations Office.
- DOE-ID, 2005a, *Track 2 Summary Report for Operable Unit 10-08 Sites MISC-033, CFA-10A, TRA-60, and TRA-63*, DOE/NE-ID-11232, Rev. 0, U.S. Department of Energy Idaho Operations Office.
- DOE-ID, 2005b, *Idaho National Engineering and Environmental Laboratory Waste Acceptance Criteria*, DOE/ID-10381, Rev. 21, U.S. Department of Energy Idaho Operations Office.
- DOE-ID, 2003, *Operable Units 6-05 and 10-04, Experimental Breeder Reactor-I/Boiling Water Reactor Experiment Area and Miscellaneous Sites, Remedial Design/Remedial Action Scope of Work*, DOE/ID-11035, Rev. 0, U.S. Department of Energy Idaho Operations Office.
- DOE-ID, 2002a, *Record of Decision Experimental Breeder Reactor-I/Boiling Water Reactor Experiment Area and Miscellaneous Sites, Operable Units 6-05 and 10-04*, DOE/ID-10980, Rev. 0, U.S. Department of Energy Idaho Operations Office.
- DOE-ID, 2002b, *Track 1 Decision Documentation Package – Site 003 (MISC-33) Operable Unit 10-08, Experimental Test Drum in EOCR-01 Leach Pond*, 24882, U.S. Department of Energy Idaho Operations Office.
- DOE-ID, 2001, *Comprehensive Remedial Investigation/Feasibility Study for Waste Area Groups 6 and 10 Operable Unit 10-04*, DOE/ID-10807, Rev. 0, U.S. Department of Energy Idaho Operations Office.
- DOE-ID, 1991, *Federal Facility Agreement and Consent Order for the Idaho National Engineering Laboratory*, Administrative Record No. 1088-06-29-120, U.S. Department of Energy Operations Office; U.S. Environmental Protection Agency, Region 10; Idaho Department of Health and Welfare, December 4, 1991.
- EPA, 2004, *ProUCL*, Version 3, Environmental Protection Agency Technical Support Center, Las Vegas, Nevada.
- EPA, 2002, *Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites*, OSWER 9285.6-10, U.S. Environmental Protection Agency.
- EPA, 1996a, SW-186, Method 6010B, “Inductively Coupled Plasma-Atomic Emission Spectrometry,” Rev. 2, *On-Line Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods*, <http://www.epa.gov/epaoswer/hazwaste/test/under.htm>, U.S. Environmental Protection Agency, Office of Solid Waste.
- EPA, 1996b, SW-186, Method 3050B, “Acid Digestion of Sediments, Sludges, and Soils,” Rev. 2, *On-Line Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods*, <http://www.epa.gov/epaoswer/hazwaste/test/under.htm>, U.S. Environmental Protection Agency, Office of Solid Waste.

- EPA, 1994, SW-186, Method 6020, “Inductively Coupled Plasma-Mass Spectrometry,” Rev. 0, *On-Line Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods*, <http://www.epa.gov/epaoswer/hazwaste/test/under.htm>, U.S. Environmental Protection Agency, Office of Solid Waste.
- EPA, 1992a, SW-186, Method 1311, “Toxicity Characteristic Leaching Procedure,” Rev. 0, *On-Line Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods*, <http://www.epa.gov/epaoswer/hazwaste/test/under.htm>, U.S. Environmental Protection Agency, Office of Solid Waste.
- EPA, 1992b, SW-186, Method 3010A, “Acid Digestion of Aqueous Samples and Extracts for Total Metals for Analysis by FLAA or ICP Spectroscopy,” Rev. 1, *On-Line Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods*, <http://www.epa.gov/epaoswer/hazwaste/test/under.htm>, U.S. Environmental Protection Agency, Office of Solid Waste.
- EPA, 1988, *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*, Interim Final, EPA/540/G-89/004, U.S. Environmental Protection Agency.
- Helsel, D. R., 2005, *Nondetects and Data Analysis: Statistics for Censored Environmental Data*, John Wiley and Sons, New York.
- IDAPA 58.01.05.011, “Land Disposal Restrictions,” Idaho Administrative Procedures Act.
- INL, 2005, *Idaho National Laboratory Comprehensive Land Use and Environmental Stewardship Report*, INL/EXT-05-00726, Rev. 0, Idaho National Laboratory, September 2005.
- NIOSH, 1994, “Lead by Flame AAS,” Analytical Method 7082, Issue 2, National Institute of Occupational Safety and Health.
- PLN-2128, “Miscellaneous Sites Cleanup Project Health and Safety Plan,” Rev. 2, October 31, 2006.
- Rapanos et Ux., et al. v. United states, No. 04-1034, June 19, 2006.
- Ryan, Mark A., 2003, “Stormwater Compliance at the INEEL,” CCN 46063, U.S. Environmental Protection Agency, Region X, Idaho Operations Office, letter to Amy Grose, U.S. Department of Energy Idaho Operations Office, October 27, 2003.
- STD-101, “ICP Integrated Work Control Process,” Rev. 19, October 26, 2006.

Appendix A

STF-02 Gun Range Photographic Record of Remediation Activities

Appendix A

STF-02 Gun Range Photographic Record of Remediation Activities

The photographic record in this appendix provides a pictorial summary of the progression of the remedial action at the STF-02 Gun Range from the initial preremediation sampling through the revegetation and mulching of the site.



Figure A-1. STF-02 Gun Range prior to remediation.



Figure A-2. STF-02 Gun Range preremediation sample locations.



Figure A-3. Experimental Organic-Cooled Reactor Pond preremediation sample locations.



Figure A-4. Test barrel in Experimental Organic-Cooled Reactor Pond.



Figure A-5. Excavation of Berm A.



Figure A-6. Backfilling the Experimental Organic-Cooled Reactor Pond.



Figure A-7. Test barrel following removal.



Figure A-8. Excavating Berm E.

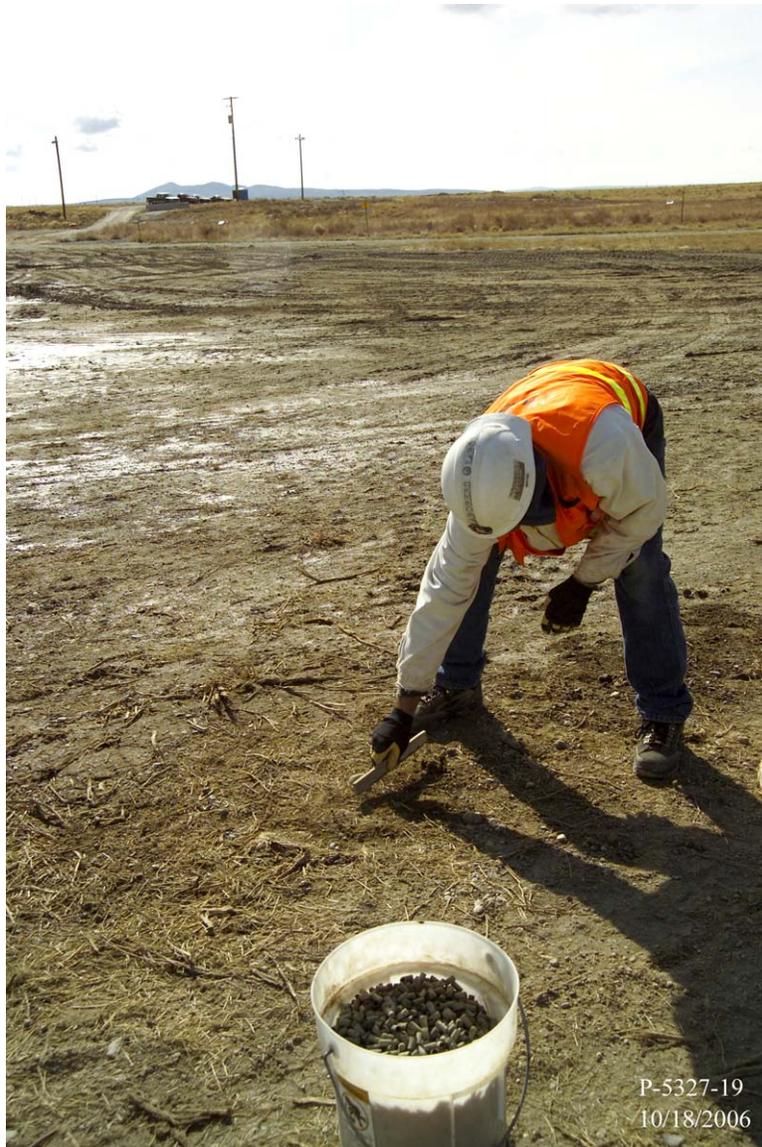


Figure A-9. Removing spent ammunition casings by hand.



Figure A-10. Berm E excavation prior to shooting house demolition.



Figure A-11. Shooting house removal.



Figure A-12. Segregation of lead-contaminated railroad ties.



Figure A-13. Sampling an excavation location in the Experimental Organic-Cooled Reactor Pond.



Figure A-14. Labeling a soil sample container.



Figure A-15. Temporary staging of railroad ties prior to shipment.



Figure A-16. Screening of lead-contaminated soils.



Figure A-17. Temporary soil staging piles.



Figure A-18. Loading contaminated soil into the screening plant.



Figure A-19. Excavation of Berm B prior to screening.



Figure A-20. Excavation of contaminated location between the berms.



Figure A-21. View of staging piles following completion of screening.



Figure A-22. Railroad tie shipping containers with wood chip mulch in background.



Figure A-23. Loading of soil shipping intermodal containers.



Figure A-24. Placing intermodal containers on shipping trailer.



Figure A-25. STF-02 Gun Range prior to final contouring.



Figure A-26. STF-02 Gun Range following reseeding and mulching.



Figure A-27. STF-02 Gun Range with remediation complete.

Appendix B
Remedial Action Analytical Summaries

Appendix B

Remedial Action Analytical Summaries

The analytical summaries in this appendix present data from the various sampling conducted during the remedial action at the STF-02 Gun Range, including the data generated by analytical laboratories and by the portable x-ray fluorescence spectrometer.

Table B-1. Preremediation analytical results.

Sample ID #	Location	Depth	Lead Conc. (mg/kg)	Q
GR110101LD	A1	0-0.5 ft	11.3	J
GR110201LD	A5	0-0.5 ft	10.7	J
GR110202LD	A5	0-0.5 ft	11.7	J
GR110301LD	A9	0-0.5 ft	12.7	J
GR110401LD	A13	0-0.5 ft	10.2	J
GR110501LD	A17	0-0.5 ft	11.3	J
GR110601LD	A21	0-0.5 ft	21.8	J
GR110701LD	A25	0-0.5 ft	14.4	J
GR110801LD	A29	0-0.5 ft	13.6	J
GR110901LD	A33	0-0.5 ft	11.6	J
GR111001LD	A37	0-0.5 ft	26.3	J
GR111101LD	A41	0-0.5 ft	42.2	J
GR111201LD	A45	0-0.5 ft	28.1	J
GR111301LD	A49	0-0.5 ft	53.3	J
GR111401LD	B1	0-0.5 ft	24.9	J
GR111501LD	B5	0-0.5 ft	43.9	J
GR111601LD	B9	0-0.5 ft	92	J
GR111701LD	B13	0-0.5 ft	24.8	J
GR111801LD	B17	0-0.5 ft	258	J
GR111901LD	B21	0-0.5 ft	158	J
GR112001LD	B25	0-0.5 ft	124	
GR112101LD	B29	0-0.5 ft	71.1	
GR112102LD	B29	0-0.5 ft	1,940	
GR112201LD	B33	0-0.5 ft	74.2	
GR112301LD	B37	0-0.5 ft	505	
GR112401LD	B41	0-0.5 ft	2,220	
GR112501LD	B45	0-0.5 ft	15,400	
GR112601LD	B74	0-0.5 ft	12.3	J
GR112701LD	B95	0-0.5 ft	19.7	
GR112801LD	C1	0-0.5 ft	13.9	J
GR112901LD	C5	0-0.5 ft	21.8	J
GR113001LD	C9	0-0.5 ft	67	J

Table B-1. (continued).

Sample ID #	Location	Depth	Lead Conc. (mg/kg)	Q
GR113101LD	C24	0-0.5 ft	12.1	J
GR113201LD	C28	0-0.5 ft	10.8	J
GR113301LD	C32	0-0.5 ft	11.7	J
GR113401LD	C33	0-0.5 ft	15.6	J
GR113501LD	C37	0-0.5 ft	15.7	J
GR113601LD	C41	0-0.5 ft	0.12	J
GR113701LD	C45	0-0.5 ft	0.17	J
GR113801LD	C49	0-0.5 ft	67.6	J
GR113901LD	C53	0-0.5 ft	20.3	J
GR114001LD	C57	0-0.5 ft	13.3	J
GR114101LD	C61	0-0.5 ft	11.1	J
GR114102LD	C61	0-0.5 ft	0.12	J
GR114201LD	D1	0-0.5 ft	9.6	
GR114301LD	D5	0-0.5 ft	45.1	
GR114401LD	D9	0-0.5 ft	8.1	
GR114501LD	D13	0-0.5 ft	11.6	
GR114601LD	D17	0-0.5 ft	11.3	
GR114701LD	D21	0-0.5 ft	14.1	
GR114801LD	D25	0-0.5 ft	10.8	
GR114901LD	E1	0-0.5 ft	9.2	
GR115001LD	E5	0-0.5 ft	8.8	
GR115101LD	E9	0-0.5 ft	12.5	
GR115201LD	E13	0-0.5 ft	16.1	
GR115301LD	E17	0-0.5 ft	11.1	
GR115401LD	B51	0-0.5 ft	58	
GR115501LD	B51	0.5-1.5 ft	10.5	
GR115601LD	B52	0-0.5 ft	292	
GR115701LD	B52	0.5-1.5 ft	21.8	
GR115801LD	B53	0-0.5 ft	1,360	
GR115901LD	B53	0.5-1.5 ft	58.2	
GR116001LD	B54	0-0.5 ft	6,370	
GR116101LD	B54	0.5-1.5 ft	174	
GR116102LD	B54	0.5-1.5 ft	257	
GR116201LD	B55	0-0.5 ft	3,460	
GR116301LD	B56	0.5-1.5 ft	20.6	
GR116401LD	B57	0-0.5 ft	383	
GR116501LD	B57	0.5-1.5 ft	74.3	
GR116601LD	B58	0-0.5 ft	1,080	
GR116701LD	B58	0.5-1.5 ft	94.1	
GR116801LD	B59	0-0.5 ft	788	
GR116901LD	B59	0.5-1.5 ft	33.5	

Table B-1. (continued).

Sample ID #	Location	Depth	Lead Conc. (mg/kg)	Q
GR117001LD	B60	0–0.5 ft	7.4	J
GR117101LD	B60	0.5–1.5 ft	333	J
GR117201LD	B61	0–0.5 ft	728	J
GR117301LD	B61	0.5–1.5 ft	882	J
GR117401LD	B62	0–0.5 ft	94.6	J
GR117501LD	B62	0.5–1.5 ft	68.5	J
GR117601LD	B63	0–0.5 ft	62.2	J
GR117701LD	B63	0.5–1.5 ft	8.4	J
GR117801LD	B64	0–0.5 ft	177	J
GR117901LD	B64	0.5–1.5 ft	10.4	J
GR118001LD	B65	0–0.5 ft	144	J
GR118101LD	B65	0.5–1.5 ft	9.8	J
GR118102LD	B65	0.5–1.5 ft	7.3	J
GR118201LD	B66	0–0.5 ft	125	J
GR118301LD	B66	0.5–1.5 ft	13.4	J
GR118401LD	B67	0–0.5 ft	163	J
GR118501LD	B67	0.5–1.5 ft	83.7	J
GR118601LD	B68	0–0.5 ft	96	J
GR118701LD	B68	0.5–1.5 ft	9.9	J
GR118801LD	B69	0–0.5 ft	11.9	J
GR118901LD	B69	0.5–1.5 ft	8.3	J
GR119001LD	B70	0–0.5 ft	32.9	J
GR119101LD	B70	0.5–1.5 ft	34.7	J
GR119201LD	B75	0–0.5 ft	18.6	J
GR119301LD	B75	0.5–1.5 ft	9.7	J
GR119401LD	B76	0–0.5 ft	11.6	J
GR119501LD	B76	0.5–1.5 ft	28.1	J
GR119601LD	B77	0–0.5 ft	13.9	J
GR119701LD	B77	0.5–1.5 ft	31.5	J
GR119801LD	B78	0–0.5 ft	9.1	J
GR119901LD	B78	0.5–1.5 ft	12.8	J
GR120001LD		Grain-size Distribution		
GR120101LD		Grain-size Distribution		
GR120201LD		Grain-size Distribution		
GR120301LD		Grain-size Distribution		
GR120401LD		Grain-size Distribution		
GR120501LD		Grain-size Distribution		
GR120601LD		Grain-size Distribution		
GR120701LD		Grain-size Distribution		
GR120801LD		Grain-size Distribution		
GR120901LD		Grain-size Distribution		

Table B-1. (continued).

Sample ID #	Location	Depth	Lead Conc. (mg/kg)	Q
GR121001LD	B55	0.5–1.5 ft	412	
GR121101LD	B56	0–0.5 ft	3,360	
GR121102LD	B56	0–0.5 ft	4,880	
GR1A0101LD	B79	0–0.5 ft	9.6	J
GR1A0201LD	B79	0.5–1.5 ft	10.2	J
GR1A0301LD	B80	0–0.5 ft	8.9	J
GR1A0401LD	B80	0.5–1.5 ft	12.6	J
GR1A0501LD	B81	0–0.5 ft	312	J
GR1A0601LD	B81	0.5–1.5 ft	341	J
GR1A0701LD	B82	0–0.5 ft	312	J
GR1A0801LD	B82	0.5–1.5 ft	83.6	J
GR1A0901LD	B83	0–0.5 ft	523	J
GR1A1001LD	B83	0.5–1.5 ft	448	J
GR1A1101LD	B84	0–0.5 ft	1,590	J
GR1A1201LD	B84	0.5–1.5 ft	12,700	J
GR1A1301LD	B85	0–0.5 ft	1,180	J
GR1A1401LD	B85	0.5–1.5 ft	841	J
GR1A1501LD	B86	0–0.5 ft	6,190	J
GR1A1601LD	B86	0.5–1.5 ft	1,950	J
GR1A1701LD	B87	0–0.5 ft	3,900	J
GR1A1801LD	B87	0.5–1.5 ft	1,760	J
GR1A1901LD	B88	0–0.5 ft	1,890	J
GR1A2001LD	B88	0.5–1.5 ft	1,730	J
GR1A2002LD	B88	0.5–1.5 ft	1,310	J
GR1A2101LD	B89	0–0.5 ft	2,940	J
GR1A2201LD	B89	0.5–1.5 ft	1,800	J
GR1A2301LD	B90	0–0.5 ft	689	J
GR1A2401LD	B90	0.5–1.5 ft	761	
GR1A2501LD	B91	0–0.5 ft	724	
GR1A2601LD	B91	0.5–1.5 ft	4,570	
GR1A2701LD	B92	0–0.5 ft	1,160	
GR1A2801LD	B92	0.5–1.5 ft	23.4	
GR1A2901LD	B93	0–0.5 ft	417	
GR1A3001LD	B93	0.5–1.5 ft	37.5	
GR1A3101LD	B94	0–0.5 ft	213	
GR1A3201LD	B94	0.5–1.5 ft	8.6	
GR1A3301LD	C10	0–0.5 ft	10.9	J
GR1A3401LD	C10	0.5–1.5 ft	11.8	J
GR1A3501LD	C11	0–0.5 ft	8.3	J
GR1A3601LD	C11	0.5–1.5 ft	14.9	J
GR1A3701LD	C12	0–0.5 ft	8.5	J

Table B-1. (continued).

Sample ID #	Location	Depth	Lead Conc. (mg/kg)	Q
GR1A3801LD	C12	0.5–1.5 ft	27.8	J
GR1A3901LD	C13	0–0.5 ft	7.8	J
GR1A4001LD	C13	0.5–1.5 ft	26.8	J
GR1A4002LD	C13	0.5–1.5 ft	27.4	J
GR1A4101LD	C14	0–0.5 ft	8.2	J
GR1A4201LD	C14	0.5–1.5 ft	14.7	J
GR1A4301LD	C15	0–0.5 ft	8.1	J
GR1A4401LD	C15	0.5–1.5 ft	203	J
GR1A4501LD	C16	0–0.5 ft	11.7	J
GR1A4601LD	C16	0.5–1.5 ft	334	J
GR1A4701LD	C17	0–0.5 ft	18.8	J
GR1A4801LD	C17	0.5–1.5 ft	807	J
GR1A4901LD	C18	0–0.5 ft	200	J
GR1A5001LD	C18	0.5–1.5 ft	426	J
GR1A5101LD	C19	0–0.5 ft	267	J
GR1A5201LD	C19	0.5–1.5 ft	42.8	J
GR1A5301LD	C20	0–0.5 ft	9.2	J
GR1A5401LD	C20	0.5–1.5 ft	238	J
GR1A5501LD	C21	0–0.5 ft	86	J
GR1A5601LD	C21	0.5–1.5 ft	212	J
GR1A5701LD	C22	0–0.5 ft	59.6	J
GR1A5801LD	C22	0.5–1.5 ft	260	J
GR1A5901LD	C23	0–0.5 ft	10.6	J
GR1A6001LD	C23	0.5–1.5 ft	15	J
GR1A6002LD	C23	0.5–1.5 ft	7.9	
GR1A6101LD	F1	0–0.5 ft	33.9	J
GR1A6201LD	F2	0–0.5 ft	20.5	J
GR1A6301LD	F3	0–0.5 ft	8.5	J
GR1A6401LD	F4	0–0.5 ft	17.4	J
GR1A6501LD	F5	0–0.5 ft	13	J
GR1A6601LD	F6	0–0.5 ft	28.9	J
GR1A6701LD	F7	0–0.5 ft	56.8	R
GR1A6801LD	F8	0–0.5 ft	26.5	R
GR1A6901LD	F9	0–0.5 ft	21	R
GR1A7001LD	F10	0–0.5 ft	19.2	J
GR1A7101LD	F11	0–0.5 ft	31.3	J
GR1A7201LD	F12	0–0.5 ft	27.4	J
GR1A7301LD	F13	0–0.5 ft	75.4	J
GR1A7401LD	F14	0–0.5 ft	254	J
GR1A7501LD	F15	0–0.5 ft	273	J
GR1A7601LD	F16	0–0.5 ft	272	J

Table B-1. (continued).

Sample ID #	Location	Depth	Lead Conc. (mg/kg)	Q
GR1A7701LD	F17	0-0.5 ft	563	J
GR1A7801LD	F18	0-0.5 ft	560	J
GR1A7901LD	F19	0-0.5 ft	199	J
GR1A8001LD	F20	0-0.5 ft	91.3	J
GR1A8102LD	F20	0-0.5 ft	89.2	J
GR1A8101LD	F21	0-0.5 ft	29.8	J
GR1A8201LD	F22	0-0.5 ft	56.6	J
GR1A8301LD	F23	0-0.5 ft	42.1	J
GR1A8401LD	F24	0-0.5 ft	53.6	J
GR1A8501LD	F25	0-0.5 ft	48.6	J
GR1A8601LD	F26	0-0.5 ft	24.4	J
GR1A8701LD	F27	0-0.5 ft	14.5	J
GR1A8801LD	F28	0-0.5 ft	62.3	J
GR1A8901LD	F29	0-0.5 ft	49.4	J
GR1A9001LD	F30	0-0.5 ft	46,100	J
GR1A9101LD	F31	0-0.5 ft	25	J
GR1A9201LD	F32	0-0.5 ft	19.1	J
GR1A9301LD	F33	0-0.5 ft	11.2	J
GR1A9401LD	F34	0-0.5 ft	15.1	J
GR1A9501LD	F35	0-0.5 ft	22.6	J
GR1A9601LD	F36	0-0.5 ft	36.5	J
GR1A9701LD	F37	0-0.5 ft	15.3	J
GR1A9801LD	F38	0-0.5 ft	31	J
GR1A9901LD	F39	0-0.5 ft	14.2	J
GR1B0101LD	F40	0-0.5 ft	84.4	J
GR1B0102LD	F40	0-0.5 ft	88.6	J
GR1B0201LD	F41	0-0.5 ft	18.9	J
GR1B0301LD	F42	0-0.5 ft	27.5	
GR1B0401LD	F43	0-0.5 ft	31.7	
GR1B0501LD	F44	0-0.5 ft	288	
GR1B0601LD	F45	0-0.5 ft	16.3	
GR1B0701LD	F46	0-0.5 ft	60.9	
GR1B0801LD	F47	0-0.5 ft	913	
GR1B0901LD	F48	0-0.5 ft	346	
GR1B1001LD	F49	0-0.5 ft	120	
GR1B1101LD	F50	0-0.5 ft	27.2	
GR1B1201LD	F51	0-0.5 ft	25.5	
GR1B1301LD	F52	0-0.5 ft	29.3	
GR1B1401LD	F53	0-0.5 ft	36.8	
GR1B1501LD	F54	0-0.5 ft	50.5	
GR1B1601LD	F55	0-0.5 ft	55.2	

Table B-1. (continued).

Sample ID #	Location	Depth	Lead Conc. (mg/kg)	Q
GR1B1701LD	F56	0-0.5 ft	89	
GR1B1801LD	F57	0-0.5 ft	79.1	
GR1B1901LD	F58	0-0.5 ft	13.6	
GR1B2001LD	F59	0-0.5 ft	17.5	
GR1B2101LD	F60	0-0.5 ft	24.4	
GR1B2102LD	F60	0-0.5 ft	17.6	
GR1B2201LD	F61	0-0.5 ft	32.2	R
GR1B2301LD	F62	0-0.5 ft	26.6	R
GR1B2401LD	F63	0-0.5 ft	36.8	R
GR1B2501LD	F64	0-0.5 ft	35.3	R
GR1B2601LD	F65	0-0.5 ft	39.8	
GR1B2701LD	F66	0-0.5 ft	21.6	
GR1B2801LD	F67	0-0.5 ft	66.4	
GR1B2901LD	F68	0-0.5 ft	86.5	
GR1B3001LD	F69	0-0.5 ft	40.7	
GR1B3101LD	F70	0-0.5 ft	90.5	
GR1B3201LD	F71	0-0.5 ft	23.6	
GR1B3301LD	F72	0-0.5 ft	94.5	
GR1B3401LD	F73	0-0.5 ft	21.8	
GR1B3501LD	F74	0-0.5 ft	41.7	
GR1B3601LD	F75	0-0.5 ft	577	
GR1B3701LD	F76	0-0.5 ft	954	
GR1B3801LD	F77	0-0.5 ft	107	
GR1B3901LD	F78	0-0.5 ft	17.9	
GR1B4001LD	F79	0-0.5 ft	17.2	
GR1B4101LD	F80	0-0.5 ft	17.7	
GR1B4102LD	F80	0-0.5 ft	18.6	
GR1B4201LD	F81	0-0.5 ft	53.9	
GR1B4301LD	F82	0-0.5 ft	57.8	
GR1B4401LD	F83	0-0.5 ft	509	
GR1B4501LD	F84	0-0.5 ft	156	J
GR1B4601LD	F85	0-0.5 ft	62.7	J
GR1B4701LD	F86	0-0.5 ft	47.2	J
GR1B4801LD	F87	0-0.5 ft	49.8	J
GR1B4901LD	F88	0-0.5 ft	30.7	J
GR1B5001LD	F89	0-0.5 ft	24.9	J
GR1B5101LD	F90	0-0.5 ft	14.4	J
GR1B5201LD	F91	0-0.5 ft	16.9	J
GR1B5301LD	F92	0-0.5 ft	37.7	J
GR1B5401LD	F93	0-0.5 ft	94	J
GR1B5501LD	F94	0-0.5 ft	45.9	J

Table B-1. (continued).

Sample ID #	Location	Depth	Lead Conc. (mg/kg)	Q
GR1B5601LD	F95	0-0.5 ft	41.3	J
GR1B5701LD	F96	0-0.5 ft	362	J
GR1B5801LD	F97	0-0.5 ft	51	J
GR1B5901LD	F98	0-0.5 ft	24.6	J
GR1B6001LD	F99	0-0.5 ft	26.3	J
GR1B6101LD	F100	0-0.5 ft	69.6	J
GR1B6102LD	F100	0-0.5 ft	28.3	J
GR1B6201LD	F101	0-0.5 ft	15.9	J
GR1B6301LD	F102	0-0.5 ft	49.8	J
GR1B6401LD	F103	0-0.5 ft	6,790	
GR1B6501LD	F104	0-0.5 ft	2,350	
GR1B6601LD	F105	0-0.5 ft	59.8	
GR1B6701LD	F106	0-0.5 ft	23.7	
GR1B6801LD	F107	0-0.5 ft	58.6	
GR1B6901LD	F108	0-0.5 ft	63.5	
GR1B7001LD	F109	0-0.5 ft	200	
GR1B7101LD	F110	0-0.5 ft	68.5	
GR1B7201LD	F111	0-0.5 ft	48.4	
GR1B7301LD	F112	0-0.5 ft	55.6	
GR1B7401LD	F113	0-0.5 ft	72.7	
GR1B7501LD	F114	0-0.5 ft	22.1	
GR1B7601LD	F115	0-0.5 ft	15.3	
GR1B7701LD	F116	0-0.5 ft	19.3	
GR1B7801LD	F117	0-0.5 ft	26.1	
GR1B7901LD	F118	0-0.5 ft	19.9	
GR1B8001LD	F119	0-0.5 ft	17.8	
GR1B8101LD	F120	0-0.5 ft	14.8	
GR1B8102LD	F120	0-0.5 ft	16.2	
GR1B8201LD	F121	0-0.5 ft	34.3	
GR1B8301LD	F122	0-0.5 ft	28.4	J
GR1B8401LD	F123	0-0.5 ft	42.3	J
GR1B8501LD	F124	0-0.5 ft	27.4	J
GR1B8601LD	F125	0-0.5 ft	33.3	J
GR1B8701LD	F126	0-0.5 ft	29.9	J
GR1B8801LD	F127	0-0.5 ft	808	J
GR1B8901LD	F128	0-0.5 ft	35.6	J
GR1B9001LD	F129	0-0.5 ft	37.1	J
GR1B9101LD	F130	0-0.5 ft	35.5	J
GR1B9201LD	F131	0-0.5 ft	43.5	J
GR1B9301LD	F132	0-0.5 ft	61.6	J
GR1B9401LD	F133	0-0.5 ft	951	J

Table B-1. (continued).

Sample ID #	Location	Depth	Lead Conc. (mg/kg)	Q
GR1B9501LD	F134	0-0.5 ft	1,130	J
GR1B9601LD	F135	0-0.5 ft	708	J
GR1B9701LD	F136	0-0.5 ft	2,520	J
No Sample - In Berm	F137	0-0.5 ft	N/A	
No Sample - In Berm	F138	0-0.5 ft	N/A	
No Sample - In Berm	F139	0-0.5 ft	N/A	
No Sample - In Berm	F140	0-0.5 ft	N/A	
No Sample - In Berm	F141	0-0.5 ft	N/A	
No Sample - In Berm	F142	0-0.5 ft	N/A	
No Sample - In Berm	F143	0-0.5 ft	N/A	
No Sample - In Berm	F144	0-0.5 ft	N/A	
No Sample - In Berm	F145	0-0.5 ft	N/A	
GR1C0801LD	F146	0-0.5 ft	18.8	J
GR1C0901LD	F147	0-0.5 ft	45.5	J
GR1C1001LD	F148	0-0.5 ft	18.2	J
GR1C1101LD	F149	0-0.5 ft	33.6	J
GR1C1201LD	F150	0-0.5 ft	10.8	J
GR1C1301LD	F151	0-0.5 ft	10.7	J
GR1C1401LD	F152	0-0.5 ft	9.6	J
GR1C1501LD	F153	0-0.5 ft	19.4	J
GR1C1601LD	F154	0-0.5 ft	14	J
GR1C1701LD	F155	0-0.5 ft	14.3	J
GR1C1801LD	F156	0-0.5 ft	3,130	J
GR1C1901LD	F157	0-0.5 ft	19.5	J
GR1C2001LD	F158	0-0.5 ft	17.4	J
GR1C2101LD	F159	0-0.5 ft	1,840	J
GR1C2102LD	F159	0-0.5 ft	407	J
GR1C2201LD	F160	0-0.5 ft	23.1	J
GR1C2301LD	F161	0-0.5 ft	21	J
GR1C2401LD	F162	0-0.5 ft	17	J
GR1C2501LD	F163	0-0.5 ft	16.6	J
GR1C2601LD	F164	0-0.5 ft	13.9	J
GR1C2701LD	F165	0-0.5 ft	15.4	J
GR1C2801LD	F166	0-0.5 ft	13.6	J
GR1C2901LD	F167	0-0.5 ft	17.6	J
GR1C3001LD	F168	0-0.5 ft	14.8	J
GR1C3101LD	F169	0-0.5 ft	22.9	J
GR1C3201LD	F170	0-0.5 ft	17.8	J
GR1C3301LD	F171	0-0.5 ft	39.9	J
GR1C3401LD	F172	0-0.5 ft	15.3	J
GR1C3501LD	F173	0-0.5 ft	12.8	J

Table B-1. (continued).

Sample ID #	Location	Depth	Lead Conc. (mg/kg)	Q
GR1C3601LD	F174	0-0.5 ft	14.1	J
GR1C3701LD	F175	0-0.5 ft	16.3	J
GR1C3801LD	F176	0-0.5 ft	12.1	J
GR1C3901LD	F177	0-0.5 ft	13.7	J
GR1C4001LD	F178	0-0.5 ft	13.1	J
GR1C4101LD	F179	0-0.5 ft	13.1	J
GR1C4102LD	F179	0-0.5 ft	14.5	J
GR1C4201LD	F180	0-0.5 ft	17.3	J
GR1C4301LD	F181	0-0.5 ft	13.8	J
GR1C4401LD	F182	0-0.5 ft	17	J
GR1C4501LD	F183	0-0.5 ft	29.7	J
GR1C4601LD	F184	0-0.5 ft	19.8	J
GR1C4701LD	F185	0-0.5 ft	16.7	J
GR1C4801LD	F186	0-0.5 ft	16.3	J
GR1C4901LD	F187	0-0.5 ft	16.4	J
GR1C5001LD	F188	0-0.5 ft	77	J
GR1C5101LD	F189	0-0.5 ft	11.7	J
GR1C5201LD	F190	0-0.5 ft	13.6	J
GR1C5301LD	F191	0-0.5 ft	10.7	J
GR1C5401LD	F192	0-0.5 ft	11.6	J
GR1C5501LD	F193	0-0.5 ft	19.3	J
GR1C5601LD	F194	0-0.5 ft	13.3	J
GR1C5701LD	F195	0-0.5 ft	60.4	J
GR1C5801LD	G1	0-0.5 ft	232	
GR1C5901LD	G2	0-0.5 ft	231	
GR1C6001LD	G3	0-0.5 ft	122	
GR1C6101LD	G4	0-0.5 ft	36.7	
GR1C6102LD	G4	0-0.5 ft	51.5	
GR1C6201LD	G5	0-0.5 ft	91.4	
GR1C6301LD	G6	0-0.5 ft	259	
GR1C6401LD	G7	0-0.5 ft	50.9	
GR1C6501LD	G8	0-0.5 ft	34.4	J
GR1C6601LD	G9	0-0.5 ft	19.8	J
GR1C6701LD	G10	0-0.5 ft	89.7	J
GR1C6801LD	G11	0-0.5 ft	42.3	J
GR1C6901LD	G12	0-0.5 ft	21.4	J
GR1C7001LD	G13	0-0.5 ft	26.4	J
GR1C7101LD	G14	0-0.5 ft	97	
GR1C7201LD	G15	0-0.5 ft	231	
GR1C7301LD	G16	0-0.5 ft	25.1	J
GR1C7401LD	G17	0-0.5 ft	23	J

Table B-1. (continued).

Sample ID #	Location	Depth	Lead Conc. (mg/kg)	Q
GR1C7501LD	G18	0-0.5 ft	34.6	J
GR1C7601LD	G19	0-0.5 ft	19.7	J
GR1C7701LD	G20	0-0.5 ft	34.6	J
GR1C7801LD	G21	0-0.5 ft	36.3	J
GR1C7901LD	G22	0-0.5 ft	347	
GR1C8001LD	G23	0-0.5 ft	81.3	
GR1C8101LD	G24	0-0.5 ft	36.9	J
GR1C8102LD	G24	0-0.5 ft	67.4	J
GR1C8201LD	G25	0-0.5 ft	28.6	J
GR1C8301LD	G26	0-0.5 ft	19.5	J
GR1C8401LD	G27	0-0.5 ft	26.9	J
GR1C8501LD	G28	0-0.5 ft	41	J
GR1C8601LD	G29	0-0.5 ft	40.3	J
GR1C8701LD	G30	0-0.5 ft	26.1	
GR1C8801LD	1	0-0.5 ft	14.2	J
GR1C8901LD	2	0-0.5 ft	6	J
GR1C9001LD	3	0-0.5 ft	12.8	J
GR1C9101LD	4	0-0.5 ft	7.2	J
GR1C9201LD	5	0-0.5 ft	11.6	J
GR1C9301LD	6	0-0.5 ft	11.3	J
GR1C9401LD	7	0-0.5 ft	12.5	J
GR1C9501LD	8	0-0.5 ft	12	J
GR1C9601LD	9	0-0.5 ft	11.5	J
GR1C9701LD	10	0-0.5 ft	15.4	J
GR1C9801LD	11	0-0.5 ft	15.9	J
GR1C9901LD	12	0-0.5 ft	12.2	J
GR1D0101LD	13	0-0.5 ft	11.7	J
GR1D0102LD	13	0-0.5 ft	12.2	J
GR1D0201LD	14	5 in.	13.9	J
GR1D0301LD	15	4 in.	13.7	J
GR1D0401LD	16	4 in.	11.7	J
GR1D0501LD	17	3 in.	10.8	J
GR1D0601LD	18	0-0.5 ft	20	J
GR1D0701LD	19	0-0.5 ft	15.9	J
GR1D0801LD	20	0-0.5 ft	15.7	J
GR1D0901LD	21	0-0.5 ft	130	J
GR1D1001LD	22	0-0.5 ft	14.9	J
GR1D1101LD	23	3 in.	12.3	J
GR1D1201LD	24	No Sample - On Basalt		
GR1D1301LD	25	0-0.5 ft	11.1	J
GR1D1401LD	26	0-0.5 ft	12.3	J

Table B-1. (continued).

Sample ID #	Location	Depth	Lead Conc. (mg/kg)	Q
GR1D1501LD	27	No Sample - On Basalt		
GR1D1601LD	28	0-0.5 ft	12.1	J
GR1D1701LD	29	0-0.5 ft	11.7	J
GR1D1801LD	30	4 in.	8.6	J
GR1D1901LD	31	0-0.5 ft	12.5	J
GR1D2001LD	32	0-0.5 ft	11.8	J
GR1D2101LD	33	0-0.5 ft	11.2	J
GR1D2102LD	33	0-0.5 ft	12.5	J
GR1D2201LD	34	4 in.	10.9	J
GR1D2301LD	35	5 in.	14.1	J
GR1D2401LD	36	No Sample - On Basalt		
GR1D2501LD	37	No Sample - On Basalt		
GR1D2601LD	38	No Sample - On Basalt		
GR1D2701LD	39	No Sample - On Basalt		
GR1D2801LD	40	No Sample - On Basalt		
GR1D2901LD	41	1 in.	10.1	J
GR1D3001LD	42	2 in.	18	J
GR1D3101LD	43	0-0.5 ft	13.2	J
GR1D3201LD	44	0-0.5 ft	11.7	J
GR1D3301LD	45	3 in.	13.4	J
GR1D3401LD	46	2 in.	8.6	
GR1D3501LD	47	4 in.	7.5	
GR1D3601LD	48	0-0.5 ft	11.2	
GR1D3701LD	49	No Sample - On Basalt		
GR1D3801LD	50	No Sample - On Basalt		
GR1D3901LD	51	3 in.	14.4	
GR1D4001LD	52	4 in.	7.6	
GR1D4101LD	53	0-0.5 ft	12.9	
GR1D4102LD	53	0-0.5 ft	11.3	
GR1D4201LD	54	0-0.5 ft	12.9	
GR1D4301LD	55	0-0.5 ft	12.8	
GR1D4401LD	56	0-0.5 ft	12.2	
GR1D4501LD	57	0-0.5 ft	10.9	
GR1D4601LD	58	0-0.5 ft	9.9	
GR1D4701LD	59	0-0.5 ft	7.5	
GR1D4801LD	60	0-0.5 ft	9.4	
GR1D4901LD	61	0-0.5 ft	15.1	
GR1D5001LD	62	5 in.	21.3	
GR1D5101LD	63	No Sample - On Basalt		
GR1D5201LD	64	4 in.	8.2	
GR1D5301LD	65	No Sample - On Basalt		

Table B-1. (continued).

Sample ID #	Location	Depth	Lead Conc. (mg/kg)	Q
GR1D5401LD	66	0-0.5 ft	14.6	
GR1D5501LD	67	0-0.5 ft	6.6	
GR1D5601LD	68	3 in.	10	
GR1D5701LD	69	4 in.	12.5	J
GR1D5801LD	70	5 in.	16.5	J
GR1D5901LD	71	3 in.	11.6	J
GR1D6001LD	72	No Sample - On Basalt		
GR1D6101LD	73	3 in.	9.1	J
GR1D6102LD	73	3 in.	9.3	J
GR1D6201LD	74	1 in.	14.4	J
GR1D6301LD	75	2 in.	8.5	J
GR1D6401LD	76	5 in.	11	J
GR1D6501LD	77	0-0.5 ft	10.6	J
GR1D6601LD	78	0-0.5 ft	10.1	J
GR1D6701LD	79	0-0.5 ft	11.4	J
GR1D6801LD	80	0-0.5 ft	11	J
GR1D6901LD	81	0-0.5 ft	16	J
GR1D7001LD	82	0-0.5 ft	14.2	J
GR1D7101LD	83	2 in.	7.1	J
GR1D7201LD	84	No Sample - On Basalt		
GR1D7301LD	85	No Sample - On Basalt		
GR1D7401LD	86	No Sample - On Basalt		
GR1D7501LD	87	No Sample - On Basalt		
GR1D7601LD	88	No Sample - On Basalt		
GR1D7701LD	89	0-0.5 ft	119	J
GR1D7801LD	90	0-0.5 ft	14	J
GR1D7901LD	91	0-0.5 ft	17.2	J
GR1D8001LD	92	0-0.5 ft	12.1	J
GR1D8101LD	93	0-0.5 ft	40.3	J
GR1D8102LD	93	0-0.5 ft	23.4	
GR1D8201LD	94	No Sample - On Basalt		
GR1D8301LD	95	3 in.	16.5	
GR1D8401LD	96	0-0.5 ft	11.5	
GR1D8501LD	97	2 in.	10	
GR1D8601LD	98	3 in.	11.9	
GR1D8701LD	99	No Sample - On Basalt		
GR1D8801LD	100	2 in.	18.2	
GR1D8901LD	101	4 in.	14.6	
GR1D9001LD	102	0-0.5 ft	15.8	
GR1D9101LD	103	0-0.5 ft	10.7	
GR1D9201LD	104	0-0.5 ft	11.8	

Table B-1. (continued).

Sample ID #	Location	Depth	Lead Conc. (mg/kg)	Q
GR1D9301LD	105	4 in.	11.1	
GR1D9401LD	106	0-0.5 ft	11.4	
GR1D9501LD	107	0-0.5 ft	16.2	
GR1D9601LD	108	0-0.5 ft	12.8	
GR1D9701LD	109	0-0.5 ft	13.1	
GR1D9801LD	110	0-0.5 ft	13.2	
GR1D9901LD	111	0-0.5 ft	13	
GR1E0101LD	112	0-0.5 ft	11.1	
GR1E0102LD	112	0-0.5 ft	11.2	
GR1E0201LD	113	0-0.5 ft	9.9	
GR1E0301LD	114	0-0.5 ft	15.1	
GR1E0401LD	115	0-0.5 ft	12.6	
GR1E0501LD	116	0-0.5 ft	13.2	
GR1E0601LD	117	0-0.5 ft	11.4	
GR1E0701LD	118	0-0.5 ft	11.6	
GR1E0801LD	119	0-0.5 ft	9.3	
GR1E0901LD	120	0-0.5 ft	8.8	
GR1E1001LD	121	0-0.5 ft	9.2	
GR1E1101LD	122	0-0.5 ft	9.2	
GR1E1201LD	123	0-0.5 ft	11.8	
GR1E1301LD	124	0-0.5 ft	12.2	
GR1E1401LD	125	0-0.5 ft	12.9	
GR1E1501LD	126	0-0.5 ft	12.4	R

Table B-2. Sieve fraction data.

Fraction	Totals (mg/kg)		TCLP ($\mu\text{g/L}$)		Wt. Ret. (g)	Wt. Pass (g)	% Pass	% Ret	Fragments (g)
	Sample	Duplicate	Sample	Duplicate					
> 3/4	25.1	136	347	451	2,263.07	83,968.47	97.4	2.6	
3/4->3/8	2,030	50.5	1,070	2,560	5,317.84	78,650.63	91.2	6.2	8,059.75
3/8->No. 4 (4.75 mm)	4,310	5,440	107,000	73,100	5,171.18	73479.45	85.2	6	1,069.69
No. 4 (4.75 mm) ->No. 10 (2.00 mm)	159	257,000	380,000	558,000	4,278.18	69,201.27	80.3	4.9	21.67
No. 10 (2.00 mm) ->No. 50 (300 μm)	867	3,130	378,000	208,000	27,878.13	41,323.14	47.9	32.4	
No. 50 (300 μm) ->No. 200 (75 μm)	1,410	1,350	20,200	7,820	38,952.98	2,370.16	2.7	45.2	
< No. 200 (75 μm) (Pan)	4,780	4,780	31,600	29,600	2,370.16	0	0	2.7	

Table B-3. EO CR Pond remediation support analytical results.

Grid #	Sample ID	Lab Data		XRF Data	
		(mg/kg)	Q	V	(mg/kg)
EOCR #1	GR1F0101LD	6.6			< 28.9
EOCR #2	GR1F0201LD	15.17			< 32.7
EOCR #2	GR1F0202LD	18.43			N/A

Table B-4. STF-02 Gun Range berm remediation support analytical results.

Grid #	Sample ID	Lab Data	Q	V	XRF Data		
					Run #1	Run #2	Run #3
B47	GR1F0301LD	17.84			52.6	< 36.9	< 36.5
B50	GR1F0401LD	9.37			47.1	< 30.3	< 40.5
B95	GR1F0501LD	10.27			< 37.5	< 34.5	< 35.9
B51	GR1F0601LD	8.16			< 30.5	< 38.8	< 35.4
B94	GR1F0701LD	10.38			< 47.7	< 33.3	< 36.8
B46	GR1F0801LD	8.86			< 33.1	41.7	< 32.7
B45	GR1F0901LD	9.95			37.8	< 39.0	< 36.2
B44	GR1F1001LD	52.56			176.8	188.2	178.8
B41	GR1F1101LD	11.69			< 37.4	< 35.9	< 37.6
B42	GR1F1201LD	31.88			99.8	45.4	67.8
B43	GR1F1301LD	16.64			< 39.4	< 39.0	< 40.2
B55	GR1F1401LD	11.68			< 32.1	< 33.4	< 31.9
B56	GR1F1501LD	45.41			52.4	76.8	67.7
B54	GR1F1601LD	9.79			< 33.6	95.7	< 31.6
B53	GR1F1701LD	10.5			< 36.0	< 38.1	< 38.8
B36	GR1F1801LD	11.59			< 34.4	< 37.4	< 35.0
B37	GR1F1901LD	11.64			< 38.4	< 38.6	< 33.7
B40	GR1F2001LD	20.82			< 40.8	< 36.3	< 36.3
B52	GR1F2101LD	8.88			< 36.2	< 31.8	< 33.4
B39	GR1F2201LD	27.49	N	R	41.9	40.2	< 36.3
B39	GR1F2202LD	23.01	N	R	N/A	N/A	N/A
B29	GR1F2301LD	10.68	N	R	< 38.5	< 34.0	< 35.9
B38	GR1F2401LD	10.39	N	R	48.3	< 38.0	< 38.0
C16	GR1F2501LD	9.55	N	R	< 33.9	< 30.3	< 31.2
C15	GR1F2601LD	8.42	N	R	50.9	< 38.9	< 32.2
B69	GR1F2701LD	17.67	N	R	< 36.6	< 37.2	< 33.3
B68	GR1F2801LD	8.98	N	R	< 31.4	< 45.0	< 27.0
B75	GR1F2901LD	8.14	N	R	< 33.8	< 39.9	38.4
B64	GR1F3001LD	16.53	N	R	< 35.7	< 34.2	< 32.8
B70	GR1F3101LD	10.11	N	R	48.6	< 36.3	< 31.9
B26	GR1F3201LD	24.48	N	R	< 33.5	< 28.9	36.6
C18	GR1F3301LD	8.71	N	R	44.4	< 35.9	< 34.3
C46	GR1F3401LD	7.72	N	R	< 37.6	< 32.7	< 37.6
C14	GR1F3501LD	8.68	N	R	< 51.4	142.3	< 33.2
C17	GR1F3601LD	8.54	N	R	< 30.1	< 34.4	< 42.1

Table B-4. (continued).

Grid #	Sample ID	Lab Data	Q	V	XRF Data		
					Run #1	Run #2	Run #3
B74	GR1F3701LD	20.06	N	R	< 40.2	42.1	50.9
C47	GR1F3801LD	8.84	N	R	< 37.2	< 36.1	< 32.4
B35	GR1F3901LD	10.08	N	R	< 34.5	< 31.6	< 33.6
B28	GR1F4001LD	11.76			< 35.2	< 38.0	< 35.3
B65	GR1F4101LD	10.24			< 28.3	< 13.8	< 38.5
B31	GR1F4201LD	8.88			< 40.9	< 38.1	< 34.1
B31	GR1F4202LD	9.80			N/A	N/A	N/A
B60	GR1F4301LD	8.85			< 38.7	< 30.8	< 44.2
C48	GR1F4401LD	14.55			< 36.4	< 34.6	< 36.9
C19	GR1F4501LD	7.70			< 31.6	< 35.9	< 35.1
B76	GR1F4601LD	9.52			< 33.4	< 36.1	< 37.8
B62	GR1F4701LD	21.56			< 33.4	< 34.0	< 43.0
B67	GR1F4801LD	9.49			< 37.7	47.3	< 39.7
B27	GR1F4901LD	8.01			< 37.0	< 35.2	91.0
B66	GR1F5001LD	8.87			< 30.4	< 38.2	< 35.7
B61	GR1F5101LD	14.93			< 35.9	< 31.3	< 35.8
B63	GR1F5201LD	9.75			< 27.0	< 28.8	36.3
B63	GR1F5202LD	11.58			N/A	N/A	N/A
B59	GR1F5301LD	65.09			49.3	89.0	79.7
B57	GR1F5401LD	10.45			< 35.6	< 35.0	< 31.4
B32	GR1F5501LD	9.25			< 36.5	< 32.0	< 39.6
B30	GR1F5601LD	8.68			< 35.1	< 29.5	< 32.6
B58	GR1F5701LD	137			< 32.9	< 37.4	< 40.0
B34	GR1F5801LD	15.73			< 39.2	< 36.2	< 37.9
B33	GR1F5901LD	11.59			< 43.2	< 33.8	< 36.2
B77	GR1F6001LD	26.10			< 35.9	< 43.1	48.9
B78	GR1F6101LD	13.92			38.6	< 39.3	45.9
B85	GR1F6201LD	52.27			52.3	47.9	89.0
F133	GR1F6301LD	95.15			106.1	107.4	99.5
B82	GR1F6401LD	125.84			97.8	112.5	134.9
B84	GR1F6501LD	100.99			108.6	135.0	77.6
B83	GR1F6601LD	94.93			77.2	50.9	149.2
B90	GR1F6701LD	303.33			252.3	245.3	239.7
F132	GR1F6801LD	60.33			98.1	58.3	71.0
F103	GR1F6901LD	20.19		U	39.5	< 37.1	< 34.4
F76	GR1F7001LD	36.68		U	40.5	211.5	< 39.0
B86	GR1F7101LD	99.64			55.1	63.4	< 35.9
B87	GR1F7201LD	621.38			276.2	237.2	781.8
B87	GR1F7202LD	779.75			N/A	N/A	N/A
B79	GR1F7301LD	27.11		U	59.8	44.3	52.6
B80	GR1F7401LD	11.62		U	< 38.4	42.4	< 33.7
B81	GR1F7501LD	225.38			93.0	112.2	47.6
F17	GR1F7601LD	43.94		U	42.5	55.9	59.2
F104	GR1F7701LD	47.86		U	237.4	51.9	58.1
F138	GR1F7801LD	9.02		U	< 39.9	< 36.3	< 37.7

Table B-4. (continued).

Grid #	Sample ID	Lab Data	Q	V	XRF Data		
					Run #1	Run #2	Run #3
F18	GR1F7901LD	24.94		U	39.6	< 38.0	48.3
E6	GR1F8001LD	6.48		U	< 35.7	< 31.5	< 26.5
B89	GR1F8101LD	248.53			135.8	122.0	117.7
B91	GR1F8201LD	141.26			126.5	112.2	158.2
B93	GR1F8301LD	21.72		U	< 35.1	42.3	< 37.6
B92	GR1F8401LD	183.61			61.7	61.2	54.7
A51	GR1F8501LD	11.05		U	< 35.6	< 38.5	41.0
B88	GR1F8601LD	84.95			< 35.6	89.3	< 39.7
F137	GR1F8701LD	15.61			< 36.2	< 29.5	< 33.2
F48	GR1F8801LD	6.85			< 30.7	< 30.9	< 37.1
B90-2	GR1F8901LD	7.79			< 33.1	< 35.8	< 32.9
B87	GR1F9001LD	6.22			< 33.3	< 33.9	< 26.9

Table B-5. Remediation support analytical results for the area between the berms.

Grid #	Sample ID	Lab Data	Q	V	XRF Data		
					Run #1	Run #2	Run #3
F30	GR1F9101LD	6.73			< 35.8	< 32.8	< 36.5
F156	GR1F9201LD	12.62			< 34.9	< 29.6	< 36.3
F156	GR1F9202LD	12.76			N/A	N/A	N/A
F182	GR1F9301LD	13.78			41.0	< 40.2	< 37.0
F185	GR1F9401LD	16.34			73.0	50.1	34.0
F194	GR1F9501LD	15.17			< 32.0	< 34.2	< 36.0
F195	GR1F9601LD	16.36			< 32.4	< 38.5	< 38.7
F184	GR1F9701LD	17.96			< 35.0	< 34.3	40.6
F183	GR1F9801LD	17.40			< 30.9	43.4	< 30.0
F172	GR1F9901LD	15.11			44.4	< 34.8	< 37.2
D25	GR1G0101LD	14.60			< 34.3	< 31.6	< 34.4
D24	GR1G0201LD	14.75			< 28.7	< 36.3	< 32.9
D24	GR1G0202LD	19.92			N/A	N/A	N/A
D23	GR1G0301LD	12.25			< 34.1	< 30.3	< 32.6
D20	GR1G0401LD	12.44			< 30.6	< 34.3	< 26.5
D19	GR1G0501LD	23.18			54.0	< 27.5	< 32.3
D18	GR1G0601LD	13.61			< 33.1	< 32.2	< 35.5
D11	GR1G0701LD	12.84			< 37.0	< 38.4	< 31.6
D10	GR1G0801LD	20.28			43.6	< 35.8	63.3
D9	GR1G0901LD	14.13			< 40.3	< 32.2	< 30.3
D8	GR1G1001LD	21.03			< 31.3	43.9	39.3
D21	GR1G1101LD	19.10			< 34.2	41.4	54.0
D22	GR1G1201LD	12.73			< 31.6	< 33.5	< 34.7
D7	GR1G1301LD	28.84			65.1	46.7	45.4
D6	GR1G1401LD	14.48			< 31.3	< 28.9	47.9

Table B-5. (continued).

Grid #	Sample ID	Lab Data	Q	V	XRF Data		
					Run #1	Run #2	Run #3
D5	GR1G1501LD	12.89			< 35.4	34.2	< 29.3
G28	GR1G1601LD	17.87			< 29.5	< 38.4	< 34.4
G29	GR1G1701LD	15.98			< 33.2	< 31.4	< 36.6
G30	GR1G1801LD	19.63			< 34.5	< 38.1	< 31.4
G23	GR1G1901LD	13.55			< 27.6	< 33.8	< 36.4
G24	GR1G2001LD	13.20			< 34.3	< 31.2	< 33.8
G25	GR1G2101LD	11.65			< 30.3	< 36.5	< 33.6
E13	GR1G2201LD	16.45			< 35.7	< 35.9	< 33.7
E13	GR1G2202LD	16.40			N/A	N/A	N/A
D3	GR1G2301LD	25.46			51.6	< 30.7	< 33.5
D13	GR1G2401LD	25.06			< 35.1	< 33.4	< 30.4
D2	GR1G2501LD	44.50			< 35.8	36.3	< 37.8
E12	GR1G2601LD	11.95			51.6	< 37.7	< 37.1
E1	GR1G2701LD	16.22			35.9	45.1	< 33.3
D1	GR1G2801LD	24.58			40.6	61.0	47.7
D14	GR1G2901LD	36.86			< 37.1	< 31.8	62.4
D15	GR1G3001LD	86.63			57.1	61.6	150.4
F145	GR1G3101LD	15.49			< 32.9	< 31.6	< 34.2
F144	GR1G3201LD	10.40			< 34.5	< 34.5	39.9
F143	GR1G3301LD	11.76			< 34.7	< 34.9	< 36.4
F142	GR1G3401LD	13.21			< 34.3	< 32.8	< 38.7
F141	GR1G3501LD	33.78			38.3	< 36.3	< 28.9
F130	GR1G3601LD	9.15			< 37.1	< 28.7	< 34.2
F129	GR1G3701LD	13.92			< 30.0	< 32.6	< 34.0
F128	GR1G3801LD	14.62			< 33.6	< 32.2	< 33.2
F127	GR1G3901LD	14.13			< 31.3	< 32.0	< 29.3
F126	GR1G4001LD	17.11			57.7	< 34.8	< 38.7
F111	GR1G4101LD	15.07			< 31.7	< 37.7	< 30.7
F110	GR1G4201LD	15.23			63.0	< 27.2	< 33.8
F110	GR1G4202LD	13.82			N/A	N/A	N/A
F109	GR1G4301LD	14.45			< 34.2	< 32.0	< 36.7
F108	GR1G4401LD	15.04			< 33.8	< 29.8	< 36.3
F107	GR1G4501LD	14.31			< 39.3	< 33.5	< 32.0
F100	GR1G4601LD	63.61			78.5	62.2	92.0
F99	GR1G4701LD	14.10			< 37.8	< 33.7	< 35.3
F98	GR1G4801LD	12.84			< 34.6	< 29.4	< 36.0
F97	GR1G4901LD	12.62			< 35.6	36.9	< 30.8
F96	GR1G5001LD	7.63			< 30.4	38.2	< 33.8
F83	GR1G5101LD	14.75			40.2	< 31.4	< 36.9
F82	GR1G5201LD	10.11			< 34.2	< 32.2	< 30.1
F81	GR1G5301LD	12.60			< 33.9	< 35.1	< 30.6
F80	GR1G5401LD	13.16			< 30.1	< 30.7	< 39.0

Table B-5. (continued).

Grid #	Sample ID	Lab Data	Q	V	XRF Data		
					Run #1	Run #2	Run #3
F79	GR1G5501LD	50.40			51.8	54.6	48.0
F7	GR1G5601LD	13.61			< 34.9	< 33.8	< 36.6
F8	GR1G5701LD	27.12			< 40.9	< 36.8	< 38.3
F9	GR1G5801LD	12.93			< 40.2	< 36.2	< 35.1
F10	GR1G5901LD	11.81			< 33.4	< 36.2	< 31.7
F25	GR1G6001LD	34.54			49.3	< 36.9	< 35.2
F26	GR1G6101LD	19.52			< 37.7	< 30.5	< 31.4
F27	GR1G6201LD	25.89			46.8	51.8	< 35.4
F27	GR1G6202LD	28.92			N/A	N/A	N/A
F28	GR1G6301LD	14.94			< 30.4	35.8	54.5
F40	GR1G6401LD	13.40			< 29.9	37.3	< 38.1
F41	GR1G6501LD	15.33			35.8	< 32.2	< 35.0
F42	GR1G6601LD	31.22			< 30.7	< 34.3	< 37.3
F39	GR1G6701LD	21.64			< 29.5	33.8	< 39.2
F53	GR1G6801LD	12.46			40.2	< 37.6	< 41.5
F54	GR1G6901LD	15.83			< 35.2	< 28.7	< 34.4
F55	GR1G7001LD	14.72			< 32.9	41.1	< 33.9
F56	GR1G7101LD	15.19			< 32.9	< 31.5	42.0
F72	GR1G7201LD	17.38			< 37.7	43.8	< 32.5
F68	GR1G7301LD	45.07			< 38.7	49.9	40.7
F69	GR1G7401LD	14.93			< 38.7	< 33.0	< 36.6
F70	GR1G7501LD	35.33			78.0	83.5	< 34.7
F83	GR1G7601LD	15.33			< 38.2	< 39.9	< 36.3
F114	GR1G7701LD	217.66			138.8	83.7	78.9
F163	GR1G7801LD	10.97			< 34.7	< 32.4	< 33.4
F155	GR1G7901LD	12.32			< 37.5	< 36.4	45.2
F150	GR1G8001LD	12.70			< 35.1	< 29.2	< 36.8
F116	GR1G8101LD	45.22			172.2	61.3	83.1
F121	GR1G8201LD	22.04			< 32.4	< 34.6	47.9
F121	GR1G8202LD	35.46			N/A	N/A	N/A
F91	GR1G8301LD	20.12			92.7	< 30.4	< 35.6
F93	GR1G8401LD	21.25			< 38.7	< 34.1	< 40.5
F87	GR1G8501LD	294.76			187.6	170.7	222.3
F112	GR1G8601LD	13.75			< 43.7	< 35.9	< 32.5
F86	GR1G8701LD	226.58			81.1	160.1	58.8
F113	GR1G8801LD	100.95			178.9	102.5	64.1
F85	GR1G8901LD	38.96			< 37.5	< 33.7	< 40.1
F95	GR1G9001LD	28.15			47.5	< 39.2	< 33.0
F94	GR1G9101LD	76.64			49.9	103.4	53.3
F84	GR1G9201LD	173.23			215.3	1,040	747.3
F60	GR1G9301LD	23.35			< 36.2	< 37.0	< 37.6
F59	GR1G9401LD	13.82			< 36.3	< 30.1	< 30.5

Table B-5. (continued).

Grid #	Sample ID	Lab Data	Q	V	XRF Data		
					Run #1	Run #2	Run #3
F35	GR1G9501LD	19.02			< 34.5	< 39.1	< 39.0
F31	GR1G9601LD	11.17			< 26.7	< 32.0	< 37.0
F64	GR1G9701LD	109.27			< 40.2	< 36.6	< 34.7
F63	GR1G9801LD	15.22			< 39.9	< 32.9	< 34.2
Z26	GR1G9901LD	11.12			< 32.1	< 35.4	< 34.1
Z25	GR1H0001LD	13.10			< 36.8	< 27.9	< 29.9
Z24	GR1H0101LD	25.14			< 33.9	< 32.9	64.9
Z23	GR1H0201LD	12.85			< 29.3	40.4	< 34.3
Z23	GR1H0202LD	13.82			N/A	N/A	N/A
Z22	GR1H0301LD	16.85			< 31.6	< 35.3	< 31.5
Z21	GR1H0401LD	14.57			< 31.6	< 33.8	< 36.4
Z20	GR1H0501LD	10.42			< 34.3	< 35.6	< 31.5
Z19	GR1H0601LD	16.06			< 34.9	42.6	< 34.9
Z18	GR1H0701LD	9.76			< 36.3	< 31.8	< 25.9
Z17	GR1H0801LD	11.08			< 35.4	< 34.6	< 34.7
Z16	GR1H0901LD	11.56			< 32.3	< 29.0	< 36.2
Z15	GR1H1001LD	13.89			40.1	< 32.3	< 36.6
Z14	GR1H1101LD	14.91			< 33.4	< 33.5	44.1
Z13	GR1H1201LD	14.73			< 33.4	< 32.8	< 32.3
Z12	GR1H1301LD	13.08			< 32.2	< 31.4	< 35.9
Z11	GR1H1401LD	18.92			39.0	43.0	< 35.0
Z10	GR1H1501LD	17.80			38.1	< 32.6	< 31.4
Z9	GR1H1601LD	18.04			< 33.6	< 36.2	< 36.3
Z8	GR1H1701LD	44.14			52.8	51.0	< 31.8
Z7	GR1H1801LD	15.54			< 35.2	< 33.1	47.0
Z6	GR1H1901LD	15.27			< 36.8	< 29.3	< 38.7
Z5	GR1H2001LD	14.51			< 38.1	< 32.7	< 34.7
Z4	GR1H2101LD	17.27			51.2	< 39.7	< 32.3
Z3	GR1H2201LD	12.32			54.1	< 37.3	44.2
Z3	GR1H2202LD	12.56			N/A	N/A	N/A
Z2	GR1H2301LD	12.46			< 33.5	< 33.0	< 37.0
F190	GR1H2401LD	12.74			< 33.4	< 37.0	< 36.3
F189	GR1H2501LD	11.15			< 30.5	< 33.1	< 33.7
F179	GR1H2601LD	13.39			< 34.4	< 32.9	< 38.8
F178	GR1H2701LD	10.87			41.1	< 34.4	< 34.7
F177	GR1H2801LD	14.28			< 33.6	< 33.7	< 35.4
F176	GR1H2901LD	14.00			< 31.0	< 39.0	< 37.9
F167	GR1H3001LD	15.14			< 30.4	< 37.7	< 32.4
F166	GR1H3101LD	15.46			< 38.1	< 33.5	< 31.0
F165	GR1H3201LD	25.41			< 38.9	< 32.3	< 32.4
F164	GR1H3301LD	10.58			< 34.9	< 33.8	< 38.1
F154	GR1H3401LD	11.92			< 48.0	< 34.3	< 37.5

Table B-5. (continued).

Grid #	Sample ID	Lab Data	Q	V	XRF Data		
					Run #1	Run #2	Run #3
F153	GR1H3501LD	8.72			41.2	< 33.4	< 34.0
F152	GR1H3601LD	11.77			38.8	41.8	< 31.0
F151	GR1H3701LD	9.69			< 29.5	< 31.0	< 34.1
F120	GR1H3801LD	11.20			< 33.5	< 32.6	< 35.0
F119	GR1H3901LD	15.08			< 37.0	< 34.0	< 32.5
F118	GR1H4001LD	13.69			51.5	< 35.5	< 38.8
F117	GR1H4101LD	13.93			46.6	< 36.2	< 37.5
F90	GR1H4201LD	13.87			< 32.6	51.0	< 31.7
F90	GR1H4202LD	13.85			N/A	N/A	N/A
F89	GR1H4301LD	15.73			< 29.8	< 32.1	< 33.5
F62	GR1H4401LD	11.84			< 32.9	< 37.1	< 36.0
F61	GR1H4501LD	14.20			40.1	< 31.0	< 32.3
F84-2	GR1H4601LD	16.00			< 40.2	47.3	< 34.3
F85-2	GR1H4701LD	43.41			< 37.3	< 36.9	< 34.5
F86-2	GR1H4801LD	14.37			< 38.6	56.4	67.1
F87-2	N/A	N/A			187.6	187.5	238.4
F87-3	GR1H4901LD	21.96			< 30.9	45.2	< 33.5
F62	GR1H5001LD	14.44			< 34.0	< 33.3	< 34.5
F90	GR1H5101LD	12.66			< 39.9	< 37.8	< 33.0
F89	GR1H5201LD	14.21			< 36.6	< 29.0	< 33.4
F88	GR1H5301LD	65.76			60.0	94.4	92.8
Z08	GR1H5401LD	28.17			49.9	38.4	< 28.3
Z07	GR1H5501LD	16.50			< 39.3	< 35.8	< 38.0
Z06	GR1H5601LD	13.89			33.9	< 33.3	< 31.2
Z05	GR1H5701LD	14.55			37.8	< 33.6	< 35.1
Z04	GR1H5801LD	12.98			< 28.8	< 35.8	< 32.6

Appendix C

Remedial Action Prefinal Inspection Checklist

Appendix A

Remedial Action Prefinal Inspection Checklist

The prefinal inspection checklist in this appendix summarizes the results of the inspection of the STF-02 Gun Range conducted by the Agencies on January 10, 2007.

Table C-1. STF-02 Gun Range prefinal inspection checklist.

Inspection Item	Verification Information	Satisfactory		Comments
		Yes	No	
1. Verify that the three asphalt pads have been removed from the STF-02 Gun Range.	Visual observation Photographic records	X		An inspection was completed on January 10, 2007. The photographic record is provided in Appendix A of the remedial action report.
2. Verify that the perimeter fencing has been removed from the STF-02 Gun Range.	Visual observation Photographic records	X		An inspection was completed on January 10, 2007. The photographic record is provided in Appendix A of the remedial action report.
3. Verify that the shooting house has been removed from the STF-02 Gun Range.	Visual observation Photographic records	X		An inspection was completed on January 10, 2007. The photographic record is provided in Appendix A of the remedial action report.
4. Verify that the berms have been removed from the STF-02 Gun Range.	Visual observation Photographic records	X		An inspection was completed on January 10, 2007. The photographic record is provided in Appendix A of the remedial action report.
5. Verify that the Experimental Organic-Cooled Reactor leach pond has been backfilled and contoured to match the surrounding terrain.	Visual observation Photographic records	X		An inspection was completed on January 10, 2007. The photographic record is provided in Appendix A of the remedial action report.
6. Verify that the STF-02 Gun Range has been regraded and contoured to match the surrounding terrain.	Visual observation Photographic records	X		An inspection was completed on January 10, 2007. The photographic record is provided in Appendix A of the remedial action report.
7. Verify that the soil stockpiles have been removed from the STF-02 Gun Range.	Visual observation Photographic records	X		An inspection was completed on January 10, 2007. The photographic record is provided in Appendix A of the remedial action report.

Table C-1. (continued).

Inspection Item	Verification Information	Satisfactory		Comments
		Yes	No	
8. Verify that the electrical power poles, conduits and abovegrade lines, and ancillary electrical equipment (e.g., electrical panel) have been removed from the STF-02 Gun Range.	Visual observation Photographic records	X		An inspection was completed on January 10, 2007. The photographic record is provided in Appendix A of the remedial action report.
9. Verify that the contaminated soil has been transported and disposed of at an approved facility.	CleanHarbors Invoice	X		An inspection was completed on January 10, 2007. The photographic record is provided in Appendix A of the remedial action report.
10. Verify that the seed mix for revegetation has been tested to verify compliance with specification requirements.	Vendor data submittal	X		An inspection was completed on January 10, 2007. The photographic record is provided in Appendix A of the remedial action report.
11. Verify that appropriate sampling data appear to have been collected to enable the Agencies to determine in the remedial action report whether the remedial action objectives were met.	Data summary	X		An inspection was completed on January 10, 2007. The photographic record is provided in Appendix A of the remedial action report.

Appendix D

STF-02 Gun Range Site Contour Drawings

Appendix D

STF-02 Gun Range Site Contour Drawings

The contour drawings in this appendix present the results of the topographical surveys conducted by a subcontractor at the STF-02 Gun Range prior to remediation, after soil removal, and after final grading and contouring of the site to match the surrounding terrain. The topographical surveys were performed by a professional land surveyor registered in the State of Idaho.



Figure D-1. Initial topographic survey of the STF-02 Gun Range.

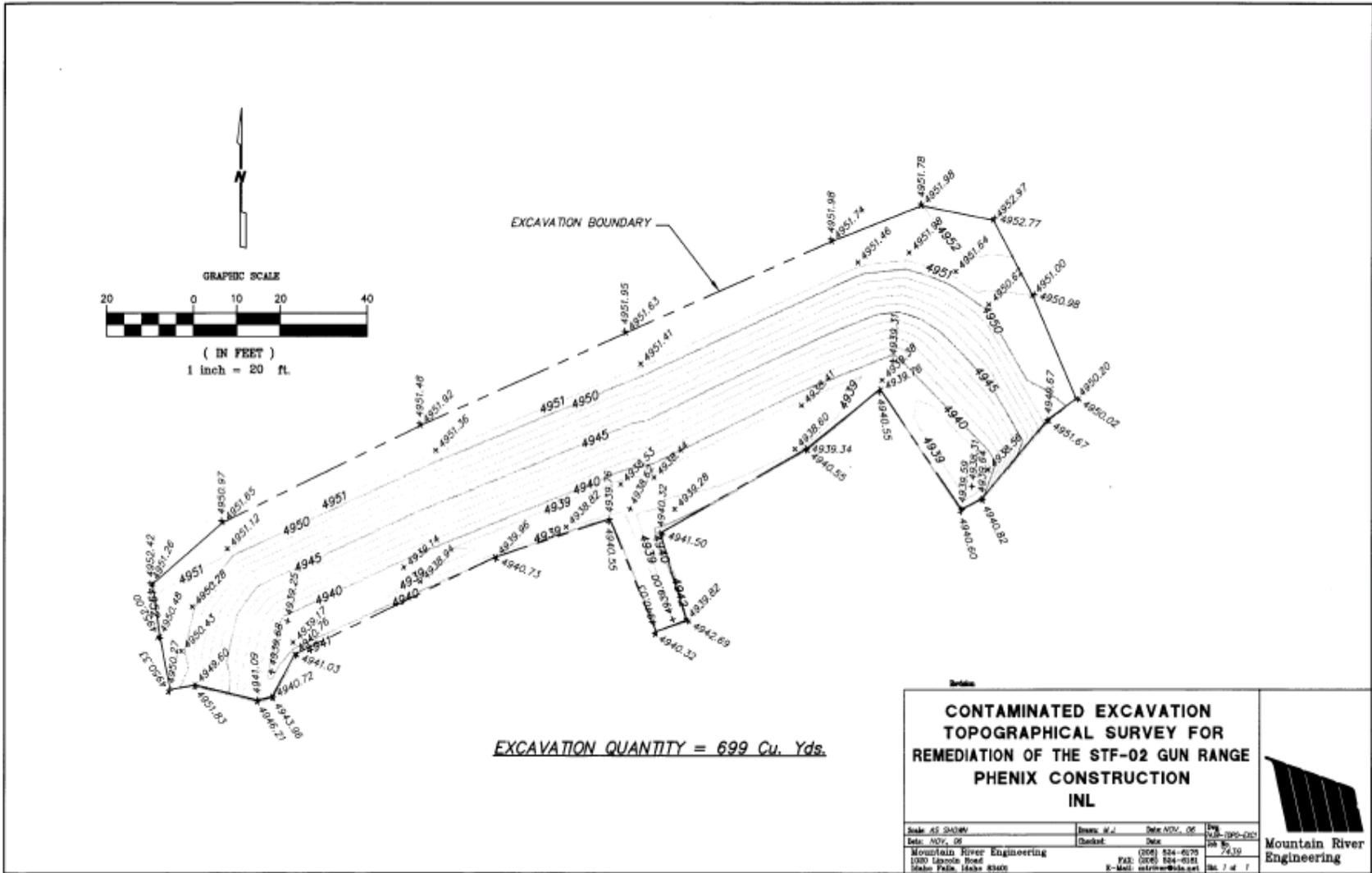


Figure D-2. Topographic survey of berms following excavation of contaminated soil.

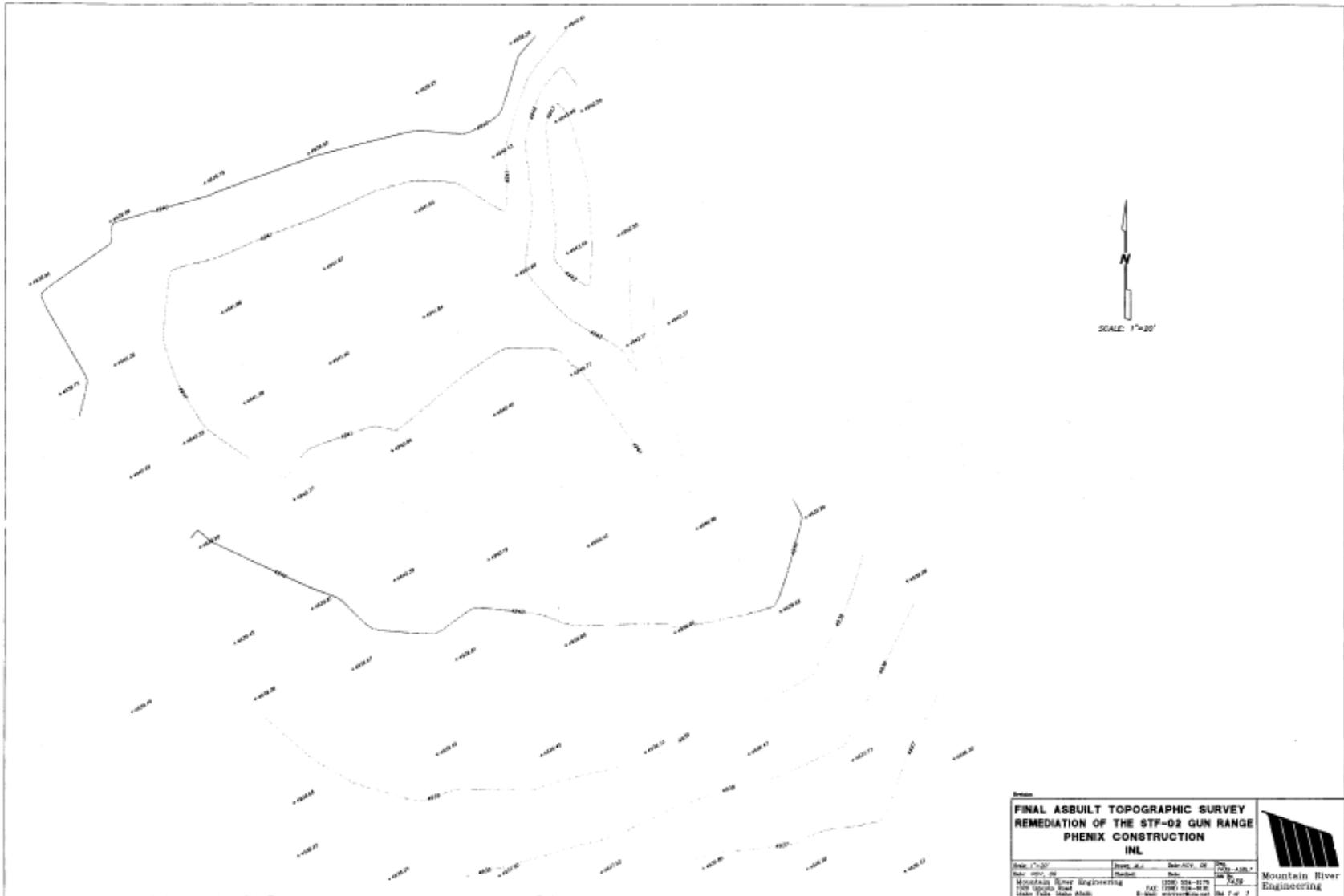


Figure D-3. Final topographic survey of the STF-02 Gun Range.

Appendix E
Shipping Manifest Data

Appendix E

Shipping Manifest Data

The shipping manifest in this appendix is a summary of the contaminated soil shipments made from the STF-02 Gun Range off-Site to the approved treatment, storage, and disposal facility at which the soil was stabilized prior to disposal.

Table E-1. Shipping manifests.

Weight (lb)	Manifest Number	Bar Code	Date	Transporter
34,400	001499045JJK-9/1	CFA060128	Nov. 6, 2006	Clean Harbors Environmental Services
30,300	001499046JJK-9/1	CFA060129	Nov. 6, 2006	Clean Harbors Environmental Services
29,300	001499047JJK-9/1	CFA060130	Nov. 6, 2006	Clean Harbors Environmental Services
30,480	001499048JJK-9/1	CFA060131	Nov. 6, 2006	Clean Harbors Environmental Services
29,380	001499050JJK-9/1	CFA060132	Nov. 6, 2006	Clean Harbors Environmental Services
30,040	001499051JJK-9/1	CFA060133	Nov. 6, 2006	Clean Harbors Environmental Services
32,160	001499052JJK-9/1	CFA060134	Nov. 6, 2006	Triad Transport
32,540	001499053JJK-9/1	CFA060135	Nov. 6, 2006	Triad Transport
29,180	001499054JJK-9/1	CFA060136	Nov. 6, 2006	Triad Transport
29,560	001499055JJK-9/1	CFA060137	Nov. 6, 2006	Triad Transport
31,000	001499056JJK-9/1	CFA060138	Nov. 6, 2006	MP Environmental Services, Inc.
31,240	001499069JJK-9/1	CFA060139	Nov. 7, 2006	Clean Harbors Environmental Services
32,220	001499070JJK-9/1	CFA060140	Nov. 7, 2006	Clean Harbors Environmental Services
35,240	001499071JJK-9/1	CFA060141	Nov. 7, 2006	Clean Harbors Environmental Services
33,640	001499072JJK-9/1	CFA060142	Nov. 7, 2006	Clean Harbors Environmental Services
25,060	001499073JJK-9/1	CFA060143	Nov. 8, 2006	Clean Harbors Environmental Services
35,920	001499074JJK-9/1	CFA060144	Nov. 8, 2006	Clean Harbors Environmental Services
31,720	001499075JJK-9/1	CFA060145	Nov. 7, 2006	Triad Transport
26,980	001499076JJK-9/1	CFA060146	Nov. 8, 2006	Triad Transport
29,420	001499077JJK-9/1	CFA060147	Nov. 8, 2006	Triad Transport
30,920	001499079JJK-9/1	CFA060148	Nov. 8, 2006	Triad Transport
35,060	001499081JJK-9/1	CFA060149	Nov. 7, 2006	MP Environmental Services
34,800	001499085JJK-9/1	CFA060150	Nov. 9, 2006	MP Environmental Services
33,400	001499086JJK-9/1	CFA060151	Nov. 9, 2006	Triad Transport
36,920	001499087JJK-9/1	CFA060152	Nov. 9, 2006	Clean Harbors Environmental Services
30,100	001499088JJK-9/1	CFA060153	Nov. 9, 2006	Clean Harbors Environmental Services
31,920	001499089JJK-9/1	CFA060154	Nov. 9, 2006	Clean Harbors Environmental Services

Table E-1. (continued).

Weight (lb)	Manifest Number	Bar Code	Date	Transporter
33,740	001499095JJK-9/1	CFA060155	Nov. 9, 2006	Triad Transport
29,380	001499096JJK-9/1	CFA060156	Nov. 9, 2006	Triad Transport
29,740	001499097JJK-9/1	CFA060157	Nov. 9, 2006	Triad Transport
34,820	001499098JJK-9/1	CFA060158	Nov. 9, 2006	Clean Harbors Environmental Services
33,900	001499100JJK-9/1	CFA060159	Nov. 10, 2006	Clean Harbors Environmental Services
35,140	001499101JJK-9/1	CFA060160	Nov. 10, 2006	Clean Harbors Environmental Services
30,940	001499107JJK-9/1	CFA060161	Nov. 10, 2006	Clean Harbors Environmental Services
34,800	001499108JJK-9/1	CFA060162	Nov. 11, 2006	Clean Harbors Environmental Services
33,300	001499109JJK-9/1	CFA060163	Nov. 10, 2006	Triad Transport
32,140	001499110JJK-9/1	CFA060164	Nov. 10, 2006	Triad Transport
34,440	001499111JJK-9/1	CFA060165	Nov. 10, 2006	Triad Transport
34,300	001499112JJK-9/1	CFA060166	Nov. 10, 2006	Triad Transport
33,560	001499113JJK-9/1	CFA060167	Nov. 10, 2006	MP Environmental Services
33,860	001499114JJK-9/1	CFA060168	Nov. 13, 2006	Clean Harbors Environmental Services
35,260	001499115JJK-9/1	CFA060169	Nov. 13, 2006	Clean Harbors Environmental Services
34,700	001499116JJK-9/1	CFA060170	Nov. 14, 2006	Clean Harbors Environmental Services
34,180	001499117JJK-9/1	CFA060171	Nov. 13, 2006	Triad Transport
34,420	001499119JJK-9/1	CFA060172	Nov. 13, 2006	Triad Transport
34,480	001499120JJK-9/1	CFA060173	Nov. 13, 2006	Triad Transport
36,280	001499121JJK-9/1	CFA060174	Nov. 13, 2006	Tri-State Motor Transport
36,340	001499122JJK-9/1	CFA060175	Nov. 13, 2006	Tri-State Motor Transport
34,020	001499123JJK-9/1	CFA060176	Nov. 13, 2006	MP Environmental Services
32,780	001499125JJK-9/1	CFA060177	Nov. 13, 2006	Triad Transport
33,440	001499126JJK-9/1	CFA060178	Nov. 13, 2006	MP Environmental Services
34,680	001499127JJK-9/1	CFA060179	Nov. 14, 2006	Clean Harbors Environmental Services
33,120	001499128JJK-9/1	CFA060180	Nov. 14, 2006	Clean Harbors Environmental Services
32,520	001499129JJK-9/1	CFA060181	Nov. 14, 2006	Triad Transport
33,840	001499130JJK-9/1	CFA060182	Nov. 14, 2006	Triad Transport
32,440	001499131JJK-9/1	CFA060183	Nov. 14, 2006	Triad Transport
31,160	001499132JJK-9/1	CFA060184	Nov. 14, 2006	Triad Transport
37,820	001499133JJK-9/1	CFA060185	Nov. 14, 2006	MP Environmental Services
35,800	001499134JJK-9/1	CFA060186	Nov. 16, 2006	MP Environmental Services
37,200	001499135JJK-9/1	CFA060187	Nov. 14, 2006	Tri-State Motor Transport
37,580	001499136JJK-9/1	CFA060188	Nov. 14, 2006	Tri-State Motor Transport
34,280	001499146JJK-9/1	CFA060189	Nov. 15, 2006	Clean Harbors Environmental Services

Table E-1. (continued).

Weight (lb)	Manifest Number	Bar Code	Date	Transporter
36,508	001499147JJK-9/1	CFA060190	Nov. 15, 2006	Clean Harbors Environmental Services
34,980	001499140JJK-9/1	CFA060191	Nov. 15, 2006	Clean Harbors Environmental Services
33,600	001499141JJK-9/1	CFA060192	Nov. 15, 2006	Triad Transport
33,280	001499142JJK-9/1	CFA060193	Nov. 15, 2006	Triad Transport
32,780	001499143JJK-9/1	CFA060194	Nov. 15, 2006	Triad Transport
30,580	001499144JJK-9/1	CFA060195	Nov. 16, 2006	Triad Transport
32,580	001499148JJK-9/1	CFA060196	Nov. 16, 2006	Clean Harbors Environmental Services
34,060	01499160JJK-9/1	CFA060197	Nov. 16, 2006	Clean Harbors Environmental Services
36,340	001499150JJK-9/1	CFA060198	Nov. 16, 2006	Clean Harbors Environmental Services
32,860	001499151JJK-9/1	CFA060199	Nov. 17, 2006	Clean Harbors Environmental Services
33,680	001499152JJK-9/1	CFA060200	Nov. 16, 2006	Triad Transport
34,660	001499153JJK-9/1	CFA060201	Nov. 16, 2006	Triad Transport
32,960	001499158JJK-9/1	CFA060202	Nov. 16, 2006	Triad Transport
35,000	001499163JJK-9/1	CFA060203	Nov. 17, 2006	Clean Harbors Environmental Services
26,780	001499164JJK-9/1	CFA060204	Nov. 17, 2006	Clean Harbors Environmental Services
33,900	00149165JJK-9/1	CFA060205	Nov. 17, 2006	Clean Harbors Environmental Services
32,740	001499166JJK-9/1	CFA060206	Nov. 17, 2006	Triad Transport
27,220	001499167JJK-9/1	CFA060207	Nov. 17, 2006	Triad Transport
30,200	001499168JJK-9/1	CFA060250	Nov. 17, 2006	Triad Transport
30,860	001499169JJK-9/1	CFA060251	Nov. 17, 2006	Triad Transport
33,300	001499170JJK-9/1	CFA060252	Nov. 17, 2006	Triad Transport
33,260	001499171JJK-9/1	CFA060253	Nov. 17, 2006	MP Environmental Services
35,120	001499179JJK-9/1	CFA060254	Nov. 17, 2006	Clean Harbors Environmental Services
34,620	001499180JJK-9/1	CFA060255	Nov. 20, 2006	Clean Harbors Environmental Services
32,460	001499181JJK-9/1	CFA060256	Nov. 20, 2006	Clean Harbors Environmental Services
34,340	001499182JJK-9/1	CFA060257	Nov. 20, 2006	Clean Harbors Environmental Services
32,600	001499183JJK-9/1	CFA060258	Nov. 20, 2006	Clean Harbors Environmental Services
33,960	001499184JJK-9/1	CFA060259	Nov. 20, 2006	Triad Transport
28,880	001499185JJK-9/1	CFA060260	Nov. 20, 2006	Triad Transport
30,640	001499186JJK-9/1	CFA060261	Nov. 20, 2006	Triad Transport
33,760	001499187JJK-9/1	CFA060262	Nov. 20, 2006	Triad Transport
29,240	001499188JJK-9/1	CFA060263	Nov. 20, 2006	MP Environmental Services
32,840	001499198JJK-9/1	CFA060264	Nov. 28, 2006	Clean Harbors Environmental Services
27,100	001499199JJK-9/1	CFA060265	Nov. 29, 2006	Clean Harbors Environmental Services

Appendix F

Subcontractor Vendor Data Submittals

Appendix F

Subcontractor Vendor Data Submittals

Table F-1 summarizes all subcontractor vendor data submittals received to meet the requirements set forth in the vendor data schedule in accordance with Specification (SPC) -646, "Construction Specification – Remediation of the STF-02 Gun Range." The compilation of full vendor data submittals is provided subsequent to the table.

Table F-1. Vendor data submittals.

Drawing Section	Description	Schedule Item Number	Transaction Number	Transaction Date	Revision Number	VDR Number
01005	Chemical Inventory List - Form 432.21 Quarterly Report	1	S-507296-011	11/27/2006	0	VDR-157349
01005	Chemical Inventory List - Form 432.21 - Final Report	2	S-507296-012	12/5/2006	0	VDR-158077
01005	Chemical Inventory List - Form 432.21 Initial and Resubmittal with Supporting MSDS	3	S-507296-01	9/22/2006	0	VDR-153307
01005	Chemical Inventory List - Form 432.21 Initial and Resubmittal with Supporting MSDS	3	S-507296-07	10/9/2006	0	VDR-154111
01051	Land Surveyor Registered Professional Certification	4	S-507296-02	9/22/2006	0	VDR-153312
01051	Topographical Survey - Original Topography	5	S-507296-09	10/30/2006	0	VDR-155376
01051	Topographical Survey - After Soil Removal	6	S-507296-010	11/8/2006	0	VDR-155906
01051	Topographical Survey - Final Surface	7	S-507296-013	12/13/2006	0	VDR-158614
02200	Emissions and Dust Control Plan	8	S-507296-04	10/2/2006	0	VDR-153746
02200	Emissions and Dust Control Plan	8	S-507296-04R.1	10/9/2006	1	VDR-153746
02486	Seed Mix Certification	9	S-507296-08	10/26/2006	0	VDR-155291
02486	Soil Analysis	10	S-507296-03	9/22/2006	0	VDR-153317
SC-17	Personnel Lead Exposure Assessment Plan	11	S-507296-05	10/2/2006	0	VDR-153751
SC-17	Personnel Lead Exposure Assessment Plan	11	S-507296-05R.1	10/16/2006	1	VDR-153751
SC-17	Personnel Lead Exposure Assessment Plan	11	S-507296-05R.2	10/18/2006	2	VDR-153751
SC-3	Job Safety Analysis	12	S-507296-06	10/2/2006	0	VDR-153746
SC-3	Job Safety Analysis	12	S-507296-06R.1	10/11/2006	1	VDR-153756

VDS #1_157349

SUBCONTRACTOR REPORTING FORM CHEMICAL INVENTORY LIST

<input checked="" type="checkbox"/> Initial Submittal <input type="checkbox"/> Re-Submittal Rev. # _____	<input type="checkbox"/> First Quarter Nov 16 to Feb 15 Submit by Feb 15 <input type="checkbox"/> Second Quarter Feb 16 to May 15 Submit by May 15	<input type="checkbox"/> Third Quarter May 16 to Aug 15 Submit by Aug 15 <input checked="" type="checkbox"/> Fourth Quarter Aug 16 to Nov 15 Submit Nov 15	<input type="checkbox"/> Final Submittal Submit within 15 days after project completion
--	---	---	---

Page 1 of 4

Prime Subcontractor Name: Phenix Construction

Project Name and Subcontract Number: Remediation of The STF - 02 Gun Range Contract No. 00507296

Responsible Person: Mike Garcia Telephone No.: 589-6489

STF - 02

Item # 1 Date On-Site: 10 / 02 / 06 Chemical Location (On-Site): Gun Range Date Product Taken Off-Site: / /

Product Name: Chevron Diesel #2 Manufacturer: Chevron USA Products

Storage Codes: R 1 4 Container Size: 100 Gal Tank Quantity Brought On-Site This Period: 900 Gal

End Use: Fuel for Vehicles and Equipment

Waste Disposal Location: No Waste Generated

Physical State: Solid Liquid Gas Quantity Used This Period: 800 Gal

STF - 02

Item # 2 Date On-Site: 10 / 02 / 06 Chemical Location (On-Site): Gun Range Date Product Taken Off-Site: / /

Product Name: Chevron Regular Unleaded Gasoline Manufacturer: Chevron USA Products

Storage Codes: R 1 4 Container Size: 5 Gal Can Quantity Brought On-Site This Period: 5 Gal

End Use: Fuel for Vehicles and Equipment

Waste Disposal Location: No Waste Generated

Physical State: Solid Liquid Gas Quantity Used This Period: 5 Gal

STF - 02

Item # 3 Date On-Site: 10 / 02 / 06 Chemical Location (On-Site): Gun Range Date Product Taken Off-Site: / /

Product Name: Mobil Devac 1300 Super 15W - 40 Manufacturer: Mobil Oil Corp.

Storage Codes: N 1 4 Container Size: 1 Gal Quantity Brought On-Site This Period: 6 Gal

End Use: Lubricant for Vehicles and Equipment

Waste Disposal Location: No Waste Generated

Physical State: Solid Liquid Gas Quantity Used This Period: 3 Gal

STF - 02

Item # 4 Date On-Site: 10 / 02 / 06 Chemical Location (On-Site): Gun Range Date Product Taken Off-Site: / /

Product Name: Mobilfluid 424 Hydraulic Oil Manufacturer: Mobil Oil Corp.

Storage Codes: N 1 4 Container Size: 5 Gal Quantity Brought On-Site This Period: 5 Gal

End Use: Lubricant for Vehicles and Equipment

Waste Disposal Location: No Waste Generated

Physical State: Solid Liquid Gas Quantity Used This Period: 2 Gal

If you need more line items please use Form 432.21A "Subcontractor Reporting Form Chemical Inventory List - Continuation Sheet."

**SUBCONTRACTOR REPORTING FORM
CHEMICAL INVENTORY LIST
(CONTINUATION SHEET)**

Page <u>2</u> of <u>4</u>	
Prime Subcontractor Name: <u>Phenix Construction</u>	
Project Name and Subcontract Number: <u>Remediation of The STF - 02 Gun Range Contract No. 00507296</u>	
Responsible Person: <u>Mike Garcia</u>	Telephone No.: <u>589-6489</u>
STF - 02	
Item # <u>5</u>	Date On-Site: <u>10 / 02 / 06</u> Chemical Location (On-Site): <u>Gun Range</u> Date Product Taken Off-Site: <u> / /</u>
Product Name: <u>Mobil Grease HTS</u>	Manufacturer: <u>Mobil</u>
Storage Codes: <input type="checkbox"/> R <input type="checkbox"/> 1 <input type="checkbox"/> 4	Container Size: <u>14 OZ. Tube</u> Quantity Brought On-Site This Period: <u>20 14 OZ. Tubes</u>
End Use: <u>Lubricant for Vehicles and Equipment</u>	
Waste Disposal Location: <u>INEEL Landfill</u>	
Physical State: <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas	Quantity Used This Period: <u>16 14 OZ. Tubes</u>
STF - 02	
Item # <u>6</u>	Date On-Site: <u>01 / 02 / 06</u> Chemical Location (On-Site): <u>Gun Range</u> Date Product Taken Off-Site: <u> / /</u>
Product Name: <u>Zerex 50/50 Premix</u>	Manufacturer: <u>Valvoline</u>
Storage Codes: <input type="checkbox"/> N <input type="checkbox"/> 1 <input type="checkbox"/> 4	Container Size: <u>1 Gal</u> Quantity Brought On-Site This Period: <u>6 Gal</u>
End Use: <u>Coolant System Protectant</u>	
Waste Disposal Location: <u>No Waste Generated</u>	
Physical State: <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas	Quantity Used This Period: <u>2 Gal</u>
STF - 02	
Item # <u>7</u>	Date On-Site: <u>10 / 02 / 06</u> Chemical Location (On-Site): <u>Gun Range</u> Date Product Taken Off-Site: <u> / /</u>
Product Name: <u>Premium Starting Fluid</u>	Manufacturer: <u>Valvoline</u>
Storage Codes: <input type="checkbox"/> F <input type="checkbox"/> 2 <input type="checkbox"/> 4	Container Size: <u>11 OZ. Can</u> Quantity Brought On-Site This Period: <u>12 11 OZ. Can</u>
End Use: <u>Help Start Equipment Motors (cold weather)</u>	
Waste Disposal Location: <u>INEEL Landfill</u>	
Physical State: <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas	Quantity Used This Period: <u>2 11 OZ. Can</u>
STF - 02	
Item # <u>8</u>	Date On-Site: <u>10 / 02 / 06</u> Chemical Location (On-Site): <u>Gun Range</u> Date Product Taken Off-Site: <u> / /</u>
Product Name: <u>WD - 40</u>	Manufacturer: <u>WD 40 Company</u>
Storage Codes: <input type="checkbox"/> F <input type="checkbox"/> 2 <input type="checkbox"/> 4	Container Size: <u>16 OZ. Can</u> Quantity Brought On-Site This Period: <u>1 16 OZ. Can</u>
End Use: <u>Lubricant</u>	
Waste Disposal Location: <u>INEEL Landfill</u>	
Physical State: <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas	Quantity Used This Period: <u>0 16 OZ. Can</u>

**SUBCONTRACTOR REPORTING FORM
CHEMICAL INVENTORY LIST
(CONTINUATION SHEET)**

Page <u>3</u> of <u>4</u>	
Prime Subcontractor Name: <u>Phenix Construction</u>	
Project Name and Subcontract Number: <u>Remediation of The STF - 02 Gun Range Contract No. 00507296</u>	
Responsible Person: <u>Mike Garcia</u>	Telephone No.: <u>589-6489</u>
STF - 02	
Item # <u>9</u>	Date On-Site: <u>10/02/06</u> Chemical Location (On-Site): <u>Gun Range</u> Date Product Taken Off-Site: <u>/ /</u>
Product Name: <u>(17A) Marking Paint</u>	Manufacturer: <u>AerVOE Pacific Company Inc.</u>
Storage Codes: <u>F</u> <u>2</u> <u>4</u>	Container Size: <u>17 OZ. Can</u> Quantity Brought On-Site This Period: <u>12 17 OZ. Can</u>
End Use: <u>Construction Layout</u>	
Waste Disposal Location: <u>INEEL Landfill</u>	
Physical State: <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas	Quantity Used This Period: <u>6 17 OZ. Can</u>
STF - 02	
Item # <u>10</u>	Date On-Site: <u>10/02/06</u> Chemical Location (On-Site): <u>Gun Range</u> Date Product Taken Off-Site: <u>/ /</u>
Product Name: <u>Windshield Washer Fluid</u>	Manufacturer: <u>Valvoline Inc.</u>
Storage Codes: <u>N</u> <u>1</u> <u>4</u>	Container Size: <u>1 Gal</u> Quantity Brought On-Site This Period: <u>2 Gal</u>
End Use: <u>Clean Vehicle Windows</u>	
Waste Disposal Location: <u>INEEL Landfill</u>	
Physical State: <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas	Quantity Used This Period: <u>1 Gal</u>
STF - 02	
Item # <u>11</u>	Date On-Site: <u>10/02/06</u> Chemical Location (On-Site): <u>Gun Range</u> Date Product Taken Off-Site: <u>/ /</u>
Product Name: <u>Krylon Marking Paint</u>	Manufacturer: <u>The Sherwin - Williams Company</u>
Storage Codes: <u>F</u> <u>2</u> <u>4</u>	Container Size: <u>17 OZ. Can</u> Quantity Brought On-Site This Period: <u>12 17 OZ. Can</u>
End Use: <u>Construction Layout</u>	
Waste Disposal Location: <u>INL Landfill</u>	
Physical State: <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas	Quantity Used This Period: <u>6 17 OZ. Can</u>
STF - 02	
Item # <u>12</u>	Date On-Site: <u>10/02/06</u> Chemical Location (On-Site): <u>Gun Range</u> Date Product Taken Off-Site: <u>/ /</u>
Product Name: <u>CAT DEAC</u>	Manufacturer: <u>Chevron Texaco</u>
Storage Codes: <u>N</u> <u>1</u> <u>4</u>	Container Size: <u>1 Gal</u> Quantity Brought On-Site This Period: <u>6 Gal</u>
End Use: <u>Coolant System Protect</u>	
Waste Disposal Location: <u>INL Landfill</u>	
Physical State: <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas	Quantity Used This Period: <u>3 Gal</u>

**SUBCONTRACTOR REPORTING FORM
CHEMICAL INVENTORY LIST
(CONTINUATION SHEET)**

Page <u>4</u> of <u>4</u>				
Prime Subcontractor Name: <u>Phenix Construction</u>				
Project Name and Subcontract Number: <u>Remediation of The STF - 02 Gun Range Contract No. 00507296</u>				
Responsible Person: <u>Mike Garcia</u>	Telephone No.: <u>589-6489</u>			
STF - 02				
Item # <u>13</u>	Date On-Site: <u>10 / 02 / 06</u>	Chemical Location (On-Site): <u>Gun Range</u>	Date Product Taken Off-Site: <u> / /</u>	
Product Name: <u>RONEX EXTRA DUTY MOLY 2</u>		Manufacturer: <u>EXXONMOBIL Oil Corporation</u>		
Storage Codes: <input type="checkbox"/> R <input type="checkbox"/> 1 <input type="checkbox"/> 4	Container Size: <u>14 OZ. Tube</u>	Quantity Brought On-Site This Period: <u>20 14 OZ. Tubes</u>		
End Use: <u>Lubricant for Vehicles and Equipment</u>				
Waste Disposal Location: <u>INL Landfill</u>				
Physical State: <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas		Quantity Used This Period: <u>16 14 OZ. Tube</u>		
STF - 02				
Item # <u>14</u>	Date On-Site: <u>10 / 16 / 06</u>	Chemical Location (On-Site): <u>Gun Range</u>	Date Product Taken Off-Site: <u>11 / 15 / 06</u>	
Product Name: <u>Stockopam - Terra Bond</u>		Manufacturer: <u>Stockhausen Inc.</u>		
Storage Codes: <input type="checkbox"/> J <input type="checkbox"/> 1 <input type="checkbox"/> 4	Container Size: <u>30 PD Tote</u>	Quantity Brought On-Site This Period: <u>0 PD</u>		
End Use: <u>Stabilize soil to minimize dust</u>				
Waste Disposal Location: <u>INL Landfill</u>				
Physical State: <input checked="" type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas		Quantity Used This Period: <u>0 PD</u>		
Item # _____		Date On-Site: <u> / /</u>	Chemical Location (On-Site): _____	Date Product Taken Off-Site: <u> / /</u>
Product Name: _____		Manufacturer: _____		
Storage Codes: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Container Size: _____	Quantity Brought On-Site This Period: _____		
End Use: _____				
Waste Disposal Location: _____				
Physical State: <input type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas		Quantity Used This Period: _____		
Item # _____		Date On-Site: <u> / /</u>	Chemical Location (On-Site): _____	Date Product Taken Off-Site: <u> / /</u>
Product Name: _____		Manufacturer: _____		
Storage Codes: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Container Size: _____	Quantity Brought On-Site This Period: _____		
End Use: _____				
Waste Disposal Location: _____				
Physical State: <input type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas		Quantity Used This Period: _____		

Vendor Data Review System Final Disposition Screen

This vendor data item has been given the following disposition codes

Reviewer	Revision Level	Date	Disposition Code	Comments
DRIEVER MIKEL K	0	27-NOV-06	A	
FRITZ KURT D	0	14-DEC-06	D	
TUOTT LEE C	0	27-NOV-06	A	
LANDIS JOSEPH A	0	27-NOV-06	A	no comment
MCMANAMON LAWRENCE E	0	27-NOV-06	A	
VANDEL DOUG S	0	27-NOV-06	A	

**The following reviewers have NOT yet reviewed
this vendor data item**

JOLLEY WENDELL L

VDR Number:	VDR-157349
Revision Level:	0
Project Number:	23368 - 152173
Transmittal Number:	S-507296-011
Transmittal Status:	Mandatory Approval
Line Item:	1

Disposition Code::

A

Final Comments::

VDS #2_158077

VENDOR DATA
TRANSMITTAL & DISPOSITION FORM

ORIGINAL

To be completed by Supplier/Subcontractor

Purchase Order or Subcontract Number: 00507296 - 012 R.O Project Title/Number: Remediation of The STF - 02 Gun Range

Submittal Number: 6131 - 12 Supplier/Subcontractor Name: Phenix Construction

Submittal Date: 12-04-06 Address: P.O. Box 1626 Idaho Falls Idaho 83403 23368-152173

INEEL VDS Item No.	VDT Item No.	Specification/ Drawing Reference	Tag Number	Submittal Status	Revision Level	Supplier/ Subcontractor Document Number (if applicable)	Description	INEEL VDR Number	Disp Code
2		01005		I.O.		6131 - 12	Chemical Inventory List - Form 432.21 Final Report	158077	A

Remarks

 12-04-06
Supplier/Subcontractor Authorized Signature / Date

To Be Completed by Contractor/AE

INEEL Authorized Signature / Date

F-15

SUBCONTRACTOR REPORTING FORM CHEMICAL INVENTORY LIST

<input type="checkbox"/> Initial Submittal <input type="checkbox"/> Re-Submittal Rev. # _____	<input type="checkbox"/> First Quarter Nov 16 to Feb 15 Submit by Feb 15 <input type="checkbox"/> Second Quarter Feb 16 to May 15 Submit by May 15	<input type="checkbox"/> Third Quarter May 16 to Aug 15 Submit by Aug 15 <input type="checkbox"/> Fourth Quarter Aug 16 to Nov 15 Submit Nov 15	<input checked="" type="checkbox"/> Final Submittal Submit within 15 days after project completion
---	---	--	---

Page 1 of 4

Prime Subcontractor Name: Phenix Construction

Project Name and Subcontract Number: Remediation of The STF - 02 Gun Range Contract No. 00507296

Responsible Person: Mike Garcia Telephone No.: 589-6489

STF - 02

Item # 1 Date On-Site: 10 / 02 / 06 Chemical Location (On-Site): Gun Range Date Product Taken Off-Site: 11 / 22 / 06

Product Name: Chevron Diesel #2 Manufacturer: Chevron USA Products

Storage Codes: R 1 4 Container Size: 100 Gal Tank Quantity Brought On-Site This Period: 150 Gal

End Use: Fuel for Vehicles and Equipment

Waste Disposal Location: No Waste Generated

Physical State: Solid Liquid Gas Quantity Used This Period: 150 Gal

STF - 02

Item # 2 Date On-Site: 10 / 02 / 06 Chemical Location (On-Site): Gun Range Date Product Taken Off-Site: 11 / 22 / 06

Product Name: Chevron Regular Unleaded Gasoline Manufacturer: Chevron USA Products

Storage Codes: R 1 4 Container Size: 5 Gal Can Quantity Brought On-Site This Period: 5 Gal

End Use: Fuel for Vehicles and Equipment

Waste Disposal Location: No Waste Generated

Physical State: Solid Liquid Gas Quantity Used This Period: 0 Gal

STF - 02

Item # 3 Date On-Site: 10 / 02 / 06 Chemical Location (On-Site): Gun Range Date Product Taken Off-Site: 11 / 22 / 06

Product Name: Mobil Devac 1300 Super 15W - 40 Manufacturer: Mobil Oil Corp.

Storage Codes: N 1 4 Container Size: 1 Gal Quantity Brought On-Site This Period: 2 Gal

End Use: Lubricant for Vehicles and Equipment

Waste Disposal Location: No Waste Generated

Physical State: Solid Liquid Gas Quantity Used This Period: 1 Gal

STF - 02

Item # 4 Date On-Site: 10 / 02 / 06 Chemical Location (On-Site): Gun Range Date Product Taken Off-Site: 11 / 22 / 06

Product Name: Mobilfluid 424 Hydraulic Oil Manufacturer: Mobil Oil Corp.

Storage Codes: N 1 4 Container Size: 5 Gal Quantity Brought On-Site This Period: 5 Gal

End Use: Lubricant for Vehicles and Equipment

Waste Disposal Location: No Waste Generated

Physical State: Solid Liquid Gas Quantity Used This Period: 0 Gal

If you need more line items please use Form 432.21A "Subcontractor Reporting Form Chemical Inventory List - Continuation Sheet."

**SUBCONTRACTOR REPORTING FORM
CHEMICAL INVENTORY LIST
(CONTINUATION SHEET)**

Page <u>2</u> of <u>4</u>	
Prime Subcontractor Name: <u>Phenix Construction</u>	
Project Name and Subcontract Number: <u>Remediation of The STF - 02 Gun Range Contract No. 00507296</u>	
Responsible Person: <u>Mike Garcia</u> Telephone No.: <u>589-6489</u>	
STF - 02	
Item # <u>5</u>	Date On-Site: <u>10 / 02 / 06</u> Chemical Location (On-Site): <u>Gun Range</u> Date Product Taken Off-Site: <u>11 / 22 / 06</u>
Product Name: <u>Mobil Grease HTS</u>	Manufacturer: <u>Mobil</u>
Storage Codes: <input type="checkbox"/> R <input type="checkbox"/> 1 <input type="checkbox"/> 4	Container Size: <u>14 OZ. Tube</u> Quantity Brought On-Site This Period: <u>10 14 OZ. Tubes</u>
End Use: <u>Lubricant for Vehicles and Equipment</u>	
Waste Disposal Location: <u>INEEL Landfill</u>	
Physical State: <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas	Quantity Used This Period: <u>0 14 OZ. Tubes</u>
STF - 02	
Item # <u>6</u>	Date On-Site: <u>01 / 02 / 06</u> Chemical Location (On-Site): <u>Gun Range</u> Date Product Taken Off-Site: <u>11 / 22 / 06</u>
Product Name: <u>Zerex 50/50 Premix</u>	Manufacturer: <u>Valvoline</u>
Storage Codes: <input type="checkbox"/> N <input type="checkbox"/> 1 <input type="checkbox"/> 4	Container Size: <u>1 Gal</u> Quantity Brought On-Site This Period: <u>2 Gal</u>
End Use: <u>Coolant System Protectant</u>	
Waste Disposal Location: <u>No Waste Generated</u>	
Physical State: <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas	Quantity Used This Period: <u>2 Gal</u>
STF - 02	
Item # <u>7</u>	Date On-Site: <u>10 / 02 / 06</u> Chemical Location (On-Site): <u>Gun Range</u> Date Product Taken Off-Site: <u>11 / 22 / 06</u>
Product Name: <u>Premium Starting Fluid</u>	Manufacturer: <u>Valvoline</u>
Storage Codes: <input type="checkbox"/> F <input type="checkbox"/> 2 <input type="checkbox"/> 4	Container Size: <u>11 OZ. Can</u> Quantity Brought On-Site This Period: <u>6 11 OZ. Can</u>
End Use: <u>Help Start Equipment Motors (cold weather)</u>	
Waste Disposal Location: <u>INEEL Landfill</u>	
Physical State: <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas	Quantity Used This Period: <u>2 11 OZ. Can</u>
STF - 02	
Item # <u>8</u>	Date On-Site: <u>10 / 02 / 06</u> Chemical Location (On-Site): <u>Gun Range</u> Date Product Taken Off-Site: <u>11 / 22 / 06</u>
Product Name: <u>WD - 40</u>	Manufacturer: <u>WD 40 Company</u>
Storage Codes: <input type="checkbox"/> F <input type="checkbox"/> 2 <input type="checkbox"/> 4	Container Size: <u>16 OZ. Can</u> Quantity Brought On-Site This Period: <u>1 16 OZ. Can</u>
End Use: <u>Lubricant</u>	
Waste Disposal Location: <u>INEEL Landfill</u>	
Physical State: <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas	Quantity Used This Period: <u>0 16 OZ. Can</u>

**SUBCONTRACTOR REPORTING FORM
CHEMICAL INVENTORY LIST
(CONTINUATION SHEET)**

Page <u>3</u> of <u>4</u>	
Prime Subcontractor Name: <u>Phenix Construction</u>	
Project Name and Subcontract Number: <u>Remediation of The STF - 02 Gun Range Contract No. 00507296</u>	
Responsible Person: <u>Mike Garcia</u>	Telephone No.: <u>589-6489</u>
STF - 02	
Item # <u>9</u>	Date On-Site: <u>10 / 02 / 06</u> Chemical Location (On-Site): <u>Gun Range</u> Date Product Taken Off-Site: <u>11 / 22 / 06</u>
Product Name: <u>(17A) Marking Paint</u>	Manufacturer: <u>Aerovoc Pacific Company Inc.</u>
Storage Codes: <u>F</u> <u>2</u> <u>4</u>	Container Size: <u>17 OZ. Can</u> Quantity Brought On-Site This Period: <u>2 17 OZ. Can</u>
End Use: <u>Construction Layout</u>	
Waste Disposal Location: <u>INEEL Landfill</u>	
Physical State: <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas	Quantity Used This Period: <u>0 17 OZ. Can</u>
STF - 02	
Item # <u>10</u>	Date On-Site: <u>10 / 02 / 06</u> Chemical Location (On-Site): <u>Gun Range</u> Date Product Taken Off-Site: <u>11 / 22 / 06</u>
Product Name: <u>Windshield Washer Fluid</u>	Manufacturer: <u>Valvoline Inc.</u>
Storage Codes: <u>N</u> <u>1</u> <u>4</u>	Container Size: <u>1 Gal</u> Quantity Brought On-Site This Period: <u>1 Gal</u>
End Use: <u>Clean Vehicle Windows</u>	
Waste Disposal Location: <u>INEEL Landfill</u>	
Physical State: <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas	Quantity Used This Period: <u>0 Gal</u>
STF - 02	
Item # <u>11</u>	Date On-Site: <u>10 / 02 / 06</u> Chemical Location (On-Site): <u>Gun Range</u> Date Product Taken Off-Site: <u>11 / 22 / 06</u>
Product Name: <u>Krylon Marking Paint</u>	Manufacturer: <u>The Sherwin - Williams Company</u>
Storage Codes: <u>F</u> <u>2</u> <u>4</u>	Container Size: <u>17 OZ. Can</u> Quantity Brought On-Site This Period: <u>1 17 OZ. Can</u>
End Use: <u>Construction Layout</u>	
Waste Disposal Location: <u>INL Landfill</u>	
Physical State: <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas	Quantity Used This Period: <u>0 17 OZ. Can</u>
STF - 02	
Item # <u>12</u>	Date On-Site: <u>10 / 02 / 06</u> Chemical Location (On-Site): <u>Gun Range</u> Date Product Taken Off-Site: <u>11 / 22 / 06</u>
Product Name: <u>CAT DEAC</u>	Manufacturer: <u>Chevron Texaco</u>
Storage Codes: <u>N</u> <u>1</u> <u>4</u>	Container Size: <u>1 Gal</u> Quantity Brought On-Site This Period: <u>2 Gal</u>
End Use: <u>Coolant System Protect</u>	
Waste Disposal Location: <u>INL Landfill</u>	
Physical State: <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas	Quantity Used This Period: <u>0 Gal</u>

**SUBCONTRACTOR REPORTING FORM
CHEMICAL INVENTORY LIST
(CONTINUATION SHEET)**

Page <u>4</u> of <u>4</u>	
Prime Subcontractor Name: <u>Phenix Construction</u>	
Project Name and Subcontract Number: <u>Remediation of The STF - 02 Gun Range Contract No. 00507296</u>	
Responsible Person: <u>Mike Garcia</u>	Telephone No.: <u>589-6489</u>
STF - 02	
Item # <u>13</u>	Date On-Site: <u>10 / 02 / 06</u> Chemical Location (On-Site): <u>Gun Range</u> Date Product Taken Off-Site: <u>11 / 22 / 06</u>
Product Name: <u>RONEX EXTRA DUTY MOLY 2</u>	Manufacturer: <u>EXXONMOBIL Oil Corporation</u>
Storage Codes: <input type="checkbox"/> R <input type="checkbox"/> 1 <input type="checkbox"/> 4	Container Size: <u>14 OZ. Tube</u> Quantity Brought On-Site This Period: <u>2 14 OZ. Tubes</u>
End Use: <u>Lubricant for Vehicles and Equipment</u>	
Waste Disposal Location: <u>INL Landfill</u>	
Physical State: <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas	Quantity Used This Period: <u>2 14 OZ. Tube</u>
STF - 02	
Item # <u>14</u>	Date On-Site: <u>10 / 16 / 06</u> Chemical Location (On-Site): <u>Gun Range</u> Date Product Taken Off-Site: <u>11 / 15 / 06</u>
Product Name: <u>Stockopam - Terra Bond</u>	Manufacturer: <u>Stockhausen Inc.</u>
Storage Codes: <input type="checkbox"/> J <input type="checkbox"/> 1 <input type="checkbox"/> 4	Container Size: <u>30 PD Tote</u> Quantity Brought On-Site This Period: <u>0 PD</u>
End Use: <u>Stabilize soil to minimize dust</u>	
Waste Disposal Location: <u>INL Landfill</u>	
Physical State: <input checked="" type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas	Quantity Used This Period: <u>0 PD</u>
Item # _____	Date On-Site: <u> / /</u> Chemical Location (On-Site): _____ Date Product Taken Off-Site: <u> / /</u>
Product Name: _____	Manufacturer: _____
Storage Codes: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Container Size: _____ Quantity Brought On-Site This Period: _____
End Use: _____	
Waste Disposal Location: _____	
Physical State: <input type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas	Quantity Used This Period: _____
Item # _____	Date On-Site: <u> / /</u> Chemical Location (On-Site): _____ Date Product Taken Off-Site: <u> / /</u>
Product Name: _____	Manufacturer: _____
Storage Codes: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Container Size: _____ Quantity Brought On-Site This Period: _____
End Use: _____	
Waste Disposal Location: _____	
Physical State: <input type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas	Quantity Used This Period: _____

Vendor Data Review System Final Disposition Screen

This vendor data item has been given the following disposition codes

Reviewer	Revision Level	Date	Disposition Code	Comments
FRITZ KURT D	0	14-DEC-06	D	
VANDEL DOUG S	0	05-DEC-06	A	
TUOTT LEE C	0	05-DEC-06	D	
LANDIS JOSEPH A	0	05-DEC-06	A	no comment
MCMANAMON LAWRENCE E	0	05-DEC-06	D	
DRIEVER MIKEL K	0	05-DEC-06	A	

**The following reviewers have NOT yet reviewed
this vendor data item**

JOLLEY WENDELL L

VDR Number:	VDR-158077
Revision Level:	0
Project Number:	23368 - 152173
Transmittal Number:	S-507296-012
Transmittal Status:	Information Only
Line Item:	1

Disposition Code::

A

Final Comments::

VDS #3_153307

431.13
07/23/2002
Rev. 04

VENDOR DATA
TRANSMITTAL & DISPOSITION FORM

ORIGINAL

To be completed by Supplier/Subcontractor									
Purchase Order or Subcontract Number: <u>00507296-01R.0</u>			Project Title/Number: <u>Remediation of The STF - 02 Gun Range</u>						
Submittal Number: <u>6131 - 01</u>			Supplier/Subcontractor Name: <u>Phenix Construction</u>						
Submittal Date: <u>09-20-06</u>			Address: <u>P.O. Box 1626 Idaho Falls Idaho 83403</u>				<u>23368-152173</u>		
INEEL VDS Item No.	VDT Item No.	Specification/ Drawing Reference	Tag Number	Submittal Status	Revision Level	Supplier/ Subcontractor Document Number (if applicable)	Description	INEEL VDR Number	Disp Code
3		01005		M.A.	0	6131 - 01	Chemical Inventory List - Form 432.21 Initial With Supporting MSDS	153307	A
Remarks									
 <u>09-20-06</u> Supplier/Subcontractor Authorized Signature / Date									
To Be Completed by Contractor/AE									
_____ INEEL Authorized Signature / Date									

SUBCONTRACTOR REPORTING FORM CHEMICAL INVENTORY LIST

<input checked="" type="checkbox"/> Initial Submittal <input type="checkbox"/> Re-Submittal	<input type="checkbox"/> First Quarter Nov 16 to Feb 15 Submit by Feb 15 <input type="checkbox"/> Second Quarter Feb 16 to May 15 Submit by May 15	<input type="checkbox"/> Third Quarter May 16 to Aug 15 Submit by Aug 15 <input type="checkbox"/> Fourth Quarter Aug 16 to Nov 15 Submit Nov 15	<input type="checkbox"/> Final Submittal Submit within 15 days after project completion
Rev. # _____			

Page 1 of 4

Prime Subcontractor Name: Phenix Construction

Project Name and Subcontract Number: Remediation of The STF - 02 Gun Range Contract No. 00507296

Responsible Person: Mike Garcia Telephone No.: 589-6489

STF - 02

Item # 1 Date On-Site: 10/02/06 Chemical Location (On-Site): Gun Range Date Product Taken Off-Site: / /

Product Name: Chevron Diesel #2 Manufacturer: Chevron USA Products

Storage Codes: R 1 4 Container Size: 100 Gal Tank Quantity Brought On-Site This Period: Gal

End Use: Fuel for V

Waste Disposal Location: _____

Physical State: _____

Item # 2 Date _____

Product Name: Chev

Storage Codes: R

End Use: Fuel for V

Waste Disposal Location: _____

Physical State: _____

A WORK MAY PROCEED SUBJECT TO INCORPORATION OF CHANGES

B REVISE AND RESUBMIT WORK MAY PROCEED SUBJECT TO INCORPORATION OF CHANGES INDICATED

C REVISE AND RESUBMIT WORK MAY NOT PROCEED

D REVIEW NOT REQUIRED WORK MAY PROCEED

VDR NO. 153307 R.D

BY: Quentin Ragle

DATE: 9-27-06

Item # 3 Date _____

Product Name: Mot

Storage Codes: N

End Use: Lubricat

Waste Disposal Location: _____

Physical State: _____

Item # 4 Date _____

Product Name: Mo

Storage Codes: N

End Use: Lubrica

Waste Disposal Location: _____

Physical State: _____

If you need more lines

SUBCONTRACTOR REPORTING FORM CHEMICAL INVENTORY LIST

<input checked="" type="checkbox"/> Initial Submittal <input type="checkbox"/> Re-Submittal	<input type="checkbox"/> First Quarter Nov 16 to Feb 15 Submit by Feb 15 <input type="checkbox"/> Second Quarter Feb 16 to May 15 Submit by May 15	<input type="checkbox"/> Third Quarter May 16 to Aug 15 Submit by Aug 15 <input type="checkbox"/> Fourth Quarter Aug 16 to Nov 15 Submit Nov 15	<input type="checkbox"/> Final Submittal Submit within 15 days after project completion
Rev. # _____			
Page <u>1</u> of <u>4</u>			
Prime Subcontractor Name: <u>Phenix Construction</u>			
Project Name and Subcontract Number: <u>Remediation of The STF - 02 Gun Range Contract No. 00507296</u>			
Responsible Person: <u>Mike Garcia</u> Telephone No.: <u>589-6489</u>			
STF - 02			
Item # <u>1</u> Date On-Site: <u>10 / 02 / 06</u> Chemical Location (On-Site): <u>Gun Range</u> Date Product Taken Off-Site: <u> / /</u>			
Product Name: <u>Chevron Diesel #2</u>		Manufacturer: <u>Chevron USA Products</u>	
Storage Codes: <input type="checkbox"/> R <input type="checkbox"/> 1 <input type="checkbox"/> 4	Container Size: <u>100 Gal Tank</u>	Quantity Brought On-Site This Period: <u>Gal</u>	
End Use: <u>Fuel for Vehicles and Equipment</u>			
Waste Disposal Location: <u>No Waste Generated</u>			
Physical State: <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas		Quantity Used This Period: <u>Gal</u>	
STF - 02			
Item # <u>2</u> Date On-Site: <u>10 / 02 / 06</u> Chemical Location (On-Site): <u>Gun Range</u> Date Product Taken Off-Site: <u> / /</u>			
Product Name: <u>Chevron Regular Unleaded Gasoline</u>		Manufacturer: <u>Chevron USA Products</u>	
Storage Codes: <input type="checkbox"/> R <input type="checkbox"/> 1 <input type="checkbox"/> 4	Container Size: <u>5 Gal Can</u>	Quantity Brought On-Site This Period: <u>Gal</u>	
End Use: <u>Fuel for Vehicles and Equipment</u>			
Waste Disposal Location: <u>No Waste Generated</u>			
Physical State: <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas		Quantity Used This Period: <u>Gal</u>	
STF - 02			
Item # <u>3</u> Date On-Site: <u>10 / 02 / 06</u> Chemical Location (On-Site): <u>Gun Range</u> Date Product Taken Off-Site: <u> / /</u>			
Product Name: <u>Mobil Devac 1300 Super 15W - 40</u>		Manufacturer: <u>Mobil Oil Corp.</u>	
Storage Codes: <input type="checkbox"/> N <input type="checkbox"/> 1 <input type="checkbox"/> 4	Container Size: <u>1 Gal</u>	Quantity Brought On-Site This Period: <u>Gal</u>	
End Use: <u>Lubricant for Vehicles and Equipment</u>			
Waste Disposal Location: <u>No Waste Generated</u>			
Physical State: <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas		Quantity Used This Period: <u>Gal</u>	
STF - 02			
Item # <u>4</u> Date On-Site: <u>10 / 02 / 06</u> Chemical Location (On-Site): <u>Gun Range</u> Date Product Taken Off-Site: <u> / /</u>			
Product Name: <u>Mobilfluid 424 Hydraulic Oil</u>		Manufacturer: <u>Mobil Oil Corp.</u>	
Storage Codes: <input type="checkbox"/> N <input type="checkbox"/> 1 <input type="checkbox"/> 4	Container Size: <u>5 Gal</u>	Quantity Brought On-Site This Period: <u>Gal</u>	
End Use: <u>Lubricant for Vehicles and Equipment</u>			
Waste Disposal Location: <u>No Waste Generated</u>			
Physical State: <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas		Quantity Used This Period: <u>0 Gal</u>	

If you need more line items please use Form 432.21A "Subcontractor Reporting Form Chemical Inventory List - Continuation Sheet."

**SUBCONTRACTOR REPORTING FORM
CHEMICAL INVENTORY LIST
(CONTINUATION SHEET)**

Page <u>2</u> of <u>4</u>	
Prime Subcontractor Name: <u>Phenix Construction</u>	
Project Name and Subcontract Number: <u>Remediation of The STF - 02 Gun Range Contract No. 00507296</u>	
Responsible Person: <u>Mike Garcia</u>	Telephone No.: <u>589-6489</u>
STF - 02	
Item # <u>5</u>	Date On-Site: <u>10 / 02 / 06</u> Chemical Location (On-Site): <u>Gun Range</u> Date Product Taken Off-Site: <u> / /</u>
Product Name: <u>Mobil Grease HTS</u>	Manufacturer: <u>Mobil</u>
Storage Codes: <input type="checkbox"/> R <input type="checkbox"/> 1 <input type="checkbox"/> 4	Container Size: <u>14 OZ. Tube</u> Quantity Brought On-Site This Period: <u>14 OZ. Tubes</u>
End Use: <u>Lubricant for Vehicles and Equipment</u>	
Waste Disposal Location: <u>INEEL Landfill</u>	
Physical State: <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas	Quantity Used This Period: <u>14 OZ. Tubes</u>
STF - 02	
Item # <u>6</u>	Date On-Site: <u>01 / 02 / 06</u> Chemical Location (On-Site): <u>Gun Range</u> Date Product Taken Off-Site: <u> / /</u>
Product Name: <u>Zerex 50/50 Premix</u>	Manufacturer: <u>Valvoline</u>
Storage Codes: <input type="checkbox"/> N <input type="checkbox"/> 1 <input type="checkbox"/> 4	Container Size: <u>1 Gal</u> Quantity Brought On-Site This Period: <u>Gal</u>
End Use: <u>Coolant System Protectant</u>	
Waste Disposal Location: <u>No Waste Generated</u>	
Physical State: <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas	Quantity Used This Period: <u>0 Gal</u>
STF - 02	
Item # <u>7</u>	Date On-Site: <u>10 / 02 / 06</u> Chemical Location (On-Site): <u>Gun Range</u> Date Product Taken Off-Site: <u> / /</u>
Product Name: <u>Premium Starting Fluid</u>	Manufacturer: <u>Valvoline</u>
Storage Codes: <input type="checkbox"/> F <input type="checkbox"/> 2 <input type="checkbox"/> 4	Container Size: <u>11 OZ. Can</u> Quantity Brought On-Site This Period: <u>11 OZ. Can</u>
End Use: <u>Help Start Equipment Motors (cold weather)</u>	
Waste Disposal Location: <u>INEEL Landfill</u>	
Physical State: <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas	Quantity Used This Period: <u>0 11 OZ. Can</u>
STF - 02	
Item # <u>8</u>	Date On-Site: <u>10 / 02 / 06</u> Chemical Location (On-Site): <u>Gun Range</u> Date Product Taken Off-Site: <u> / /</u>
Product Name: <u>WD - 40</u>	Manufacturer: <u>WD 40 Company</u>
Storage Codes: <input type="checkbox"/> F <input type="checkbox"/> 2 <input type="checkbox"/> 4	Container Size: <u>16 OZ. Can</u> Quantity Brought On-Site This Period: <u>16 OZ. Can</u>
End Use: <u>Lubricant</u>	
Waste Disposal Location: <u>INEEL Landfill</u>	
Physical State: <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas	Quantity Used This Period: <u>0 16 OZ. Can</u>

**SUBCONTRACTOR REPORTING FORM
CHEMICAL INVENTORY LIST
(CONTINUATION SHEET)**

Page <u>3</u> of <u>4</u>	
Prime Subcontractor Name: <u>Phenix Construction</u>	
Project Name and Subcontract Number: <u>Remediation of The STF - 02 Gun Range Contract No. 00507296</u>	
Responsible Person: <u>Mike Garcia</u> Telephone No.: <u>589-6489</u>	
STF - 02	
Item # <u>9</u>	Date On-Site: <u>10 / 02 / 06</u> Chemical Location (On-Site): <u>Gun Range</u> Date Product Taken Off-Site: <u> / /</u>
Product Name: <u>(17A) Marking Paint</u>	Manufacturer: <u>Aerove Pacific Company Inc.</u>
Storage Codes: <u>F</u> <u>2</u> <u>4</u>	Container Size: <u>17 OZ. Can</u> Quantity Brought On-Site This Period: <u>17 OZ. Can</u>
End Use: <u>Construction Layout</u>	
Waste Disposal Location: <u>INEEL Landfill</u>	
Physical State: <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas	Quantity Used This Period: <u>17 OZ. Can</u>
STF - 02	
Item # <u>10</u>	Date On-Site: <u>10 / 02 / 06</u> Chemical Location (On-Site): <u>Gun Range</u> Date Product Taken Off-Site: <u> / /</u>
Product Name: <u>Windshield Washer Fluid</u>	Manufacturer: <u>Valvoline Inc.</u>
Storage Codes: <u>N</u> <u>1</u> <u>4</u>	Container Size: <u>1 Gal</u> Quantity Brought On-Site This Period: <u>Gal</u>
End Use: <u>Clean Vehicle Windows</u>	
Waste Disposal Location: <u>INEEL Landfill</u>	
Physical State: <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas	Quantity Used This Period: <u>0 Gal</u>
STF - 02	
Item # <u>11</u>	Date On-Site: <u>10 / 02 / 06</u> Chemical Location (On-Site): <u>Gun Range</u> Date Product Taken Off-Site: <u> / /</u>
Product Name: <u>Krylon Marking Paint</u>	Manufacturer: <u>The Sherwin - Williams Company</u>
Storage Codes: <u>F</u> <u>2</u> <u>4</u>	Container Size: <u>17 OZ. Can</u> Quantity Brought On-Site This Period: <u>17 OZ. Can</u>
End Use: <u>Construction Layout</u>	
Waste Disposal Location: <u>INL Landfill</u>	
Physical State: <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas	Quantity Used This Period: <u>17 OZ. Can</u>
STF - 02	
Item # <u>12</u>	Date On-Site: <u>10 / 02 / 06</u> Chemical Location (On-Site): <u>Gun Range</u> Date Product Taken Off-Site: <u> / /</u>
Product Name: <u>CAT DEAC</u>	Manufacturer: <u>Chevron Texaco</u>
Storage Codes: <u>N</u> <u>1</u> <u>4</u>	Container Size: <u>1 Gal</u> Quantity Brought On-Site This Period: <u>Gal</u>
End Use: <u>Coolant System Protect</u>	
Waste Disposal Location: <u>INL Landfill</u>	
Physical State: <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas	Quantity Used This Period: <u>0 Gal</u>

**SUBCONTRACTOR REPORTING FORM
CHEMICAL INVENTORY LIST
(CONTINUATION SHEET)**

Page <u>4</u> of <u>4</u>	
Prime Subcontractor Name: <u>Phenix Construction</u>	
Project Name and Subcontract Number: <u>Remediation of The STF - 02 Gun Range Contract No. 00507296</u>	
Responsible Person: <u>Mike Garcia</u>	Telephone No.: <u>589-6489</u>
STF - 02	
Item # <u>13</u>	Date On-Site: <u>10 / 02 / 06</u> Chemical Location (On-Site): <u>Gun Range</u> Date Product Taken Off-Site: <u> / /</u>
Product Name: <u>RONEX EXTRA DUTY MOLY 2</u>	Manufacturer: <u>EXXONMOBIL Oil Corporation</u>
Storage Codes: <input type="checkbox"/> R <input type="checkbox"/> 1 <input type="checkbox"/> 4	Container Size: <u>14 OZ. Tube</u> Quantity Brought On-Site This Period: <u>14 OZ. Tubes</u>
End Use: <u>Lubricant for Vehicles and Equipment</u>	
Waste Disposal Location: <u>INL Landfill</u>	
Physical State: <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas	Quantity Used This Period: <u>14 OZ. Tube</u>
Item # _____	Date On-Site: <u> / /</u> Chemical Location (On-Site): _____ Date Product Taken Off-Site: <u> / /</u>
Product Name: _____	Manufacturer: _____
Storage Codes: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Container Size: _____ Quantity Brought On-Site This Period: _____
End Use: _____	
Waste Disposal Location: _____	
Physical State: <input type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas	Quantity Used This Period: _____
Item # _____	Date On-Site: <u> / /</u> Chemical Location (On-Site): _____ Date Product Taken Off-Site: <u> / /</u>
Product Name: _____	Manufacturer: _____
Storage Codes: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Container Size: _____ Quantity Brought On-Site This Period: _____
End Use: _____	
Waste Disposal Location: _____	
Physical State: <input type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas	Quantity Used This Period: _____
Item # _____	Date On-Site: <u> / /</u> Chemical Location (On-Site): _____ Date Product Taken Off-Site: <u> / /</u>
Product Name: _____	Manufacturer: _____
Storage Codes: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Container Size: _____ Quantity Brought On-Site This Period: _____
End Use: _____	
Waste Disposal Location: _____	
Physical State: <input type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas	Quantity Used This Period: _____

Material Safety Data Sheet

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

DIESEL FUEL No. 2

Product Use: Fuel

Product Number(s): CPS220122 [See Section 16 for Additional Product Numbers]

Synonyms: 15 S Diesel Fuel 2, Alternative Low Aromatic Diesel (ALAD), Calco LS Diesel 2, Calco ULS DF2, Calco ULS Diesel 2, Chevron LS Diesel 2, Chevron ULS Diesel 2, Diesel Fuel Oil, Diesel Grade No. 2, Diesel No. 2-D S15, Diesel No. 2-D S500, Diesel No. 2-D S5000, Gas Oil, HS Diesel 2, HS Heating Fuel 2, Light Diesel Oil Grade No. 2-D, LS Diesel 2, LS Heating Fuel 2, Marine Diesel, RR Diesel Fuel, Texaco Diesel, Texaco Diesel No. 2, Ultra Low Sulfur Diesel 2

Company Identification

 Chevron Products Company
 Marketing, MSDS Coordinator
 6001 Bollinger Canyon Road
 San Ramon, CA 94583
 United States of America

Transportation Emergency Response

CHEMTREC: (800) 424-9300 or (703) 527-3887

Health Emergency

ChevronTexaco Emergency Information Center: Located in the USA. International collect calls accepted. (800) 231-0623 or (510) 231-0623

Product Information

MSDS Requests: (800) 689-3998

Technical Information: (510) 242-5357

SPECIAL NOTES: This MSDS covers all Chevron and Calco non-CARB Diesel No. 2 Fuels. The sulfur content is less than 0.5% (mass). Red dye is added to non-taxable fuel. (MSDS 6894)

SECTION 2 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENTS	CAS NUMBER	AMOUNT
Diesel Fuel No. 2	68476-34-6	100 %weight
Distillates, hydrodesulfurized, middle	64742-80-9	0 - 100 %weight
Distillates, straight run middle (gas oil, light)	64741-44-2	0 - 100 %weight
Kerosine	8008-20-6	0 - 25 %weight
Kerosine, hydrodesulfurized	64742-81-0	0 - 25 %weight
Distillates (petroleum), light catalytic cracked	64741-59-9	0 - 50 %weight
Naphthalene	91-20-3	0.02 - 0.2 %weight
Total sulfur	None	0 - 0.5 %weight

SECTION 3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

- COMBUSTIBLE LIQUID AND VAPOR
- HARMFUL OR FATAL IF SWALLOWED - MAY CAUSE LUNG DAMAGE IF SWALLOWED
- CAUSES SKIN IRRITATION
- POSSIBLE CANCER HAZARD - MAY CAUSE CANCER BASED ON ANIMAL DATA
- TOXIC TO AQUATIC ORGANISMS

IMMEDIATE HEALTH EFFECTS

Eye: Not expected to cause prolonged or significant eye irritation.
Skin: Contact with the skin causes irritation. Skin contact may cause drying or defatting of the skin. Contact with the skin is not expected to cause an allergic skin response. Symptoms may include pain, itching, discoloration, swelling, and blistering. Not expected to be harmful to internal organs if absorbed through the skin.
Ingestion: Because of its low viscosity, this material can directly enter the lungs, if swallowed, or if subsequently vomited. Once in the lungs it is very difficult to remove and can cause severe injury or death. May be irritating to mouth, throat, and stomach. Symptoms may include pain, nausea, vomiting, and diarrhea.
Inhalation: Mists of this material may cause respiratory irritation. Symptoms of respiratory irritation may include coughing and difficulty breathing. Breathing this material at concentrations above the recommended exposure limits may cause central nervous system effects. Central nervous system effects may include headache, dizziness, nausea, vomiting, weakness, loss of coordination, blurred vision, drowsiness, confusion, or disorientation. At extreme exposures, central nervous system effects may include respiratory depression, tremors or convulsions, loss of consciousness, coma or death.

DELAYED OR OTHER HEALTH EFFECTS:

Cancer: Prolonged or repeated exposure to this material may cause cancer. Whole diesel engine exhaust has been classified as a Group 2A carcinogen (probably carcinogenic to humans) by the International Agency for Research on Cancer (IARC). Diesel exhaust particulate has been classified as reasonably anticipated to be a human carcinogen in the National Toxicology Program's Ninth Report on Carcinogens. The National Institute of Occupational Safety and Health (NIOSH) has recommended that whole diesel exhaust be regarded as potentially causing cancer. Diesel engine exhaust is known to the State of California to cause cancer. Contains naphthalene, which has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).
 See Section 11 for additional information. Risk depends on duration and level of exposure.

SECTION 4 FIRST AID MEASURES

Eye: No specific first aid measures are required. As a precaution, remove contact lenses, if worn, and flush eyes with water.
Skin: Wash skin with water immediately and remove contaminated clothing and shoes. Get medical attention if any symptoms develop. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.
Ingestion: If swallowed, get immediate medical attention. Do not induce vomiting. Never give anything by mouth to an unconscious person. If swallowed, get medical attention. Do not induce vomiting. Never give anything by mouth to an unconscious person.
Inhalation: Move the exposed person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if breathing difficulties continue.
Note to Physicians: Ingestion of this product or subsequent vomiting may result in aspiration of light hydrocarbon liquid, which may cause pneumonitis.

SECTION 5 FIRE FIGHTING MEASURES

See Section 7 for proper handling and storage.

FIRE CLASSIFICATION:
 OSHA Classification (29 CFR 1910.1200): Combustible liquid.

NFPA RATINGS: Health: 0 Flammability: 2 Reactivity: 0

FLAMMABLE PROPERTIES:

Flashpoint: (Pensky-Martens Closed Cup) 52 °C (125 °F) (Min)

Autoignition: 257 °C (494 °F)

Flammability (Explosive) Limits (% by volume in air): Lower: 0.6 Upper: 4.7

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO₂) to extinguish flames.

PROTECTION OF FIRE FIGHTERS:

Fire Fighting Instructions: For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.

Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in the vicinity of the spill or released vapor. If this material is released into the work area, evacuate the area immediately. Monitor area with combustible gas indicator.

Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. All equipment used when handling the product must be grounded. A vapor suppressing foam may be used to reduce vapors. Use clean non-sparking tools to collect absorbed material. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.

Reporting: Report spills to local authorities and/or the U.S. Coast Guard's National Response Center at (800) 424-8802 as appropriate or required.

SECTION 7 HANDLING AND STORAGE

Precautionary Measures: Liquid evaporates and forms vapor (fumes) which can catch fire and burn with explosive force. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights, welding equipment, and electrical motors and switches. Fire hazard is greater as liquid temperature rises above 29C (85F).

Do not get in eyes, on skin, or on clothing. Do not taste or swallow. Do not breathe vapor or fumes. Do not breathe the mist. Wash thoroughly after handling. Keep out of the reach of children.

Unusual Handling Hazards: WARNING! Do not use as portable heater or appliance fuel. Toxic fumes may accumulate and cause death.

General Handling Information: Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.

Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids', National Fire Protection Association (NFPA 77, 'Recommended Practice on Static Electricity', and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents'.

General Storage Information: DO NOT USE OR STORE near heat, sparks, flames, or hot surfaces. USE AND STORE ONLY IN WELL VENTILATED AREA. Keep container closed when not in use.

Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION**GENERAL CONSIDERATIONS:**

Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If

engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:

Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below the recommended exposure limits.

PERSONAL PROTECTIVE EQUIPMENT

Eye/Face Protection: No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.

Skin Protection: Wear protective clothing to prevent skin contact. Selection of protective clothing may include gloves, apron, boots, and complete facial protection depending on operations conducted. Suggested materials for protective gloves include: Chlorinated Polyethylene (or Chlorosulfonated Polyethylene), Nitrile Rubber, Polyurethane, Viton.

Respiratory Protection: Determine if airborne concentrations are below the recommended occupational exposure limits for jurisdiction of use. If airborne concentrations are above the acceptable limits, wear an approved respirator that provides adequate protection from this material, such as: Air-Purifying Respirator for Organic Vapors.

When used as a fuel, this material can produce carbon monoxide in the exhaust. Determine if airborne concentrations are below the occupational exposure limit for carbon monoxide. If not, wear an approved positive-pressure air-supplying respirator.

Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.

Occupational Exposure Limits:

Component	Agency	TWA	STEL	Ceiling	Notation
Diesel Fuel No. 2	ACGIH	100 mg/m ³	--	--	Skin A3
Diesel Fuel No. 2	CVX	--	1000 mg/m ³	--	--
Kerosine	ACGIH	200 mg/m ³	--	--	Skin A3
Kerosine	CVX	--	1000 mg/m ³	--	--
Kerosine, hydrodesulfurized	ACGIH	200 mg/m ³	--	--	Skin A3
Kerosine, hydrodesulfurized	CVX	--	1000 mg/m ³	--	--
Naphthalene	ACGIH	10 ppm	15 ppm	--	A4 Skin
Naphthalene	OSHA Z-1	50 mg/m ³	--	--	--

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color: Varies depending on specification

Physical State: Liquid

Odor: Petroleum odor

pH: Not Applicable

Vapor Pressure: 0.04 kPa (Approximate) @ 40 °C (104 °F)

Vapor Density (Air = 1): >1

Boiling Point: 175.8 °C (348°F) - 370°C (698°F)

Solubility: Soluble in hydrocarbons; insoluble in water

Freezing Point: Not Applicable

Melting Point: Not Applicable

Specific Gravity: 0.8 - 0.88 @ 15.6 °C (60.1°F) (Typical)

Viscosity: 1.9 cSt - 4.1 cSt @ 40 °C (104°F)

SECTION 10 STABILITY AND REACTIVITY

Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Incompatibility With Other Materials: May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

Hazardous Decomposition Products: None known (None expected)

Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

IMMEDIATE HEALTH EFFECTS

Eye Irritation: The eye irritation hazard is based on evaluation of data for similar materials or product components.

Skin Irritation: The skin irritation hazard is based on evaluation of data for similar materials or product components.

Skin Sensitization: This material did not cause skin sensitization reactions in a Buehler guinea pig test.

Acute Dermal Toxicity: LD50: >5ml/kg (rabbit).

Acute Oral Toxicity: LD50: > 5 ml/kg (rat)

Acute Inhalation Toxicity: 4 hour(s) LC50: > 5mg/l (rat).

ADDITIONAL TOXICOLOGY INFORMATION:

This product contains gas oils.

CONCAWE (product dossier 95/107) has summarized current health, safety and environmental data available for a number of gas oils, typically hydrodesulfurized middle distillates, CAS 64742-80-9, straight-run middle distillates, CAS 64741-44-2, and/or light cat-cracked distillate CAS 64741-59-9. **CARCINOGENICITY:** All materials tested have caused the development of skin tumors in mice, but all featured severe skin irritation and sometimes a long latency period before tumors developed. Straight-run and cracked gas oil samples were studied to determine the influence of dermal irritation on the carcinogenic activity of middle distillates. At non-irritant doses the straight-run gas oil was not carcinogenic, but at irritant doses, weak activity was demonstrated. Cracked gas oils, when diluted with mineral oil, demonstrated carcinogenic activity irrespective of the occurrence of skin irritation. Gas oils were tested on male mice to study tumor initiating/promoting activity. The results demonstrated that while a straight-run gas oil sample was neither an initiator or promoter, a blend of straight-run and FCC stock was both a tumor initiator and a promoter.

GENOTOXICITY: Hydrotreated & hydrodesulfurized gas oils range in activity from inactive to weakly positive in in-vitro bacterial mutagenicity assays. Mouse lymphoma assays on straight-run gas oils without subsequent hydrodesulfurization gave positive results in the presence of S9 metabolic activation. In-vivo bone marrow cytogenetics and sister chromatic exchange assay exhibited no activity for straight-run components with or without hydrodesulfurization. Thermally or catalytically cracked gas oils tested with in-vitro bacterial mutagenicity assays in the presence of S9 metabolic activation were shown to be mutagenic. In-vitro sister chromatic exchange assays on cracked gas oil gave equivocal results both with and without S9 metabolic activation. In-vivo bone marrow cytogenetics assay was inactive for two cracked gas oil samples. Three hydrocracked gas oils were tested with in-vitro bacterial mutagenicity assays with S9, and one of the three gave positive results. Twelve distillate fuel samples were tested with in-vitro bacterial mutagenicity assays & with S9 metabolic activation and showed negative to weakly positive results. In one series, activity was shown to be related to the PCA content of samples tested. Two in-vivo studies were also conducted. A mouse dominant lethal assay was negative for a sample of diesel fuel. In the other study, 9 samples of No 2 heating oil containing 50% cracked stocks caused a slight increase in the number of chromosomal aberrations in bone marrow cytogenetics assays. **DEVELOPMENTAL TOXICITY:** Diesel fuel vapor did not cause fetotoxic or teratogenic effects when pregnant rats were exposed on days 6-15 of pregnancy. Gas oils were applied to the skin of pregnant rats daily on days 0-19 of gestation. All but one (coker light gas oil) caused fetotoxicity (increased resorptions, reduced litter weight, reduced litter size) at dose levels that were also maternally toxic.

This product contains naphthalene. **GENERAL TOXICITY:** Exposure to naphthalene has been reported to cause methemoglobinemia and/or hemolytic anemia, especially in humans deficient in the enzyme glucose-6-phosphate dehydrogenase. Laboratory animals given repeated oral doses of naphthalene have developed cataracts.

REPRODUCTIVE TOXICITY AND BIRTH DEFECTS: Naphthalene did not cause birth defects when administered orally to rabbits, rats, and mice during pregnancy, but slightly reduced litter size in mice at dose levels that were lethal to the pregnant females. Naphthalene has been reported to cross the human placenta. **GENETIC TOXICITY:** Naphthalene caused chromosome aberrations and sister chromatid exchanges in Chinese hamster ovary cells, but was not a mutagen in several other in-vitro tests. **CARCINOGENICITY:** In a study conducted by the National Toxicology Program (NTP), mice exposed to 10 or 30 ppm of naphthalene by inhalation daily for two years had chronic inflammation of the nose and lungs and increased incidences of metaplasia in those tissues. The incidence of benign lung tumors (alveolar/bronchiolar adenomas) was significantly increased in the high-dose

female group but not in the male groups. In another two-year inhalation study conducted by NTP, exposure of rats to 10, 30, and 60 ppm naphthalene caused increases in the incidences of a variety of nonneoplastic lesions in the nose. Increases in nasal tumors were seen in both sexes, including olfactory neuroblastomas in females at 60 ppm and adenomas of the respiratory epithelium in males at all exposure levels. The relevance of these effects to humans has not been established. No carcinogenic effect was reported in a 2-year feeding study in rats receiving naphthalene at 41 mg/kg/day. This product may contain significant amounts of Polynuclear Aromatic Hydrocarbons (PAH's) which have been shown to cause skin cancer after prolonged and frequent contact with the skin of test animals. Brief or intermittent skin contact with this product is not expected to have serious effects if it is washed from the skin. While skin cancer is unlikely to occur in human beings following use of this product, skin contact and breathing, of mists, vapors or dusts should be reduced to a minimum.

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY

96 hour(s) LC50: 21-210 mg/l (*Salmo gairdneri*)

48 hour(s) EC50: 20-210 mg/l (*Daphnia magna*)

72 hour(s) EC50: 2.6-25 mg/l (*Raphidocellus subcapitata*)

This material is expected to be toxic to aquatic organisms.

ENVIRONMENTAL FATE

On release to the environment the lighter components of diesel fuel will generally evaporate but depending on local environmental conditions (temperature, wind, mixing or wave action, soil type, etc.) the remainder may become dispersed in the water column or absorbed to soil or sediment. Diesel fuel would not be expected to be readily biodegradable. In a modified Strum test (OECD method 301B) approximately 40% biodegradation was recorded over 28 days. However, it has been shown that most hydrocarbon components of diesel fuel are degraded in soil in the presence of oxygen. Under anaerobic conditions, such as in anoxic sediments, rates of biodegradation are negligible.

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

DOT Shipping Description: GAS OIL, Combustible Liquid, UN1202,III

IMO/IMDG Shipping Description: GAS OIL,3,UN1202,III, FLASH POINT SEE SECTION 5

ICAO/IATA Shipping Description: GAS OIL,3,UN1202,III,

SECTION 15 REGULATORY INFORMATION

EPCRA 311/312 CATEGORIES: 1. Immediate (Acute) Health Effects: YES

2. Delayed (Chronic) Health Effects: YES

3. Fire Hazard: YES

4. Sudden Release of Pressure Hazard: NO

5. Reactivity Hazard: NO

REGULATORY LISTS SEARCHED:

01-1=IARC Group 1
 01-2A=IARC Group 2A
 01-2B=IARC Group 2B
 02=NTP Carcinogen
 03=EPCRA 313
 04=CA Proposition 65
 05=MA RTK
 06=NJ RTK
 07=PA RTK

The following components of this material are found on the regulatory lists indicated.

Diesel Fuel No. 2 07
 Distillates, straight run middle (gas oil, light) 06
 Kerosine 05, 06, 07
 Naphthalene 01-2B, 03, 04, 05, 06, 07

CERCLA REPORTABLE QUANTITIES(RQ)/EPCRA 302 THRESHOLD PLANNING QUANTITIES(TPQ):

Component	Component RQ	Component TPQ	Product RQ
Naphthalene	100 lbs	None	55556 lbs

CHEMICAL INVENTORIES:

All components comply with the following chemical inventory requirements: AICS (Australia), DSL (Canada), EINECS (European Union), IECSC (China), KECI (Korea), PICCS (Philippines), TSCA (United States).

NEW JERSEY RTK CLASSIFICATION:

Refer to components listed in Section 2. Under the New Jersey Right-to-Know Act L. 1983 Chapter 315 N.J.S.A. 34.5A-1 et. seq., the product is to be identified as follows: DIESEL FUEL

WHMIS CLASSIFICATION:

Class B, Division 3: Combustible Liquids
 Class D, Division 2, Subdivision A: Very Toxic Material -
 Carcinogenicity
 Class D, Division 2, Subdivision B: Toxic Material -
 Skin or Eye Irritation

SECTION 16 OTHER INFORMATION

NFPA RATINGS: Health: 0 Flammability: 2 Reactivity: 0

(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

Additional Product Number(s): CPS225114, CPS225115, CPS225150, CPS266176, CPS270005, CPS270094, CPS270095, CPS270096, CPS271006, CPS272093, CPS272102, CPS272126, CPS272152, CPS272185, CPS272190, CPS272195, CPS272593, CPS272601, CPS272693, CPS272793, CPS273003, CPS273030, CPS273053, CPS275000

REVISION STATEMENT: This revision updates the following sections of this Material Safety Data Sheet: 1.
Revision Date: 12/13/2004

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	PEL - Permissible Exposure Limit
	CAS - Chemical Abstract Service Number
ACGIH - American Conference of Government Industrial Hygienists	IMO/IMDG - International Maritime Dangerous Goods Code
API - American Petroleum Institute	MSDS - Material Safety Data Sheet
CVX - ChevronTexaco	NFPA - National Fire Protection Association (USA)
DOT - Department of Transportation (USA)	NTP - National Toxicology Program (USA)

IARC - International Agency for Research on Cancer OSHA - Occupational Safety and Health Administration

Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the ANSI MSDS Standard (Z400.1) by the ChevronTexaco Energy Research & Technology Company, 100 Chevron Way, Richmond, California 94802.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

Material Safety Data Sheet

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

CHEVRON and TEXACO REGULAR UNLEADED GASOLINES

Product Number(s): CPS201000 [See Section 16 for Additional Product Numbers]

Synonyms: Calco Regular Unleaded Gasoline, Chevron Regular Unleaded Gasoline, Texaco Unleaded Gasoline

Company Identification

Chevron Products Company
Marketing, MSDS Coordinator
6001 Bollinger Canyon Road
San Ramon, CA 94583
United States of America

Transportation Emergency Response

CHEMTREC: (800) 424-9300 or (703) 527-3887

Health Emergency

ChevronTexaco Emergency Information Center: Located in the USA, International collect calls accepted. (800) 231-0623 or (510) 231-0623

Product Information

Technical Information: (510) 242-5357

SPECIAL NOTES: This MSDS applies to: all motor gasoline.

SECTION 2 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENTS	CAS NUMBER	AMOUNT
Gasoline	86290-81-5	100 %volume
Benzene	71-43-2	0.1 - 4.9 %volume
Toluene (methylbenzene)	108-88-3	1 - 17 %volume
Ethyl benzene	100-41-4	0.1 - 3 %volume
Xylene (contains o-, m-, & p- xylene isomers in varying amounts)	1330-20-7	1 - 15 %volume
Butane	106-97-8	1 - 12 %volume
Heptane	142-82-5	1 - 4 %volume
Hexane	110-64-3	1 - 5 %volume
Cyclohexane	110-82-7	1 - 3 %volume
Methylcyclohexane	108-87-2	1 - 2 %volume
Pentane, 2,2,4-trimethyl- (Isooctane)	540-84-1	1 - 13 %volume
Naphthalene	91-20-3	0.1 - 2 %volume
Ethanol	64-17-5	0 - 10 %volume
Methyl tert-butyl ether (MTBE)	1634-04-4	0 - 15 %volume

Tertiary amyl methyl ether (TAME)	994-05-8	0 - 17 %volume
Ethyl tert-butyl ether (ETBE)	637-92-3	0 - 18 %volume

Motor gasoline is considered a mixture by EPA under the Toxic Substances Control Act (TSCA). The refinery streams used to blend motor gasoline are all on the TSCA Chemical Substances Inventory. The appropriate CAS number for refinery blended motor gasoline is 86290-81-5. The product specifications of motor gasoline sold in your area will depend on applicable Federal and State regulations.

SECTION 3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

- EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE
- HARMFUL OR FATAL IF SWALLOWED - MAY CAUSE LUNG DAMAGE IF SWALLOWED
- VAPOR HARMFUL
- CAUSES EYE AND SKIN IRRITATION
- LONG-TERM EXPOSURE TO VAPOR HAS CAUSED CANCER IN LABORATORY ANIMALS
- KEEP OUT OF REACH OF CHILDREN
- TOXIC TO AQUATIC ORGANISMS

IMMEDIATE HEALTH EFFECTS

Eye: Contact with the eyes causes irritation. Symptoms may include pain, tearing, reddening, swelling and impaired vision.

Skin: Contact with the skin causes irritation. Skin contact may cause drying or defatting of the skin. Contact with the skin is not expected to cause an allergic skin response. Symptoms may include pain, itching, discoloration, swelling, and blistering. Not expected to be harmful to internal organs if absorbed through the skin.

Ingestion: Because of its low viscosity, this material can directly enter the lungs, if swallowed, or if subsequently vomited. Once in the lungs it is very difficult to remove and can cause severe injury or death.

Inhalation: The vapor or fumes from this material may cause respiratory irritation. Symptoms of respiratory irritation may include coughing and difficulty breathing. Breathing this material at concentrations above the recommended exposure limits may cause central nervous system effects. Central nervous system effects may include headache, dizziness, nausea, vomiting, weakness, loss of coordination, blurred vision, drowsiness, confusion, or disorientation. At extreme exposures, central nervous system effects may include respiratory depression, tremors or convulsions, loss of consciousness, coma or death.

DELAYED OR OTHER HEALTH EFFECTS:

Reproduction and Birth Defects: This material is not expected to cause birth defects or other harm to the developing fetus based on animal data.

Cancer: Prolonged or repeated exposure to this material may cause cancer. Gasoline has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

Whole gasoline exhaust has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

Contains benzene, which has been classified as a carcinogen by the National Toxicology Program (NTP) and a Group 1 carcinogen (carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

Contains ethylbenzene which has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

Contains naphthalene, which has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

See Section 11 for additional information. Risk depends on duration and level of exposure.

SECTION 4 FIRST AID MEASURES

Eye: Flush eyes with water immediately while holding the eyelids open. Remove contact lenses, if worn, after initial flushing, and continue flushing for at least 15 minutes. Get medical attention if irritation persists.

Skin: Wash skin with water immediately and remove contaminated clothing and shoes. Get medical attention if any symptoms develop. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.

Ingestion: If swallowed, get immediate medical attention. Do not induce vomiting. Never give anything by mouth to an unconscious person. If swallowed, get medical attention. Do not induce vomiting. Never give anything by mouth to an unconscious person.

Inhalation: Move the exposed person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if breathing difficulties continue.

Note to Physicians: Ingestion of this product or subsequent vomiting may result in aspiration of light hydrocarbon liquid, which may cause pneumonitis.

SECTION 5 FIRE FIGHTING MEASURES

See Section 7 for proper handling and storage.

FIRE CLASSIFICATION:

OSHA Classification (29 CFR 1910.1200): Flammable liquid.

NFPA RATINGS: Health: 1 Flammability: 3 Reactivity: 0

FLAMMABLE PROPERTIES:

Flashpoint: (Tagliabue Closed Cup ASTM D56) < -45 °C (< -49 °F)

Autoignition: > 280 °C (> 536 °F)

Flammability (Explosive) Limits (% by volume in air): Lower: 1.4 Upper: 7.6 (Typical)

EXTINGUISHING MEDIA: Dry Chemical, CO₂, AFFF Foam or alcohol resistant foam if >15% volume polar solvents (oxygenates).

PROTECTION OF FIRE FIGHTERS:

Fire Fighting Instructions: Use water spray to cool fire-exposed containers and to protect personnel. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.

Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in the vicinity of the spill or released vapor. If this material is released into the work area, evacuate the area immediately. Monitor area with combustible gas indicator.

Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. All equipment used when handling the product must be grounded. A vapor suppressing foam may be used to reduce vapors. Use clean non-sparking tools to collect absorbed material. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.

Reporting: Report spills to local authorities and/or the U.S. Coast Guard's National Response Center at (800) 424-8802 as appropriate or required. This material is covered by EPA's Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Petroleum Exclusion. Therefore, releases to the environment may not be reportable under CERCLA.

SECTION 7 HANDLING AND STORAGE

Precautionary Measures: READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL. This product presents an extreme fire hazard. Liquid very quickly evaporates, even at low temperatures, and forms vapor (fumes) which can catch fire and burn with explosive violence. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights, welding equipment, and electrical motors and switches. Do not store in open or unlabeled containers. Use only as a motor fuel. Do not use for cleaning, pressure appliance fuel, or any

other such use. Never siphon gasoline by mouth.

Do not get in eyes, on skin, or on clothing. Do not taste or swallow. Do not breathe vapor or fumes. Wash thoroughly after handling. Keep out of the reach of children.

Unusual Handling Hazards: WARNING! Do not use as portable heater or appliance fuel. Toxic fumes may accumulate and cause death.

General Handling Information: Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.

Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids', National Fire Protection Association (NFPA 77, 'Recommended Practice on Static Electricity', and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents'. Improper filling of portable gasoline containers creates danger of fire. Only dispense gasoline into approved and properly labeled gasoline containers. Always place portable containers on the ground. Be sure pump nozzle is in contact with the container while filling. Do not use a nozzle's lock-open device. Do not fill portable containers that are inside a vehicle or truck/trailer bed.

General Storage Information: DO NOT USE OR STORE near heat, sparks, flames, or hot surfaces. USE AND STORE ONLY IN WELL VENTILATED AREA. Keep container closed when not in use.

Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:

Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:

Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below the recommended exposure limits.

PERSONAL PROTECTIVE EQUIPMENT

Eye/Face Protection: No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.

Skin Protection: No special protective clothing is normally required. Where splashing is possible, select protective clothing depending on operations conducted, physical requirements and other substances in the workplace. Suggested materials for protective gloves include: Chlorinated Polyethylene (or Chlorosulfonated Polyethylene), Nitrile Rubber, Polyurethane, Viton.

Respiratory Protection: Determine if airborne concentrations are below the recommended occupational exposure limits for jurisdiction of use. If airborne concentrations are above the acceptable limits, wear an approved respirator that provides adequate protection from this material, such as: Air-Purifying Respirator for Organic Vapors.

When used as a fuel, this material can produce carbon monoxide in the exhaust. Determine if airborne concentrations are below the occupational exposure limit for carbon monoxide. If not, wear an approved positive-pressure air-supplying respirator.

Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.

Occupational Exposure Limits:

Component	Agency	TWA	STEL	Ceiling	Notation
Benzene	ACGIH	5 ppm (weight)	2.5 ppm	--	Skin A1

			(weight)		
Benzene	OSHA SRS	1 ppm (weight)	5 ppm (weight)	--	--
Benzene	OSHA Z-2	10 ppm (weight)	--	25 ppm (weight)	--
Butane	ACGIH	800 ppm (weight)	--	--	--
Cyclohexane	ACGIH	100 ppm (weight)	--	--	--
Cyclohexane	OSHA Z-1	1050 mg/m3	--	--	--
Ethanol	ACGIH	1000 ppm (weight)	--	--	A4
Ethanol	OSHA Z-1	1900 mg/m3	--	--	--
Ethyl benzene	ACGIH	100 ppm (weight)	125 ppm (weight)	--	A3
Ethyl benzene	OSHA Z-1	435 mg/m3	--	--	--
Ethyl tert-butyl ether (ETBE)	ACGIH	5 ppm (weight)	--	--	--
Heptane	ACGIH	400 ppm (weight)	500 ppm (weight)	--	--
Heptane	OSHA Z-1	2000 mg/m3	--	--	--
Hexane	ACGIH	50 ppm (weight)	--	--	Skin
Hexane	OSHA Z-1	1800 mg/m3	--	--	--
Methyl tert-butyl ether (MTBE)	ACGIH	50 ppm (weight)	--	--	A3
Methyl tert-butyl ether (MTBE)	CVX	--	50 ppm	--	--
Methylcyclohexane	ACGIH	400 ppm (weight)	--	--	--
Methylcyclohexane	OSHA Z-1	2000 mg/m3	--	--	--
Naphthalene	ACGIH	10 ppm	15 ppm	--	A4 Skin
Naphthalene	OSHA Z-1	50 mg/m3	--	--	--
Pentane, 2,2,4-trimethyl- (Isooctane)	ACGIH	300 ppm (weight)	--	--	--
Pentane, 2,2,4-trimethyl- (Isooctane)	OSHA Z-1	2350 mg/m3	--	--	--
Tertiary amyl methyl ether (TAME)	ACGIH	20 ppm (weight)	--	--	--
Tertiary amyl methyl ether (TAME)	CVX	--	50 ppm	--	--
Toluene (methylbenzene)	ACGIH	50 ppm (weight)	--	--	Skin A4
Toluene (methylbenzene)	OSHA Z-2	200 ppm (weight)	--	300 ppm (weight)	--
Xylene (contains o-, m-, & p- xylene isomers in varying amounts)	ACGIH	100 ppm (weight)	150 ppm (weight)	--	A4
Xylene (contains o-, m-, & p- xylene isomers in varying amounts)	OSHA Z-1	435 mg/m3	--	--	--

Refer to the OSHA Benzene Standard (29 CFR 1910.1028) and Table Z-2 for detailed training, exposure monitoring, respiratory protection and medical surveillance requirements before using this product.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color: Colorless to yellow

Physical State: Liquid

Odor: Petroleum odor

pH: Not Applicable

Vapor Pressure: 5 psi - 15 psi (Typical) @ 37.8 °C (100 °F)

Vapor Density (Air = 1): 3 - 4 (Typical)

Boiling Point: 37.8 °C (100°F) - 204.4°C (400°F) (Typical)

Solubility: Insoluble in water; miscible with most organic solvents.

Freezing Point: Not Applicable
Melting Point: Not Applicable
Specific Gravity: 0.7 g/ml - 0.8 g/ml @ 15.6 °C (60.1°F) (Typical)
Viscosity: <1 SUS @ 37.8 °C (100°F)

SECTION 10 STABILITY AND REACTIVITY

Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Incompatibility With Other Materials: May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Hazardous Decomposition Products: None known (None expected)
Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

IMMEDIATE HEALTH EFFECTS

Eye Irritation: The Draize eye irritation mean score in rabbits for a 24-hour exposure was: 0/110.

Skin Irritation: For a 4-hour exposure, the Primary Irritation Index (PII) in rabbits is: 4.8/8.0.

Skin Sensitization: This material did not cause skin sensitization reactions in a Buehler guinea pig test.

Acute Dermal Toxicity: LD50: >3.75g/kg (rabbit).

Acute Oral Toxicity: LD50: >5 ml/kg (rat)

Acute Inhalation Toxicity: 4 hour(s) LD50: >20000mg/m³ vapor (rat).

Subchronic Effects: Exposure of rats for 13 weeks (6 hr/day for 5 days/week) to the light ends of gasoline (up to 20,000 mg/m³) resulted in minimal responses of toxicity. There were no indications of neurotoxicity based morphological, functional and biochemical indices. There was also no evidence of immunotoxicity in the rats. However, when rats were exposed to gasoline vapor containing ethanol up to 20,000 mg/m³ there was evidence of both humoral immune suppression and mild astrogliosis. **Reproduction and Birth Defects:** Exposure of rats to the light ends of gasoline at up to 20,000 mg/m³ had generally no impact upon reproductive abilities and did not cause birth defects.

Genetic Toxicity: Gasoline was not mutagenic, with or without activation, in the Ames assay (Salmonella typhimurium), Saccharomyces cerevisiae, or mouse lymphoma assays. In addition, point mutations were not induced in human lymphocytes. Gasoline was not mutagenic when tested in the mouse dominant lethal assay. Administration of gasoline to rats did not cause chromosomal aberrations in their bone marrow cells. Inhalation exposure of rats to the light ends of gasoline caused increased sister chromatid exchange in their peripheral white blood cells but did not cause an increase in micronucleated red blood cells in their bone marrow.

ADDITIONAL TOXICOLOGY INFORMATION:

Gasolines are highly volatile and can produce significant concentrations of vapor at ambient temperatures. Gasoline vapor is heavier than air and at high concentrations may accumulate in confined spaces to present both safety and health hazards. When vapor exposures are low, or short duration and infrequent, such as during refueling and tanker loading/unloading, neither total hydrocarbon nor components such as benzene are likely to result in any adverse health effects. In situations such as accidents or spills where exposure to gasoline vapor is potentially high, attention should be paid to potential toxic effects of specific components. Information about specific components in gasoline can be found in Sections 2, 8 and 15 of this MSDS. More detailed information on the health hazard of specific gasoline components can be obtained calling the ChevronTexaco Emergency Information Center (see Section 1 for phone numbers).

Pathological misuse of solvents and gasoline, involving repeated and prolonged exposure to high concentrations of vapor is a significant exposure on which there are many reports in the medical literature. As with other solvents, persistent abuse involving repeated and prolonged exposures to high concentrations of vapor has been reported to result in central nervous system damage and eventually, death. In a study in which ten human volunteers were exposed for 30 minutes to approximately 200, 500 or 1000 ppm concentrations of gasoline vapor, irritation of the eyes was the only significant effect observed, based on both subjective and objective assessments.

Lifetime inhalation of wholly vaporized unleaded gasoline at 2056 ppm has caused increased liver tumors in female mice and kidney cancer in male rats. In their 1988 review of carcinogenic risk from gasoline, The International Agency for Research on Cancer (IARC) noted that, because published epidemiology studies did not include any exposure data, only occupations where gasoline exposure may have occurred were reviewed. These included gasoline service station attendants and automobile mechanics. IARC also noted that there was no opportunity to separate effects of combustion products from those of gasoline itself. Although IARC allocated gasoline a final overall classification of Group 2B, i.e. possibly carcinogenic to humans, this was based on limited evidence in experimental animals plus supporting evidence including the presence in gasoline of benzene. The

actual evidence for carcinogenicity in humans was considered inadequate. To explore the health effects of workers potentially exposed to gasoline vapors in the marketing and distribution sectors of the petroleum industry, the American Petroleum Institute sponsored a cohort mortality study (Publication 4555), a nested case-control study (Publication 4551), and an exposure assessment study (Publication 4552). Histories of exposure to gasoline were reconstructed for cohort of more than 18,000 employees from four companies for the time period between 1946 and 1985. The results of the cohort mortality study indicated that there was no increased mortality from either kidney cancer or leukemia among marketing and marine distribution employees who were exposed to gasoline in the petroleum industry, when compared to the general population. More importantly, based on internal comparisons, there was no association between mortality from kidney cancer or leukemia and various indices of gasoline exposure. In particular, neither duration of employment, duration of exposure, age at first exposure, year of first exposure, job category, cumulative exposure, frequency of peak exposure, nor average intensity of exposure had any effect on kidney cancer or leukemia mortality. The results of the nested case-control study confirmed the findings of the original cohort study. That is, exposure to gasoline at the levels experienced by this cohort of distribution workers is not a significant risk factor for leukemia (all cell types), acute myeloid leukemia, kidney cancer or multiple myeloma.

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY

96 hour(s) LC50: 8.3 mg/l (Cyprinodon variegatus)

96 hour(s) LC50: 1.8 mg/l (Mysidopsis bahia)

48 hour(s) LC50: 3.0 mg/l (Daphnia magna)

96 hour(s) LC50: 2.7 mg/l (Oncorhynchus mykiss)

This material is expected to be toxic to aquatic organisms. The bulk of the available literature on gasoline relates to the environmental impact of monoaromatic (BTEX) and diaromatic (naphthalene, methylnaphthalenes) constituents. In general, non-oxygenated gasoline exhibits some short-term toxicity to freshwater and marine organisms, especially under closed vessel or flow-through exposure conditions in the laboratory. The components which are the most prominent in the water soluble fraction and cause aquatic toxicity, are also highly volatile and can be readily biodegraded by microorganisms.

Gasoline studies have been conducted in the laboratory under a variety of test conditions with a range of fish and invertebrate species. An even more extensive database is available on the aquatic toxicity of individual aromatic constituents. The majority of published studies do not identify the type of gasoline evaluated, or even provide distinguishing characteristics such as aromatic content or presence of lead alkyls. As a result, comparison of results among studies using open and closed vessels, different ages and species of test animals and different gasoline types, is difficult.

ENVIRONMENTAL FATE

This material is expected to be readily biodegradable. Following spillage, the more volatile components of gasoline will be rapidly lost, with concurrent dissolution of these and other constituents into the water. Factors such as local environmental conditions (temperature, wind, mixing or wave action, soil type, etc), photo-oxidation, biodegradation and adsorption onto suspended sediments, can contribute to the weathering of spilled gasoline.

The aqueous solubility of non-oxygenated unleaded gasoline, based on analysis of benzene, toluene, ethylbenzene+xylenes and naphthalene, is reported to be 112 mg/l. Solubility data on individual gasoline constituents also available.

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

DOT Shipping Description: GASOLINE,3,UN1203,II

IMO/IMDG Shipping Description: GASOLINE,3,UN1203,II,FLASH POINT SEE SECTION 5

ICAO/IATA Shipping Description: GASOLINE, 3, UN1203, II

SECTION 15 REGULATORY INFORMATION

- EPCRA 311/312 CATEGORIES:** 1. Immediate (Acute) Health Effects: YES
 2. Delayed (Chronic) Health Effects: YES
 3. Fire Hazard: YES
 4. Sudden Release of Pressure Hazard: NO
 5. Reactivity Hazard: NO

REGULATORY LISTS SEARCHED:

- | | |
|---------------------|----------------------|
| 01-1=IARC Group 1 | 03=EPCRA 313 |
| 01-2A=IARC Group 2A | 04=CA Proposition 65 |
| 01-2B=IARC Group 2B | 05=MA RTK |
| 02=NTP Carcinogen | 06=NJ RTK |
| | 07=PA RTK |

The following components of this material are found on the regulatory lists indicated.

- | | |
|--|------------------------------|
| Benzene | 01-1, 02, 03, 04, 05, 06, 07 |
| Butane | 05, 06, 07 |
| Cyclohexane | 03, 05, 06, 07 |
| Ethanol | 05, 06, 07 |
| Ethyl benzene | 01-2B, 03, 05, 06, 07 |
| Gasoline | 01-2B, 07 |
| Heptane | 05, 06, 07 |
| Hexane | 03, 05, 06, 07 |
| Methyl tert-butyl ether (MTBE) | 03, 05, 06, 07 |
| Methylcyclohexane | 05, 06, 07 |
| Naphthalene | 01-2B, 03, 04, 05, 06, 07 |
| Pentane, 2,2,4-trimethyl- (Isooctane) | 05, 06, 07 |
| Toluene (methylbenzene) | 03, 04, 05, 06, 07 |
| Xylene (contains o-, m-, & p- xylene isomers in varying amounts) | 03, 05, 06, 07 |

CERCLA REPORTABLE QUANTITIES(RQ)/EPCRA 302 THRESHOLD PLANNING QUANTITIES(TPQ):

Component	Component RQ	Component TPQ	Product RQ
Benzene	10 lbs	None	186 lbs
Butane	100 lbs	None	725 lbs
Cyclohexane	1000 lbs	None	34188 lbs
Ethanol	100 lbs	None	1934 lbs
Ethyl benzene	1000 lbs	None	34964 lbs
Gasoline	100 lbs	None	107 lbs
Heptane	100 lbs	None	3644 lbs
Hexane	5000 lbs	None	129149 lbs
Methyl tert-butyl ether (MTBE)	1000 lbs	None	7513 lbs

Methylcyclohexane	100 lbs	None	4278 lbs
Naphthalene	100 lbs	None	4000 lbs
Pentane, 2,2,4-trimethyl- (isooctane)	1000 lbs	None	6270 lbs
Toluene (methylbenzene)	1000 lbs	None	5480 lbs
Xylene (contains o-, m-, & p- xylene isomers in varying amounts)	100 lbs	None	649 lbs

CHEMICAL INVENTORIES:

All components comply with the following chemical inventory requirements: DSL (Canada), EINECS (European Union), KECI (Korea), TSCA (United States).

WHMIS CLASSIFICATION:

Class B, Division 2: Flammable Liquids
 Class D, Division 2, Subdivision A: Very Toxic Material -
 Carcinogenicity
 Class D, Division 2, Subdivision B: Toxic Material -
 Skin or Eye Irritation

SECTION 16 OTHER INFORMATION

NFPA RATINGS: Health: 1 Flammability: 3 Reactivity: 0

(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

Additional Product Number(s): CPS201023, CPS201054, CPS201055, CPS201075, CPS201090, CPS201105, CPS201106, CPS201120, CPS201121, CPS201122, CPS201126, CPS201128, CPS201131, CPS201136, CPS201141, CPS201142, CPS201148, CPS201153, CPS201158, CPS201161, CPS201162, CPS201168, CPS201181, CPS201185, CPS201186, CPS201188, CPS201216, CPS201217, CPS201218, CPS201236, CPS201237, CPS201238, CPS201266, CPS201267, CPS201268, CPS201277, CPS201278, CPS201279, CPS201286, CPS201287, CPS201289, CPS201296, CPS201297, CPS201298, CPS201849, CPS201850, CPS201855, CPS201856, CPS201857, CPS204000, CPS204001, CPS204002, CPS204003, CPS204010, CPS204011, CPS204022, CPS204023, CPS204046, CPS204047, CPS204070, CPS204071, CPS204088, CPS204089, CPS204104, CPS204105, CPS204116, CPS204117, CPS204140, CPS204141, CPS204164, CPS204165, CPS204188, CPS204189, CPS204200, CPS204201, CPS204212, CPS204213, CPS204224, CPS204225, CPS204248, CPS204249, CPS204272, CPS204273, CPS204290, CPS204291, CPS204322, CPS204323, CPS204324, CPS204350, CPS204352, CPS204354, CPS204356, CPS204358, CPS204359, CPS204364, CPS204365, CPS204370, CPS204371, CPS204376, CPS204377, CPS204382, CPS204383, CPS204388, CPS204389, CPS204394, CPS204395, CPS204400, CPS204401, CPS204406, CPS204407, CPS204412, CPS204413, CPS204418, CPS204419, CPS204424, CPS204425, CPS204430, CPS204431, CPS204436, CPS204437, CPS204442, CPS204446, CPS204450, CPS204454, CPS204458, CPS204462, CPS204466, CPS204467, CPS204484, CPS204485, CPS204502, CPS204503, CPS204520, CPS204521, CPS204538, CPS204539, CPS204556, CPS204557, CPS204574, CPS204575, CPS204592, CPS204593, CPS204610, CPS204611, CPS204628, CPS204629, CPS204646, CPS204647, CPS204664, CPS204665, CPS204682, CPS204690, CPS204691, CPS204696, CPS204697, CPS204702, CPS204703, CPS204708, CPS204709, CPS204721, CPS204722, CPS204727, CPS204728, CPS241765

REVISION STATEMENT: This revision updates the following sections of this Material Safety Data Sheet: 1, 2, 8, 11, 14, 15.

Revision Date: 06/25/2004

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	PEL - Permissible Exposure Limit
	CAS - Chemical Abstract Service Number
ACGIH - American Conference of Government Industrial Hygienists	IMO/IMDG - International Maritime Dangerous Goods Code

API - American Petroleum Institute	MSDS - Material Safety Data Sheet
CVX - ChevronTexaco	NFPA - National Fire Protection Association (USA)
DOT - Department of Transportation (USA)	NTP - National Toxicology Program (USA)
IARC - International Agency for Research on Cancer	OSHA - Occupational Safety and Health Administration

Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the ANSI MSDS Standard (Z400.1) by the ChevronTexaco Energy Research & Technology Company, 100 Chevron Way, Richmond, California 94802.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

ExxonMobil

440693-00 MOBIL DELVAC 1300 SUPER 15W-40
MATERIAL SAFETY DATA BULLETIN

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: MOBIL DELVAC 1300 SUPER 15W-40
SUPPLIER: EXXONMOBIL OIL CORPORATION
3225 GALLOWES RD.
FAIRFAX, VA 22037

24 - Hour Health and Safety Emergency (call collect): 609-737-4411

24 - Hour Transportation Emergency:
CHEMTREC: 800-424-9300 202-483-7616
LUBES AND FUELS: 281-834-3296

Product and Technical Information:
Lubricants and Specialties: 800-662-4525 800-443-9966
Fuels Products: 800-947-9147
MSDS Fax on Demand: 713-613-3661
MSDS Internet Website: <http://www.exxon.com>, <http://www.mobil.com>

2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAMES AND SYNONYMS: SEVERE TREAT MIN. OILS & ADDITIVES

GLOBALLY REPORTABLE MSDS INGREDIENTS:

Substance Name	Approx. Wt%
PHOSPHORODITHIOIC ACID, O,O-DI-C1-14-ALKYL ESTERS, ZINC SALT (2:1) ZDDP (58649-42-3)	1-5

See Section 8 for exposure limits (if applicable).

3. HAZARDS IDENTIFICATION

Under normal conditions of use, this product is not considered hazardous according to regulatory guidelines (See section 15).

EMERGENCY OVERVIEW: Brown Liquid. DOT ERG No. : NA

POTENTIAL HEALTH EFFECTS: Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin or respiratory irritation.

For further health effects/toxicological data, see Section 11.

4. FIRST AID MEASURES

EYE CONTACT: Flush thoroughly with water. If irritation occurs, call a physician.

SKIN CONTACT: Wash contact areas with soap and water. Remove and clean oil soaked clothing daily and wash affected area. (See Section 16 - Injection Injury)

INHALATION: Not expected to be a problem. However, if respiratory irritation, dizziness, nausea, or unconsciousness occurs due to excessive vapor or mist exposure, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or mouth-to-mouth resuscitation.

INGESTION: Not expected to be a problem. Seek medical attention if discomfort occurs. Do not induce vomiting.

5. FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA: Carbon dioxide, foam, dry chemical and water fog.
SPECIAL FIRE FIGHTING PROCEDURES: Water or foam may cause frothing.

Use water to keep fire exposed containers cool. Water spray may be used to flush spills away from exposure. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply.

SPECIAL PROTECTIVE EQUIPMENT: For fires in enclosed areas, fire fighters must use self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None.

COMBUSTION PRODUCTS: Fumes, smoke, carbon monoxide, sulfur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.

Flash Point C(F): 230(446) (ASTM D-92).

Flammable Limits (approx.% vol.in air) - LEL: 0.9%, UEL: 7.0%

NFPA HAZARD ID: Health: 0, Flammability: 1, Reactivity: 0

6. ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES: Report spills/releases as required to appropriate authorities. U.S. Coast Guard and EPA regulations require immediate reporting of spills/releases that could reach any waterway including intermittent dry creeks. Report spill/release to Coast Guard National Response Center toll free number (800)424-8802. In case of accident or road spill notify CHEMTREC (800) 424-9300.

PROCEDURES IF MATERIAL IS RELEASED OR SPILLED:

LAND SPILL: Shut off source taking normal safety precautions. Take measures to minimize the effects on ground water. Recover by pumping or contain spilled material with sand or other suitable

absorbent and remove mechanically into containers. If necessary, dispose of adsorbed residues as directed in Section 13.
WATER SPILL: Confine the spill immediately with booms. Warn other ships in the vicinity. Notify port and other relevant authorities. Remove from the surface by skimming or with suitable absorbents. If permitted by regulatory authorities the use of suitable dispersants should be considered where recommended in local oil spill procedures.

ENVIRONMENTAL PRECAUTIONS: Prevent material from entering sewers, water sources or low lying areas; advise the relevant authorities if it has, or if it contaminates soil/vegetation.

PERSONAL PRECAUTIONS: See Section 8

7. HANDLING AND STORAGE

HANDLING: No special precautions are necessary beyond normal good hygiene practices. See Section 8 for additional personal protection advice when handling this product.

STORAGE: Keep containers closed when not in use. Do not store in open or unlabelled containers. Store away from strong oxidizing agents and combustible materials. Do not store near heat, sparks, flame or strong oxidants.

SPECIAL PRECAUTIONS: Prevent small spills and leakages to avoid slip hazard.

EMPTY CONTAINER WARNING: Empty containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to refill or clean container since residue is difficult to remove. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS:

When mists/aerosols can occur, the following are recommended: 5 mg/m³ (as oil mist) - ACGIH Threshold Limit Value (TLV), 10 mg/m³ (as oil mist) - ACGIH Short Term Exposure Limit (STEL), 5 mg/m³ (as oil mist) - OSHA Permissible Exposure Limit (PEL)

VENTILATION: If mists are generated, use adequate ventilation, local exhaust or enclosures to control below exposure limits.

RESPIRATORY PROTECTION: If mists are generated, and/or when ventilation is not adequate, wear approved respirator.

EYE PROTECTION: If eye contact is likely, safety glasses with side shields or chemical type goggles should be worn.

SKIN PROTECTION: Not normally required. When splashing or liquid contact can occur frequently, wear oil resistant gloves and/or other protective clothing. Good personal hygiene practices should always be followed.

9. PHYSICAL AND CHEMICAL PROPERTIES

Typical physical properties are given below. Consult Product Data Sheet for specific details.

APPEARANCE: Liquid
COLOR: Brown
ODOR: Mild
ODOR THRESHOLD-ppm: NE
pH: NA
BOILING POINT C(F): > 316(600)
MELTING POINT C(F): NA
FLASH POINT C(F): 230(446) (ASTM D-92)
FLAMMABILITY (solids): NE
AUTO FLAMMABILITY C(F): NA
EXPLOSIVE PROPERTIES: NA
OXIDIZING PROPERTIES: NA
VAPOR PRESSURE-mmHg 20 C: NE
VAPOR DENSITY: NE
EVAPORATION RATE: NE
RELATIVE DENSITY, 15/4 C: 0.877
SOLUBILITY IN WATER: Negligible
PARTITION COEFFICIENT: > 3.5
VISCOSITY AT 40 C, cSt: 117.0
VISCOSITY AT 100 C, cSt: 15.5
POUR POINT C(F): -33(-27)
FREEZING POINT C(F): NE
VOLATILE ORGANIC COMPOUND: NE
DMSO EXTRACT, IP-346 (WT.%): <3, for mineral oil only
NA=NOT APPLICABLE NE=NOT ESTABLISHED D=DECOMPOSES

FOR FURTHER TECHNICAL INFORMATION, CONTACT YOUR MARKETING REPRESENTATIVE

10. STABILITY AND REACTIVITY

STABILITY (THERMAL, LIGHT, ETC.): Stable.
CONDITIONS TO AVOID: Extreme heat and high energy sources of ignition.
INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizers.
HAZARDOUS DECOMPOSITION PRODUCTS: Product does not decompose at ambient temperatures.
HAZARDOUS POLYMERIZATION: Will not occur.

11. TOXICOLOGICAL DATA

---ACUTE TOXICOLOGY---

ORAL TOXICITY (RATS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.
DERMAL TOXICITY (RABBITS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.
INHALATION TOXICITY (RATS): Practically non-toxic (LC50: greater than 5 mg/l). ---Based on testing of similar products and/or the

components.

EYE IRRITATION (RABBITS): Practically non-irritating. (Draize score: greater than 6 but 15 or less). ---Based on testing of similar products and/or the components.

SKIN IRRITATION (RABBITS): Practically non-irritating. (Primary Irritation Index: greater than 0.5 but less than 3). ---Based on testing of similar products and/or the components.

OTHER ACUTE TOXICITY DATA: Although an acute inhalation study was not performed with this product, a variety of mineral and synthetic oils, such as those in this product, have been tested. These samples had virtually no effect other than a nonspecific inflammatory response in the lung to the aerosolized mineral oil. The presence of additives in other tested formulations (in approximately the same amounts as in the present formulation) did not alter the observed effects.

---SUBCHRONIC TOXICOLOGY (SUMMARY)---

No significant adverse effects were found in studies using repeated dermal applications of similar formulations to the skin of laboratory animals for 13 weeks at doses significantly higher than those expected during normal industrial exposure. The animals were evaluated extensively for effects of exposure (hematology, serum chemistry, urinalysis, organ weights, microscopic examination of tissues etc.).

---REPRODUCTIVE TOXICOLOGY (SUMMARY)---

No teratogenic effects would be expected from dermal exposure, based on laboratory developmental toxicity studies of major components in this formulation and/or materials of similar composition.

---CHRONIC TOXICOLOGY (SUMMARY)---

Repeated and/or prolonged exposure may cause irritation to the skin, eyes or respiratory tract. Overexposure to oil mist may result in oil droplet deposition and/or granuloma formation. For mineral base oils: Base oils in this product are severely solvent refined and/or severely hydrotreated. Chronic mouse skin painting studies of severely treated oils showed no evidence of carcinogenic effects. These results are confirmed on a continuing basis using various screening methods such as Modified Ames Test, IP-346, and/or other analytical methods. For synthetic base oils: The base oils in this product have been tested in the Ames assay and other tests of mutagenicity with negative results. These base oils are not expected to be carcinogenic with chronic dermal exposures.

---SENSITIZATION (SUMMARY)---

Not expected to be sensitizing based on tests of this product, components, or similar products.

---OTHER TOXICOLOGY DATA---

Used gasoline engine oils have shown evidence of skin carcinogenic activity in laboratory tests when no effort was made to wash the oil off between applications. Used oil from diesel engines did not produce this effect.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE AND EFFECTS:

In the absence of specific environmental data for this product, this assessment is based on information for representative products.

ECOTOXICITY: Available ecotoxicity data (LL50 >1000 mg/L) indicates that adverse effects to aquatic organisms are not expected from this product.

MOBILITY: When released into the environment, adsorption to sediment and soil will be the predominant behavior.

PERSISTENCE AND DEGRADABILITY: This product is expected to be inherently biodegradable.

BIOACCUMULATIVE POTENTIAL: Bioaccumulation is unlikely due to the very low water solubility of this product, therefore bioavailability to aquatic organisms is minimal.

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: Product is suitable for burning in an enclosed, controlled burner for fuel value. Such burning may be limited pursuant to the Resource Conservation and Recovery Act. In addition, the product is suitable for processing by an approved recycling facility or can be disposed of at an appropriate government waste disposal facility. Use of these methods is subject to user compliance with applicable laws and regulations and consideration of product characteristics at time of disposal.

RCRA INFORMATION: The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrosivity, or reactivity. The unused product is not formulated with substances covered by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

14. TRANSPORT INFORMATION

USA DOT: NOT REGULATED BY USA DOT.

RID/ADR: NOT REGULATED BY RID/ADR.

IMO: NOT REGULATED BY IMO.

IATA: NOT REGULATED BY IATA.

STATIC ACCUMULATOR (50 picosiemens or less): YES

15. REGULATORY INFORMATION

US OSHA HAZARD COMMUNICATION STANDARD: When used for its intended purposes, this product is not classified as hazardous in accordance with OSHA 29 CFR 1910.1200.

EU Labeling: Product is not dangerous as defined by the European Union Dangerous Substances/Preparations Directives. EU labeling not required.

Governmental Inventory Status: All components comply with TSCA, EINECS/ELINCS, AICS, METI, DSL, KOREA, and PHILIPPINES.

U.S. Superfund Amendments and Reauthorization Act (SARA) Title III: This product contains no "EXTREMELY HAZARDOUS SUBSTANCES".

SARA (311/312) REPORTABLE HAZARD CATEGORIES: None.

This product contains the following SARA (313) Toxic Release Chemicals:

CHEMICAL NAME	CAS NUMBER	CONC.
ZINC DITHIOPHOSPHATE	68649-42-3	1.2%

The following product ingredients are cited on the lists below:

CHEMICAL NAME	CAS NUMBER	LIST CITATIONS *
ZINC (ELEMENTAL ANALYSIS) (0.15%)	7440-66-6	22
ZINC DITHIOPHOSPHATE (1.22%)	68649-42-3	18, 20, 21, 22, 24, 25

--- REGULATORY LISTS SEARCHED ---

1=ACGIH ALL	6=IARC 1	11=TSCA 4	16=CA P65 CARC	21=LA RTK
2=ACGIH A1	7=IARC 2A	12=TSCA 5a2	17=CA P65 REPRO	22=MI 293
3=ACGIH A2	8=IARC 2B	13=TSCA 5e	18=CA RTK	23=MN RTK
4=NTP CARC	9=OSHA CARC	14=TSCA 6	19=FL RTK	24=NJ RTK
5=NTP SUS	10=OSHA Z	15=TSCA 12b	20=IL RTK	25=PA RTK
				26=RI RTK

* EPA recently added new chemical substances to its TSCA Section 4 test rules. Please contact the supplier to confirm whether the ingredients in this product currently appear on a TSCA 4 or TSCA 12b list.
Code key: CARC=Carcinogen; SUS=Suspected Carcinogen; REPRO=Reproductive

16. OTHER INFORMATION

USE: COMMERCIAL ENGINE OIL

NOTE: PRODUCTS OF EXXON MOBIL CORPORATION AND ITS AFFILIATED COMPANIES ARE NOT FORMULATED TO CONTAIN PCBS.

Health studies have shown that many hydrocarbons pose potential human health risks which may vary from person to person. Information provided on this MSDS reflects intended use. This product should not be used for other applications. In any case, the following advice should be considered:

INJECTION INJURY WARNING: If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

INDUSTRIAL LABEL

Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin or respiratory irritation. Always observe good hygiene measures. First Aid: Wash skin with soap and water. Flush eyes with water. If overcome by fumes or vapor, remove to fresh air. If ingested do not induce vomiting. If symptoms persist seek medical assistance. Read and understand the MSDS before using this product.

For Internal Use Only: MHC: 1* 1* 1* 1* 1*, MPPEC: A, TRN: 440693-00,
CMCS97: 970529, REQ: US - MARKETING, SAFE USE: L
EHS Approval Date: 17JUN2003

Information given herein is offered in good faith as accurate, but without guarantee. Conditions of use and suitability of the product for particular uses are beyond our control; all risks of use of the product are therefore assumed by the user and WE EXPRESSLY DISCLAIM ALL WARRANTIES OF EVERY KIND AND NATURE, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE IN RESPECT TO THE USE OR SUITABILITY OF THE PRODUCT. Nothing is intended as a recommendation for uses which infringe valid patents or as extending license under valid patents. Appropriate warnings and safe handling procedures should be provided to handlers and users. Alteration of this document is strictly prohibited. Except to the extent required by law, republication or retransmission of this document, in whole or in part, is not permitted. Exxon Mobil Corporation and its affiliated companies assume no responsibility for accuracy of information unless the document is the most current available from an official ExxonMobil distribution system. Exxon Mobil Corporation and its affiliated companies neither represent nor warrant that the format, content or product formulas contained in this document comply with the laws of any other country except the United States of America.

Prepared by: ExxonMobil Oil Corporation
Environmental Health and Safety Department, Clinton, USA

Product Name: MOBILFLUID 424
 Revision Date: 19May2005
 Page 1 of 8

MATERIAL SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: MOBILFLUID 424
 Product Description: Base Oil and Additives
 Product Code: 522334-00, 971955
 Intended Use: Hydraulic fluid

COMPANY IDENTIFICATION

Supplier: EXXON MOBIL CORPORATION
 3225 GALLOWS RD.
 FAIRFAX, VA, 22037 USA

24 Hour Health Emergency 609-737-4411
 Transportation Emergency Phone 800-424-9300
 ExxonMobil Transportation No. 281-834-3296
 MSDS Requests 713-813-3661
 Product Technical Information 800-882-4525, 800-947-9147
 MSDS internet Address <http://www.exxon.com>, <http://www.mobil.com>

SECTION 2 COMPOSITION / INFORMATION ON INGREDIENTS

Reportable Hazardous Substance(s) or Complex Substance(s)

Name	CAS#	Concentration*
ZINC DITHIOPHOSPHATE	68649-42-3	< 2.5%

* All concentrations are percent by weight unless material is a gas. Gas concentrations are in percent by volume.

SECTION 3 HAZARDS IDENTIFICATION

This material is not considered to be hazardous according to regulatory guidelines (see (M)SDS Section 15).

POTENTIAL HEALTH EFFECTS

Low order of toxicity. Excessive exposure may result in eye, skin, or respiratory irritation. High-pressure injection under skin may cause serious damage.

NFPA Hazard ID: Health: 0 Flammability: 1 Reactivity: 0
 HMIS Hazard ID: Health: 0 Flammability: 1 Reactivity: 0

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 4 FIRST AID MEASURES

Product Name: MOBILFLUID 424

Revision Date: 19May2005

Page 2 of 8

INHALATION

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

SKIN CONTACT

Wash contact areas with soap and water. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

INGESTION

First aid is normally not required. Seek medical attention if discomfort occurs.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO₂) to extinguish flames.

Inappropriate Extinguishing Media: Straight Streams of Water

FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply. Firefighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Unusual Fire Hazards: Pressurized mists may form a flammable mixture.

Hazardous Combustion Products: Aldehydes, Incomplete combustion products, Smoke, Fume, Oxides of carbon, Sulfur oxides

FLAMMABILITY PROPERTIES

Flash Point [Method]: >198°C (389°F) [ASTM D-92]

Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0

Autoignition Temperature: N/D

SECTION 6 ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable

Product Name: MOBILFLUID 424
Revision Date: 19May2005
Page 3 of 8

regulations. U.S. regulations require reporting releases of this material to the environment which exceed the reportable quantity or oil spills which could reach any waterway including intermittent dry creeks. The National Response Center can be reached at (800)424-8802.

SPILL MANAGEMENT

Land Spill: Stop leak if you can do it without risk. Recover by pumping or with suitable absorbent.

Water Spill: Confine the spill immediately with booms. Stop leak if you can do it without risk. Warn other shipping. Remove from the surface by skimming or with suitable absorbents. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Large Spills: Dike far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7	HANDLING AND STORAGE
------------------	-----------------------------

HANDLING

Prevent small spills and leakage to avoid slip hazard.

Static Accumulator: This material is a static accumulator.

STORAGE

Do not store in open or unlabelled containers.

SECTION 8	EXPOSURE CONTROLS / PERSONAL PROTECTION
------------------	--

Exposure limits/standards for materials that can be formed when handling this product: When mists / aerosols can occur, the following are recommended: 5 mg/m³ - ACGIH TLV, 10 mg/m³ - ACGIH STEL, 5 mg/m³ - OSHA PEL.

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

No special requirements under ordinary conditions of use and with adequate ventilation.

PERSONAL PROTECTION

Product Name: MOBILFLUID 424
Revision Date: 19May2005
Page 4 of 8

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

No special requirements under ordinary conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapor warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Work conditions can greatly effect glove durability; inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

No protection is ordinarily required under normal conditions of use.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

No skin protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid skin contact.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

ENVIRONMENTAL CONTROLS

See Sections 6, 7, 12, 13.

SECTION 9

PHYSICAL AND CHEMICAL PROPERTIES

Typical physical and chemical properties are given below. Consult the Supplier in Section 1 for additional data.

GENERAL INFORMATION

Physical State: Liquid
Color: Amber
Odor: Characteristic
Odor Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 °C): 0.884
Flash Point [Method]: >198°C (389°F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0
Autoignition Temperature: N/D
Boiling Point / Range: > 316°C (600°F)

Product Name: MOBILFLUID 424
 Revision Date: 19May2005
 Page 5 of 8

Vapor Density (Air = 1): > 2 at 101 kPa
 Vapor Pressure: < 0.013 kPa (0.1 mm Hg) at 20°C
 Evaporation Rate (n-butyl acetate = 1): N/D
 pH: N/A
 Log Pow (n-Octanol/Water Partition Coefficient): > 3.5
 Solubility in Water: Negligible
 Viscosity: 55 cSt (55 mm²/sec) at 40 °C | 9.6 cSt (9.6 mm²/sec) at 100°C
 Oxidizing Properties: See Sections 3, 15, 16.

OTHER INFORMATION

Freezing Point: N/D
 Melting Point: N/A
 Pour Point: -36°C (-33°F)
 DMSO Extract (mineral oil only), IP-346: < 3 %wt

SECTION 10	STABILITY AND REACTIVITY
-------------------	---------------------------------

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Excessive heat. High energy sources of ignition.

MATERIALS TO AVOID: Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11	TOXICOLOGICAL INFORMATION
-------------------	----------------------------------

ACUTE TOXICITY

Route of Exposure	Conclusion / Remarks
Inhalation	
Toxicity (Rat): LC50 > 5000 mg/m ³	Minimally Toxic. Based on assessment of the components.
Irritation: No end point data.	Negligible hazard at ambient/normal handling temperatures. Based on assessment of the components.
Ingestion	
Toxicity (Rat): LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Skin	
Toxicity (Rabbit): LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Irritation (Rabbit): Data available.	Negligible irritation to skin at ambient temperatures. Based on assessment of the components.
Eye	
Irritation (Rabbit): Data available.	May cause mild, short-lasting discomfort to eyes. Based on assessment of the components.

CHRONIC/OTHER EFFECTS

Contains:

Base oil severely refined: Not carcinogenic in animal studies. Representative material passes IP-346, Modified

Product Name: MOBILFLUID 424
Revision Date: 19May2005
Page 6 of 8

Ames test, and/or other screening tests. Dermal and inhalation studies showed minimal effects; lung non-specific infiltration of immune cells, oil deposition and minimal granuloma formation. Not sensitizing in test animals.

Additional information is available by request.

The following ingredients are cited on the lists below: None.

--REGULATORY LISTS SEARCHED--		
1 = NTP CARC	3 = IARC 1	5 = IARC 2B
2 = NTP SUS	4 = IARC 2A	6 = OSHA CARC

SECTION 12	ECOLOGICAL INFORMATION
-------------------	-------------------------------

The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material – Not expected to be harmful to aquatic organisms.

MOBILITY

Base oil component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

PERSISTENCE AND DEGRADABILITY

Biodegradation:

Base oil component -- Expected to be inherently biodegradable

BIOACCUMULATION POTENTIAL

Base oil component -- Has the potential to bioaccumulate, however metabolism or physical properties may reduce the bioconcentration or limit bioavailability.

SECTION 13	DISPOSAL CONSIDERATIONS
-------------------	--------------------------------

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

REGULATORY DISPOSAL INFORMATION

RCRA Information: The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed as hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrosivity or reactivity and is not formulated with contaminants as determined by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

Product Name: MOBILFLUID 424
 Revision Date: 19May2005
 Page 7 of 8

Empty Container Warning PRECAUTIONARY LABEL TEXT: Empty containers may retain residue and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to refill or clean container since residue is difficult to remove. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

SECTION 14	TRANSPORT INFORMATION
-------------------	------------------------------

LAND (DOT) : Not Regulated for Land Transport

LAND (TDG) : Not Regulated for Land Transport

SEA (IMDG) : Not Regulated for Sea Transport according to IMDG-Code

AIR (IATA) : Not Regulated for Air Transport

SECTION 15	REGULATORY INFORMATION
-------------------	-------------------------------

OSHA HAZARD COMMUNICATION STANDARD: When used for its intended purposes, this material is not classified as hazardous in accordance with OSHA 29 CFR 1910.1200.

NATIONAL CHEMICAL INVENTORY LISTING: AICS, DSL, EINECS, ENCS, KECI, PICCS, TSCA

EPCRA: This material contains no extremely hazardous substances.

SARA (311/312) REPORTABLE HAZARD CATEGORIES: None.

SARA (313) TOXIC RELEASE INVENTORY:

Chemical Name	CAS Number	Typical Value
ZINC DITHIOPHOSPHATE	68649-42-3	< 2.5%

The Following Ingredients are Cited on the Lists Below:

Chemical Name	CAS Number	List Citations
PHOSPHORUS	7723-14-0	1, 4
TOLUENE	108-88-3	15
ZINC DITHIOPHOSPHATE	68649-42-3	13, 15, 17

--REGULATORY LISTS SEARCHED--

- | | | | |
|---------------|--------------|-------------------|-------------|
| 1 = ACGIH ALL | 6 = TSCA 5a2 | 11 = CA P65 REPRO | 16 = MN RTK |
| 2 = ACGIH A1 | 7 = TSCA 5e | 12 = CA RTK | 17 = NJ RTK |
| 3 = ACGIH A2 | 8 = TSCA 6 | 13 = IL RTK | 18 = PA RTK |
| 4 = OSHA Z | 9 = TSCA 12b | 14 = LA RTK | 19 = RI RTK |



Product Name: MOBILFLUID 424

Revision Date: 19May2005

Page 8 of 8

5 = TSCA 4

10 = CA P65 CARC

15 = MI 293

Code key: CARC=Carcinogen; REPRO=Reproductive

* EPA recently added new chemical substances to its TSCA Section 4 test rules. Please contact the supplier to confirm whether the ingredients in this product currently appear on a TSCA 4 or TSCA 12b list.

SECTION 16

OTHER INFORMATION

N/D = Not determined, N/A = Not applicable

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:

No revision information is available.

The information and recommendations contained herein are, to the best of ExxonMobil's knowledge and belief, accurate and reliable as of the date issued. You can contact ExxonMobil to insure that this document is the most current available from ExxonMobil. The information and recommendations are offered for the user's consideration and examination. It is the user's responsibility to satisfy itself that the product is suitable for the intended use. If buyer repackages this product, it is the user's responsibility to insure proper health, safety and other necessary information is included with and/or on the container. Appropriate warnings and safe-handling procedures should be provided to handlers and users. Alteration of this document is strictly prohibited. Except to the extent required by law, republication or retransmission of this document, in whole or in part, is not permitted. The term, "ExxonMobil" is used for convenience, and may include any one or more of ExxonMobil Chemical Company, Exxon Mobil Corporation, or any affiliates in which they directly or indirectly hold any interest.

Internal Use Only

MHC: 0, 0, 0, 0, 0, 0

PPEC: A

DGN: 2005922XUS (538859)

Copyright 2002 Exxon Mobil Corporation, All rights reserved

ExxonMobil

642314-00 MOBILGREASE HTS
MATERIAL SAFETY DATA BULLETIN

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: MOBILGREASE HTS
SUPPLIER: EXXONMOBIL OIL CORPORATION
3225 GALLOWS RD.
FAIRFAX, VA 22037

24 - Hour Health and Safety Emergency (call collect): 609-737-4411

24 - Hour Transportation Emergency:
CHEMTREC: 800-424-9300 202-493-7616
LUBES AND FUELS: 281-834-3296

Product and Technical Information:
Lubricants and Specialties: 800-662-4525 800-443-9966
Fuels Products: 800-947-9147
MSDS Fax on Demand: 713-613-3661
MSDS Internet Website: <http://www.exxon.com>, <http://www.mobil.com>

2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAMES AND SYNONYMS: PET. HYDROCARBONS AND ADDITIVES

GLOBALLY REPORTABLE MSDS INGREDIENTS:

Substance Name	Approx. Wt%
PHOSPHORODITHOIC ACID, O,O-DI C1-14-ALKYL ESTERS, ZINC SALTS (2:1) (ZDDP) (68649-42-3)	1-5

See Section 8 for exposure limits (if applicable).

3. HAZARDS IDENTIFICATION

Under normal conditions of use, this product is not considered hazardous according to regulatory guidelines (See section 15).

EMERGENCY OVERVIEW: Black Grease. DOT ERG No. : NA

POTENTIAL HEALTH EFFECTS: Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin or respiratory irritation.

For further health effects/toxicological data, see Section 11.

4. FIRST AID MEASURES

EYE CONTACT: Flush thoroughly with water. If irritation occurs, call a physician.

SKIN CONTACT: Wash contact areas with soap and water. Remove and clean oil soaked clothing daily and wash affected area.

INJECTION INJURY WARNING: If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

INHALATION: Remove from further exposure. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with mechanical device or use mouth-to-mouth resuscitation.

INGESTION: Not expected to be a problem. Seek medical attention if discomfort occurs. Do not induce vomiting.

5. FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA: Carbon dioxide, foam, dry chemical and water fog.

SPECIAL FIRE FIGHTING PROCEDURES: Water or foam may cause frothing. Use water to keep fire exposed containers cool. Water spray may be used to flush spills away from exposure. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply.

SPECIAL PROTECTIVE EQUIPMENT: For fires in enclosed areas, fire fighters must use self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None.

COMBUSTION PRODUCTS: Fumes, smoke, carbon monoxide, sulfur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.

Flash Point C(F): > 204(400) (ESTIMATED FOR OIL, ASTM D-92 (COC)).

Flammable Limits (approx.% vol.in air) - LEL: NE, UEL: NE

NFPA HAZARD ID: Health: 0, Flammability: 1, Reactivity: 0

6. ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES: Report spills/releases as required to appropriate authorities. U.S. Coast Guard and EPA regulations require immediate reporting of spills/releases that could reach any waterway including intermittent dry creeks. Report spill/release to Coast Guard National Response Center toll free number (800)424-8802. In case of accident or road spill notify

CHEMTREC (800) 424-9300.

PROCEDURES IF MATERIAL IS RELEASED OR SPILLED:

LAND SPILL: Shut off source taking normal safety precautions. Take measures to minimize the effects on ground water. Recover by pumping or contain spilled material with sand or other suitable absorbent and remove mechanically into containers. If necessary, dispose of adsorbed residues as directed in Section 13.

WATER SPILL: Confine the spill immediately with booms. Warn other ships in the vicinity. Notify port and other relevant authorities. Remove from the surface by skimming or with suitable absorbents. If permitted by regulatory authorities the use of suitable dispersants should be considered where recommended in local oil spill procedures.

ENVIRONMENTAL PRECAUTIONS: Prevent material from entering sewers, water sources or low lying areas; advise the relevant authorities if it has, or if it contaminates soil/vegetation.

PERSONAL PRECAUTIONS: See Section 8

7. HANDLING AND STORAGE

HANDLING: High pressure injection under the skin may occur due to the rupture of pressurized lines. Always seek medical attention. No special precautions are necessary beyond normal good hygiene practices. See Section 8 for additional personal protection advice when handling this product.

STORAGE: Keep containers closed when not in use. Do not store in open or unlabelled containers. Store away from strong oxidizing agents and combustible materials. Do not store near heat, sparks, flame or strong oxidants.

SPECIAL PRECAUTIONS: Prevent small spills and leakages to avoid slip hazard.

EMPTY CONTAINER WARNING: Empty containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to refill or clean container since residue is difficult to remove. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS:

This product does not contain any components which have recognized exposure limits.

VENTILATION: Use adequate ventilation.

RESPIRATORY PROTECTION: No special requirements under ordinary conditions of use and with adequate ventilation.

EYE PROTECTION: Generally eye contact is unlikely with this type material. If eye contact is likely, safety glasses with side shields or chemical type goggles should be worn.

SKIN PROTECTION: If prolonged or repeated skin contact is likely, oil impervious gloves should be worn. Good personal hygiene practices should always be followed.

9. PHYSICAL AND CHEMICAL PROPERTIES

Typical physical properties are given below. Consult Product Data Sheet for specific details.

APPEARANCE: Grease
COLOR: Black
ODOR: Mild
ODOR THRESHOLD-ppm: NE
pH: NA
BOILING POINT C(F): > 316(600)
DROP POINT C(F): NE
FLASH POINT C(F): > 204(400) (ESTIMATED FOR OIL, ASTM D-92 (COC))
FLAMMABILITY (solids): NE
AUTO FLAMMABILITY C(F): NA
EXPLOSIVE PROPERTIES: NA
OXIDIZING PROPERTIES: NA
VAPOR PRESSURE-mmHg 20 C: < 0.1
VAPOR DENSITY: NE
EVAPORATION RATE: NE
RELATIVE DENSITY, 15/4 C: 0.94
SOLUBILITY IN WATER: Negligible
PARTITION COEFFICIENT: > 3.5
VISCOSITY AT 40 C, cSt: NE
VISCOSITY AT 100 C, cSt: 23.7
POUR POINT C(F): NA
FREEZING POINT C(F): NE
VOLATILE ORGANIC COMPOUND: NE
NOTE: MOST PHYSICAL PROPERTIES FOR OIL COMPONENT.
DMSO EXTRACT, IP-346 (WT.%): <3, for mineral oil only
NA=NOT APPLICABLE NE=NOT ESTABLISHED D=DECOMPOSES

FOR FURTHER TECHNICAL INFORMATION, CONTACT YOUR MARKETING REPRESENTATIVE

10. STABILITY AND REACTIVITY

STABILITY (THERMAL, LIGHT, ETC.): Stable.
CONDITIONS TO AVOID: Extreme heat and high energy sources of ignition.
INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizers.
HAZARDOUS DECOMPOSITION PRODUCTS: Product does not decompose at ambient temperatures.
HAZARDOUS POLYMERIZATION: Will not occur.

11. TOXICOLOGICAL DATA

---ACUTE TOXICOLOGY---

ORAL TOXICITY (RATS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.
DERMAL TOXICITY (RABBITS): Practically non-toxic (LD50: greater than

2000 mg/kg). ---Based on testing of similar products and/or the components.

INHALATION TOXICITY (RATS): Practically non-toxic (LC50: greater than 5 mg/l). ---Based on testing of similar products and/or the components.

EYE IRRITATION (RABBITS): Practically non-irritating. (Draize score: greater than 5 but 15 or less). ---Based on testing of similar products and/or the components.

SKIN IRRITATION (RABBITS): Practically non-irritating. (Primary Irritation Index: greater than 0.5 but less than 3). ---Based on testing of similar products and/or the components.

OTHER ACUTE TOXICITY DATA: Although an acute inhalation study was not performed with this product, a variety of mineral oils and synthetic base oils, such as those in this product have been tested. These samples had virtually no effect other than a nonspecific inflammatory response in the lung to the aerosolized mineral oil. The presence of additives in other tested formulations (in approximately the same amounts as in the present formulation) did not alter the observed effects.

---SUBCHRONIC TOXICOLOGY (SUMMARY)---

No significant adverse effects were found in studies using repeated dermal applications of similar formulations to the skin of laboratory animals for 13 weeks at doses significantly higher than those expected during normal industrial exposure. The animals were evaluated extensively for effects of exposure (hematology, serum chemistry, urinalysis, organ weights, microscopic examination of tissues etc.).

---REPRODUCTIVE TOXICOLOGY (SUMMARY)---

No teratogenic effects would be expected from dermal exposure, based on laboratory developmental toxicity studies of major components in this formulation and/or materials of similar composition.

---CHRONIC TOXICOLOGY (SUMMARY)---

Repeated and/or prolonged exposure may cause irritation to the skin, eyes or respiratory tract. For mineral base oils: Base oils in this product are severely solvent refined and/or severely hydrotreated. Chronic mouse skin painting studies of severely treated oils showed no evidence of carcinogenic effects. These results are confirmed on a continuing basis using various screening methods such as Modified Ames Test, IP-346, and/or other analytical methods. For synthetic base oils: The base oils in this product have been tested in the Ames assay and other tests of mutagenicity with negative results. These base oils are not expected to be carcinogenic with chronic dermal exposures.

---SENSITIZATION (SUMMARY)---

Not expected to be sensitizing based on tests of this product, components, or similar products.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE AND EFFECTS:

This environmental assessment was conducted using information on the individual components as no test data was available for this specific formulation.

ECOTOXICITY: The major components in the formulation show no aquatic toxicity at 1000 mg/L loading, therefore long-term adverse effects in the aquatic environment are not expected.

MOBILITY: Not established.

PERSISTENCE AND DEGRADABILITY: This product is expected to be inherently biodegradable, as the principal components have been shown to degrade at slow to moderate rates.

BIOACCUMULATIVE POTENTIAL: Not established.

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: Product is suitable for burning in an enclosed, controlled burner for fuel value. Such burning may be limited pursuant to the Resource Conservation and Recovery Act. In addition, the product is suitable for processing by an approved recycling facility or can be disposed of at an appropriate government waste disposal facility. Use of these methods is subject to user compliance with applicable laws and regulations and consideration of product characteristics at time of disposal.

RCRA INFORMATION: The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261), nor is it formulated to contain materials which are listed hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrosivity, or reactivity. The unused product is not formulated with substances covered by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

14. TRANSPORT INFORMATION

USA DOT: NOT REGULATED BY USA DOT.

RID/ADR: NOT REGULATED BY RID/ADR.

IMO: NOT REGULATED BY IMO.

IATA: NOT REGULATED BY IATA.

15. REGULATORY INFORMATION

OS OSHA HAZARD COMMUNICATION STANDARD: When used for its intended purposes, this product is not classified as hazardous in accordance with OSHA 29 CFR 1910.1200.

EU Labeling: Product is not dangerous as defined by the European Union Dangerous Substances/Preparations Directives. EU labeling not required.

Governmental Inventory Status: All components comply with TSCA, EINECS/ELINCS and AICS.

U.S. Superfund Amendments and Reauthorization Act (SARA) Title III: This product contains no "EXTREMELY HAZARDOUS SUBSTANCES".

SARA (311/312) REPORTABLE HAZARD CATEGORIES: None.

This product contains the following SARA (313) Toxic Release Chemicals:

CHEMICAL NAME	CAS NUMBER	CONC.
PHOSPHORODITHOIC ACID, O,O-DI C1-14-ALKYL ESTERS, ZINC SALTS (2:1) (ZDDP)	68649-42-3	1.3%

The following product ingredients are cited on the lists below:

CHEMICAL NAME	CAS NUMBER	LIST CITATIONS *
LITHIUM HYDROXIDE MONOHYDRATE (0.06%)	1310-66-3	22
ZINC (ELEMENTAL ANALYSIS) (0.15%)	7440-66-6	22
LITHIUM-SOAP THICKENER (6.58%)	7620-77-1	22
PHOSPHORODITHOIC ACID, O,O-DI C1-14-ALKYL ESTERS, ZINC SALTS (2: 1) (ZDDP) (1.29%)	68649-42-3	18, 20, 21, 22, 24, 25
FATTY ACIDS, C16-22, LITHIUM SALTS (0.81%)	68783-36-8	22

--- REGULATORY LISTS SEARCHED ---

1=ACGIH ALL	6=IARC 1	11=TSCA 4	16=CA P65 CARC	21=LA RTK
2=ACGIH A1	7=IARC 2A	12=TSCA 5a2	17=CA P65 REPRO	22=MI 293
3=ACGIH A2	8=IARC 2B	13=TSCA 5e	18=CA RTK	23=MN RTK
4=NTP CARC	9=OSHA CARC	14=TSCA 6	19=FL RTK	24=NJ RTK
5=NTP SUS	10=OSHA 2	15=TSCA 12b	20=IL RTK	25=PA RTK
				26=RI RTK

* EPA recently added new chemical substances to its TSCA Section 4 test rules. Please contact the supplier to confirm whether the ingredients in this product currently appear on a TSCA 4 or TSCA 12b list.

Code key:CARC=Carcinogen; SUS=Suspected Carcinogen; REPRO=Reproductive

16. OTHER INFORMATION

USE: EXTREME PRESSURE GREASE

NOTE: PRODUCTS OF EXXON MOBIL CORPORATION AND ITS AFFILIATED COMPANIES ARE NOT FORMULATED TO CONTAIN PCBs.

Health studies have shown that many hydrocarbons pose potential human health risks which may vary from person to person. Information provided on this MSDS reflects intended use. This product should not be used for other applications. In any case, the following advice should be considered:

INDUSTRIAL LABEL

Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin or respiratory irritation. Always observe good hygiene measures. First Aid: Wash skin with soap and water. Flush eyes with water. If overcome by fumes or vapor, remove to fresh air. If ingested do not induce vomiting. If symptoms persist seek medical assistance. Read and understand the MSDS before using this product.

For Internal Use Only: MHC: 1* 1* 1* 1* 1*, MPPEC: A, TRN: 642314-00,
ELIS: 400584, CMCS97: 971554, REQ: US - MARKETING, SAFE USE: L
EHS Approval Date: 20AUG2001

Information given herein is offered in good faith as accurate, but without guarantee. Conditions of use and suitability of the product for particular uses are beyond our control; all risks of use of the product are therefore assumed by the user and WE EXPRESSLY DISCLAIM ALL WARRANTIES OF EVERY KIND AND NATURE, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE IN RESPECT TO THE USE OR SUITABILITY OF THE PRODUCT. Nothing is intended as a recommendation for uses which infringe valid patents or as extending license under valid patents. Appropriate warnings and safe handling procedures should be provided to handlers and users. Alteration of this document is strictly prohibited. Except to the extent required by law, republication or retransmission of this document, in whole or in part, is not permitted. Exxon Mobil Corporation and its affiliated companies assume no responsibility for accuracy of information unless the document is the most current available from an official ExxonMobil distribution system. Exxon Mobil Corporation and its affiliated companies neither represent nor warrant that the format, content or product formulas contained in this document comply with the laws of any other country except the United States of America.

Prepared by: ExxonMobil Oil Corporation
Environmental Health and Safety Department, Clinton, USA

18844
②

MATERIAL SAFETY DATA SHEET

T Valvoline Company

Page 001
Date Prepared: 10/05/01
Date Printed: 05/17/04
MSDS No: 503.0321158-001.004

ZEREX 50/50 PREMIX

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Material Identity
Product Name: ZEREX 50/50 PREMIX
General or Generic ID: GLYCOL

Company	Telephone Number's
The Valvoline Company	Emergency: 1-800-274-5263
P.O. Box 14000	Information: 1-859-357-7206
Lexington, KY 40512	

2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient(s)	CAS Number	% (by weight)
ETHYLENE GLYCOL	107-21-1	48.0- 48.0
ETHYLENE GLYCOL	111-46-6	1.0- 8.0

3. HAZARDS IDENTIFICATION

Potential Health Effects

Eye
May cause mild eye irritation.

Skin
May cause mild skin irritation. Although rare, skin contact with ethylene glycol may cause allergic skin reaction (delayed skin rash which may be followed by blistering, scaling and other skin effects). Passage through the skin may add to toxic effects from breathing or swallowing.

Swallowing
Swallowing small amounts of this material during normal handling is not likely to cause harmful effects. Swallowing large amounts may be harmful.

Continued on next page

05-17-04

MATERIAL SAFETY DATA SHEET

U. Valvoline Company

Page 002

Date Prepared: 10/05/01

Date Printed: 05/17/04

MSDS No: 503.0321158-001.004

TEREX 50/50 PREMIX

Inhalation

Breathing of vapor or mist is possible.

Symptoms of Exposure

stomach or intestinal upset (nausea, vomiting, diarrhea), irritation (nose, throat, airways), central nervous system excitation (giddiness, liveliness, light-headed feeling) followed by central nervous system depression (dizziness, drowsiness, weakness, fatigue, nausea, headache, unconsciousness) and other central nervous system effects, involuntary eye movement, kidney damage.

Target Organ Effects

Overexposure to this material (or its components) has been suggested as a cause of the following effects in laboratory animals, and may aggravate preexisting disorders of these organs in humans: kidney damage, Overexposure to this material (or its components) has been suggested as a cause of the following effects in humans, and may aggravate preexisting disorders of these organs: central nervous system effects, liver abnormalities, kidney damage, liver damage.

Developmental Information

Ethylene glycol has caused birth defects in animal studies at high oral doses.

Cancer Information

No data

Other Health Effects

No data

Primary Route(s) of Entry

Skin absorption, Skin contact, Eye contact, Ingestion.

4. FIRST AID MEASURES

Eyes

If symptoms develop, immediately move individual away from exposure and into fresh air. Flush eyes gently with water for at least 15 minutes while holding eyelids apart; seek immediate medical attention.

Continued on next page

MATERIAL SAFETY DATA SHEET

T. Valvoline Company

Page 003

Date Prepared: 10/05/01

Date Printed: 05/17/04

MSDS No: 503.0321158-001.004

ZEREX 50/50 PREMIX

Skin

Remove contaminated clothing. Wash exposed area with soap and water. If symptoms persist, seek medical attention. Launder clothing before reuse.

Swallowing

Seek medical attention. If individual is drowsy or unconscious, do not give anything by mouth; place individual on the left side with the head down. Contact a physician, medical facility, or poison control center for advice about whether to induce vomiting. If possible, do not leave individual unattended.

Inhalation

If symptoms develop, immediately move individual away from exposure and into fresh air. Seek immediate medical attention; keep person warm and quiet. If person is not breathing, begin artificial respiration. If breathing is difficult, administer oxygen.

Note to Physicians

This product contains ethylene glycol. Ethanol decreases the metabolism of ethylene glycol to toxic metabolites. Ethanol should be administered as soon as possible in cases of severe poisoning since the elimination half-life of ethylene glycol is 3 hours. If medical care will be delayed several hours, give the patient three to four 1-ounce oral "shots" of 86-proof or higher whiskey before or during transport to the hospital. Fomepizole (4-methylpyrazole) is an effective antagonist of alcohol dehydrogenase, and as such, may be used as an antidote in the treatment of ethylene glycol poisoning. Hemodialysis effectively removes ethylene glycol and its metabolites from the body. Effects of acute ethylene glycol poisoning appear in three fairly distinct stages. The initial stage occurs shortly after exposure, lasts 6-12 hours, and is characterized by central nervous system effects (transient exhilaration, nausea, vomiting, and in severe cases, coma, convulsions, and possible death. The second stage lasts from 12-36 hours after exposure and is initiated by the onset of coma. This phase is characterized by tachypnea, tachycardia, mild hypotension, cyanosis, and in severe cases, pulmonary edema, bronchopneumonia, cardiac enlargement, and congestive failure. The final stage occurs 24-72 post-exposure and is characterized by renal failure ranging from a mild increase in blood urea nitrogen and creatinine followed by recovery to complete anuria with acute tubular necrosis that can lead to death. Oxaluria is found in most cases. The most significant laboratory finding in ethylene glycol intoxication is severe

Continued on next page

MATERIAL SAFETY DATA SHEET

1 Valvoline Company

Page 004

Date Prepared: 10/05/01

Date Printed: 05/17/04

MSDS No: 503.0321158-001.004

ZEREX 50/50 PREMIX

metabolic acidosis.

5. FIRE FIGHTING MEASURES

Flash Point

250.0 F (121.1 C)

Explosive Limit

Not applicable

Autoignition Temperature

No data

Hazardous Products of Combustion

May form: carbon dioxide and carbon monoxide, various hydrocarbons.

Fire and Explosion Hazards

Never use welding or cutting torch on or near drum (even empty) because product (even just residue) can ignite explosively.

Extinguishing Media

alcohol foam, carbon dioxide, dry chemical.

Fire Fighting Instructions

Wear a self-contained breathing apparatus with a full facepiece operated in the positive pressure demand mode with appropriate turn-out gear and chemical resistant personal protective equipment. Refer to the personal protective equipment section of this MSDS.

NFPA Rating

Health - 1, Flammability - 1, Reactivity - 0

6. ACCIDENTAL RELEASE MEASURES

Small Spill

Absorb liquid on vermiculite, floor absorbent or other absorbent material.

Continued on next page

MATERIAL SAFETY DATA SHEET

T. Valvoline Company

Page 005

Date Prepared: 10/05/01

Date Printed: 05/17/04

MSDS No: 503.0321158-001.004

ZEREX 50/50 PREMIX

Large Spill

Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed. Stop spill at source, dike area of spill to prevent spreading, pump liquid to salvage tank. Remaining liquid may be taken up on sand, clay, earth, floor absorbent, or other absorbent material and shoveled into containers.

7. HANDLING AND STORAGE

Handling

Containers of this material may be hazardous when emptied. Since emptied containers retain product residues (vapor, liquid, and/or solid), all hazard precautions given in the data sheet must be observed.

Age

Not applicable

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Eye Protection

Chemical splash goggles in compliance with OSHA regulations are advised; however, OSHA regulations also permit other type safety glasses. Consult your safety representative.

Skin Protection

Wear resistant gloves such as: neoprene, nitrile rubber, polyvinyl chloride. To prevent repeated or prolonged skin contact, wear impervious clothing and boots.

Respiratory Protections

If workplace exposure limit(s) of product or any component is exceeded (See Exposure Guidelines), a NIOSH/MSHA approved air supplied respirator is advised in absence of proper environmental control. OSHA regulations also permit other NIOSH/MSHA respirators (negative pressure type) under specified conditions (consult your industrial hygienist). Engineering or administrative controls should be implemented to reduce exposure.

Continued on next page

MATERIAL SAFETY DATA SHEET

1 Valvoline Company

Page 006

Date Prepared: 10/05/01

Date Printed: 05/17/04

MSDS No: 503.0321158-001.004

ZZREX 50/50 PREMIX

Engineering Controls

Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below TLV(s).

Exposure Guidelines

Component

ETHYLENE GLYCOL (107-21-1)

OSHA PEL 50.000 ppm - Ceiling

ACGIH TLV 127.000 mg/m³ - Ceiling

ACGIH TLV 50.000 ppm - Ceiling vapor and mist

DITHYLENE GLYCOL (111-46-6)

No exposure limits established

PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point

(for product) 225.0 F (107.2 C) @ 760.00 mmHg

Vapor Pressure

(for product) 18.000 mmHg @ 68.00 F

Specific Vapor Density

No data

Specific Gravity

1.078 @ 60.00 F

Liquid Density

8.977 lbs/gal @ 60.00 F

1.078 kg/l @ 15.60 C

Percent Volatiles (Including Water)

No data

Continued on next page

MATERIAL SAFETY DATA SHEET

1 Valvoline Company

Page 007

Date Prepared: 10/05/01

Date Printed: 05/17/04

MSDS No: 503.0321158-001.004

ZEREX 50/50 PREMIX

Evaporation Rate
No data

Appearance
No data

State
LIQUID

Physical Form
No data

Color
No data

Odor
No data

10.0 - 11.0

10. STABILITY AND REACTIVITY

Hazardous Polymerization
Product will not undergo hazardous polymerization.

Hazardous Decomposition
May form: carbon dioxide and carbon monoxide, various hydrocarbons.

Chemical Stability
Stable.

Incompatibility
Avoid contact with: strong oxidizing agents.

Continued on next page

MATERIAL SAFETY DATA SHEET

1 Valvoline Company

Page 008
Date Prepared: 10/05/01
Date Printed: 05/17/04
MSDS No: 503.0321158-001.004

ZEREX 50/50 PREMIX

11. TOXICOLOGICAL INFORMATION

No data

12. ECOLOGICAL INFORMATION

No data

13. DISPOSAL CONSIDERATION

Waste Management Information

Destroy by liquid incineration. Dispose of in accordance with all applicable local, state and federal regulations.

14. TRANSPORT INFORMATION

DOT Information - 49 CFR 172.101

DOT Description:
Not Regulated

Container/Mode:
CASES/SURFACE - NO EXCEPTIONS

NOS Component:
None

RQ (Reportable Quantity) - 49 CFR 172.101

Product Quantity (lbs) Component

10456	ETHYLENE GLYCOL
-------	-----------------

15. REGULATORY INFORMATION

US Federal Regulations

TSCA (Toxic Substances Control Act) Status
TSCA (UNITED STATES) The intentional ingredients of this product are listed.

Continued on next page

MATERIAL SAFETY DATA SHEET

T Valvoline Company

Page 009
 Date Prepared: 10/05/01
 Date Printed: 05/17/04
 MSDS No: 503.0321158-001.004

ZEREX 50/50 PREMIX

CERCLA RQ - 40 CFR 302.4

Component	Component
ETHYLENE GLYCOL	5000

SARA 302 Components - 40 CFR 355 Appendix A
 None

Section 311/312 Hazard Class - 40 CFR 370.2
 Immediate(X) Delayed(X) Fire() Reactive() Sudden
 Release of Pressure()

SARA 313 Components - 40 CFR 372.65

Section 313 Component(s)	CAS Number
ETHYLENE GLYCOL	107-21-1

International Regulations
 Inventory Status
 Not determined

State and Local Regulations
 California Proposition 65
 None

New Jersey RTK Label Information
 ETHYLENE GLYCOL 107-21-1

Pennsylvania RTK Label Information
 1,2-ETHANEDIOL 107-21-1
 ETHANOL, 2,2'-OXYBIS- 111-46-6

16. OTHER INFORMATION

The information accumulated herein is believed to be accurate but is not warranted to be whether originating with the company or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances.

Last page

The Valvoline Company

Date Prepared: 01/14/02

MSDS No: 503.0340955-001.0051

BLEND #0091A PREMIUM STARTING FLUID

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Material Identity

Product Name: BLEND #0091A PREMIUM STARTING FLUID

General or Generic ID: SOLVENT BLEND

Company

The Valvoline Company
P.O. Box 14000
Lexington, KY 40512

Telephone Numbers

Emergency: 1-800-274-5263
Information: 1-859-357-7206

2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient(s)	CAS Number	% (by weight)
HEPTANE	142-82-5	60.0- 70.0
ETHYL ETHER ACS REAGENT GRADE	60-29-7	23.0- 33.0
CARBON DIOXIDE	124-38-9	1.0- 11.0

3. HAZARDS IDENTIFICATION

Potential Health Effects

Eye

May cause mild eye irritation.

Skin

Can cause skin irritation. Prolonged or repeated contact may dry and crack the skin. Passage of this material into the body through the skin is possible, but it is unlikely that this would result in harmful effects during safe handling and use.

Swallowing

Swallowing small amounts of this material during normal handling is not likely to cause harmful effects. Swallowing large amounts may be harmful. This material can get into the lungs during swallowing or vomiting. This results in lung inflammation and other lung injury.

Inhalation

Breathing aerosol and/or mist is possible when material is sprayed. Aerosol and mist may present a greater risk of injury because more material may be present in the air than from vapor alone. Breathing small amounts of this material during normal handling is not likely to cause harmful effects. Breathing large amounts may be harmful. Symptoms usually occur at air concentrations higher than the recommended exposure limits (See Section 8).

Symptoms of Exposure

Signs and symptoms of exposure to this material through breathing, swallowing, and/or passage of the material through the skin may

include: stomach or intestinal upset (nausea, vomiting, diarrhea); irritation (nose, throat, airways); central nervous system depression (dizziness, drowsiness, weakness, fatigue, nausea, headache, unconsciousness); loss of appetits, loss of coordination irregular heartbeat, narcosis (dazed or sluggish feeling).

Target Organ Effects

testis damage, lung damage, visual impairment, central nervous system effects.

Developmental Information

There are no data available for assessing risk to the fetus from maternal exposure to this material.

Cancer Information

This material is not listed as a carcinogen by the International Agency for Research on Cancer, the National Toxicology Program, or the Occupational Safety and Health Administration.

Other Health Effects

No data

Primary Route(s) of Entry

Inhalation, Skin absorption, Skin contact, Eye contact.

4. FIRST AID MEASURES

Eyes

If symptoms develop, move individual away from exposure and into fresh air. Flush eyes gently with water while holding eyelids apart. If symptoms persist or there is any visual difficulty, seek medical attention.

Skin

Remove contaminated clothing. Flush exposed area with large amounts of water. If skin is damaged, seek immediate medical attention. If skin is not damaged and symptoms persist, seek medical attention. Launder clothing before reuse.

Swallowing

Seek medical attention. If individual is drowsy or unconscious, do not give anything by mouth; place individual on the left side with the head down. Contact a physician, medical facility, or poison control center for advice about whether to induce vomiting. If possible, do not leave individual unattended.

Inhalation

If symptoms develop, move individual away from exposure and into fresh air. If symptoms persist, seek medical attention. If breathing is difficult, administer oxygen. Keep person warm and quiet; seek immediate medical attention.

Note to Physicians

Inhalation of high concentrations of this material, as could occur in enclosed spaces or during deliberate abuse, may be associated with cardiac arrhythmias. Sympathomimetic drugs may initiate cardiac arrhythmias in persons exposed to this material. This material is an aspiration hazard. Potential danger from aspiration must be weighed against possible oral toxicity (See Section 3 - Swallowing) when deciding whether to induce vomiting. Preexisting disorders of the following organs (or organ systems) may be

aggravated by exposure to this material: skin, lung (for example, asthma-like conditions), Individuals with pre-existing heart disorders may be more susceptible to arrhythmias (irregular heartbeats) if exposed to high concentrations of this material.

5. FIRE FIGHTING MEASURES

Flash Point
Not applicable

Explosive Limit
(for component) Lower 1.0 %

Autoignition Temperature
No data

Hazardous Products of Combustion
May form:

Fire and Explosion Hazards
Material is highly volatile and readily gives off vapors which may travel along the ground or be moved by ventilation and ignited by pilot lights, other flames, sparks, heaters, smoking, electric motors, static discharge, or other ignition sources at locations distant from material handling point. Never use welding or cutting torch on or near drum (even empty) because product (even just residue) can ignite explosively.

Extinguishing Media
No data

Fire Fighting Instructions
Wear a self-contained breathing apparatus with a full facepiece operated in the positive pressure demand mode with appropriate turn-out gear and chemical resistant personal protective equipment. Refer to the personal protective equipment section of this MSDS.

NFPA Rating
Health - 1, Flammability - 4, Reactivity - 0

6. ACCIDENTAL RELEASE MEASURES

Small Spill
Eliminate all sources of ignition such as flares, flames (including pilot lights), and electrical sparks. Absorb liquid on vermiculite, floor absorbent or other absorbent material. Persons not wearing proper personal protective equipment should be excluded from area of spill.

Large Spill
Prevent run-off to sewers, streams or other bodies of water. If run-off occurs, notify proper authorities as required, that a spill has occurred. Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed. Eliminate all ignition sources (flares, flames, including pilot lights, electrical sparks).

7. HANDLING AND STORAGE

Handling

Containers of this material may be hazardous when emptied. Since emptied containers retain product residues (vapor, liquid, and/or solid), all hazard precautions given in the data sheet must be observed. All five gallon pails and larger metal containers including tank cars and tank trucks should be grounded and/or bonded when material is transferred. Precautions during use: avoid prolonged or frequently repeated skin contact with this material. Skin contact can be minimized by wearing impervious protective gloves. As with all products of this nature, good personal hygiene is essential. Hands and other exposed areas should be washed thoroughly with soap and water after contact, especially before eating and/or smoking. Regular laundering of contaminated clothing is essential to reduce indirect skin contact with this material. Hydrocarbon solvents are basically non-conductors of electricity and can become electrostatically charged during mixing, filtering or pumping at high flow rates. If this charge reaches a sufficiently high level, sparks can form that may ignite the vapors of flammable liquids.

Storage

Do not store near extreme heat, open flame, or sources of ignition.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Eye Protection

Chemical splash goggles in compliance with OSHA regulations are advised; however, OSHA regulations also permit other type safety glasses. Consult your safety representative.

Skin Protection

Wear resistant gloves (consult your safety equipment supplier). To prevent repeated or prolonged skin contact, wear impervious clothing and boots.

Respiratory Protections

If workplace exposure limit(s) of product or any component is exceeded (See Exposure Guidelines), a NIOSH/MSHA approved air supplied respirator is advised in absence of proper environmental control. OSHA regulations also permit other NIOSH/MSHA respirators (negative pressure type) under specified conditions (consult your industrial hygienist). Engineering or administrative controls should be implemented to reduce exposure.

Engineering Controls

Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below TLV(s).

Exposure Guidelines

Component

HEPTANE (142-82-5)

OSHA VPEL 1600.000 mg/m³ - TWA

OSHA VPEL 400.000 ppm - TWA

OSHA VPEL 500.000 ppm - STEL

OSHA VPEL 2000.000 mg/m³ - STEL

ACGIH TLV 400.000 ppm - TWA
ACGIH TLV 1640.000 mg/m3 - TWA
ACGIH TLV 2050.000 mg/m3 - STEL
ACGIH TLV 500.000 ppm - STEL

ETHYL ETHER ACS REAGENT GRADE (60-29-7)
No exposure limits established

CARBON DIOXIDE (124-38-9)
OSHA VPEL 10000.000 ppm - TWA
OSHA VPEL 18000.000 mg/m3 - TWA
OSHA VPEL 54000.000 mg/m3 - STEL
OSHA VPEL 30000.000 ppm - STEL
ACGIH TLV 9000.000 mg/m3 - TWA
ACGIH TLV 5000.000 ppm - TWA
ACGIH TLV 54000.000 mg/m3 - STEL
ACGIH TLV 30000.000 ppm - STEL

9. PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point
(for component) 94.0 F (34.4 C)

Vapor Pressure
(for component) 439.000 mmHg

Specific Vapor Density
> 1.000 @ AIR=1

Specific Gravity
.690 - .720 @ 77.00 F

Liquid Density
5.860 lbs/gal @ 77.00 F
.705 kg/l @ 25.00 C

Percent Volatiles (Including Water)
No data

Evaporation Rate
SLOWER THAN ETHYL ETHER

Appearance
No data

State
LIQUID

Physical Form
No data

Color
No data

Odor
No data

pH
Not applicable

Flame Propagation

> 18,000 in

10. STABILITY AND REACTIVITY

Hazardous Polymerization

Product will not undergo hazardous polymerization.

Hazardous Decomposition

May form: carbon dioxide and carbon monoxide, various hydrocarbons.

Chemical Stability

Stable.

Incompatibility

Avoid contact with: aldehydes, alkanol amines, amines, ammonia, chlorinated solvents, oxygen, strong bases, strong oxidizing agents.

11. TOXICOLOGICAL INFORMATION

No data

12. ECOLOGICAL INFORMATION

No data

13. DISPOSAL CONSIDERATION

Waste Management Information

Dispose of in accordance with all applicable local, state and federal regulations.

14. TRANSPORT INFORMATION

DOT Information - 49 CFR 172.101

DOT Description:

CONSUMER COMMODITY, ORM-D

Container/Mode:

CASES/SURFACE - ORM-D EXCEPTION

NOS Component:

None

RQ (Reportable Quantity) - 49 CFR 172.101

Product Quantity (lbs) Component

333

DIETHYL ETHER

15. REGULATORY INFORMATION

US Federal Regulations

CERCLA RQ - 40 CFR 302.4
None

SARA 302 Components - 40 CFR 355 Appendix A
None

Section 311/312 Hazard Class - 40 CFR 370.2
Immediate(X) Delayed(X) Fire(X) Reactive() Sudden
Release of Pressure()

SARA 313 Components - 40 CFR 372.65
None

International Regulations

Inventory Status
Not determined

State and Local Regulations

California Proposition 65
None

New Jersey RTK Label Information

N-HEPTANE	142-82-5
CARBON DIOXIDE	124-38-9

Pennsylvania RTK Label Information

HEPTANE (N-)	142-82-5
CARBON DIOXIDE	124-38-9

16. OTHER INFORMATION

The information accumulated herein is believed to be accurate but is not warranted to be whether originating with the company or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances.

Last page



WD-40



MATERIAL SAFETY DATA SHEET

I. PRODUCT IDENTIFICATION

Manufacturer:	WD-40 Company	Telephone:	
Address:	1061 Cudahy Place (92110) P.O. Box 80607 San Diego, California 92138-0607	Emergency only:	1-(800) 424-9300 (CHEMTREC)
		Information:	(619) 275-1400
		Chemical Name:	Organic Mixture
		Trade Name:	WD-40 Aerosol

II. HAZARDOUS INGREDIENTS

Chemical Name	CAS Number	%	Exposure Limit ACGIH/OSHA
Aliphatic Petroleum Distillates	8052-41-3	45-50	100 ppm PEL
Petroleum Base Oil	64742-65-0	15-25	5 mg/M ³ TWA (mist)
LVP Hydrocarbon Fluid	64742-47-8	12-18	1200 mg/M ³ TWA
Carbon Dioxide	124-38-9	2-3	5000 ppm PEL
Non-hazardous Ingredients		< 10	

III. PHYSICAL DATA

Boiling Point:	323°F (minimum)	Evaporation Rate:	Not determined
Vapor Density (air=1):	Greater than 1	Vapor Pressure:	110 ±5 PSI @ 70°F
Solubility in Water:	insoluble	Appearance:	Light amber
Specific Gravity (H ₂ O=1):	0.817 @ 72°F	Odor:	Characteristic odor
Percent Volatile (volume):	74%	VOC:	412 grams/liter (49.5%)

IV. FIRE AND EXPLOSION

Flash Point:	131°F Tag Closed Cup
Flammable Limits:	(Solvent Portion) [Le] 1.0% [Uel] 6.0%
Extinguishing Media:	CO ₂ , Dry Chemical, Foam.
Special Fire Fighting Procedures:	Contents Under Pressure
Unusual Fire and Explosion Hazards:	FLAMMABLE - U.F.C. level 3 AEROSOL

V. HEALTH HAZARD / ROUTE(S) OF ENTRY

Threshold Limit Value	Aliphatic Petroleum Distillates (Stoddard Solvent) lowest TLV (ACGIH 100 ppm.)
Symptoms of Overexposure	
Inhalation (Breathing):	May cause anesthesia, headache, dizziness, nausea and upper respiratory irritation.
Skin contact:	May cause drying of skin and/or irritation.
Eye contact:	May cause irritation, tearing and redness.
Ingestion (Swallowed):	May caused irritation, nausea, vomiting and diarrhea.
First Aid Emergency Procedures	
Ingestion (Swallowed):	Do not induce vomiting, seek medical attention.
Eye Contact:	Immediately flush eyes with large amounts of water for 15 minutes.
Skin Contact:	Wash with soap and water.
Inhalation (Breathing):	Remove to fresh air. Give artificial respiration if necessary. If breathing is difficult, give oxygen.
	Pre-existing medical conditions such as eye, skin and respiratory disorders may be aggravated by exposure.
DANGER!	
Aspiration Hazard:	If swallowed, can enter lungs and may cause chemical pneumonitis. Do not induce vomiting. Call Physician immediately.
Supported Cancer Agent	The components in this mixture have been found to be noncarcinogenic by NTP.

VI. REACTIVITY DATA

Stability:	Stable <u>X</u>	Unstable <u> </u>
Conditions to avoid:	NA	
Compatibility:	Strong oxidizing agents	
Hazardous decomposition products:	Thermal decomposition may yield carbon monoxide and/or carbon dioxide.	
Hazardous polymerization:	May occur <u> </u>	Will not occur <u>X</u>

VII. SPILL OR LEAK PROCEDURES

Spill Response Procedures
 Spill unlikely from aerosol cans. Leaking cans should be placed in plastic bag or open pail until pressure has dissipated.

Waste Disposal Method
 Empty aerosol cans should not be punctured or incinerated; bury in land fill. Liquid should be incinerated or buried in land fill. Dispose of in accordance with local, state and federal regulations.

VIII. SPECIAL HANDLING INFORMATION

Ventilation:	Sufficient to keep solvent vapor less than TLV.
Respiratory Protection:	Advised when concentrations exceed TLV.
Protective Gloves:	Advised to prevent possible skin irritation.
Eye Protection:	Approved eye protections to safeguard against potential eye contact, irritation or injury.
Other Protective Equipment:	None required.

IX. SPECIAL PRECAUTIONS

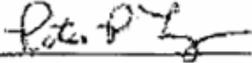
Keep from sources of ignition. Avoid excessive inhalation of spray particles, do not take internally. Do not puncture, incinerate or store container above 120°F. Exposure to heat may cause bursting. Keep can away from electrical current or battery terminals. Electrical arcing can cause burn-through (puncture) which may result in flash fire, causing serious injury. Keep from children.

X. TRANSPORTATION DATA (49 CFR 172.101)

Domestic Surface	
Description:	Consumer Commodity
Hazard Class:	ORM-D
ID No:	None
Label Required:	Consumer commodity (ORM-D)

XI. REGULATORY INFORMATION

All ingredients for this product are listed on the TSCA inventory.	
SARA Title III chemicals:	None
California Prop 65 chemicals:	None
CERCLA reportable quantity:	None
RCRA hazardous waste no:	D001 (Ignitable)

SIGNATURE: Peter Fougner  TITLE: Director of Global Quality Assurance

REVISION DATE: December, 2004 SUPERSEDES: November, 2003

NA: Not applicable NDA: No data available < = Less than > = More than

We believe the statements, technical information and recommendations contained herein are reliable. However, the data is provided without warranty, expressed or implied. It is the user's responsibility both to determine safe conditions for use of this product and assume loss, damage or expense, direct or consequential, arising from its use. Before using product, read label.

Marking Paint - Aerosol

Material Safety Data Sheet

Information is believed to be correct and sufficient to meet the requirements of OSHA Hazard Communication concerning worker's right to know.

This sheet covers the hazardous ingredients associated with more than one color aerosol product. As per the manufacturer, whenever the hazards associated with similar mixtures are the same, then one MSDS may be prepared.

Marking Paint

Fluorescent Colors	16 oz. I.A.C.		High Delivery	Metallic
220 Red	261S Red	270S Fluorescent Red	281 Red	210 Silver
222 Orange	262S Yellow	272S Fluorescent Orange	282 Yellow	
224 Green	263S Blue	274S Fluorescent Green	288 Fluorescent Orange	
226 Yellow	265S Orange	275S Fluorescent Red/Orange		
227 Blue	267S White	279S Fluorescent Pink		
229 Pink				
230 Red/Orange				

SECTION I - MANUFACTURER IDENTIFICATION

Corrosion Industries, Inc. ADDRESS: 1198 Mark Circle, Gardnerville, NV 89410
 -0100 EMERGENCY PHONE: 1-800-424-9300
 REASON REVISED: Updated

HAZARDOUS INGREDIENTS / SARA III INFORMATION / OCCUPATIONAL EXPOSURE LIMITS

Chemical Name	Xylene	Aliphatic Petroleum Distillates	Ethyl Acetate	Acetone	Glycol Ether EB Acetate	Vinyl Naphtha	Aliphatic Hydrocarbon	n-Butyl Acetate
1330-20-7	64742-89-7	141-78-6	67-64-1	112-07-2	64742-89-8	64742-47-8	123-86-4	
100 ppm	100 ppm	400 ppm	1000 ppm	N / AV	300 ppm	N / AV	150 ppm	
100 ppm	100 ppm	400 ppm	500 ppm	N / AV	400 ppm	N / AV	150 ppm	
4300 mg/kg (Rat-Oral)	N / AV	N / AV	5900 mg/kg (Rat-Oral)	N / AV	N / AV	N / AV	N / AV	
6700 ppm 4 hr (Rat)	N / AV	N / AV	21,000 ppm 8 hr (Rat)	N / AV	N / AV	N / AV	N / AV	
yes	yes	no	no	yes	no	no	no	
wt %	wt %	wt %	wt %	wt %	wt %	wt %	wt %	

Colors

13	5 - 10	1 - 5	1 - 5	3 - 7	1 - 5			
13		1 - 5				7 - 13		
	7 - 13			30 - 60		5 - 10	5 - 10	1 - 5

17A

SECTION III - PHYSICAL / CHEMICAL CHARACTERISTICS

BOILING POINT: N / AP
 VAPOR DENSITY: Heavier than air
 EVAPORATION RATE: Faster than n-Butyl Acetate
 SPECIFIC GRAVITY (4): 0.8 to 0.9
 SOLUBILITY IN WATER: Partially
 APPEARANCE AND ODOR: Opaque liquid w/

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: < 0° F (-18° C)
 EXTINGUISHING MEDIA: Carbon dioxide, dry chemical, water spray.
 SPECIAL FIRE FIGHTING PROCEDURES: Use water spray to cool containers exposed to heat or fire to prevent pressure build up from extreme temperature.
 UNUSUAL FIRE AND EXPLOSION HAZARDS: Treat as cylinders of compressed gas. Closed containers may rupture under conditions of sparks, flame, or hot surfaces.
 FLAMMABILITY: Flammable aerosol under conditions of sparks, flame, or hot surfaces.
 SENSITIVITY TO IMPACT: Do not puncture
 SENSITIVITY TO STATIC DISCHARGE: Primarily

SECTION V - REACTIVITY DATA

STABILITY: Stable
 INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizing agents.
 HAZARDOUS DECOMPOSITION OR BY-PRODUCTS: Carbon Monoxide, Carbon Dioxide.
 HAZARDOUS POLYMERIZATION: Will not occur
 CONDITIONS TO AVOID: Open flames, spark

SECTION VI - HEALTH HAZARD DATA

INHALATION: Respiratory tract irritant. May cause dizziness, light-headedness and / or headaches.
 SKIN CONTACT: Prolonged or repeated contact may cause irritation and dermatitis.
 EYE CONTACT: Painful with slight to moderate irritation.
 SKIN ABSORPTION: Not likely to be absorbed in toxic amounts under normal use.
 INGESTION: Not likely to be harmful in small amounts but swallowing large amounts may be harmful.
 CARCINOGENICITY: The ingredients are not listed as a human carcinogen by IARC, ACGIH, NTP, or OSHA.
 TERATOGENICITY: Not established
 MUTAGENICITY: Not established
 MEDICAL CONDITION GENERALLY AGGRAVATED BY EXPOSURE: Not established
 EMERGENCY AND FIRST AID PROCEDURES: INHALATION - Remove from exposure, seek medical attention if significant irritation persists.
 SKIN - Wash affected area with soap and water, remove contaminated clothing, seek medical attention if irritation persists.
 EYES - Flush immediately with water for 15 minutes, seek medical attention if irritation persists.
 INGESTION - Do NOT induce vomiting. Drink plenty of water, seek medical attention.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Remove all sources of ignition. Ventilate watercourse. Use an inert absorbent material and non-sparking type tools.
 WASTE DISPOSAL METHOD: Dispose of in accordance with local, state and federal regulations. Do not incinerate.
 PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Do not store above 120° F (49° C). Do not store or use in confined spaces.
 OTHER PRECAUTIONS: Do not get in eyes or on skin. Do not breathe vapors, take internally or smoke while using it.

SECTION VIII - CONTROL MEASURES

RESPIRATORY PROTECTION: In areas with poor ventilation, use a NIOSH approved Organic Vapor Cartridge Respirator. For concentrations above the TLV (as defined in Section II), use a positive air supplied respirator.
 VENTILATION: General ventilation to maintain exposure limits below TLV's as defined in Section II.
 PROTECTIVE GLOVES: Chemical resistant gloves such as Neoprene or Nitrile rubber.
 EYE PROTECTION: Safety glasses or goggles.
 OTHER PROTECTIVE CLOTHING OR EQUIPMENT: Not established.
 WORK HYGIENIC PRACTICES: Avoid prolonged or repeated contact. Do not breathe vapors. Wash contaminated

SECTION IX - DISCLAIMER

THE INFORMATION CONTAINED HEREIN IS BELIEVED TO BE ACCURATE BUT IS NOT WARRANTED TO BE ACCURATE. THIS INFORMATION CONSTITUTES A SPECIFICATION NOR IS IT INTENDED TO WARRANT SUITABILITY FOR THE

Marking Paint (Regular Colors) - Bulk

Material Safety Data Sheet

ety data sheet as per your request.

forms is believed to be correct and sufficient to meet the requirements of OSHA Hazard Communication concerning worker's right to know. In order for the information contained in the MSDS to be most helpful re made available to all those who handle or may otherwise be exposed to the product.

sheet covers the hazardous ingredients associated with more than one color bulk product. As per 29 whenever the hazards associated with similar mixtures are the same, then one MSDS may be prepared

erve-Pacific bulk products.

MARKING PAINT - REGULAR COLORS

204 GREEN	207 WHITE	210 SILVER
205 ORANGE	208 HI VISIBILITY YELLOW	212 PURPLE
206 BLACK	209 LIGHT BLUE	213 BROWN

INT - ALL REGULAR COLORS PRODUCT CODE: 17B H/MIS CODES: H F R P
2 3 0 X

SECTION I - MANUFACTURER IDENTIFICATION

vee-Pacific Company, Inc. ADDRESS: 1198 Mark Circle, Gardnerville, NV 89410
7-0100 EMERGENCY PHONE: 1-800-424-9300
REASON REVISED: Updated

**SECTION II - HAZARDOUS INGREDIENTS / SARA III INFORMATION
OCCUPATIONAL EXPOSURE LIMITS**

OSHA PEL	ACGIH TLV	OTHER	LD50 SPECIES & ROUTE	LC50 SPECIES & ROUTE
100 PPM	100 PPM		4300 mg / kg RAT (ORAL)	6700 PPM; 4 hr RAT (INHA)
100 PPM	100 PPM	N/A	3500 mg / kg RAT (ORAL)	N/A
100 PPM	100 PPM		N/A	N/A
N/A	N/A	N/A	N/A	N/A
FOLLOWING: 750 PPM	750 PPM		9750 mg / kg RAT (ORAL)	6700 PPM / 4 hr RAT (INHA)

o the reporting requirements of section 313 of Title III and of 40 CFR 372.
or not applicable

PRODUCT CODE: 17B

SECTION III - PHYSICAL / CHEMICAL CHARAC TICS
BOILING POINT: 149° to 259°F (65° to 142.8° C) SPECIFIC GRAVITY (H20=1): 1.1 COEFFICIENT OF W
ODOR THRESHOLD: N/A VAPOR DENSITY: Heavier than air SOLUBILITY IN WAT
EVAPORATION RATE: Slower than n-Butyl Acetate APPEARANCE AND ODOR: Opaque Liquid
COATING V.O.C. : 6.24 lbs / imp gal 5.20 lbs / US gal 523 grms / ltr FREEZING POINT: N

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: 59° to 74°F (15° to 23.3° C) METHOD USED: Estimated
FLAMMABLE LIMITS IN AIR BY VOLUME - LOWER: 0.7% UPPER: 7.0%
EXTINGUISHING MEDIA: Foam, Alcohol Foam, CO2, Dry Chemical, Water Fog
SPECIAL FIRE FIGHTING PROCEDURES: Water spray may be ineffective, but water spray may be used to cool con
to prevent pressure build up. Self-contained breathing apparatus should be used if product is involved in fire.
UNUSUAL FIRE AND EXPLOSION HAZARDS: Closed containers may rupture due to pressure build up from extreme
FLAMMABILITY: Yes - Flammable liquid under conditions of sparks, flame, or hot surfaces.
SENSITIVITY TO IMPACT: Do not puncture SENSITIVITY TO STATIC DISCHARGE: Primarily

SECTION V - REACTIVITY DATA

STABILITY: Stable CONDITIONS TO AVOID: High temperature
INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizing agents
HAZARDOUS DECOMPOSITION OR BY-PRODUCTS: Carbon Monoxide and Carbon Dioxide
HAZARDOUS POLYMERIZATION: Will not occur

SECTION VI - HEALTH HAZARD DATA

INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: May cause dizziness or nausea.
SKIN AND EYE CONTACT HEALTH RISKS AND SYMPTOMS OF EXPOSURE: SKIN - May cause irritation or burn
EYES - Primary irritation.
SKIN ABSORPTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: May cause irritation or burning sensation.
INGESTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: N/A
HEALTH HAZARDS (ACUTE AND CHRONIC): INHALATION - Anesthetic. Irritation of the respiratory tract, or nervous sy
by headache, dizziness, nausea or possible unconsciousness). SKIN OR EYE CONTACT - Primary irritation. Prolonged
cause dermatitis - exercise due care.
CARCINOGENICITY: None known NTP? No IARC MONOGRAPHS? No
TERATOGENICITY: N/A MUTAGENICITY: N/A TOXICOLOGICALLY SYNERGISTIC PROC
MEDICAL CONDITION GENERALLY AGGRAVATED BY EXPOSURE: None known
EMERGENCY AND FIRST AID PROCEDURES: VAPORS - Remove from exposure and restore breathing, seek med
SPLASH - (SKIN) Wash affected area, remove contaminated clothing, see physician if any irritation persists.
SPLASH - (EYES) Flush immediately with water for 15 minutes and take to a physician.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Remove all sources of ignition - Flames, t
electrical. Ventilate area, avoid run off into sewer by diking, and soak up with inert absorbent using non-sparking type
WASTE DISPOSAL METHOD: Dispose of in accordance with local, state and federal regulations. Do not incinerate c
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Do not store above 120° F / 49° C. Do not store or r
OTHER PRECAUTIONS: Do not get in eyes. Do not breathe vapors. Avoid skin contact. Do not take internally. Sm
must be strictly prohibited. In addition to all other hazards and precautions - dust from sanding the dry paint films sho
dust with a TLV of 10mg/cubic meter.

SECTION VIII - CONTROL MEASURES

RESPIRATORY PROTECTION: Outdoors - Recommend an approved mechanical particulate filter to remove any airb
areas with poor ventilation, use a NIOSH approved Organic Cartridge Respirator. For concentrations above the expos
supplied respirator.
VENTILATION: All application areas should be adequately ventilated in order to keep the items in SECTION III below
PROTECTIVE GLOVES: Impervious gloves (natural rubber) are recommended to prevent skin contact.
EYE PROTECTION: Safety glasses with side shields are recommended to prevent eye contact.
OTHER PROTECTIVE CLOTHING OR EQUIPMENT: Impervious apron (natural rubber) is recommended to prevent s
and safety shower.
WORK / HYGIENIC PRACTICES: Avoid prolonged or repeated contact. Do not breathe vapors. Wash contaminated

SECTION IX - DISCLAIMER

THE INFORMATION CONTAINED HEREIN IS BELIEVED TO BE ACCURATE BUT IS NOT WARRANTED TO BE
HEREIN CONSTITUTES A SPECIFICATION NOR IS IT INTENDED TO WARRANT SUITABILITY FOR TH

Marking Paint (Fluorescent Colors) - Bulk

Material Safety Data Sheet

Copy data sheet as per your request.

This information is believed to be correct and sufficient to meet the requirements of OSHA Hazard Communication concerning worker's right to know. In order for the information contained in the MSDS to be most helpful, it is made available to all those who handle or may otherwise be exposed to the product.

This sheet covers the hazardous ingredients associated with more than one color bulk product. As per 29 CFR 1910.1201, whenever the hazards associated with similar mixtures are the same, then one MSDS may be prepared.

For more information on our Pacific bulk products.

MARKING PAINT - FLUORESCENT COLORS

	224 GREEN	229 PINK
UNIFORMED GREEN	226 YELLOW	230 RED/ORANGE
	227 BLUE	

UNIFORMED - ALL FLUORESCENT COLORS PRODUCT CODE: 17B2 HMIS CODES: H F R P
2 3 0 X

SECTION I - MANUFACTURER IDENTIFICATION

Waco-Pacific Company, Inc. ADDRESS: 1198 Mark Circle, Gardnerville, NV 89410
-0100 EMERGENCY PHONE: 1-800-424-9300
REASON REVISED: Updated

**SECTION II - HAZARDOUS INGREDIENTS / SARA III INFORMATION
OCCUPATIONAL EXPOSURE LIMITS**

OSHA PEL	ACGIH TLV	OTHER	LD50 SPECIES & ROUTE	LC50 SPECIES & ROUTE
100 PPM	100 PPM		4300 mg / kg RAT (ORAL)	6700 PPM; 4 hr RAT (INHA)
100 PPM	100 PPM	N/A	3500 mg / kg RAT (ORAL)	N/A
400 PPM	400 PPM		> 7.10 g / kg RAT (ORAL) > 2.84 g / kg RAT (DERMAL)	15,000 PPM; 4 hr RAT (INHA)

For more information on the reporting requirements of section 313 of Title III and of 40 CFR 372.

* not applicable

PRODUCT CODE: 17B2

SECTION III - PHYSICAL / CHEMICAL CHARACTERISTICS
 BOILING POINT: 222° to 278°F / 105° to 132° C
 ODOR THRESHOLD: N/A
 EVAPORATION RATE: Slower than n-Butyl Acetate
 COATING V.O.C. : 5.08 lbs / imp gal 4.23 lbs / US gal 507 gms / Hr
 SPECIFIC GRAVITY (H20=1): 1.2
 VAPOR DENSITY: Heavier than air
 APPEARANCE AND ODOR: Opaque Liquid
 SOLUBILITY IN WATER: Insoluble
 FREEZING POINT: N/A

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: 20° F / -7° C
 EXTINGUISHING MEDIA: Foam, Alcohol Foam, CO2, Dry Chemical, Water Fog
 SPECIAL FIRE FIGHTING PROCEDURES: Water spray may be ineffective, but water spray may be used to cool containers to prevent pressure build up. Self-contained breathing apparatus should be used if product is involved in fire.
 UNUSUAL FIRE AND EXPLOSION HAZARDS: Closed containers may rupture due to pressure build up from extreme heat.
 FLAMMABILITY: Yes - Flammable liquid under conditions of sparks, flame, or hot surfaces.
 SENSITIVITY TO IMPACT: Do not puncture
 SENSITIVITY TO STATIC DISCHARGE: Primarily non-hazardous

SECTION V - REACTIVITY DATA

STABILITY: Stable
 INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizing agents
 HAZARDOUS DECOMPOSITION OR BY-PRODUCTS: Carbon Monoxide and Carbon Dioxide
 HAZARDOUS POLYMERIZATION: Will not occur
 CONDITIONS TO AVOID: High temperature

SECTION VI - HEALTH HAZARD DATA

INHALATION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: May cause dizziness or nausea.
 SKIN AND EYE CONTACT HEALTH RISKS AND SYMPTOMS OF EXPOSURE: SKIN - May cause irritation or burn. EYES - Primary irritation.
 SKIN ABSORPTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: May cause irritation or burning sensation.
 INGESTION HEALTH RISKS AND SYMPTOMS OF EXPOSURE: N/A
 HEALTH HAZARDS (ACUTE AND CHRONIC): INHALATION - Anesthetic. Irritation of the respiratory tract, or nervous system by headache, dizziness, nausea or possible unconsciousness. SKIN OR EYE CONTACT - Primary irritation. Prolonged contact cause dermatitis - exercise due care.
 CARCINOGENICITY: None known NTP? No IARC MONOGRAPHS? No
 TERATOGENICITY: N/A MUTAGENICITY: N/A TOXICOLOGICALLY SYNERGISTIC PROCESSES: None known
 MEDICAL CONDITION GENERALLY AGGRAVATED BY EXPOSURE: None known
 EMERGENCY AND FIRST AID PROCEDURES: VAPORS - Remove from exposure and restore breathing, seek medical attention.
 SPLASH - (SKIN) Wash affected area, remove contaminated clothing, see physician if any irritation persists.
 SPLASH - (EYES) Flush immediately with water for 15 minutes and take to a physician.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Remove all sources of ignition - Flames, electrical. Ventilate area, avoid run off into sewer by diking, and soak up with inert absorbent using non-sparking type equipment.
 WASTE DISPOSAL METHOD: Dispose of in accordance with local, state and federal regulations. Do not incinerate or dump in water.
 PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Do not store above 120° F / 49° C. Do not store or use in confined spaces.
 OTHER PRECAUTIONS: Do not get in eyes. Do not breathe vapors. Avoid skin contact. Do not take internally. Smoking must be strictly prohibited. In addition to all other hazards and precautions - dust from sanding the dry paint films should be controlled with a TLV of 10mg/cubic meter.

SECTION VIII - CONTROL MEASURES

RESPIRATORY PROTECTION: Outdoors - Recommended an approved mechanical particulate filter to remove any airborne dust. Indoors - Recommended an approved Organic Cartridge Respirator. For concentrations above the exposure limit, use a supplied respirator.
 VENTILATION: All application areas should be adequately ventilated in order to keep the items in SECTION II below 100 PPM.
 PROTECTIVE GLOVES: Impervious gloves (natural rubber) are recommended to prevent skin contact.
 EYE PROTECTION: Safety glasses with side shields are recommended to prevent eye contact.
 OTHER PROTECTIVE CLOTHING OR EQUIPMENT: Impervious apron (natural rubber) is recommended to prevent skin contact and safety shower.
 WORK / HYGIENIC PRACTICES: Avoid prolonged or repeated contact. Do not breathe vapors. Wash contaminated skin thoroughly.

SECTION IX - DISCLAIMER

THE INFORMATION CONTAINED HEREIN IS BELIEVED TO BE ACCURATE BUT IS NOT WARRANTED TO BE ACCURATE. THIS INFORMATION CONSTITUTES A SPECIFICATION NOR IS IT INTENDED TO WARRANT SUITABILITY FOR ANY PARTICULAR USE.

MATERIAL SAFETY DATA SHEET

The Valvoline Company

Page 001

Date Prepared: 01/14/02

Date Printed: 05/17/04

MSDS No: 503.0354181-001.004

WINDSHIELD WASHER FLUID, 8% METHANOL

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Material Identity

Product Name: WINDSHIELD WASHER FLUID, 8% METHANOL

General or Generic ID: SOLVENT BLEND

Company

The Valvoline Company

P.O. Box 14000

Lexington, KY 40512

Telephone Numbers

Emergency: 1-800-274-5263

Information: 1-859-357-7206

2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient(s)	CAS Number	% (by volume)
METHYL ALCOHOL	67-56-1	5.0- 15.0

3. HAZARDS IDENTIFICATION

Potential Health Effects

Eye

Can cause eye irritation.

Skin

May cause mild skin irritation. Prolonged or repeated contact may dry and crack the skin. Passage through the skin may add to toxic effects from breathing or swallowing.

Swallowing

Swallowing this material may be harmful.

Inhalation

Breathing of vapor or mist is possible. Breathing small amounts of this material during normal handling is not likely to cause harmful effects. Breathing large amounts may be harmful. Symptoms usually occur at air concentrations higher than the recommended exposure limits (See Section 8).

Continued on next page

MATERIAL SAFETY DATA SHEET

The Valvoline Company

Page 002

Date Prepared: 01/14/02

Date Printed: 05/17/04

MSDS No: 503.0354181-001.004

WINDSHIELD WASHER FLUID, 8% METHANOL

Symptoms of Exposure

Signs and symptoms of exposure to this material through breathing, swallowing, and/or passage of the material through the skin may include: stomach or intestinal upset (nausea, vomiting, diarrhea) irritation (nose, throat, airways), central nervous system depression (dizziness, drowsiness, weakness, fatigue, nausea, headache, unconsciousness), leg cramps, pain in the abdomen and lower back, blurred vision, shortness of breath, cyanosis (causes blue coloring of the skin and nails from lack of oxygen), visual impairment (including blindness), coma, and death.

Target Organ Effects

Exposure to lethal concentrations of methanol has been shown to cause damage to organs including liver, kidneys, pancreas, heart, lungs and brain. Although this rarely occurs, survivors of severe intoxication may suffer from permanent neurological damage. Overexposure to this material (or its components) has been suggested as a cause of the following effects in laboratory animals, and may aggravate preexisting disorders of these organs in humans: cardiac abnormalities, liver abnormalities, spleen damage, nervous system damage, eye damage, kidney damage, liver damage, lung damage, central nervous system damage, brain damage. Overexposure to this material (or its components) has been suggested as a cause of the following effects in humans, and may aggravate preexisting disorders of these organs: eye damage, visual impairment.

Developmental Information

Methanol has caused birth defects in laboratory animals, but only when inhaled at extremely high vapor concentrations. The relevance of this finding to humans is uncertain.

Cancer Information

Based on the available information, this material cannot be classified with regard to carcinogenicity. This material is not listed as a carcinogen by the International Agency for Research on Cancer, the National Toxicology Program, or the Occupational Safety and Health Administration.

Continued on next page

MATERIAL SAFETY DATA SHEET

The Valvoline Company

Page 003

Date Prepared: 01/14/02

Date Printed: 05/17/04

MSDS No: 503.0354181-001.004

WINDSHIELD WASHER FLUID, 8% METHANOL

Other Health Effects

No data

Primary Route(s) of Entry

Inhalation, Skin absorption, Skin contact, Eye contact, Ingestion.

4. FIRST AID MEASURES

Eyes

If symptoms develop, immediately move individual away from exposure and into fresh air. Flush eyes gently with water for at least 15 minutes while holding eyelids apart; seek immediate medical attention.

Skin

Remove contaminated clothing. Wash exposed area with soap and water. If symptoms persist, seek medical attention. Launder clothing before reuse.

Swallowing

Seek medical attention. If individual is drowsy or unconscious, do not give anything by mouth; place individual on the left side with the head down. Contact a physician, medical facility, or poison control center for advice about whether to induce vomiting. If possible, do not leave individual unattended.

Inhalation

If symptoms develop, immediately move individual away from exposure and into fresh air. Seek immediate medical attention; keep person warm and quiet. If person is not breathing, begin artificial respiration. If breathing is difficult, administer oxygen.

Note to Physicians

This product contains methanol which can cause intoxication and central nervous system depression. Methanol is metabolized to formic acid and formaldehyde. These metabolites can cause metabolic acidosis, visual disturbances and blindness. Since metabolism is required for these toxic symptoms, their onset may be delayed from 6 to 30 hours following ingestion. Ethanol competes for the same metabolic pathway and has been used to prevent methanol metabolism. Ethanol administration is indicated in symptomatic patients or at blood methanol concentrations above 20 ug/dl. Methanol is effectively removed by hemodialysis.

Continued on next page

MATERIAL SAFETY DATA SHEET

The Valvoline Company

Page 004

Date Prepared: 01/14/02

Date Printed: 05/17/04

MSDS No: 503.0354181-001.004

WINDSHIELD WASHER FLUID, 8% METHANOL

Preexisting disorders of the following organs (or organ systems) may be aggravated by exposure to this material: skin, lung (for example, asthma-like conditions), liver, kidneys, central nervous system, pancreas, heart, Exposure to this material may aggravate any pre-existing condition sensitive to a decrease in available oxygen, such as chronic lung disease, coronary artery disease or anemias.

5. FIRE FIGHTING MEASURES

Flash Point

144.5 F (62.5 C) TCC

Explosive Limit

(for component) Lower 6.0 Upper 36.0 %

Autoignition Temperature

No data

Hazardous Products of Combustion

May form: carbon dioxide and carbon monoxide, various hydrocarbons.

Fire and Explosion Hazards

Vapors are heavier than air and may travel along the ground or be moved by ventilation and ignited by heat, pilot lights, other flames and ignition sources at locations distant from material handling point. Never use welding or cutting torch on or near drum (even empty) because product (even just residue) can ignite explosively.

Extinguishing Media

regular foam, alcohol foam, water fog, carbon dioxide, dry chemical.

Fire Fighting Instructions

Water may be used to keep fire-exposed containers cool until fire is out. Wear a self-contained breathing apparatus with a full facepiece operated in the positive pressure demand mode with appropriate turn-out gear and chemical resistant personal protective equipment. Refer to the personal protective equipment section of this MSDS.

Continued on next page

MATERIAL SAFETY DATA SHEET

The Valvoline Company

Page 005

Date Prepared: 01/14/02

Date Printed: 05/17/04

MSDS No: 503.0354181-001.004

WINDSHIELD WASHER FLUID, 8% METHANOL

NFPA Rating

Health - 3, Flammability - 2, Reactivity - 0

6. ACCIDENTAL RELEASE MEASURES

Small Spill

Eliminate all sources of ignition such as flares, flames (including pilot lights), and electrical sparks. Absorb liquid on vermiculite, floor absorbent or other absorbent material. Persons not wearing proper personal protective equipment should be excluded from area of spill.

Large Spill

Prevent run-off to sewers, streams or other bodies of water. If run-off occurs, notify proper authorities as required, that a spill has occurred. Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed. Eliminate all ignition sources (flares, flames, including pilot lights, electrical sparks).

7. HANDLING AND STORAGE

Handling

Containers of this material may be hazardous when emptied. Since emptied containers retain product residues (vapor, liquid, and/or solid), all hazard precautions given in the data sheet must be observed. Avoid prolonged or repeated contact.

Storage

Do not store near extreme heat, open flame, or sources of ignition.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Eye Protection

Chemical splash goggles in compliance with OSHA regulations are advised; however, OSHA regulations also permit other type safety glasses. Consult your safety representative.

Continued on next page

MATERIAL SAFETY DATA SHEET

The Valvoline Company

Page 006

Date Prepared: 01/14/02

Date Printed: 05/17/04

MSDS No: 503.0354181-001.004

WINDSHIELD WASHER FLUID, 8% METHANOL

Skin Protection

Wear resistant gloves (consult your safety equipment supplier).
To prevent repeated or prolonged skin contact, wear impervious
clothing and boots.

Respiratory Protections

If workplace exposure limit(s) of product or any component is
exceeded (See Exposure Guidelines), a NIOSH/MSHA approved air
supplied respirator is advised in absence of proper environmental
control. OSHA regulations also permit other NIOSH/MSHA
respirators (negative pressure type) under specified conditions
(consult your industrial hygienist). Engineering or
administrative controls should be implemented to reduce exposure.

Engineering Controls

Provide sufficient mechanical (general and/or local exhaust)
ventilation to maintain exposure below TLV(s).

Exposure Guidelines

Component

METHYL ALCOHOL (67-56-1)

OSHA VPEL 200.000 ppm - TWA ((Skin))

OSHA VPEL 250.000 ppm - STEL ((Skin))

ACGIH TLV 200.000 ppm - TWA ((Skin))

ACGIH TLV 250.000 ppm - STEL ((Skin))

9. PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point

(for component) 147.0 F (63.8 C) @ 760 mmHg

Vapor Pressure

(for component) 97.680 mmHg @ 68.00 F

Specific Vapor Density

No data

Continued on next page

MATERIAL SAFETY DATA SHEET

The Valvoline Company

Page 007

Date Prepared: 01/14/02

Date Printed: 05/17/04

MSDS No: 503.0354181-001.004

WINDSHIELD WASHER FLUID, 8% METHANOL

Specific Gravity

.970 - .990 @ 68.00 F

Liquid Density

8.150 lbs/gal @ 68.00 F

.980 kg/l @ 20.00 c

Percent Volatiles (Including Water)

No data

Evaporation Rate

No data

Appearance

No data

State

LIQUID

Physical Form

No data

Color

BLUE

Odor

No data

pH

No data

10. STABILITY AND REACTIVITY

Hazardous Polymerization

Product will not undergo hazardous polymerization.

Hazardous Decomposition

May form: carbon dioxide and carbon monoxide, various hydrocarbons.

Continued on next page

MATERIAL SAFETY DATA SHEET

The Valvoline Company

Page 008

Date Prepared: 01/14/02

Date Printed: 05/17/04

MSDS No: 503.0354181-001.004

WINDSHIELD WASHER FLUID, 8% METHANOL

Chemical Stability
Stable.

Incompatibility
Avoid contact with: reactive metals such as aluminum and magnesium, strong acids, strong oxidizing agents.

11. TOXICOLOGICAL INFORMATION

No data

12. ECOLOGICAL INFORMATION

No data

13. DISPOSAL CONSIDERATION

Waste Management Information

Dispose of in accordance with all applicable local, state and federal regulations.

14. TRANSPORT INFORMATION

DOT Information - 49 CFR 172.101

DOT Description:
Not Regulated

Container/Mode:
CASES/SURFACE - NO EXCEPTIONS

NOS Component:
None

Continued on next page

MATERIAL SAFETY DATA SHEET

The Valvoline Company

Page 010

Date Prepared: 01/14/02

Date Printed: 05/17/04

MSDS No: 503.0354181-001.004

WINDSHIELD WASHER FLUID, 8% METHANOL

Pennsylvania RTK Label Information
METHANOL

67-56-1

16. OTHER INFORMATION

The information accumulated herein is believed to be accurate but is not warranted to be whether originating with the company or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances.

Last page

SOURCE: ASHLAND INC WTR, EASYWTR

MATERIAL SAFETY DATA SHEET

03622
1 00

Section 1 -- PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER	HMIS CODES
S03622	Health 2*
	Flammability 4
	Reactivity 0

PRODUCT NAME
KRYLON* Industrial QUIK-MARK* Solvent-Based Inverted Marking Paint
(Fluorescent), Hot Pink

MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
THE SHERWIN-WILLIAMS COMPANY	(216) 566-2917
Diversified Brands	
Cleveland, OH 44115	

DATE OF PREPARATION	INFORMATION TELEPHONE NO.
06-APR-05	(800) 247-3266

Section 2 -- COMPOSITION/INFORMATION ON INGREDIENTS

by WT	CAS No.	INGREDIENT	UNITS	VAPOR PRESSURE
14	74-98-6	Propane		
		ACGIH TLV	2500 ppm	760 mm
		OSHA PEL	1000 ppm	
6	106-97-8	Butane		
		ACGIH TLV	800 ppm	760 mm
		OSHA PEL	800 ppm	
9	110-54-3	Hexane		
		ACGIH TLV	50 ppm	127 mm
		OSHA PEL	50 ppm	
7	107-83-5	Isohexane Isomers		
		ACGIH TLV	500 ppm	317 mm
		ACGIH TLV	1000 ppm STEL	
		OSHA PEL	500 ppm	
		OSHA PEL	1000 ppm STEL	
7	64742-89-8	V. M. & P. Naphtha		
		ACGIH TLV	300 ppm	12 mm
		OSHA PEL	300 ppm	
		OSHA PEL	400 ppm STEL	
2	108-88-3	Toluene		
		ACGIH TLV	50 ppm (Skin)	22 mm
		OSHA PEL	100 ppm (Skin)	
		OSHA PEL	150 ppm (Skin) STEL	
9	67-64-1	Acetone		
		ACGIH TLV	500 ppm	180 mm
		ACGIH TLV	750 ppm STEL	
		OSHA PEL	1000 ppm	
21	14808-60-7	Quartz		
		ACGIH TLV	0.05 mg/m3 as Resp. Dust	
		OSHA PEL	0.1 mg/m3 as Resp. Dust	
8	7727-43-7	Barium Sulfate		
		ACGIH TLV	10 mg/m3 as Dust	
		OSHA PEL	10 mg/m3 Total Dust	
		OSHA PEL	5 mg/m3 Respirable Fraction	

continued on page 2

 Section 3 -- HAZARDS IDENTIFICATION

ROUTES OF EXPOSURE

INHALATION of vapor or spray mist.

EYE or SKIN contact with the product, vapor or spray mist.

EFFECTS OF OVEREXPOSURE

EYES: Irritation.

SKIN: Prolonged or repeated exposure may cause irritation.

INHALATION: Irritation of the upper respiratory system.

May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists.

Redness and itching or burning sensation may indicate eye or excessive skin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

None generally recognized.

CANCER INFORMATION

For complete discussion of toxicology data refer to Section 11.

 Section 4 -- FIRST AID MEASURES

EYES: Flush eyes with large amounts of water for 15 minutes.
 Get medical attention.

SKIN: Wash affected area thoroughly with soap and water.
 Remove contaminated clothing and launder before re-use.

INHALATION: If affected, remove from exposure. Restore breathing.
 Keep warm and quiet.

INGESTION: Do not induce vomiting.
 Get medical attention immediately.

 Section 5 -- FIRE FIGHTING MEASURES

FLASH POINT	LEL	UEL
Propellant < 0 F	0.9	12.8

EXTINGUISHING MEDIA

Carbon Dioxide, Dry Chemical, Foam

UNUSUAL FIRE AND EXPLOSION HAZARDS

Containers may explode when exposed to extreme heat.

Application to hot surfaces requires special precautions.

During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.

SPECIAL FIRE FIGHTING PROCEDURES

Full protective equipment including self-contained breathing apparatus should be used.

Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

Continued on page 3

=====
 Section 6 -- ACCIDENTAL RELEASE MEASURES
 =====

 STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Remove all sources of ignition. Ventilate the area.
 Remove with inert absorbent.

=====
 Section 7 -- HANDLING AND STORAGE
 =====

 STORAGE CATEGORY

Not Available

 PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Keep away from heat, sparks, and open flame. Vapors will accumulate readily and may ignite explosively.

During use and until all vapors are gone: Keep area ventilated - Do not smoke - Extinguish all flames, pilot lights, and heaters - Turn off stoves, electric tools and appliances, and any other sources of ignition.

Consult NFPA Code. Use approved Bonding and Grounding procedures. Contents under pressure. Do not puncture, incinerate, or expose to temperature above 120F. Heat from sunlight, radiators, stoves, hot water, and other heat sources could cause container to burst. Do not take internally. Keep out of the reach of children.

=====
 Section 8 -- EXPOSURE CONTROLS/PERSONAL PROTECTION
 =====

 PRECAUTIONS TO BE TAKEN IN USE

Use only with adequate ventilation.

Avoid contact with skin and eyes. Avoid breathing vapor and spray mist.

Wash hands after using.

This coating may contain materials classified as nuisance particulates listed "as Dust" in Section 2) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section 2, the applicable limits for nuisance dusts are ACGIH LV 10 mg/m³ (total dust), 3 mg/m³ (respirable fraction), OSHA PEL 15 mg/m³ (total dust), 5 mg/m³ (respirable fraction).

 VENTILATION

Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section 2 is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.

 RESPIRATORY PROTECTION

If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section 2.

When sanding or abrading the dried film, wear a dust/mist respirator approved by NIOSH/MSHA for dust which may be generated from this product, underlying paint, or the abrasive.

 PROTECTIVE GLOVES

None required for normal application of aerosol products where minimal skin contact is expected. For long or repeated contact, wear chemical resistant gloves.

 EYE PROTECTION

Wear safety spectacles with unperforated sideshields.

 OTHER PRECAUTIONS

Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

Continued on page 4

 Section 9 -- PHYSICAL AND CHEMICAL PROPERTIES

PRODUCT WEIGHT	7.54 lb/gal	903 g/l
SPECIFIC GRAVITY	0.91	
BOILING POINT	<0 - 325 F	<-18 - 162 C
MELTING POINT	Not Available	
VOLATILE VOLUME	79 %	
EVAPORATION RATE	Faster than ether	
VAPOR DENSITY	Heavier than air	
SOLUBILITY IN WATER	N.A.	
pH	7.0	
VOLATILE ORGANIC COMPOUNDS (VOC Theoretical)	Volatile Weight 47.18 % Less Water and Federally Exempt Solvents	

 Section 10 -- STABILITY AND REACTIVITY

STABILITY -- Stable
 CONDITIONS TO AVOID
 None known.
 INCOMPATIBILITY
 None known.
 DANGEROUS DECOMPOSITION PRODUCTS
 By fire: Carbon Dioxide, Carbon Monoxide
 DANGEROUS POLYMERIZATION
 Will not occur

 Section 11 -- TOXICOLOGICAL INFORMATION

CHRONIC HEALTH HAZARDS

Crystalline Silica (Quartz, Cristobalite) is listed by IARC and NTP. Long term exposure to high levels of silica dust, which can occur only when sanding or abrading the dry film, may cause lung damage (silicosis) and possibly cancer.

Prolonged and repeated exposure to Hexane may cause damage to nerve tissue of the arms and legs (peripheral neuropathy), resulting in muscular weakness and loss of sensation. This effect may be increased by the presence of Methyl Ethyl Ketone.

Prolonged overexposure to solvent ingredients in Section 2 may cause adverse effects to the liver, urinary, cardiovascular and reproductive systems.

Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

 TOXICOLOGY DATA

continued on page 5

CAS No.	Ingredient Name				
74-98-6	Propane	LC50	RAT	4HR	Not Available
		LD50	RAT		Not Available
106-97-8	Butane	LC50	RAT	4HR	Not Available
		LD50	RAT		Not Available
110-54-3	Hexane	LC50	RAT	4HR	Not Available
		LD50	RAT		28700 mg/kg
107-83-5	Isohexane Isomers	LC50	RAT	4HR	Not Available
		LD50	RAT		Not Available
64742-89-8	V. M. & P. Naphtha	LC50	RAT	4HR	Not Available
		LD50	RAT		Not Available
108-88-3	Toluene	LC50	RAT	4HR	4000 ppm
		LD50	RAT		5000 mg/kg
67-64-1	Acetone	LC50	RAT	4HR	Not Available
		LD50	RAT		5800 mg/kg
14808-60-7	Quartz	LC50	RAT	4HR	Not Available
		LD50	RAT		Not Available
7727-43-7	Barium Sulfate	LC50	RAT	4HR	Not Available
		LD50	RAT		Not Available

Section 12 -- ECOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION

No data available.

Section 13 -- DISPOSAL CONSIDERATIONS

APPROPRIATE DISPOSAL METHOD

Waste from this product may be hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.

Waste must be tested for ignitability to determine the applicable EPA hazardous waste numbers.

Do not incinerate. Depressurize container. Dispose of in accordance with Federal, State/Provincial, and Local regulations regarding pollution.

Section 14 -- TRANSPORT INFORMATION

No data available.

Continued on page 6

CATERPILLAR

[Search Again](#)
[Print Cover Page](#)

MSDS Number:
5779

Product Name:
Cat DEAC
(Diesel Engine
Antifreeze
Coolant)
Concentrate

Manufacturer:
ChevronTexaco

Part Number(s):
1562649 2P9868
8C3684 8C3686
9X6584 9X6585
9X6586

24-hour Emergency Contacts:

Rocky Mountain Poison Center
Denver, Colorado
(800) 458-5924 toll free U.S. & Canada
(303) 893-1322

Swiss Toxicological Information Centre
Zurich, Switzerland
++ 41 (0) 1 251 51 51

If you have questions about Caterpillar Material Safety Data Sheets, please contact:

Miranda Katter
Caterpillar Inc.
100 NE Adams Street Peoria, IL USA 61629-3350
(309) 675-5182 phone
(309)675-1876 FAX
e-mail: msds@cat.com

Material Safety Data Sheet

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

Cat® DEAC™ (Diesel Engine Antifreeze Coolant) Concentrate

Product Use: Antifreeze/Coolant
 Product Number(s): 07861, GPS227961

Company Identification
 ChevronTexaco Global Lubricants
 6001 Bollinger Canyon Road
 San Ramon, CA 94583
 United States of America

Transportation Emergency Response
 CHEMTREC: (800) 424-9300 or (703) 527-3887

Health Emergency
 ChevronTexaco Emergency Information Center: Located in the USA, International collect calls accepted.
 (800) 231-0623 or (510) 231-0623

Product Information
 email : lubemsds@chevron.com
 Product Information: 800-LUBE-TEK

SECTION 2 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENTS	CAS NUMBER	AMOUNT
Ethylene Glycol	107-21-1	80 - 95 %weight
Diethylene glycol	111-46-6	1 - 5 %weight
Water	7732-18-5	1 - 5 %weight

SECTION 3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

- HARMFUL OR FATAL IF SWALLOWED
- CAUSES EYE IRRITATION
- POSSIBLE BIRTH DEFECT HAZARD - CONTAINS MATERIAL THAT MAY CAUSE BIRTH DEFECTS BASED ON ANIMAL DATA
- MAY CAUSE DAMAGE TO:
- KIDNEY

IMMEDIATE HEALTH EFFECTS

Eye: Contact with the eyes causes irritation. Symptoms may include pain, tearing, reddening, swelling and impaired vision.
 Skin: Contact with the skin is not expected to cause prolonged or significant irritation. Not expected to be

Revision Number 2
 Revision Date: 11/08/2002

1 of 7

Cat® DEAC™ (Diesel Engine
 Antifreeze Coolant) Concentrate
 MSDS : 10881

harmful to internal organs if absorbed through the skin.
Ingestion: Toxic; may be harmful or fatal if swallowed.
Inhalation: The vapor or fumes from this material may cause respiratory irritation. Symptoms of respiratory irritation may include coughing and difficulty breathing. Breathing this material at concentrations above the recommended exposure limits may cause central nervous system effects. Central nervous system effects may include headache, dizziness, nausea, vomiting, weakness, loss of coordination, blurred vision, drowsiness, confusion, or disorientation. At extreme exposures, central nervous system effects may include respiratory depression, tremors or convulsions, loss of consciousness, coma or death.

DELAYED OR OTHER HEALTH EFFECTS:

Reproduction and Birth Defects: Contains material that may be harmful to the developing fetus based on animal data.

Target Organs: Contains material that may cause damage to the following organ(s) following repeated ingestion based on animal data: Kidney

See Section 11 for additional information. Risk depends on duration and level of exposure.

SECTION 4 FIRST AID MEASURES

Eye: Flush eyes with water immediately while holding the eyelids open. Remove contact lenses, if worn, after initial flushing, and continue flushing for at least 15 minutes. Get medical attention if irritation persists.

Skin: To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.

Ingestion: If swallowed, get immediate medical attention. Do not induce vomiting. Never give anything by mouth to an unconscious person.

Inhalation: Move the exposed person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if breathing difficulties continue.

SECTION 5 FIRE FIGHTING MEASURES

FIRE CLASSIFICATION:

OSHA Classification (29 CFR 1910.1200): Not classified by OSHA as flammable or combustible.

NFPA RATINGS: Health: 2 Flammability: 1 Reactivity: 0

FLAMMABLE PROPERTIES:

Flashpoint: (Pensky-Martens Closed Cup) 260 °F (127 °C)

Autoignition: NDA

Flammability (Explosive) Limits (% by volume in air): Lower: 3.2 Upper:

EXTINGUISHING MEDIA: Dry Chemical, CO2, AFFF Foam or alcohol resistant foam.

PROTECTION OF FIRE FIGHTERS:

Fire Fighting Instructions: This material will burn although it is not easily ignited. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.

Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion. Combustion may form oxides of Sodium.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in vicinity of spilled material.

Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.

Reporting: Report spills to local authorities and/or the U.S. Coast Guard's National Response Center at (800) 424-8802 as appropriate or required.

SECTION 7 HANDLING AND STORAGE

Precautionary Measures: Do not breathe vapor or fumes. Do not get in eyes. Wash thoroughly after handling.

Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating an accumulation of electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids', National Fire Protection Association (NFPA 77, 'Recommended Practice on Static Electricity', and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents'.

Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION**GENERAL CONSIDERATIONS:**

Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:

Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below the recommended exposure limits.

PERSONAL PROTECTIVE EQUIPMENT

Eye/Face Protection: Wear protective equipment to prevent eye contact. Selection of protective equipment may include safety glasses, chemical goggles, face shields, or a combination depending on the work operations conducted.

Skin Protection: No special protective clothing is normally required. Where splashing is possible, select protective clothing depending on operations conducted, physical requirements and other substances in the workplace. Suggested materials for protective gloves include: Natural rubber, Neoprene, Nitrile

Rubber, Polyvinyl Chloride (PVC or Vinyl).

Respiratory Protection: Determine if airborne concentrations are below the recommended exposure limits. If not, wear an approved respirator that provides adequate protection from measured concentrations of this material, such as: Air-Purifying Respirator for Organic Vapors, Dusts and Mists. Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.

Occupational Exposure Limits:

Component	Limit	TWA	STEL	Ceiling	Notation
Ethylene Glycol	ACGIH_TLV			100 mg/m3	
Ethylene Glycol	OSHA PEL			125 mg/m3	
Ethylene Glycol	ACGIH			39.4 ppm (weight)	

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color: Purple
 Physical State: Liquid
 Odor: NDA
 pH: 10 - 11
 Vapor Pressure: 0.12 mmHg (Typical) @ 20 °C
 Vapor Density (Air = 1): 2.1
 Boiling Point: 228 °F (109 C)
 Solubility: Miscible
 Freezing Point: -34 °F (-37 C)
 Specific Gravity: 1.13 @ 15.6 °C / 15.6 °C
 Viscosity: 8 cSt @ 40 °C
 Evaporation Rate: NDA

SECTION 10 STABILITY AND REACTIVITY

Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Incompatibility With Other Materials: May react with strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Hazardous Decomposition Products: Aldehydes (Elevated temperatures)
Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

IMMEDIATE HEALTH EFFECTS

Eye Irritation: The eye irritation hazard is based on evaluation of data for similar materials or product components.
Skin Irritation: The skin irritation hazard is based on evaluation of data for similar materials or product components.
Skin Sensitization: No product toxicology data available.
Acute Dermal Toxicity: The acute dermal toxicity hazard is based on evaluation of data for similar materials or product components.
Acute Oral Toxicity: The acute oral toxicity hazard is based on evaluation of data for similar materials or product components.
Acute Inhalation Toxicity: The acute inhalation toxicity hazard is based on evaluation of data for similar

materials or product components.

ADDITIONAL TOXICOLOGY INFORMATION:

This product contains ethylene glycol (EG). The toxicity of EG via inhalation or skin contact is expected to be slight at room temperature. The estimated oral lethal dose is about 100 cc (3.3 oz.) for an adult human. Ethylene glycol is oxidized to oxalic acid which results in the deposition of calcium oxalate crystals mainly in the brain and kidneys. Early signs and symptoms of EG poisoning may resemble those of alcohol intoxication. Later, the victim may experience nausea, vomiting, weakness, abdominal and muscle pain, difficulty in breathing and decreased urine output. When EG was heated above the boiling point of water, vapors formed which reportedly caused unconsciousness, increased lymphocyte count, and a rapid, jerky movement of the eyes in persons chronically exposed. When EG was administered orally to pregnant rats and mice, there was an increase in fetal deaths and birth defects. Some of these effects occurred at doses that had no toxic effects on the mothers. We are not aware of any reports that EG causes reproductive toxicity in human beings.

This product contains diethylene glycol (DEG). The estimated oral lethal dose is about 50 cc (1.6 oz) for an adult human. DEG has caused the following effects in laboratory animals: liver abnormalities, kidney damage and blood abnormalities. It has been suggested as a cause of the following effects in humans: liver abnormalities, kidney damage, lung damage and central nervous system damage.

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY

The toxicity of this material to aquatic organisms has not been evaluated. Consequently, this material should be kept out of sewage and drainage systems and all bodies of water.

ENVIRONMENTAL FATE

This material is expected to be readily biodegradable.

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

DOT Shipping Name: NOT REGULATED AS A HAZARDOUS MATERIAL FOR TRANSPORTATION UNDER 49 CFR

DOT Hazard Class: NOT APPLICABLE

DOT Identification Number: NOT APPLICABLE

DOT Packing Group: NOT APPLICABLE

SECTION 15 REGULATORY INFORMATION

SARA 311/312 CATEGORIES:	1. Immediate (Acute) Health Effects:	YES
	2. Delayed (Chronic) Health Effects:	YES
	3. Fire Hazard:	NO

Revision Number: 2
Revision Date: 11/06/2002

5 of 7

Cat® DEAC™ (Diesel Engine
Antifreeze Coolant) Concentrate
MSDS : 10681

4. Sudden Release of Pressure Hazard: NO
 5. Reactivity Hazard: NO

REGULATORY LISTS SEARCHED:

4_1=IARC Group 1	15=SARA Section 313
4_12A=IARC Group 2A	16=CA Proposition 65
4_12B=IARC Group 2B	17=MA RTK
05=NTP Carcinogen	18=NJ RTK
06=OSHA Carcinogen	19=DOT Marine Pollutant
09=TSCA 12(b)	20=PA RTK

The following components of this material are found on the regulatory lists indicated.
 Ethylene Glycol 15, 17, 18, 20

CERCLA REPORTABLE QUANTITIES(RQ)/SARA 302 THRESHOLD PLANNING QUANTITIES(TPQ):

Component	Component RQ	Component TPQ	Product RQ
Ethylene Glycol	5000 lbs	None	5238 lbs

CHEMICAL INVENTORIES:

AUSTRALIA: This material contains components that require notification before sale or importation into Australia.

CANADA: All the components of this material are on the Canadian DSL or have been notified under the New Substance Notification Regulations, but have not yet been published in the Canada Gazette.

EUROPEAN UNION: All the components of this material are in compliance with the EU Seventh Amendment Directive 92/32/EEC.

JAPAN: This material contains components that require notification before sale or importation into Japan.

KOREA: This material contains components that require notification before sale or importation into Korea.

PHILIPPINES: All the components of this product are listed on the Philippine Inventory of Chemicals and Chemical Substances (PICCS).

UNITED STATES: All of the components of this material are on the Toxic Substances Control Act (TSCA) Chemical Inventory.

NEW JERSEY RTK CLASSIFICATION:

Refer to components listed in Section 2.

WHMIS CLASSIFICATION:

Class D, Division 1, Subdivision B: Toxic Material -
 Acute Lethality

Class D, Division 2, Subdivision A: Very Toxic Material -
 Chronic Toxic Effects

Teratogenicity and Embryotoxicity

Class D, Division 2, Subdivision B: Toxic Material -

Chronic Toxic Effects

Skin or Eye Irritation

SECTION 16 OTHER INFORMATION

NFPA RATINGS: Health: 2 Flammability: 1 Reactivity: 0

HMIS RATINGS: Health: 2* Flammability: 1 Reactivity: 0

(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines of

Revision Number: 2
 Revision Date: 11/08/2002

6 of 7

Cat® DEAC™ (Diesel Engine
 Antifreeze Coolant) Concentrate
 MSDS : 10691

published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

REVISION STATEMENT: This revision updates the following sections of this Material Safety Data Sheet: 1, 15

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV	-	Threshold Limit Value	TWA	-	Time Weighted Average
STEL	-	Short-term Exposure Limit	PEL	-	Permissible Exposure Limit
NDA	-	No Data Available	CAS	-	Chemical Abstract Service Number
<=	-	Less Than or Equal To	NA	-	Not Applicable
			>=	-	Greater Than or Equal To

Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the ANSI MSDS Standard (Z400.1) by the ChevronTexaco Energy Research & Technology Company, 100 Chevron Way, Richmond, California 94802.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

ExxonMobil

641639-00 RONEX EXTRA DUTY MOLY 2
MATERIAL SAFETY DATA BULLETIN

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: RONEX EXTRA DUTY MOLY 2
SUPPLIER: EXXONMOBIL OIL CORPORATION
3225 GALLOWS RD.
FAIRFAX, VA 22037

24 - Hour Health and Safety Emergency (call collect): 609-737-4411

24 - Hour Transportation Emergency:
CHEMTREC: 800-424-9300 202-483-7616
LUBES AND FUELS: 281-834-3296

Product and Technical Information:

Lubricants and Specialties: 800-662-4525 800-443-9966
Fuels Products: 800-947-9147
MSDS Fax on Demand: 713-613-3661
MSDS Internet Website: <http://www.exxon.com>, <http://www.mobil.com>

2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAMES AND SYNONYMS: SEVERE TREAT MIN. OILS & ADDITIVES

GLOBALLY REPORTABLE MSDS INGREDIENTS:

Substance Name	Approx. Wt%
MOLYBDENUM DISULFIDE (1317-33-5)	1-5
PHOSPHORODITHOIC ACID, O,O-DI C1-14-ALKYL ESTERS, ZINC SALTS (2:1) (ZDDP) (68649-42-3)	1-5

See Section 8 for exposure limits (if applicable).

3. HAZARDS IDENTIFICATION

Under normal conditions of use, this product is not considered hazardous according to regulatory guidelines (See section 15).

EMERGENCY OVERVIEW: Dark Gray/Black Grease. DOT ERG No. : NA

POTENTIAL HEALTH EFFECTS: Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin or respiratory irritation.

For further health effects/toxicological data, see Section 11.

4. FIRST AID MEASURES

EYE CONTACT: Flush thoroughly with water. If irritation occurs, call a physician.

SKIN CONTACT: Wash contact areas with soap and water. Remove and clean oil soaked clothing daily and wash affected area.

INJECTION INJURY WARNING: If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

INHALATION: Remove from further exposure. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with mechanical device or use mouth-to-mouth resuscitation.

INGESTION: Not expected to be a problem. Seek medical attention if discomfort occurs. Do not induce vomiting.

5. FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA: Carbon dioxide, foam, dry chemical and water fog.

SPECIAL FIRE FIGHTING PROCEDURES: Water or foam may cause frothing. Use water to keep fire exposed containers cool. Water spray may be used to flush spills away from exposure. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply.

SPECIAL PROTECTIVE EQUIPMENT: For fires in enclosed areas, fire fighters must use self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None.

COMBUSTION PRODUCTS: Fumes, smoke, carbon monoxide, sulfur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.

Flash Point C(F): > 200(392) (ESTIMATED FOR OIL, ASTM D-92 (COC)).

Flammable Limits (approx. % vol. in air) - LEL: NE, UEL: NE

NFPA HAZARD ID: Health: 0, Flammability: 1, Reactivity: 0

6. ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES: Report spills/releases as required to appropriate authorities. U.S. Coast Guard and EPA regulations require immediate reporting of spills/releases that could reach

any waterway including intermittent dry creeks. Report spill/release to Coast Guard National Response Center toll free number (800)424-8802. In case of accident or road spill notify CHEMTREC (800) 424-9300.

PROCEDURES IF MATERIAL IS RELEASED OR SPILLED:

LAND SPILL: Shut off source taking normal safety precautions. Take measures to minimize the effects on ground water. Recover by pumping or contain spilled material with sand or other suitable absorbent and remove mechanically into containers. If necessary, dispose of adsorbed residues as directed in Section 13.

WATER SPILL: Confine the spill immediately with booms. Warn other ships in the vicinity. Notify port and other relevant authorities. Remove from the surface by skimming or with suitable absorbents. If permitted by regulatory authorities the use of suitable dispersants should be considered where recommended in local oil spill procedures.

ENVIRONMENTAL PRECAUTIONS: Prevent material from entering sewers, water sources or low lying areas; advise the relevant authorities if it has, or if it contaminates soil/vegetation.

PERSONAL PRECAUTIONS: See Section 8

7. HANDLING AND STORAGE

HANDLING: High pressure injection under the skin may occur due to the rupture of pressurized lines. Always seek medical attention. No special precautions are necessary beyond normal good hygiene practices. See Section 8 for additional personal protection advice when handling this product.

STORAGE: Keep containers closed when not in use. Do not store in open or unlabelled containers. Store away from strong oxidizing agents and combustible materials. Do not store near heat, sparks, flame or strong oxidants.

SPECIAL PRECAUTIONS: Prevent small spills and leakages to avoid slip hazard.

EMPTY CONTAINER WARNING: Empty containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to refill or clean container since residue is difficult to remove. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Substance Name (CAS-No.)	Source	---TWA---		----	NOTE
		ppm	mg/m3	STEL	ppm mg/m3
MOLYBDENUM DISULFIDE (1317-33-5)					

as Mo Sol Cmpds	OSHA	5
as Mo Insol Cmpds Tot Dust	OSHA	10
as Mo Sol Cmpds	ACGIH	5
as Mo Insol Cmpds	ACGIH	10

NOTE: Limits shown for guidance only. Follow applicable regulations.

VENTILATION: Use adequate ventilation.

RESPIRATORY PROTECTION: No special requirements under ordinary conditions of use and with adequate ventilation.

EYE PROTECTION: Generally eye contact is unlikely with this type material. If eye contact is likely, safety glasses with side shields or chemical type goggles should be worn.

SKIN PROTECTION: If prolonged or repeated skin contact is likely, oil impervious gloves should be worn. Good personal hygiene practices should always be followed.

9. PHYSICAL AND CHEMICAL PROPERTIES

Typical physical properties are given below. Consult Product Data Sheet for specific details.

APPEARANCE: Grease

COLOR: Dark Gray/Black

ODOR: Mild

ODOR THRESHOLD-ppm: NE

pH: NA

BOILING POINT C(F): > 316(600)

DROP POINT C(F): > 246(475)

FLASH POINT C(F): > 200(392) (ESTIMATED FOR OIL, ASTM D-92 (COC))

FLAMMABILITY (solids): NE

AUTO FLAMMABILITY C(F): NA

EXPLOSIVE PROPERTIES: NA

OXIDIZING PROPERTIES: NA

VAPOR PRESSURE-mmHg 20 C: < 0.1

VAPOR DENSITY: NE

EVAPORATION RATE: NE

RELATIVE DENSITY, 15/4 C: 0.9

SOLUBILITY IN WATER: Negligible

PARTITION COEFFICIENT: > 3.5

VISCOSITY AT 40 C, cSt: 460.0

VISCOSITY AT 100 C, cSt: 32.0

FOUR POINT C(F): NA

FREEZING POINT C(F): NE

VOLATILE ORGANIC COMPOUND: NE

NOTE: MOST PHYSICAL PROPERTIES FOR OIL COMPONENT.

DMSO EXTRACT, IP-346 (WT.%): <3, for mineral oil only

NA=NOT APPLICABLE NE=NOT ESTABLISHED D=DECOMPOSES

FOR FURTHER TECHNICAL INFORMATION, CONTACT YOUR MARKETING REPRESENTATIVE

10. STABILITY AND REACTIVITY

STABILITY (THERMAL, LIGHT, ETC.): Stable.

CONDITIONS TO AVOID: Extreme heat and high energy sources of ignition.
INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizers.
HAZARDOUS DECOMPOSITION PRODUCTS: Product does not decompose at ambient temperatures.
HAZARDOUS POLYMERIZATION: Will not occur.

11. TOXICOLOGICAL DATA

---ACUTE TOXICOLOGY---

ORAL TOXICITY (RATS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.
DERMAL TOXICITY (RABBITS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.
INHALATION TOXICITY (RATS): Practically non-toxic (LC50: greater than 5 mg/l). ---Based on testing of similar products and/or the components.
EYE IRRITATION (RABBITS): Practically non-irritating. (Draize score: greater than 6 but 15 or less). ---Based on testing of similar products and/or the components.
SKIN IRRITATION (RABBITS): Practically non-irritating. (Primary Irritation Index: greater than 0.5 but less than 3). ---Based on testing of similar products and/or the components.
OTHER ACUTE TOXICITY DATA: Although an acute inhalation study was not performed with this product, a variety of mineral oils and synthetic base oils, such as those in this product have been tested. These samples had virtually no effect other than a nonspecific inflammatory response in the lung to the aerosolized mineral oil. The presence of additives in other tested formulations (in approximately the same amounts as in the present formulation) did not alter the observed effects.

---SUBCHRONIC TOXICOLOGY (SUMMARY)---

No significant adverse effects were found in studies using repeated dermal applications of similar formulations to the skin of laboratory animals for 13 weeks at doses significantly higher than those expected during normal industrial exposure. The animals were evaluated extensively for effects of exposure (hematology, serum chemistry, urinalysis, organ weights, microscopic examination of tissues etc.).

---REPRODUCTIVE TOXICOLOGY (SUMMARY)---

No teratogenic effects would be expected from dermal exposure, based on laboratory developmental toxicity studies of major components in this formulation and/or materials of similar composition.

---CHRONIC TOXICOLOGY (SUMMARY)---

Repeated and/or prolonged exposure may cause irritation to the skin, eyes or respiratory tract. For mineral base oils: Base oils in this product are severely solvent refined and/or severely hydrotreated. Chronic mouse skin painting studies of severely treated oils showed no evidence of carcinogenic effects. These results are confirmed on a continuing basis using various screening methods such as Modified Ames Test, IP-345, and/or other analytical methods. For synthetic base oils: The base

oils in this product have been tested in the Ames assay and other tests of mutagenicity with negative results. These base oils are not expected to be carcinogenic with chronic dermal exposures.

---SENSITIZATION (SUMMARY)---

Not expected to be sensitizing based on tests of this product, components, or similar products.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE AND EFFECTS:

This environmental assessment was conducted using information on the individual components as no test data was available for this specific formulation.

ECOTOXICITY: The major components in the formulation show no aquatic toxicity at 1000 mg/L loading, therefore long-term adverse effects in the aquatic environment are not expected.

MOBILITY: Not established.

PERSISTENCE AND DEGRADABILITY: This product is expected to be inherently biodegradable, as the principal components have been shown to degrade at slow to moderate rates.

BIOACCUMULATIVE POTENTIAL: Not established.

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: Product is suitable for burning in an enclosed, controlled burner for fuel value. Such burning may be limited pursuant to the Resource Conservation and Recovery Act. In addition, the product is suitable for processing by an approved recycling facility or can be disposed of at an appropriate government waste disposal facility. Use of these methods is subject to user compliance with applicable laws and regulations and consideration of product characteristics at time of disposal.

RCRA INFORMATION: The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrosivity, or reactivity. The unused product is not formulated with substances covered by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

14. TRANSPORT INFORMATION

USA DOT: NOT REGULATED BY USA DOT.

RID/ADR: NOT REGULATED BY RID/ADR.

IMO: NOT REGULATED BY IMO.

IATA: NOT REGULATED BY IATA.

15. REGULATORY INFORMATION

US OSHA HAZARD COMMUNICATION STANDARD: When used for its intended purposes, this product is not classified as hazardous in accordance with OSHA 29 CFR 1910.1200.

EU Labeling: Product is not dangerous as defined by the European Union Dangerous Substances/Preparations Directives. EU labeling not required.

Governmental Inventory Status: All components comply with TSCA, EINECS/ELINCS and AICS.

U.S. Superfund Amendments and Reauthorization Act (SARA) Title III: This product contains no "EXTREMELY HAZARDOUS SUBSTANCES".

SARA (311/312) REPORTABLE HAZARD CATEGORIES: None.

This product contains the following SARA (313) Toxic Release Chemicals:

CHEMICAL NAME	CAS NUMBER	CONC.
PHOSPHORODITHOIC ACID, O,O-DI C1-14-ALKYL ESTERS, ZINC SALTS (2:1) (ZDDP)	68649-42-3	1.3%

The following product ingredients are cited on the lists below:

CHEMICAL NAME	CAS NUMBER	LIST CITATIONS *
LITHIUM HYDROXIDE (0.06%)	1310-65-2	22
MOLYBDENUM (IV) SULFIDE	1317-33-5	1, 10, 18, 20, 21, 23
ZINC (ELEMENTAL ANALYSIS) (0.18%)	7440-66-6	22
LITHIUM-SOAP THICKENER (7.02%)	7620-77-1	22
ZINC DINONYLNAPHTHALENE SULFONATE (0.40%)	28016-00-4	22
PHOSPHORODITHOIC ACID, O,O-DI C1-14-ALKYL ESTERS, ZINC SALTS (2: 1) (ZDDP) (1.29%)	68649-42-3	18, 20, 21, 22, 24, 25
FATTY ACIDS, C16-22, LITHIUM SALTS	68783-36-8	22

(0.87%)

--- REGULATORY LISTS SEARCHED ---

1=ACGIH ALL	6=IARC 1	11=TSCA 4	16=CA P65 CARC	21=LA RTK
2=ACGIH A1	7=IARC 2A	12=TSCA 5a2	17=CA P65 REPRO	22=MI 293
3=ACGIH A2	8=IARC 2B	13=TSCA 5e	18=CA RTK	23=MN RTK
4=NTP CARC	9=OSHA CARC	14=TSCA 6	19=FL RTK	24=NJ RTK
5=NTP SUS	10=OSHA 2	15=TSCA 12b	20=IL RTK	25=PA RTK
				26=RI RTK

* EPA recently added new chemical substances to its TSCA Section 4 test rules. Please contact the supplier to confirm whether the ingredients in this product currently appear on a TSCA 4 or TSCA 12b list.

Code key: CARC=Carcinogen; SUS=Suspected Carcinogen; REPRO=Reproductive

16. OTHER INFORMATION

USE: GREASE

NOTE: PRODUCTS OF EXXON MOBIL CORPORATION AND ITS AFFILIATED COMPANIES ARE NOT FORMULATED TO CONTAIN PCBS.

Health studies have shown that many hydrocarbons pose potential human health risks which may vary from person to person. Information provided on this MSDS reflects intended use. This product should not be used for other applications. In any case, the following advice should be considered:

INDUSTRIAL LABEL

Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin or respiratory irritation. Always observe good hygiene measures. First Aid: Wash skin with soap and water. Flush eyes with water. If overcome by fumes or vapor, remove to fresh air. If ingested do not induce vomiting. If symptoms persist seek medical assistance. Read and understand the MSDS before using this product.

For Internal Use Only: MHC: 1* 1* 1* 1* 1*, MPPEC: A, TRN: 641639-00,
CMCS97: 97P758, REQ: US - MARKETING, SAFE USE: L
EHS Approval Date: 13NOV2001

Information given herein is offered in good faith as accurate, but without guarantee. Conditions of use and suitability of the product for particular uses are beyond our control; all risks of use of the product are therefore assumed by the user and WE EXPRESSLY DISCLAIM ALL WARRANTIES OF EVERY KIND AND NATURE, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE IN RESPECT TO THE USE OR SUITABILITY OF THE PRODUCT. Nothing is intended as a recommendation for uses which infringe valid patents or as extending license under valid patents. Appropriate warnings and safe handling procedures should be provided to handlers and users. Alteration of this document is strictly prohibited. Except to the extent required by law, republication or retransmission of this document, in whole or in part, is not permitted. Exxon Mobil Corporation and its affiliated companies assume no responsibility for accuracy of information unless the document is the most current available from an official ExxonMobil distribution system. Exxon Mobil Corporation and its affiliated companies neither represent nor warrant that the format, content or product formulas contained in this document comply with the laws of any other country except the United States of America.

Prepared by: ExxonMobil Oil Corporation
Environmental Health and Safety Department, Clinton, USA

Vendor Data Review System Final Disposition Screen

This vendor data item has been given the following disposition codes

Reviewer	Revision Level	Date	Disposition Code	Comments
VANDEL DOUG S	0	25-SEP-06	A	
TUOTT LEE C	0	25-SEP-06	D	Chemical info/data has been submitted and approved by Mikel Driever, Chemical Coordinator.
DRIEVER MIKEL K	0	25-SEP-06	A	
FRITZ KURT D	0	22-SEP-06	D	
MCMANAMON LAWRENCE E	0	27-SEP-06	A	

VDR Number:	VDR-153307
Revision Level:	0
Project Number:	23368 - 152173
Transmittal Number:	S-507296-01
Transmittal Status:	Mandatory Approval
Line Item:	1

Disposition Code::	Final Comments::
A	No comments

VDS #3_154111

VENDOR DATA
TRANSMITTAL & DISPOSITION FORM

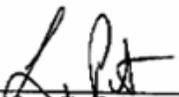
ORIGINAL

To be completed by Supplier/Subcontractor

Purchase Order or Subcontract Number: 00507296 - 07R.O Project Title/Number: Remediation of The STF - 02 Gun Range
 Submittal Number: 6131 - 07 Supplier/Subcontractor Name: Phenix Construction
 Submittal Date: 10-06-06 Address: P.O. Box 1626 Idaho Falls Idaho 83403 23368-152173

INEEL VDS Item No.	VDT Item No.	Specification/ Drawing Reference	Tag Number	Submittal Status	Revision Level	Supplier/ Subcontractor Document Number (if applicable)	Description	INEEL VDR Number	Disp Code
3		01005		M.A.	0	6131 - 07	Chemical Inventory List - Form 432.21 Supporting MSDS Add Item No. 14 Stockpam - Terra Bond	154111	A

Remarks

 10-06-06
 Supplier/Subcontractor Authorized Signature / Date

To Be Completed by Contractor/AE

 INEEL Authorized Signature / Date

F-129

SUBCONTRACTOR REPORTING FORM CHEMICAL INVENTORY LIST (CONTINUATION SHEET)

Page <u>4</u> of <u>4</u>	
Prime Subcontractor Name: <u>Phenix Construction</u>	
Project Name and Subcontract Number: <u>Remediation of The STF - 02 Gun Range Contract No. 00507296</u>	
Responsible Person: <u>Mike Garcia</u>	Telephone No.: <u>589-6489</u>
STF - 02	
Item # <u>13</u>	Date On-Site: <u>10 / 02 / 06</u> Chemical Location (On-Site): <u>Gun Range</u> Date Product Taken Off-Site: <u> / /</u>
Product Name: <u>RONEX EXTRA DUTY MOLY 2</u>	Manufacturer: <u>EXXONMOBIL Oil Corporation</u>
Storage Codes: <input type="checkbox"/> R <input type="checkbox"/> 1 <input type="checkbox"/> 4	Container Size: <u>14 OZ. Tube</u> Quantity Brought On-Site This Period: <u>14 OZ. Tubes</u>
End Use: <u>Lubricant for Vehicles and Equipment</u>	
Waste Disposal Location: <u>INL Landfill</u>	
Physical State: <input type="checkbox"/> Solid <input checked="" type="checkbox"/> Liquid <input type="checkbox"/> Gas	Quantity Used This Period: <u>14 OZ. Tube</u>
STF - 02	
Item # <u>14</u>	Date On-Site: <u>10 / 16 / 06</u> Chemical Location (On-Site): <u>Gun Range</u> Date Product Taken Off-Site: <u> / /</u>
Product Name: <u>Stockopam - Terra Bond</u>	Manufacturer: <u>Stockhausen Inc.</u>
Storage Codes: <input type="checkbox"/> J <input type="checkbox"/> 1 <input type="checkbox"/> 4	Container Size: <u>30 PD Tote</u> Quantity Brought On-Site This Period: _____
End Use: <u>Stabilize soil to minimize dust</u>	
Waste Disposal Location: <u>INL Landfill</u>	
Physical State: <input checked="" type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas	Quantity Used This Period: _____
Item # _____	Date On-Site: <u> / /</u> Chemical Location (On-Site): _____ Date Product Taken Off-Site: <u> / /</u>
Product Name: _____	Manufacturer: _____
Storage Codes: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Container Size: _____ Quantity Brought On-Site This Period: _____
End Use: _____	
Waste Disposal Location: _____	
Physical State: <input type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas	Quantity Used This Period: _____
Item # _____	Date On-Site: <u> / /</u> Chemical Location _____
Product Name: _____	
Storage Codes: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Container Size: _____
End Use: _____	
Waste Disposal Location: _____	
Physical State: <input type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Gas	

<input checked="" type="checkbox"/> A WORK MAY PROCEED FORWARD FORWARD FORWARD FORWARD
<input type="checkbox"/> B REVISE AND RESUBMIT WORK MAY PROCEED SUBJECT TO INCORPORATION OF CHANGES INDICED
<input type="checkbox"/> C REVISE AND RESUBMIT WORK MAY NOT PROCEED
<input type="checkbox"/> D REVISE NOT REQUIRED WORK MUST PROCEED
VDR NO. <u>154111 B.C</u>
BY: <u>Christie P. [Signature]</u>
DATE: <u>11-30-06</u>

degussa.

Material Safety Data Sheet

STOCKOPAM

MSDS ID: CR-119

*** Section 1 - Chemical Product and Company Identification ***

Chemical Name: Polyacrylamide

Company:

Stockhausen Inc.
2401 Doyle Street
Greensboro, NC 27408

Phone: (800) 242-2271

Emergency #: (800) 424-9300 CHEMTREC

*** Section 2 - Composition / Information on Ingredients ***

CAS #	Component	Percent
25085-02-3	2-Propenoic acid, sodium salt, polymer with 2-propenamido	

Component Information/Information on Non-Hazardous Components
None

*** Section 3 - Hazards Identification ***

Emergency Overview

Irritant to eyes. Prolonged or repeated skin contact may cause dryness and irritation.

Potential Health Effects: Eyes

Irritant

Potential Health Effects: Skin

Irritant

Potential Health Effects: Ingestion

Potential Health Effects: Inhalation

HMS Ratings: Health: 1 Fire: 0 Reactivity: 0 Pers. Prot.: B

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

*** Section 4 - First Aid Measures ***

First Aid: Eyes

Immediately flush eyes with water for at least 15 minutes, while holding eyelids open. Seek medical attention.

First Aid: Skin

Wash thoroughly with soap and water.

First Aid: Ingestion

If ingested, get immediate medical attention. Do not induce vomiting unless instructed to do so by medical personnel.

First Aid: Inhalation

Move to source of fresh air.

*** Section 5 - Fire Fighting Measures ***

General Fire Hazards

No particular hazards.

Material Safety Data Sheet

STOCKOPAM

MSDS ID: CR-119

Upper Flammable Limit (UFL): Not determined

Lower Flammable Limit (LFL): Not determined

Method Used: DIN 51758

Flash Point: >200 C

Flammability Classification:

Auto Ignition: >200° C

Hazardous Combustion Products

On thermal decomposition oxides of carbon and nitrogen.

Extinguishing Media

Dry chemical, foam, carbon dioxide, water fog.

Fire Fighting Equipment/Instructions

Firefighters should wear full protective clothing including self contained breathing apparatus.

NFPA Ratings: Health: 1 Fire: 0 Reactivity: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

***** Section 6 - Accidental Release Measures *****

Containment Procedures

Flush residuals to the drain for normal biological treatment. CAUTION- spilled material in contact with water creates very slippery conditions.

Clean-Up Procedures

None specified.

Evacuation Procedures

Isolate area. Keep unnecessary personnel away.

Special Procedures

Remove spills promptly as they may make floors slippery. Several washes and/or the use of detergents may be necessary to completely clean any spill.

***** Section 7 - Handling and Storage *****

Handling Procedures

Handle as an irritant. Do not get into eyes.

Storage Procedures

None specified.

***** Section 8 - Exposure Controls / Personal Protection *****

A: Component Exposure Limits

No information is available.

Engineering Controls

Provide adequate ventilation to minimize worker exposure.

PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment: Eyes/Face

Safety glasses

Personal Protective Equipment: Skin

Skin contact should be minimized. Impervious gloves (rubber or neoprene) are recommended.

Personal Protective Equipment: Respiratory

Use a nuisance dust mask for dusty conditions.

Personal Protective Equipment: General

CAUTION Extreme slipping hazard when wet.

Material Safety Data Sheet

STOCKOPAM

MSDS ID: CR-119

*** Section 9 - Physical & Chemical Properties ***

Appearance: White granular	Odor: Mild acrylic odor
Physical State: Solid	pH: 5-7 at 10 g/l (20°C)
Vapor Pressure: N/E	Vapor Density: N/E
Boiling Point: N/E	Melting Point: N/E
Solubility (H2O): Limited solubility	Specific Gravity: N/E
Evaporation Rate: <1 (butyl acetate =1)	Bulk Density: 44 lbs./ft ³

*** Section 10 - Chemical Stability & Reactivity Information ***

Chemical Stability

Stable under usual application conditions.

Chemical Stability: Conditions to Avoid

None.

Incompatibility

None identified.

Hazardous Decomposition

None identified.

Hazardous Polymerization

Hazardous polymerization will not occur.

*** Section 11 - Toxicological Information ***

Acute and Chronic Toxicity

A: General Product Information

Eye and skin irritant. May aggravate existing medical conditions such as rashes, allergies or other sensitive areas.

Symptoms may include reddening, swelling of affected areas with possible itching, burning or other discomfort.

LD50 mouse: >5000 mg/kg (5% solution)

B: Acute Toxicity-LD50/LC50

No LD50/LC50's are available for this product's components.

Carcinogenicity

A: General Product Information

NTP: No

IARC: No

OSHA: No

B: Component Carcinogenicity

No information is available.

Mutagenicity

Results of mutagenicity testing with the Ames Test (Salmonella typhimurium plate test): negative.

*** Section 12 - Ecological Information ***

Ecotoxicity

A: General Product Information

Prevent concentrated product from penetrating surface waters without biological waste water treatment.

Dilute solutions in normal use are not to be regarded as hazardous to aquatic life.

Fish toxicity: LC50 Leuciscus idus ~4000 mg/l, 96 hour.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

No information available.

Material Safety Data Sheet

STOCKOPAM

MSDS ID: CR-119

Environmental Fate

Biodegradation is negligible, possibly due to the highly polymerized structure of the polyacrylamides. However, the substance is removed from waste water effluent due to flocculation with the bio-sludge.

*** Section 13 - Disposal Considerations ***

US EPA Waste Number & Descriptions

A: General Product Information

Incinerate or dispose of solidified product according to local, state and federal regulations. Unadulterated product is considered non-hazardous.

B: Component Waste Numbers

No EPA Waste Numbers are applicable for this product's components.

Disposal Instructions

Contain and collect using absorbent material if needed. Flush residuals to drain for normal biological treatment. Place collected material into suitable containers for proper disposal.

*** Section 14 - Transportation Information ***

International Transportation Regulations

This product is not regulated as a hazardous material by the United States (DOT) or Canadian (TDG) transportation regulations.

*** Section 15 - Regulatory Information ***

US Federal Regulations

A: General Product Information

SARA 313 reportable toxic chemicals - None This product is not Federally regulated as a hazardous material.

B: Clean Air Act

No information is available.

C: Component Analysis

No information is available.

D: Food & Drug Administration

CFR references for the FDA regulated components in this product are listed.

2-Propenoic acid, sodium salt, polymer with 2-propenamide (25085-02-3)

Direct Food 172.710, 173.5, 173.310

Additives:

State Regulations

A: General Product Information

None

B: Component Analysis - State

None of this product's components are listed on the state lists from CA, FL, MA, MN, NJ, or PA.

Component Analysis - WHMIS IDL

No components are listed in the WHMIS IDL.

Component Analysis - Inventory

Component	CAS #	TSCA	CAN	EEC
2-Propenoic acid, sodium salt, polymer with 2-propenamide	25085-02-3	Yes	DSL	No

*** Section 16 - Other Information ***

Material Safety Data Sheet

STOCKOPAM

MSDS ID: CR-119

Other Information

Reasonable care has been taken in the preparation of this information, but the manufacturer makes no warranty of merchantability or any other warranty, expressed or implied, with respect to this information. The manufacturer makes no representations and assumes no liability for any direct, incidental or consequential damages resulting from its use.

MSDS History

This is the U.S. version of the MSDS for STOCKOPAM.

Key/Legend

Contact: Product Compliance Officer

Contact Phone: (800) 242-2271

degussa.

Technical Data

STOCKOPAM®

0.5% Brine Viscosity, mPas	220 Min.
Gel Content, ml/l	15 Max
Anionic Charge, %	27 – 33
Residual Acrylamide, ppm	< 500

Stockhausen, Inc.
2401 Doyle St.
Greensboro, NC 27406
Tel 1-888-533-7764
Fax 1-336-379-3586
www.stockhausen-inc.com

Stockhausen GmbH
Postfach 570
D-47705, Krefeld
Tel 49 2151 38 18 80
Fax 49 2151 38 12 92
www.stockhausen.com

DATA

Safety Data of

STOCKOPAM®

Anionic Polymers

Introduction

STOCKOPAM is an anionic polymer primarily used for hydroseeding and erosion control, e.g., for preventing irrigation-induced erosion. STOCKOPAM is a copolymer of acrylamide and sodium acrylate. STOCKOPAM shows

the same physical and chemical properties as other anionic synthetic flocculating agents manufactured by STOCKHAUSEN. Not all of the different variations of the STOCKOPAM types were tested with all the following test

systems due to ethical and economical reasons. All studies were performed in the Laboratory for Toxicology and Ecology, Stockhausen, Germany. In the following, STOCKOPAM is referred to as PAM.

Toxicity Data

Acute oral toxicity

LD₅₀ > 1,200 mg/kg body weight.

Up to 1,200 mg/kg body weight of PAM were applied with a stomach tube to 10 male mice. This was the highest oral dose level applicable due to the high viscosity of PAM in saline solution. Only slight and reversible toxic symptoms were observed in the highest dosage group; no death was recorded. Body weight development was normal during observation over 14 days after single application.

PAM has to be regarded as essentially non-toxic after oral intake.

HET-CAM-Test

Hen's egg test (HET) – Chorion allantoic membrane (CAM) assay: 200 mg of PAM were applied onto the CAM of hen embryos of 10 days of age. There were moderate effects with respect to vascular injection and hemorrhaging within 2 minutes after application but no effect regarding coagulation. Potential for cell toxicity and adverse effects on membranes seems to be low.

Cytotoxicity in vitro

PAM was examined regarding its influence on mammalian cells in a cell culture system using a fibroblastic cell line derived from mice. The cells were incubated for 24 hours with a 1% (v/v) solution of PAM in cell culture medium. No adverse effects on the morphology or viability of the cells were observed with this concentration.

Ames Test:

Salmonella typhimurium reverse mutation assay

Mutagenicity was tested with the Ames Salmonella plate test (in vitro) with and without metabolic activation by rat liver microsomes. The strains TA 100 and TA 1537 were used as well as TA 98 and TA 1537. An increase in the revertants was not detected in any of the examined cases. Therefore, there was no indication of a mutagenic potential in S. typhimurium of PAM

In vivo micronucleus test

PAM was assayed in an in vivo mouse bone marrow micronucleus test with an oral dose of 600 mg/kg body weight. Groups of 5 male and 5 female animals were used and were killed at intervals of 24, 48 and 72 hours after treatment. At no time point was there a significant increase in micronucleus frequency in the test groups. Therefore it is concluded that PAM is not able to induce micronuclei in polychromatic or normochromatic erythrocytes of bone marrow of mice.

Ecotoxicity Data

Chronic bacterial toxicity

Growth behavior and propagation of the microorganism Pseudomonas putida was determined with PAM in concentrations up to 1,600 mg/l. Inhibitory effects on the growth behavior were not observed, i.e. no cytostatic or biocidal effects are to be expected. The EC50-value for half maximum propagation is higher than the highest concentration tested.

Therefore no critical effects to bacteria are expected under relevant use and disposal conditions.

Chronic algae toxicity

Growth behavior of the single cellular algae Scenedesmus subspicatus was determined with PAM up to a concentration of 500 mg/l. Inhibition of growth was observed in concentrations of 1 mg/l and higher but the EC50-value which defines half maximum growth is higher than the highest concentration tested. However, the observed mild toxicity is thought to be of minor practical importance under realistic environmental exposure conditions.

Acute daphnia toxicity

Acute effects on the swimming ability of the daphnids Daphnia magna were determined with PAM in concentrations up to 640 mg/l. The EC50-value for half maximum swimming inhibition is approximately 300 mg/l, the EC0-value, the concentration where no effect on the swimming ability occurred, is approximately 40 mg/l. The observed slight toxicity of PAM to daphnids is thought to be of minor relevance when realistic environmental exposure conditions are taken into account.

Acute fish toxicity

To determine the potential acute lethal effects on fish, the cold water species Leuciscus idus (golden orf) and the warm water species Brachydanio rerio (zebra fish) were exposed to PAM. The LC50-value which defines the mean lethal concentration is approximately 140 mg/l and 160 mg/l for the golden orf and the zebra fish respectively. Therefore, PAM has to be regarded as slightly toxic to fish.

Biodegradability in aquatic systems

Two different degradation studies on PAM in liquid systems with sewage microorganisms as inoculum have been conducted:

- The Modified Sturm Test (CO2 evolution test)
- The BODIS Test (closed bottle test)

In the CO2 evolution test PAM was incubated over 28 days under aerobic conditions with activated sludge. The amount of carbon dioxide produced from the test substance is measured as a result of biodegradation.

In the BODIS Test degradation is followed by analysis of dissolved oxygen over a period of 28 days. PAM was inoculated with mixed microorganisms and kept in completely full, closed bottles. The amount of oxygen taken up by the microbial population during biodegradation is measured.

The results of both laboratory tests indicate that PAM is poorly biodegradable.

Conclusion

STOCKOPAM is an anionic polyacrylamides which exhibits a low toxicological profile. There have been no signs of acute oral toxicity and there is no evidence for marked irritative properties; no mutagenic potency was found. With respect to the environmental compatibility of STOCKOPAM the data indicate some slight toxic effects on aquatic organisms. However, under realistic environmental exposure conditions no critical deleterious effects are expected.

In standard laboratory test systems biodegradation could not be observed. Nevertheless, due to results of the latest research there is sufficient and increasing evidence that polyacrylamides do not constitute persistent, non-degradable man-made polymers.

Therefore, STOCKOPAM is regarded as essentially compatible to the environment, especially taking into account the very low dosage levels used for application.

To support this assessment the following facts should be taken into account:

- anionic flocculants have been used successfully in sewage disposal plants for several decades
- for preparation of drinking water similar anionic type polymers are approved by relevant authorities
- the use of polyacrylamides as soil conditioner is well known.

No negative effects on the environment have been reported with respect to these areas of applications.

Vendor Data Review System Final Disposition Screen

This vendor data item has been given the following disposition codes

Reviewer	Revision Level	Date	Disposition Code	Comments
JOLLEY WENDELL L	0	09-OCT-06	D	
VANDEL DOUG S	0	09-OCT-06	A	
DRIEVER MIKEL K	0	09-OCT-06	A	
TUOTT LEE C	0	28-NOV-06	A	
MCMANAMON LAWRENCE E	0	09-OCT-06	A	
LANDIS JOSEPH A	0	09-OCT-06	A	no comments
FRITZ KURT D	0	10-OCT-06	D	

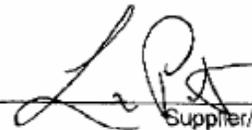
VDR Number: VDR-154111
 Revision Level: 0
 Project Number: 23368 - 152173
 Transmittal Number: S-507296-07
 Transmittal Status: Mandatory Approval
 Line Item: 1

Disposition Code:: A **Final Comments::**

VDS #4_153312

VENDOR DATA
TRANSMITTAL & DISPOSITION FORM

ORIGINAL

To be completed by Supplier/Subcontractor									
Purchase Order or Subcontract Number:		00507296 - 02 R.O			Project Title/Number: Remediation of The STF - 02 Gun Range				
Submittal Number:		6131 - 02			Supplier/Subcontractor Name: Phenix Construction				
Submittal Date:		09-21-06			Address: P.O. Box 1626 Idaho Falls Idaho 83403 23368-152173				
INEEL VDS Item No.	VDT Item No.	Specification/ Drawing Reference	Tag Number	Submittal Status	Revision Level	Supplier/ Subcontractor Document Number (if applicable)	Description	INEEL VDR Number	Disp Code
4		01051		IO NA	0	6131 - 02	Land Surveyor Registered Professional Certification	153312	A
Remarks									
<div style="display: flex; justify-content: space-between; align-items: center;">  <div style="text-align: center;"> <p>09-21-06</p> <p>Supplier/Subcontractor Authorized Signature / Date</p> </div> </div>									
To Be Completed by Contractor/AE									
<p style="text-align: center;">INEEL Authorized Signature / Date</p>									

F-145

STATE OF IDAHO

BOARD OF REGISTRATION OF PROFESSIONAL ENGINEERS AND PROFESSIONAL LAND SURVEYORS

- A WORK MAY PROCEED SUBJED TO INCORPORATION OF COMMENTS
- B REVISE AND RESUBMIT WORK MAY PROCEED SUBJECT TO INCORPORATION OF CHANGES INDICATED
- C REVISE AND RESUBMIT WORK MAY NOT PROCEED
- D REVIEW NOT REQUIRED WORK MAY PROCEED

VDR NO. 153312 R.O.
 BY: Christine Poole
 DATE: 9-27-06

TO ALL TO WHOM THESE PRESENTS SHALL COME:

This is to Certify that

Robert Jon Meikle

is registered as a

Professional Land Surveyor

and is authorized to practice Professional Land Surveying in the State of Idaho in accordance with the Laws of Idaho.

*In Testimony Whereof, this Certificate No. 8795
has been issued, and the Seal of the Board affixed this
6th day of January, 1998 at Boise, Idaho.*



BOARD OF REGISTRATION OF PROFESSIONAL ENGINEERS AND
PROFESSIONAL LAND SURVEYORS

Robert T. Hill

Chairman

Leslie M. Walker

Secretary



THIS CERTIFICATE IS THE PROPERTY OF THE STATE OF IDAHO AND IN THE EVENT OF SUSPENSION, REVOCATION OR
INVALIDATION FOR ANY REASON, IT MUST, UPON DEMAND, BE RETURNED TO THE BOARD OF REGISTRATION OF
PROFESSIONAL ENGINEERS AND PROFESSIONAL LAND SURVEYORS

Vendor Data Review System Final Disposition Screen

This vendor data item has been given the following disposition codes

Reviewer	Revision Level	Date	Disposition Code	Comments
FRITZ KURT D	0	22-SEP-06	D	
VANDEL DOUG S	0	25-SEP-06	A	
DRIEVER MIKEL K	0	25-SEP-06	D	
TUOTT LEE C	0	25-SEP-06	D	
MCMANAMON LAWRENCE E	0	26-SEP-06	A	

VDR Number: VDR-153312
Revision Level: 0
Project Number: 23368 - 152173
Transmittal Number: S-507296-02
Transmittal Status: Information Only
Line Item: 1

Disposition Code::
A

Final Comments::
No Comment

VDS #5_155376

ORIGINAL

**VENDOR DATA
TRANSMITTAL & DISPOSITION FORM**

To be completed by Supplier/Subcontractor									
Purchase Order or Subcontract Number:		00507296 - <u>09 R.D</u>			Project Title/Number: Remediation of The STF - 02 Gun Range				
Submittal Number:		6131 - 09			Supplier/Subcontractor Name: Phenix Construction				
Submittal Date:		10-25-06			Address: P.O. Box 1626 Idaho Falls Idaho 83403 <u>23368-152173</u>				
INEEL VDS Item No.	VDT Item No.	Specification/ Drawing Reference	Tag Number	Submittal Status	Revision Level	Supplier/ Subcontractor Document Number (if applicable)	Description	INEEL VDR Number	Disp Code
5		01051		M.A.		6131 - 09	Topographical Survey - Original Topography	155376	A
Remarks <div style="text-align: center; margin-top: 20px;">  10-25-06 </div> <hr style="width: 50%; margin: 0 auto;"/> <p style="text-align: center; margin: 0;">Supplier/Subcontractor Authorized Signature / Date</p>									
To Be Completed by Contractor/AE									
<hr style="width: 50%; margin: 0 auto;"/> <p style="text-align: center; margin: 0;">INEEL Authorized Signature / Date</p>									

F-151

PHENIX CONSTRUCTION
(INL GUN RANGE REMEDIATION)

7439
(10-12-06)
TOPO-1

7439T1.ASC

1,	677084.4953860,	306357.9695240,	4938.6026503,GRND
2,	677051.1913050,	306308.4719590,	4938.4500522,GRND
3,	677087.4443190,	306271.0827360,	4938.9701142,GRND
4,	677126.7854540,	306240.0890090,	4939.4280422,GRND
5,	677172.6618760,	306214.8036520,	4939.1196224,GRND
6,	677199.2064150,	306203.6765230,	4940.8261101,GRND
7,	677248.1506230,	306183.1608500,	4939.8686685,GRND
8,	677295.8925430,	306167.1903300,	4939.8956355,GRND
9,	677337.9784790,	306157.9195460,	4940.8365386,GRND
10,	677300.6582760,	306211.7875480,	4939.9550774,TOE
11,	677285.9117110,	306208.1141500,	4940.4409832,TOE
12,	677280.1055870,	306214.8541540,	4940.8426936,TOE
13,	677259.3348900,	306232.7091040,	4941.0876032,TOE
14,	677216.4306470,	306252.4910310,	4940.5419907,TOE
15,	677171.2199050,	306269.2549380,	4939.2604918,TOE
16,	677128.1975530,	306292.0234390,	4939.1155401,TOE
17,	677109.8640950,	306304.3857720,	4939.0093332,TOE
18,	677116.6993050,	306326.7460330,	4938.9050019,TOE
19,	677130.3975040,	306316.3327380,	4945.7050880,TOP
20,	677127.9155760,	306307.9610260,	4946.0524455,TOP
21,	677146.5077470,	306301.7621920,	4949.0243848,TOP
22,	677149.0529130,	306306.8023610,	4949.0525958,TOP
23,	677195.0004460,	306289.4610610,	4948.7590938,TOP
24,	677191.2464360,	306278.3178320,	4949.1034500,TOP
25,	677234.1386840,	306261.4856060,	4949.9997965,TOP
26,	677237.2160430,	306270.7145650,	4950.0488374,TOP
27,	677261.6421950,	306258.5130450,	4951.3886995,TOP
28,	677259.1660980,	306252.3700470,	4951.6298754,TOP
29,	677268.1656110,	306249.0311670,	4951.9472566,TOP
30,	677270.7270500,	306253.4626530,	4951.7892762,TOP
31,	677176.2201630,	306315.3463230,	4939.3311398,TOE
32,	677223.4850470,	306295.0155140,	4940.0781779,TOE

<input checked="" type="checkbox"/>	A WORK MAY PROCEED SUBJECT TO INCORPORATION OF COMMENTS
<input type="checkbox"/>	B REVISE AND RESUBMIT WORK MAY PROCEED SUBJECT TO INCORPORATION OF CHANGES INDICATED
<input type="checkbox"/>	C REVISE AND RESUBMIT WORK MAY NOT PROCEED
<input type="checkbox"/>	D REVIEW NOT REQUIRED WORK MAY PROCEED
VDR NO. 155376 R.D	
BY: <i>Annetha Good</i>	
DATE: 11-6-06	

7439T1.ASC

33,	677266.5025370,	306276.1506130,	4940.4998751,TOE
34,	677274.8977990,	306273.3582830,	4941.0033936,TOE
35,	677167.5769680,	306478.4473730,	4939.2655925,TOE
36,	677168.2437820,	306482.7739580,	4940.0472659,TOP
37,	677168.9340240,	306487.1468290,	4939.9163311,TOP
38,	677187.1364110,	306489.2605190,	4941.2321572,TOP
39,	677192.6520880,	306504.8328370,	4941.6992159,TOP
40,	677189.2551440,	306517.1732700,	4939.5744244,TOP
41,	677195.9605990,	306523.9857770,	4939.9986113,TOP
42,	677200.4434680,	306531.2880560,	4939.1558916,TOP
43,	677193.3495170,	306577.8189170,	4938.6104531,TOE
44,	677188.1434000,	306578.2068250,	4939.5002906,TOE
45,	677184.3463090,	306576.6917340,	4939.4611317,TOP
46,	677167.5449510,	306598.2916000,	4938.5929536,TOP
47,	677168.2780510,	306603.7666710,	4938.6464848,TOP
48,	677167.6701040,	306610.0469240,	4937.0956983,TOE
49,	677127.6401030,	306615.6397610,	4935.7828167,TOE
50,	677124.9898890,	306609.7150120,	4937.3830159,TOP
51,	677121.6666380,	306604.6593060,	4937.5351267,TOP
52,	677090.6138200,	306603.4350570,	4937.8104427,TOP
53,	677086.6578330,	306609.8359830,	4937.6703531,TOP
54,	677082.1748340,	306614.8310590,	4936.3009123,TOE
55,	677079.7334620,	306580.1520050,	4936.5433573,TOE
56,	677083.9087880,	306577.0969790,	4937.3327197,TOP
57,	677082.4149750,	306562.8454680,	4936.7649786,TOP
58,	677081.0914640,	306515.3996510,	4936.8868309,TOP
59,	677082.1283670,	306497.9095430,	4938.6810507,TOP
60,	677076.8830220,	306497.0557590,	4937.2166475,TOE
61,	677083.3622780,	306477.7044140,	4937.9702324,TOE
62,	677086.3946360,	306484.1219580,	4939.2470252,TOP
63,	677093.7862630,	306489.5939750,	4938.4728596,TOP

7439T1.ASC

64,	677120.9624800,	306482.8388690,	4939.5045027, TOP
65,	677125.4827350,	306479.6248970,	4939.6414140, TOP
66,	677124.7981700,	306474.6058300,	4938.3748525, TOE
67,	677154.5464720,	306477.0358650,	4938.7990809, TOE
68,	677157.7668410,	306482.1650410,	4939.8876740, TOP
69,	677159.7230310,	306486.5119660,	4939.8595641, TOP
70,	677170.4039150,	306431.8616640,	4939.6802088, GRND
71,	677118.8114700,	306444.0961500,	4938.7303555, GRND
72,	677070.0184600,	306467.4632340,	4937.9576898, GRND
73,	677041.9522350,	306506.5895210,	4936.9747211, GRND
74,	677041.3930150,	306559.9779130,	4936.3928716, GRND
75,	677045.5898140,	306608.7052350,	4936.4952204, GRND
76,	677055.3661170,	306639.7593420,	4936.5739527, GRND
77,	677108.6007090,	306635.2513360,	4936.0079425, GRND
78,	677158.3593690,	306631.3272290,	4936.7434425, GRND
79,	677211.4158060,	306562.1088460,	4938.9667203, GRND
80,	677224.8059090,	306534.3345620,	4939.4961067, GRND
81,	677172.1741870,	306501.3335490,	4932.4787075, TOE
82,	677175.5037070,	306524.9408180,	4932.0196105, TOE
83,	677175.1550240,	306544.2339380,	4932.4241491, TOE
84,	677176.5965670,	306564.6424670,	4932.6879799, TOE
85,	677168.9863390,	306569.8321010,	4931.3828001, TOE
86,	677164.7135420,	306575.0015050,	4930.8597559, TOE
87,	677166.9363110,	306580.9162220,	4931.6495449, TOE
88,	677155.0496270,	306590.8978900,	4931.4012330, TOE
89,	677135.8295960,	306589.9454810,	4930.3966295, TOE
90,	677116.2241310,	306590.7332120,	4930.1966258, TOE
91,	677102.8105610,	306587.7116960,	4929.8232911, TOE
92,	677096.8113990,	306580.9526520,	4929.8331566, TOE
93,	677097.3596100,	306570.5021460,	4929.2223630, TOE
94,	677096.2874380,	306550.5518800,	4929.5032709, TOE
95,	677096.6088660,	306536.4835950,	4929.5207609, TOE

7439T1.ASC

96,	677097.3770710,	306529.3437250,	4928.7461540,TOE
97,	677097.1930160,	306510.9581700,	4929.5262989,TOE
98,	677107.4662870,	306501.5297800,	4929.0408688,TOE
99,	677116.9983420,	306501.1075630,	4928.8869737,TOE
100,	677136.4312890,	306501.3548470,	4930.3359966,TOE
101,	677147.1318320,	306501.0600820,	4931.2979905,TOE
102,	677167.0003200,	306499.5642790,	4931.8457362,TOE
103,	677163.4041940,	306512.0498190,	4931.0092089,GRND
104,	677142.0701860,	306512.8132780,	4931.2380188,GRND
105,	677123.0119990,	306513.7238700,	4928.2030029,GRND
106,	677107.1097980,	306535.4181220,	4928.6281868,GRND
107,	677122.4835280,	306536.7752690,	4930.1762362,GRND
108,	677136.3780510,	306540.0981090,	4928.7811085,GRND
109,	677157.2380480,	306545.9053890,	4929.4870635,GRND
110,	677158.8528610,	306566.4505640,	4930.5223006,GRND
111,	677139.9275130,	306564.6773830,	4930.0130447,GRND
112,	677129.1265330,	306564.4129990,	4929.3292990,GRND
113,	677119.8866770,	306566.9964900,	4930.3235408,GRND
114,	677112.3145290,	306570.6890720,	4928.8778854,GRND
115,	677117.9748810,	306582.1900110,	4929.2569745,GRND
116,	677139.1497410,	306583.0373800,	4929.8304249,GRND
117,	677159.3800280,	306578.6401350,	4930.6273360,GRND
118,	677026.8653260,	306464.6461780,	4937.5195234,GRND
119,	677022.9515740,	306414.2174880,	4937.8646752,GRND
120,	677021.9181290,	306362.4221500,	4937.7546087,GRND
121,	677020.2202880,	306313.2058820,	4938.0858670,GRND
122,	677077.5047910,	306360.4665840,	4938.3901014,GRND
123,	677094.3763520,	306411.3186260,	4938.8996964,GRND
124,	677146.9114450,	306398.3544310,	4939.2431658,GRND
125,	677131.4880420,	306356.1491820,	4939.1169980,GRND
126,	677179.9032670,	306338.7985780,	4939.4193883,GRND

7439T1.ASC

127,	677199.1923930,	306379.3469170,	4939.7907135, GRND
128,	677247.0167460,	306359.5325310,	4940.0057067, GRND
129,	677232.3044920,	306316.8134820,	4939.8823490, GRND
130,	677273.0785420,	306309.5742500,	4940.2356166, GRND
131,	677286.6085510,	306341.3909260,	4940.3022564, GRND
132,	677280.9257360,	306281.4760840,	4941.1621790, TOE
133,	677296.4300790,	306316.3340240,	4940.7863278, TOE
134,	677310.9557430,	306352.6064910,	4940.5831365, TOE
135,	677323.4591570,	306379.0997320,	4940.9590094, TOE
136,	677334.8085400,	306403.4115930,	4940.4643567, TOE
137,	677340.0679730,	306413.5328720,	4941.0197934, TOE
138,	677336.2450900,	306421.9799840,	4940.8000660, TOE
139,	677311.1023250,	306432.3304200,	4940.5959236, TOE
140,	677293.6933670,	306440.2801660,	4940.6082241, TOE
141,	677278.9963880,	306447.6337020,	4940.9853971, TOE
142,	677271.0990610,	306427.1050760,	4940.5903760, TOE
143,	677268.4666100,	306417.7014050,	4940.6231744, TOE
144,	677319.3505960,	306389.5657680,	4940.5550153, TOE
145,	677318.4143150,	306377.6289030,	4941.0040861, TOE
146,	677309.6708790,	306361.3604660,	4940.8502950, TOE
147,	677298.1512630,	306355.7727670,	4940.2811020, TOE
148,	677260.9420240,	306369.9703640,	4940.3564740, TOE
149,	677221.4698700,	306390.2459950,	4940.0588973, TOE
150,	677214.8080020,	306407.6833220,	4940.2886023, TOE
151,	677226.8889380,	306437.9492620,	4940.1950365, TOE
152,	677237.4951970,	306465.9145360,	4940.1062775, TOE
153,	677212.5313640,	306476.3479340,	4940.5696198, TOE
154,	677195.4583090,	306477.1162470,	4940.7373561, TOE
155,	677199.2673730,	306497.5810250,	4941.6866034, TOE
156,	677205.8264520,	306510.2716140,	4940.5676533, TOE
157,	677215.0661820,	306512.8893100,	4939.9158827, TOE
158,	677248.1646510,	306502.8563420,	4940.4160735, TOE

7439T1.ASC

159,	677289.1840440,	306487.5778830,	4940.9864158, TOE
160,	677325.2675350,	306475.7772560,	4939.8548295, TOE
161,	677351.3846070,	306463.3143420,	4940.7333189, TOE
162,	677376.6461380,	306457.6580470,	4941.3940546, TOE
163,	677396.4904370,	306456.3823410,	4942.1304753, TOE
164,	677401.5561830,	306451.2012720,	4940.6913376, TOE
165,	677399.8911600,	306438.8974090,	4940.5477485, TOE
166,	677310.0065350,	306223.5692160,	4940.0569790, TOE
167,	677331.0966030,	306272.3013240,	4940.0569560, TOE
168,	677350.7686630,	306316.5799960,	4940.2274121, TOE
169,	677370.0937800,	306360.0497470,	4940.0647028, TOE
170,	677388.2028720,	306401.8938870,	4939.4884481, TOE
171,	677397.4872250,	306422.6247560,	4939.4153319, TOE
172,	677454.6936710,	306405.9445660,	4939.1565819, GRND
173,	677433.9358680,	306351.2943570,	4938.6432963, GRND
174,	677413.1805830,	306301.7915310,	4939.2883081, GRND
175,	677391.3310310,	306250.6638300,	4939.6382240, GRND
176,	677360.9418140,	306204.1073800,	4939.9606507, GRND
177,	677281.0659040,	306249.4655960,	4952.1107992, TOP
178,	677279.8603390,	306244.2793320,	4952.2576958, TOP
179,	677292.8591910,	306241.2698070,	4952.4173525, TOP
180,	677282.5169530,	306243.1120620,	4952.4009094, TOP
181,	677293.5771980,	306252.5828270,	4952.6112121, TOP
182,	677298.6197280,	306250.8536440,	4952.8387655, TOP
183,	677311.0419090,	306286.7648910,	4952.9414405, TOP
184,	677316.1322320,	306286.4521690,	4952.8169182, TOP
185,	677330.7202060,	306319.3906970,	4953.4427888, TOP
186,	677325.7239770,	306321.6331940,	4953.0233496, TOP
187,	677343.5775090,	306363.3935940,	4953.2767772, TOP
188,	677348.6553870,	306361.9959740,	4953.4018525, TOP
189,	677362.0711710,	306394.0694480,	4953.4574901, TOP

7439T1.ASC

190,	677358.2316590,	306396.6696940,	4953.3076209, TOP
191,	677364.5505050,	306416.3762900,	4953.6685163, TOP
192,	677369.8378200,	306417.2130070,	4953.5617364, TOP
193,	677374.0374810,	306432.3564400,	4953.9363196, TOP
194,	677362.5308730,	306425.9637930,	4953.7588234, TOP
195,	677354.9805770,	306434.7901050,	4953.4163775, TOP
196,	677357.0942980,	306440.6326360,	4953.1624269, TOP
197,	677318.3653260,	306450.3373690,	4951.2654286, TOP
198,	677321.3271320,	306457.5598030,	4951.2282080, TOP
199,	677291.7916760,	306460.5912730,	4950.5851746, TOP
200,	677293.8053180,	306468.9874620,	4950.5477542, TOP
201,	677272.7789120,	306468.2759860,	4950.0941296, TOP
202,	677272.9027930,	306478.1781100,	4950.0954471, TOP
203,	677257.2368500,	306475.4678010,	4949.7028583, TOP
204,	677258.0585160,	306483.8463340,	4949.7198565, TOP
205,	677220.0411090,	306495.3248000,	4949.0748010, TOP
206,	677219.9632340,	306489.1499410,	4948.9059155, TOP
207,	677260.3147450,	306465.7587600,	4953.2819831, TOP
208,	677263.9621110,	306464.3860640,	4953.3555964, TOP
209,	677246.9112340,	306431.6840540,	4952.8359799, TOP
210,	677249.9582230,	306430.8486280,	4952.8156777, TOP
211,	677243.6305430,	306413.3600290,	4952.7673200, TOP
212,	677240.0567320,	306414.6072350,	4952.8233331, TOP
213,	677237.2220840,	306406.9676460,	4952.6301127, TOP
214,	677243.5983780,	306408.6879900,	4952.3636004, TOP
215,	677247.5920230,	306404.8297980,	4952.3362364, TOP
216,	677246.5508430,	306401.8134540,	4952.5900784, TOP
217,	677268.6576270,	306391.8051340,	4952.6669954, TOP
218,	677271.7458270,	306392.8369440,	4952.8056711, TOP
219,	677298.8102970,	306380.7850310,	4952.5072904, TOP
220,	677297.7516910,	306378.8942410,	4952.5617583, TOP
221,	677255.8935200,	306569.1524850,	4940.5066783, GRND

7439T1.ASC

222,	677297.7262740,	306568.9985730,	4939.2164554,GRND
223,	677339.3457320,	306544.4924060,	4939.6646266,GRND
224,	677324.0752460,	306515.9998000,	4939.4670792,GRND
225,	677274.8852200,	306529.5818000,	4939.6422106,GRND
226,	677230.5538290,	306533.5314840,	4939.8831241,GRND
1000,	677106.0800000,	306220.1600000,	4939.4500000,
1001,	676836.9000000,	306489.7000000,	4934.7000000,
1002,	677259.9800000,	306459.7200000,	4953.3000000,

Vendor Data Review System Final Disposition Screen

This vendor data item has been given the following disposition codes

Reviewer	Revision Level	Date	Disposition Code	Comments
TUOTT LEE C	0	31-OCT-06	A	No comment.
MCMANAMON LAWRENCE E	0	06-NOV-06	D	
DRIEVER MIKEL K	0	30-OCT-06	D	Is there supposed to be an Initial or Resubmital CHEMical Inventory List with this?
LANDIS JOSEPH A	0	30-OCT-06	A	no comment
FRITZ KURT D	0	02-NOV-06	D	Can I have the electronic data sent to me?
JOLLEY WENDELL L	0	31-OCT-06	D	
VANDEL DOUG S	0	31-OCT-06	A	

VDR Number:	VDR-155376
Revision Level:	0
Project Number:	23368 - 152173
Transmittal Number:	S-507296-09
Transmittal Status:	Mandatory Approval
Line Item:	1

Disposition Code::
A

Final Comments::

VDS #6_155906

ORIGINAL

**VENDOR DATA
TRANSMITTAL & DISPOSITION FORM**

To be completed by Supplier/Subcontractor

Purchase Order or Subcontract Number: 00507296 - 010 R. 0 Project Title/Number: Remediation of The STF - 02 Gun Range
 Submittal Number: 6131 - 10 Supplier/Subcontractor Name: Phenix Construction
 Submittal Date: 11-07-06 Address: P.O. Box 1626 Idaho Falls Idaho 83403 23368-152173

INEEL VDS Item No.	VDT Item No.	Specification/ Drawing Reference	Tag Number	Submittal Status	Revision Level	Supplier/ Subcontractor Document Number (if applicable)	Description	INEEL VDR Number	Disp Code
6		01051		M.A.	0	6131 - 10	Topographical Survey - After Soil Removal	155906	A

Remarks
Berm Area only.


11-07-06
 Supplier/Subcontractor Authorized Signature / Date

To Be Completed by Contractor/AE

INEEL Authorized Signature / Date

F-165

(11/2/06)

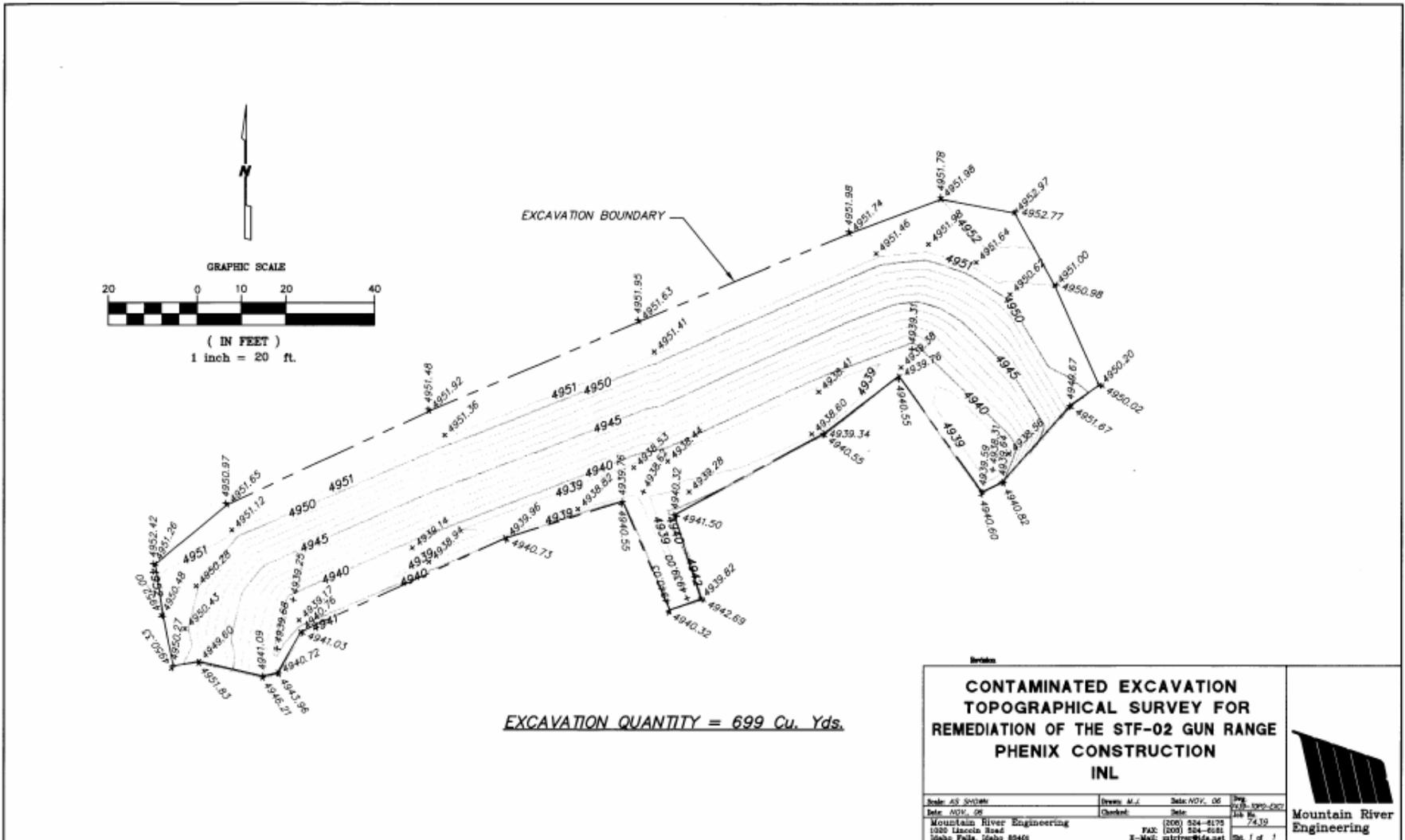
7439-TOPO-EXC1.CSV

229	677307.9017	306352.2785	4938.62 TOE
230	677346.358	306350.9647	4951.9517 TOE
231	677366.0459	306398.4236	4951.9796 TOE
232	677373.7306	306419.1645	4951.7797 TOE
233	677370.6138	306436.1409	4952.7737 TOE
234	677354.1811	306445.3552	4950.9763 TOE
235	677331.6412	306455.5945	4950.0171 TOE
236	677326.8817	306448.6954	4951.6713 TOE
237	677309.6811	306433.4285	4940.8217 TOE
238	677307.2315	306428.3342	4940.5963 TOE
239	677333.165	306409.726	4940.5464 TOE
240	677320.5757	306393.0222	4940.5475 TOE
241	677302.4563	306359.7621	4941.4968 TOE
242	677283.6206	306365.7641	4942.688 TOE
243	677280.8224	306357.9465	4940.3157 TOE
244	677305.1116	306347.263	4940.5489 TOE
245	677297.0501	306321.3969	4940.7336 TOE
246	677276.2213	306275.3991	4941.0331 TOE
247	677266.9971	306270.0733	4943.9629 TOE
248	677266.1954	306266.395	4946.2056 TOE
249	677269.4711	306251.9884	4951.8344 TOE
250	677268.3642	306245.9043	4950.3269 TOE
251	677280.0938	306243.4828	4951.9998 TOE
252	677291.8377	306241.6467	4952.419 TOE
253	677305.3493	306258.043	4950.975 TOE
254	677326.4495	306303.6829	4951.484 TOE
2000	677266.7077	306266.3973	4941.0927 TOP
2001	677267.4386	306269.7509	4940.7248 TOP
2002	677276.6105	306275.0465	4940.7599 TOP
2003	677297.5182	306321.2187	4939.9562 TOP
2004	677305.7218	306347.5408	4939.7617 TOP
2005	677281.4502	306358.2166	4940.0254 TOP
2006	677283.9287	306365.1412	4939.8238 TOP
2007	677302.6979	306359.1603	4940.3246 TOP
2008	677320.9972	306392.7506	4939.338 TOP
2009	677333.8724	306409.8338	4939.7631 TOP
2010	677307.8639	306428.4958	4939.5949 TOP
2011	677310.0881	306433.1213	4939.6388 TOP
2012	677312.8042	306430.9414	4938.3051 TOE
2013	677316.4348	306434.5857	4938.5605 TOE
2014	677339.9192	306412.7207	4939.3097 TOE
2015	677335.8219	306410.3169	4939.3793 TOE
2016	677330.3642	306391.723	4938.4098 TOE
2017	677320.9284	306390.1843	4938.6012 TOE
2018	677307.8707	306362.4918	4939.2791 TOE
2019	677314.7474	306357.7336	4938.4355 TOE
2020	677313.2729	306350.0733	4938.5345 TOE
2021	677284.0469	306362.0726	4939.0005 TOE
2022	677304.0195	306337.465	4938.8177 TOE
2023	677292.2276	306303.9072	4938.9357 TOE
2024	677295.3004	306300.0705	4939.1449 TOE
2025	677283.7073	306273.3064	4939.2533 TOE

PHENIX CONST.
EXCAVATION
FROM THE
STF-02 GUN RANGE

<input checked="" type="checkbox"/>	A WORK MAY PROCEED SUBJECT TO INCORPORATION OF COMMENTS
<input type="checkbox"/>	B REVIEW AND RESUBMIT WORK MAY PROCEED SUBJECT TO RECORDATION OF CHANGES REQUIRED
<input type="checkbox"/>	C REVIEW AND RESUBMIT WORK MAY NOT PROCEED
<input type="checkbox"/>	D REVIEW NOT REQUIRED WORK MAY PROCEED
VDR NO. 155906 R.D	
BY: Christine Poole	
DATE: 12-21-06	

2026	677279.1367	306274.6334	4939.1658 TOE
2027	677272.8023	306269.6203	4939.6839 TOE
2028	677268.9436	306246.2952	4950.2688 TOP
2029	677269.9813	306251.9995	4949.6045 TOP
2030	677277.2546	306248.8621	4950.4285 TOP
2031	677280.183	306243.9749	4950.4802 TOP
2032	677291.6332	306242.1848	4951.2649 TOP
2033	677286.804	306251.3297	4950.2801 TOP
2034	677299.306	306259.4324	4951.121 TOP
2035	677304.9225	306258.3112	4951.6534 TOP
2036	677325.992	306303.8849	4951.922 TOP
2037	677320.6314	306307.455	4951.3647 TOP
2038	677339.3097	306354.6798	4951.4093 TOP
2039	677345.9229	306351.2196	4951.6308 TOP
2040	677365.5803	306398.6063	4951.7422 TOP
2041	677361.0691	306404.672	4951.4643 TOP
2042	677363.1821	306416.4573	4951.9763 TOP
2043	677373.214	306419.2094	4951.9753 TOP
2044	677370.1645	306435.8197	4952.969 TOP
2045	677359.0908	306427.1285	4951.6422 TOP
2046	677351.9959	306434.823	4950.6175 TOP
2047	677353.955	306444.9088	4951.0006 TOP
2048	677331.8152	306454.9663	4950.1995 TOP
2049	677327.2589	306448.3616	4949.6667 TOP



Vendor Data Review System Final Disposition Screen

This vendor data item has been given the following disposition codes

Reviewer	Revision Level	Date	Disposition Code	Comments
TUOTT LEE C	0	08-NOV-06	B	A survey is also needed of the areas where the contaminated soils were stored. This should occur after the contaminated soils and the 6" of soil beneath the piles, have been removed. This survey will be used to document the performance of the removal of the additional 6" of soil beneath the remediation soil piles.
MCMANAMON LAWRENCE E	0	11-NOV-06	D	
VANDEL DOUG S	0	08-NOV-06	A	
DRIEVER MIKEL K	0	09-NOV-06	B	Should there be a Chemical Inventory List associated with this submittal? Form 432.21
FRITZ KURT D	0	28-NOV-06	B	Please submit electronic data to me.
LANDIS JOSEPH A	0	27-NOV-06	A	no comment

The following reviewers have NOT yet reviewed this vendor data item
JOLLEY WENDELL L

VDR Number:	VDR-155906
Revision Level:	0
Project Number:	23368 - 152173
Transmittal Number:	S-507296-010
Transmittal Status:	Mandatory Approval
Line Item:	1

Disposition Code::	Final Comments::
A	

VDS #7_158614

ORIGINAL

**VENDOR DATA
TRANSMITTAL & DISPOSITION FORM**

To be completed by Supplier/Subcontractor

Purchase Order or Subcontract Number: 00507296 - 013 R.O Project Title/Number: Remediation of The STF - 02 Gun Range
 Submittal Number: 6131 - 13 Supplier/Subcontractor Name: Phenix Construction
 Submittal Date: 12-12-06 Address: P.O. Box 1626 Idaho Falls Idaho 83403 23368-152173

INEEL VDS Item No.	VDT Item No.	Specification/ Drawing Reference	Tag Number	Submittal Status	Revision Level	Supplier/ Subcontractor Document Number (if applicable)	Description	INEEL VDR Number	Disp Code
7		01051		M.A.		6131 - 13	Topographical Survey - Final Surface	158614	A

Remarks


12-12-06
 Supplier/Subcontractor Authorized Signature / Date

To Be Completed by Contractor/AE

 INEEL Authorized Signature / Date

F-173

7439-ASBLT. ASC
 FINAL ASBUILT TOPOG.

7439
 (11-28-06)

PHENIX CONST.
 STF-02 GUN RANGE

1	5000	5000	0
1005	676990.7353	306402.5935	4937.803407 CP
1007	677106.08	306220.16	4939.45
1008	676836.9	306489.7	4934.7
3000	677033.9316	306304.0949	4938.252294 GRND
3001	677022.3284	306350.3104	4938.239475 GRND
3002	677024.0269	306406.0695	4937.897457 GRND
3003	677025.7535	306457.5801	4937.519121 GRND
3004	677027.6431	306509.3631	4936.802297 GRND
3005	677027.3319	306561.9043	4936.577526 GRND
3006	677026.2525	306611.4765	4936.329608 GRND
3007	677082.7787	306636.1836	4936.303928 GRND
3008	677082.2436	306584.9011	4937.772612 GRND
3009	677085.3319	306532.4927	4938.46574 GRND
3010	677086.1354	306479.8127	4939.103785 GRND
3011	677084.5605	306427.2505	4939.450218 GRND
3012	677085.1141	306374.7542	4939.454074 GRND
3013	677060.6832	306302.0475	4938.68047 GRND
3014	677112.7785	306282.5237	4939.057022 GRND
3015	677127.9273	306331.6588	4939.666801 GRND
3016	677133.0781	306384.2244	4939.808398 GRND
3017	677140.134	306439.7645	4939.891999 GRND
3018	677146.5648	306494.7684	4939.951592 GRND
3019	677157.3825	306548.5195	4939.924577 GRND
3020	677172.701	306612.4984	4938.257758 GRND
3021	677205.0015	306561.1923	4939.962415 GRND
3022	677199.1338	306505.9228	4940.964821 GRND
3023	677190.3699	306450.8791	4940.419923 GRND
3024	677183.5535	306400.4688	4940.185159 GRND
3025	677173.0802	306352.7895	4940.390253 GRND
3026	677158.6013	306311.0385	4939.808367 GRND
3027	677141.0447	306272.0584	4939.449626 GRND
3028	677189.439	306254.3361	4939.896253 GRND
3029	677213.8171	306301.9687	4940.774694 GRND
3030	677238.1126	306351.687	4940.84335 GRND
3031	677256.1529	306403.2847	4940.395323 GRND
3032	677276.3636	306442.5244	4940.773167 GRND
3033	677291.2529	306470.6261	4942.167252 GRND
3034	677302.4342	306491.4816	4940.371304 GRND
3035	677346.7129	306466.1865	4942.504235 GRND
3036	677337.7725	306440.432	4943.448778 GRND
3037	677326.774	306414.7689	4941.67901 GRND
3038	677305.4393	306367.8548	4941.837168 GRND
3039	677281.9895	306319.9666	4941.398093 GRND
3040	677261.8805	306276.809	4941.778803 GRND
3041	677241.6588	306246.3773	4940.554069 GRND
3042	677224.4571	306219.219	4940.686556 GRND
3043	677266.1331	306182.963	4939.74652 GRND
3044	677280.7556	306211.2537	4940.262894 GRND
3045	677307.4371	306265.6267	4941.879792 GRND
3046	677329.7626	306316.9641	4941.872918 GRND
3047	677358.225	306363.3962	4941.622373 GRND

3048	677386.0835	306402.7012	4940.434553 GRND
3049	677403.7889	306434.4713	4943.475669 GRND
3050	677409.0726	306447.7259	4942.502926 GRND
3051	677451.194	306439.455	4940.906913 GRND
3052	677443.3469	306411.4052	4939.291262 GRND
3053	677418.0461	306363.9896	4939.254398 GRND
3054	677387.6303	306308.9039	4939.91735 GRND
3055	677372.6339	306256.4872	4939.788445 GRND
3056	677353.2123	306208.6922	4939.955021 GRND
3057	677321.5915	306167.7128	4939.96133 GRND

Vendor Data Review System Final Disposition Screen

This vendor data item has been given the following disposition codes

Reviewer	Revision Level	Date	Disposition Code	Comments
FRITZ KURT D	0	14-DEC-06	D	I can't do anything without the electronic data.
VANDEL DOUG S	0	13-DEC-06	A	
MCMANAMON LAWRENCE E	0	14-DEC-06	D	
TUOTT LEE C	0	18-DEC-06	A	
DRIEVER MIKEL K	0	13-DEC-06	D	
LANDIS JOSEPH A	0	13-DEC-06	A	no comment

The following reviewers have NOT yet reviewed this vendor data item
 JOLLEY WENDELL L

VDR Number:	VDR-158614
Revision Level:	0
Project Number:	23368 - 152173
Transmittal Number:	S-507296-013
Transmittal Status:	Mandatory Approval
Line Item:	1

Disposition Code::
A

Final Comments::

VDS #8_153746

VENDOR DATA
TRANSMITTAL & DISPOSITION FORM

ORIGINAL

To be completed by Supplier/Subcontractor

Purchase Order or Subcontract Number: 00507296 - 04 R.1 Project Title/Number: Remediation of The STF - 02 Gun Range
 Submittal Number: 6131 - 05 R - 01 Supplier/Subcontractor Name: Phenix Construction
 Submittal Date: 10-06-06 Address: P.O. Box 1626 Idaho Falls Idaho 83403 23368-152173

INEEL VDS Item No.	VDT Item No.	Specification/ Drawing Reference	Tag Number	Submittal Status	Revision Level	Supplier/ Subcontractor Document Number (if applicable)	Description	INEEL VDR Number	Disp Code
8		02200		M.A.	R - 01	6131 - 05 R - 01	Emissions and Dust Control Plan	153746	A

Remarks

 10-06-06
 Supplier/Subcontractor Authorized Signature / Date

To Be Completed by Contractor/AE

 INEEL Authorized Signature / Date

F-181

<input checked="" type="checkbox"/> A WORK MAY PROCEED SUBJECT TO INCORPORATION OF COMMENTS	<input type="checkbox"/> B REVISE AND RESUBMIT WORK MAY BE CHANGED SUBJECT TO INCORPORATION OF CHANGES INDICATED	<input type="checkbox"/> C REVISE AND RESUBMIT WORK MAY NOT PROCEED	<input type="checkbox"/> D REVISE NOT REQUIRED WORK MAY PROCEED
VDR NO. 153746 R.O			DATE: 11-30-06
BY: <i>Amittie Apple</i>			

REMEDICATION OF THE STF-02 GUN RANGE EMISSIONS AND DUST CONTROL PLAN

DEMOLITION OF STF-02 SHOOT HOUSE

During demolition activities materials will be sprayed lightly with water supplied by 4000 gal water truck with hose to minimize dust.

EARTHWORK

During excavation of the 1.5' of lead contaminated soil from the berm a 4000 gal water truck with hose will be used to spray soils in front of excavation activities and while excavation is taking place. This material will be moved and stockpiled on 40 Mil liner or another suitable barrier. Soil will be sprayed with water truck while being stockpiled. Stockpiles will be covered with 10 Mil liner at end of each day. A written Exposure – Monitoring Plan will be submitted to CWI and approved by CWI prior to the start of any lead contaminated soil excavation and any screening activities.

During excavation and grading of the remaining berms to the Leach Pond a 4000 gal water truck will be used to minimize dust.

SOIL SCREENING

During screening operations stockpiles will be sprayed with water supplied by 4000 gal water truck with hose and screening operation lightly sprayed with water to minimize dust. A written Exposure – Monitoring Plan will be submitted to CWI and approved by CWI prior to the start of any lead contaminated soil excavation and any screening activities.

Note:

If water does not adequately minimize dust during excavation and screening of lead contaminated soils water amended with Sockopam (Terra Bond) may also be applied with use of a Hydro Seeder Unit. Water amended with Stockopam (Terra Bond) may also be used to cover stockpiled soils at end of each day in lieu of 10 Mil liner.

Vendor Data Review System Final Disposition Screen

This vendor data item has been given the following disposition codes

Reviewer	Revision Level	Date	Disposition Code	Comments
TUOTT LEE C	1	28-NOV-06	A	
DRIEVER MIKEL K	1	09-OCT-06	A	
DRIEVER MIKEL K	0	02-OCT-06	D	
FRITZ KURT D	0	04-OCT-06	A	
VANDEL DOUG S	0	02-OCT-06	A	
MCMANAMON LAWRENCE E	1	09-OCT-06	A	
MCMANAMON LAWRENCE E	0	05-OCT-06	A	
JOLLEY WENDELL L	1	09-OCT-06	D	
LANDIS JOSEPH A	1	09-OCT-06	A	NO COMMENT
TUOTT LEE C	0	02-OCT-06	B	Please revise/clarify the produce used for the "amended water." There needs to be a 1:1 tie with this produce/chemical and the approved list of chemicals.
JOLLEY WENDELL L	0	03-OCT-06	D	
VANDEL DOUG S	1	09-OCT-06	A	
FRITZ KURT D	1	10-OCT-06	A	
LANDIS JOSEPH A	0	05-OCT-06	A	no comments

VDR Number: VDR-153746
Revision Level: 1
Project Number: 23368 - 152173
Transmittal Number: S-507296-04R.1
Transmittal Status: Mandatory Approval
Line Item: 1

Disposition Code::
A

Final Comments::

VDS #9_155291

**VENDOR DATA
TRANSMITTAL & DISPOSITION FORM**

ORIGINAL

To Be Completed by Supplier/Subcontractor

Purchase Order or Subcontract Number: 00507296 - 08 R.O Project Title/Number: Remediation of The STF - 02 Gun Range
 Submittal Number: 6131 - 08 Supplier/Subcontractor Name: Phenix Construction
 Submittal Date: 10-25-06 Address: P.O. Box 1626 Idaho Falls Idaho 83403 23368-152173

INEEL VDS Item No.	VDT Item No.	Specification/ Drawing Reference	Tag Number	Submittal Status	Revision Level	Supplier/ Subcontractor Document Number (if applicable)	Description	INEEL VDR Number	Disp Code
9		02486		M.A.	0	6131 - 08	Seed Mix Certification	155291	A

Remarks

AP 10-25-06
 Supplier/Subcontractor Authorized Signature / Date

To Be Completed by Contractor/AF

 INEEL Authorized Signature / Date

F-187

Granite Seed Company
 1697 West 2100 North
 Lehi, Utah 84043
 801-768-4422

57515
 171735

DATE SHIPPED: 10/23/2006

SOLD TO:
 PHENIX OF IDAHO, INC.
 P.O. BOX 1626
 IDAHO FALLS, ID 83403-1626

PROJECT NAME: STF-02 GUN RANGE
 SEED MIX NUMBER: 57515

Letter of Certification

This memo is written to certify that this seed mix is true to label and has been duly tested by a fully accredited seed testing laboratory using rules sanctioned by the Association of Official Seed Analysts. The specifications of the seed used in the mix are as follows:

Common Name	Variety	Origin	Lot#	Purity	Germ + Dorm.	%PLS
LOW RABBITBRUSH	VNS	UT	CHVI -30899	31.18	67	20.89
INDIAN RICEGRASS	RIMROCK	MT	ORHY -36207	99.70	97	96.71
SQUIRRELTAIL	VNS	WA	SIHY -36358	96.49	89	85.88
WESTERN WHEATGRASS	ROSANA	WA	AGSM -36286	96.64	95	91.81
BLUEBUNCH WHEATGRASS	GOLDAR	WA	AGSP -35608	91.95	93	85.51
BOREAL SWEETVETCH	TIMP	WY	HEBO -36071	98.78	86	84.95
MUNRO GLOBEMALLOW	VNS	AZ	SPMU -32558	98.05	90	88.25
THICKSPIKE WHEATGRAS	BANNOCK	WA	AGDA -36377	95.64	94	89.90

Furthermore, we certify that said seed was packed as follows:

Number of Bags	Bulk Lbs.	Per Bag
1	50.00	
1	12.47	

The number of pounds and percent of bulk for this mix are as follows:

Common Name	Lot#	Total Bulk Lbs.	Total PLS Lbs.	% Bulk Lbs.
LOW RABBITBRUSH	CHVI -30899	9.57	2.00	15.11
INDIAN RICEGRASS	ORHY -36207	8.27	8.00	13.05
SQUIRRELTAIL	SIHY -36358	9.32	8.00	14.70
WESTERN WHEATGRASS	AGSM -36286	8.71	8.00	13.75
BLUEBUNCH WHEATGRASS	AGSP -35608	9.36	8.00	14.76
BOREAL SWEETVETCH	HEBO -36071	4.71	4.00	7.43
MUNRO GLOBEMALLOW	SPMU -32558	4.53	4.00	7.15
THICKSPIKE WHEATGRAS	AGDA -36377	8.90	8.00	14.04

If you have any questions, please call.

Sincerely,
 Granite Seed Co.

<input checked="" type="checkbox"/> A WORK MAY PROCEED SUBJECT TO INCORPORATION OF COMMENTS
<input type="checkbox"/> B REVIEW AND RESUBMIT WORK MAY PROCEED SUBJECT TO INCORPORATION OF CHANGES INDICATED
<input type="checkbox"/> C REVIEW AND RESUBMIT WORK MAY NOT PROCEED
<input type="checkbox"/> D REVIEW NOT REQUIRED WORK MAY PROCEED
VDR NO. 155291R.D
BY: Annette Pool
DATE: 11-3-06

Granite Seed Company
1697 West 2100 North
Lehi, Utah 84043

57515
171735

CERTIFIED COPY OF SEED ANALYSIS

Lot Number: CHVI -30899

Kind and Variety: VNS - LOW RABBITBRUSH

Scientific Name: CHRYSOTHAMNUS VISCIDIFLOR

Pure Seed %: 31.18 Total Viable %: 67.00

Crop %: 0.07 Germination %: 67.00

Inert %: 68.33 Hard Seed %: 0.00

Weed %: 0.42 Date of Test: 11/30/2005

Pure Live Seed %: 20.89 Origin: UT

Name of Lab: ID=P UT=TZ

Noxious or Restricted Weeds (all 50 States):

DOWNY BROME 674# COMMON YARROW 225#

NEEDEDLEGRASS 225#

Lot Number: ORHY -36207

Kind and Variety: RIMROCK - INDIAN RICEGRASS

Scientific Name: ACHNATHERUM HYMENOIDES

Pure Seed %: 99.70 Total Viable %: 97.00

Crop %: 0.00 Germination %: 97.00

Inert %: 0.27 Hard Seed %: 0.00

Weed %: 0.03 Date of Test: 12/29/2005

Pure Live Seed %: 96.71 Origin: MT

Name of Lab: MT=P&TZ

Noxious or Restricted Weeds (all 50 States):

NONE

Granite Seed Company certifies that this analysis accurately represents the original copy of seed analysis and, where applicable, all testing has been conducted by a certified Seed Technologist using the sanctioned rules established by the Association of Official Seed Analysts.

Signature: 

Date: 10-23-06

Granite Seed Company
1697 West 2100 North
Lehi, Utah 84043

57515
171735

CERTIFIED COPY OF SEED ANALYSIS

Lot Number: SIHY -36358

Kind and Variety: VNS - SQUIRRELTAIL

Scientific Name: ELYMUS ELYMOIDES

Pure Seed %: 96.49 Total Viable %: 89.00

Crop %: 0.04 Germination %: 89.00

Inert %: 3.47 Hard Seed %: 0.00

Weed %: 0.00 Date of Test: 10/10/2006

Pure Live Seed %: 85.88 Origin: WA

Name of Lab: WY=TZ AGRI-QUAL=TZ

Noxious or Restricted Weeds (all 50 States):

NONE

Lot Number: AGSM -36286

Kind and Variety: ROSANA - WESTERN WHEATGRASS

Scientific Name: PASCOPYRUM SMITHII

Pure Seed %: 96.64 Total Viable %: 95.00

Crop %: 0.38 Germination %: 95.00

Inert %: 2.89 Hard Seed %: 0.00

Weed %: 0.09 Date of Test: 09/22/2006

Pure Live Seed %: 91.81 Origin: WA

Name of Lab: MT=P&TZ

Noxious or Restricted Weeds (all 50 States):

Salsola kali 5/1.00 lb

Granite Seed Company certifies that this analysis accurately represents the original copy of seed analysis and, where applicable, all testing has been conducted by a certified Seed Technologist using the sanctioned rules established by the Association of Official Seed Analysts.

Signature: _____

Date: 10-23-06

Granite Seed Company
1697 West 2100 North
Lehi, Utah 84043

57515
171735

CERTIFIED COPY OF SEED ANALYSIS

Lot Number: AGSP -35608

Kind and Variety: GOLDAR - BLUEBUNCH WHEATGRASS

Scientific Name: PSEUDOROEGNERIA SPICATA SSP. SPICATA

Pure Seed %: 91.95 Total Viable %: 93.00

Crop %: 2.04 Germination %: 93.00

Inert %: 6.01 Hard Seed %: 0.00

Weed %: 0.00 Date of Test: 08/24/2006

Pure Live Seed %: 85.51 Origin: WA

Name of Lab: WA=G WA=G

Noxious or Restricted Weeds (all 50 States):

NONE

Lot Number: HEBO -36071

Kind and Variety: TIMP - BOREAL SWEETVETCH

Scientific Name: HEDYSARUM BOREALE

Pure Seed %: 98.78 Total Viable %: 86.00

Crop %: 0.00 Germination %: 54.00

Inert %: 1.22 Hard Seed %: 32.00

Weed %: 0.00 Date of Test: 08/28/2006

Pure Live Seed %: 84.95 Origin: WY

Name of Lab: WY=P&G

Noxious or Restricted Weeds (all 50 States):

NONE

Granite Seed Company certifies that this analysis accurately represents the original copy of seed analysis and, where applicable, all testing has been conducted by a certified Seed Technologist using the sanctioned rules established by the Association of Official Seed Analysts.

Signature: _____

Date: 10-23-06

Granite Seed Company
1697 West 2100 North
Lehi, Utah 84043

57515
171735

CERTIFIED COPY OF SEED ANALYSIS

Lot Number: SPMU -32558

Kind and Variety: VNS - MUNRO GLOBEMALLOW

Scientific Name: SPHAERALCEA MUNROANA

Pure Seed %: 98.05 Total Viable %: 90.00

Crop %: 0.00 Germination %: 90.00

Inert %: 1.67 Hard Seed %: 0.00

Weed %: 0.28 Date of Test: 05/10/2006

Pure Live Seed %: 88.25 Origin: AZ

Name of Lab: ID=P&TZ AZ=TZ

Noxious or Restricted Weeds (all 50 States):

GRAMA 1002/#
UNKNO WN 200/#

Lot Number: AGDA -36377

Kind and Variety: BANNOCK - THICKSPIKE WHEATGRASS

Scientific Name: ELYMUS LANCEOLATUS SSP. LANCEOLATUS

Pure Seed %: 95.64 Total Viable %: 94.00

Crop %: 0.00 Germination %: 94.00

Inert %: 4.07 Hard Seed %: 0.00

Weed %: 0.29 Date of Test: 09/27/2006

Pure Live Seed %: 89.90 Origin: WA

Name of Lab: WA=P,G,&T

Noxious or Restricted Weeds (all 50 States):

NONE

Granite Seed Company certifies that this analysis accurately represents the original copy of seed analysis and, where applicable, all testing has been conducted by a certified Seed Technologist using the sanctioned rules established by the Association of Official Seed Analysts.

Signature:



Date: 10-23-06

Vendor Data Review System Final Disposition Screen

This vendor data item has been given the following disposition codes

Reviewer	Revision Level	Date	Disposition Code	Comments
LANDIS JOSEPH A	0	26-OCT-06	A	no comment
DRIEVER MIKEL K	0	30-OCT-06	A	
FRITZ KURT D	0	02-NOV-06	D	
JOLLEY WENDELL L	0	26-OCT-06	D	
JOLLEY WENDELL L	0	26-OCT-06	D	
VANDEL DOUG S	0	26-OCT-06	A	
JOLLEY WENDELL L	0	26-OCT-06	A	
MCMANAMON LAWRENCE E	0	26-OCT-06	D	
TUOTT LEE C	0	02-NOV-06	A	Approve - have less than 4 ac. to seed so the amounts will be sufficient per the spec.

VDR Number: VDR-155291
 Revision Level: 0
 Project Number: 23368 - 152173
 Transmittal Number: S-507296-08
 Transmittal Status: Mandatory Approval
 Line Item: 1

Disposition Code:
A

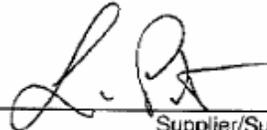
Final Comments:

VDS #10_153317

431.13
07/23/2002
Rev. 04

**VENDOR DATA
TRANSMITTAL & DISPOSITION FORM**

ORIGINAL

To be completed by Supplier/Subcontractor									
Purchase Order or Subcontract Number: <u>00507296 - 03 R.O</u>			Project Title/Number: <u>Remediation of The STF - 02 Gun Range</u>						
Submittal Number: <u>6131 - 03</u>			Supplier/Subcontractor Name: <u>Phenix Construction</u>						
Submittal Date: <u>09-21-06</u>			Address: <u>P.O. Box 1626 Idaho Falls Idaho 83403</u>				<u>23368-152173</u>		
INEEL VDS Item No.	VDT Item No.	Specification/ Drawing Reference	Tag Number	Submittal Status	Revision Level	Supplier/ Subcontractor Document Number (if applicable)	Description	INEEL VDR Number	Disp Code
10		02486		M.A.	0	6131 - 03	Soil Analysis	153317	A
Remarks									
 <u>09-21-06</u> Supplier/Subcontractor Authorized Signature / Date									
To Be Completed by Contractor/AE									
_____ INEEL Authorized Signature / Date									

F-197

STUKENHOLTZ LABORATORY, INC.

2924 ADDISON E. POB 353 TWIN FALLS, ID 83303
 TEL: 208.734.3050, 800.759.3050 FAX 734.3919

42
 VALLEY WIDE COOPERATIVE
 AGRONOMY CENTER
 4750 SOUTH 15TH WEST
 IDAHO FALLS ID 83402

208/523-0751
 208/523-0760

Report No. 38175/38176
 Date Received 9/29/04
 Date Reported 9/30/04

GROWER: PHOENIX OF IDAHO

OIL TEST DATA	Sample 1	Sample 2		Sample 1	Sample 2
			SAMPLE IDENTITY	RYE GRASS	ARA
H.....	8.1 H	7.7 H	CROP	GRASS	GRASS
IALTS, mmhos/cm...	0.7 L	17.0 VH	YIELD GOAL	4 T	4 T
ODIUM, meq/100g...	0.3 VL	2.0 H	ACRES	41	41
EC, meq/100g....	20.8 H	21.3 H	PAST CROP T/Acre	GRASS	GRASS
EXCESS LIME, t...					
ORGANIC MATTER, %					
ORGANIC N, lb/Acre					
NITRATE-N, ppm...					
P PHORUS, ppm...					
POTASSIUM, ppm...					
CALCIUM, meq/100g.					
MAGNESIUM, meq/100					
SULFATE-S, ppm...					
ZINC, ppm.....					
IRON, ppm.....					
MANGANESE, ppm...					
COPPER, ppm.....					
BORON, ppm.....					
SOIL TEXTURE...					
RATINGS :		VL			

<input checked="" type="checkbox"/>	A WORK MAY PROCEED SUBJECT TO INCORPORATION OF COMMENTS
<input type="checkbox"/>	B REVISE AND RESUBMIT WORK MAY PROCEED SUBJECT TO INCORPORATION OF CHANGES INDICATED
<input type="checkbox"/>	C REVISE AND RESUBMIT WORK MAY NOT PROCEED
<input type="checkbox"/>	D REVIEW NOT REQUIRED WORK MAY PROCEED
VDR NO. <u>153317 R.D</u>	
BY: <u>Annette Poole</u>	
DATE: <u>9-27-06</u>	

SAMPLE	Actual %	Recd
	Potassium	Pot
1	9.5	3.0
2	2.2	

ADP1: NH4-N 3 ppm, CT
 E BOTH: SPLIT APPLICATION
 M CROP2: SODIUM IS TOO F
 A CROP2: EXAMPLES OF ACI
 R CROP2: SOIL IS SALINE
 K CROP2: LOW SOIL P_h US
 S

Vendor Data Review System Final Disposition Screen

This vendor data item has been given the following disposition codes

Reviewer	Revision Level	Date	Disposition Code	Comments
DRIEVER MIKEL K	0	25-SEP-06	D	
VANDEL DOUG S	0	25-SEP-06	A	
TUOTT LEE C	0	25-SEP-06	D	No comments.
FRITZ KURT D	0	22-SEP-06	A	
MCMANAMON LAWRENCE E	0	26-SEP-06	A	None

VDR Number:	VDR-153317
Revision Level:	0
Project Number:	23368 - 152173
Transmittal Number:	S-507296-03
Transmittal Status:	Mandatory Approval
Line Item:	1

Disposition Code::
A

Final Comments::
No comment

VDS #11_153751

**Exposure Monitoring Plan
for the Remediation of the STF-02 Gun Range**

<input checked="" type="checkbox"/>	A WORK MAY PROCEED SUBJECT TO INCORPORATION OF COMMENTS
<input type="checkbox"/>	B REVISE AND RESUBMIT WORK MAY PROCEED SUBJECT TO INCORPORATION OF CHANGES INDICATED
<input type="checkbox"/>	C REVISE AND RESUBMIT WORK MAY NOT PROCEED
<input type="checkbox"/>	D REVIEW NOT REQUIRED WORK MAY PROCEED
VDR NO. <u>153751 R.2</u>	
BY: <u>Annette Rode</u>	
DATE: <u>10-18-06</u>	

1. Location of Project:

This job will take place at the STF-02 Gun Range facility near the Central Facilities Area (CFA) at the Idaho National Lab (INL). This firing range is an outdoor facility.

2. Brief Description of Job:

Phenix Construction will perform remediation of the STF-02 Gun Range site at the INL. Remediation requires the removal of lead and treatment and disposal of lead contaminated soil found within the STF-02 Gun Range. Spent ammunition was the source of lead and lead contamination.

Phenix shall furnish labor, material, equipment and supplies (other than government-furnished materials and/or equipment) and perform work and operations necessary to remediate the lead contaminated soil site to remediation action goals, in accordance with the construction drawings and these specifications.

3. Personnel and companies involved in the project are:

<u>Organization</u>	<u>Individual</u>	<u>Phone</u>
CWI Project Oversight	Joseph Landis	(208) 526-6311
CWI Safety POC	Larry McManamon	(208) 526-3658
Phenix Project Manager	Lance Peterson	(208) 524-6488
Health and Safety Lead	Mike Garcia	(208) 524-6488
HSO Level II and Lead Competent Person	Adam Hult	(208) 351-2325

4. Schedule

Prior to arriving at the site, Phenix personnel will submit this exposure monitoring plan to the CWI - Safety Contact (Larry McManamon) and the CWI STR (Jody Landis) for review and comments. Work will begin when the CWI STR and Safety Contact provide approval. Phenix is anticipating beginning work in mid-October 2006 with duration of one to two months.

5. Sequence of work

Table 1, located at the end of this exposure monitoring plan provides a description of potential and anticipated project exposures associated with the following remediation tasks. All tasks are designated to be performed in Level D PPE, but Level C (use of half-faced respirators) will be worn for tasks specified in Table 1

until lead exposure levels are known (see Section 12). Tasks associated with the remediation and cleanup at the STF-02 Gun Range are defined as:

- ***Mobilization***
- ***Constructing Staking and Surveying***

Construction surveys will be conducted throughout and following the execution of the project, from baseline topography to post-remediation of specific areas receiving clean fill and revegetation.

- ***Demolition and Removal***

During and after the clean soil excavation, site demolition will occur. Care will be exercised in excavating, loading, hauling, screening, and dumping of contaminated waste to minimize dust generation. Dust minimization practices will be implemented to mitigate any release of airborne contaminants. Suspect contaminated materials will be sprayed down by the water truck to minimize dust from demolition activities. Some materials removed will be loaded and hauled on site to designated disposal locations or landfills (i.e., bulky waste). Contaminated sand will be carefully excavated and screened. Appropriate Personal Protective Equipment, as required, will be worn by all operators and laborers performing this work. Demolished materials will be properly segregated. Baseline exposure monitoring will occur during demolition and removal of suspect materials.

- ***Excavation, Stockpiling, and Screening of Lead-Contaminated Soils***

Care will be taken to minimize contact with and dust generation from moving and handling materials. Baseline exposure monitoring will occur during these activities.

- ***Vehicle Loading***

Sieved soil will be loaded onto vehicles for shipment to an off-site treatment, storage, or disposal facility. Care will be taken to minimize dust generation. Baseline exposure monitoring will occur during vehicle loading of sieved soils.

- ***Grading and Revegetation of Disturbed Areas***

Clean soil and seeding will be added to area as part of the remediation. Care will be taken to minimize dust generation.

- ***Demobilization***

After the remedial action has been completed and all equipment has been decontaminated, all materials, supplies, tools, equipment, and project-derived wastes will be removed from the site.

The task requiring Level C PPE during the initial exposure assessment are *Demolition and Removal, Excavation, Stockpiling, and Screening of Lead-Contaminated Soils, and Vehicle Loading*. Once monitoring results are known, PPE levels can be downgraded if work practices and controls are proven to be effective.

6. Equipment and Materials

Excavators, front end loaders, dozers, shovels, rakes, protective clothing, cotton and leather gloves, hoses and sprayers, power and other hand tools as needed.

7. Crew

The initial setup of the work areas, contamination areas, waste segregation, and soil screening will be established by the Phenix crew members and the health and safety person. Key crew assignments include:

<i>Phenix Project Lead:</i>	Lance Peterson
<i>Phenix Health and Safety Lead:</i>	Mike Garcia
<i>Lead Competent Person:</i>	Adam Hult

8. Competent Person

A designated *Competent Person* for occupational health and safety issues will be on site at all times. This person will conduct daily inspections of the work areas to ensure that control measures, work practices, personnel protective equipment, and hygiene facilities are used as prescribed in this document. Additional Lead Competent Person's for specific tasks such as excavation will be identified during the project. Other personnel may be trained to act as a backup competent person on this project. This person is also responsible for all exposure monitoring activities and ensuring that samples are sent to a lab accredited by the American Industrial Hygiene Association (AIHA) for analysis.

9. Control Measures

During all phases of the scope of work, controls (primarily dust suppression with water) will be implemented to minimize the lead dust exposure. Lead containing dust has a high density and does not easily disperse like many other materials (e.g. asbestos, etc.). Physical containment and proper work practices will be sufficient to prevent untoward spread of dusts outside the immediate working zone. All due caution will be exercised by field staff to avoid actions that would tend to transport project derived dusts from leaving the work zone. Personnel working in potential or known lead contaminated areas must complete *Lead Awareness* and *Lead Worker* training.

Baseline sampling (personal and area sampling) will be performed to assess the effectiveness of controls in places. As a precaution, personnel with potential lead exposure will wear respiratory protection during the initial monitoring period until exposure levels are known.

10. Medical Surveillance

Lead workers assigned to work full-time to the project (40 hours/week) who enter controlled areas during excavation or lead contaminated soil handling will have an initial blood-Pb sample taken prior to beginning work at the site. At the direction of the *Health and Safety Lead* or the *Competent Person*, additional blood-Pb levels will be taken if monitoring data concludes the action level can be or was exceeded. Worker blood lead increases of 10 mg/dl or more will trigger an investigation of protective equipment and work practices. Workers will be removed from high risk exposure activities if blood-Pb levels are greater than 50 µg/dl. All workers on this project are informed of their blood lead levels as soon as results are received.

11. Technology Considered in Meeting Permissible Exposure Limit (PEL)

The only specialized mechanism that will be utilized for this project is the use of water and/or amended water for dust suppression and natural ventilation as work is performed in an outdoor environment.

A designated *Lead Competent Person* for occupational health and safety issues will be on site at all times. This person will conduct daily inspections of the work areas to ensure that control measures, work practices, personnel protective equipment, and hygiene facilities are used as prescribed in this document. Additional personnel may be trained to act as a backup competent person on this project.

12. Exposure Monitoring

During all phases of the scope of work controls will be in operation to minimize the lead dust exposure, primarily with administrative controls and dust suppression with water. Sampling will be performed as outlined in Table 1. Lead containing dust has a high density and does not easily disperse like many other materials (e.g. asbestos, etc.). All due caution will be exercised by field staff to avoid actions that would tend to transport project derived dusts from leaving the work zone. Administrative controls, such as job rotation and stay times, will also be used to maintain a workers 8-hr time-weight average (TWA) below the action level (AL) or permissible exposure level (PEL). The AL for lead is 30 µg/m³ and the PEL is 50 µg/m³ for 8-hr time weighted averages. All personnel working in potential or known lead contaminated areas must complete *Lead Awareness* and *Lead Worker* training.

NOTE 1: *Engineering and administrative controls are key to keeping employees below the PEL. As stated in PRD-2105, Lead, when a work environment > or equal to the PEL additional requirements must be met.*

Baseline sampling (personal and area sampling) of personnel and tasks will occur as part of performing an initial exposure assess as outlined in Table 1. IF the initial exposure assessment shows the possibility of an employee exposure at or above the action level, THEN representative monitoring shall be conducted for each employee in the workplace who is exposed to lead, according to the following schedule:

- IF exposure > PEL, THEN monitoring shall be conducted quarterly until at least 2 consecutive measurements, taken at least 7 days apart, are at or below the PEL, after which monitoring shall be performed as in (B) below.
- IF the exposure is < PEL and > AL, THEN monitoring shall be conducted every six months until at least 2 consecutive measurements, taken at least 7 days apart, are below the action level, after which monitoring may be discontinued.

NOTE 2: *If sampling results indicate that an unprotected worker's sample results > PEL then the worker must be immediately notified of the sample results and the Miscellaneous Sites Completion Point of Contact must also be notified within two hours of knowledge of that exposure (per PRD-2111).*

NOTE 3: *If unprotected workers have sample results > AL but < PEL then the Miscellaneous Sites Completion Point of Contact must be notified of the exposures.*

When administrative controls are used as a means of reducing employee exposure to lead, job rotation or a stay time schedule shall be established and implemented using the following:

1. Name or identification number of each affected employee
2. Duration and exposure levels at each job or work station where each affected employee is located, and
3. Any other applicable information that may be useful in assessing the reliability of the administrative controls.

When airborne lead concentrations exceed the PEL during a work activity, *written compliance documentation* shall be provided, using any of the following:

1. Work order

2. Approved procedure
3. Task sheet
4. Exposure assessment
5. Any other hazard evaluation (see PRD-1501, *Work Control*).

Lead workers assigned to work full-time to the project (40 hours/week) will have an initial blood-Pb sample taken prior to beginning work at the site. Blood-Pb levels will be taken if monitoring indicates the AL can be or was exceeded. Worker blood lead increases of 10 mg/dl or more will trigger an investigation of protective equipment and work practices. Workers with blood-Pb levels > 40 µg/dl must be informed in writing within five working days of result receipt. Workers will be removed from high risk exposure activities if blood-Pb levels are greater than 50 µg/dl. All workers on this project will be informed of their blood lead levels as soon as results are received.

13. Technology Considered in Meeting Permissible Exposure Limit

The only specialized mechanism that will be utilized for this project is the use of water and/or amended water for dust suppression and natural ventilation as work is performed in an outdoor environment. If sample results indicate workers are exposed above the AL or PEL-TWA then additional controls may need to be instituted and personal will be required to wear respiratory protection

14. Respirators

As all workers are deemed to be performing *incidental work*, but respirators will be worn during baseline sampling activities as indicated in Table 1, until sample results are obtained. Once known, PPE levels can be downgraded if work practices and controls are proven to be effective. Respirators will be selected in accordance with PRD-2109, Respiratory Protection and Appendix B of PRD-2105, Lead.

Phenix shall have and follow a written *Respiratory Protection Program* and be responsible to confirm to the requirement of 29 CFR 1926.103 and 29 CFR 1910.134, and American National Standards Institute (ANSI) Z88.2 standard. Medical exam and fit test records will be submitted as part of the training documentation to the CWI Safety POC.

If initial and routine sampling indicate the AL ($30\mu\text{g}/\text{m}^3$), but < PEL ($50\mu\text{g}/\text{m}^3$), may be or has been exceeded then a respirator can be prescribed either at the direction of the Health and Safety Lead or at a worker's request.

15. Protective Clothing

Level D PPE will be prescribed for this project, but Level C (use of half-faced respirators) will be worn for tasks specified in Table 1 until lead exposure levels

are known. Used disposable or designated work clothing (coveralls) will be sealed in poly bags or drums provided by Phenix. Work clothing will be donned and doffed in designated areas and shall not be the same clothing worn home by workers. Phenix will be responsible for the proper laundering and disposal of all PPE, paper and misc. debris generated during the work phase of this project.

16. Hygiene Facilities

Proper hygiene facilities will help eliminate or reduce cross-contamination and ingestion of lead-contaminated dust. Hand washing facilities will be used to decontaminate workers. A waterless wash area will be set up inside the range itself. Portable toilets and washroom facilities at the job-site must be provided and maintained by the Phenix. Water, soap and towels will be provided. Hands and face will be washed before all breaks and at the end of the day. If employees are working in an environment \geq or equal to the PEL then they will be provided a clean change area, PPE, and a shower facility. It is recommended to have disposable PPE to doff at a designated area. Follow proper guidelines for labeling and disposal of lead contaminated PPE. Employees are not permitted to enter eating facilities or leave work area wearing lead-contaminated PPE or equipment. Contact CWI Safety Contact about shower facility locations at the INL.

17. Air Monitoring Data

As stated previously, air sampling will be performed on this job. Based on expected results, the greatest potential for lead exposure will occur during the demolition and removal, excavation, stockpiling, screening of lead contaminated soil, and vehicle loading. No previous exposure monitoring is available so baseline sampling will be performed. It is expected that 8-hour time weighted average exposures on the job will be lower than the action level. See Table 1 for prescribed sampling methods.

18. Workers Right to Know

Sample results must be disseminated to each employee within 24 hours of laboratory analysis receipt. Affected employees have the right to be informed about sampling methods, the monitoring process, and may request copies laboratory results. Identified exposures in excess of the established limits must be reported to the contractor within one hour of receipt. If results are greater than the AL or PEL then the prescribed guidelines of PRD-2105 shall be implemented. All workers on this project are informed of their blood lead levels as soon as results are received.

19. Training

All workers entering the controlled work areas will have *Lead Awareness* and *Lead Worker* training to be informed as the hazards associated with lead exposure ways to eliminate and reduce exposure to lead.

20. Work Practice Program

Safety is first and foremost on every project undertaken by Phenix. Each employee is expected to review and adhere to the safety practices and procedures outlined in the site specific Health and Safety Plan. Daily discussions are held as needed to review any potentially hazardous tasks or procedures to be undertaken that day or any events from the previous day that could have had a potential for causing an accident.

Table 1. Activities and associated potential or anticipated exposure hazard.

Activity	Potential or Anticipated Exposures	Anticipated Exposure Level	Actions Used to Eliminate or Mitigate Exposures	Sample Method	Sample Frequency
Mobilization ¹	Lead ³ - airborne	< AL	<i>Lead Awareness and Lead Worker training.</i>	NA	No Sampling.
Construction Staking and Surveying ¹	Lead ³ - airborne	< AL	<i>Lead Awareness and Lead Worker training.</i>	NA	No Sampling.
Demolition and Removal ²	Lead ³ - airborne	< AL	<ul style="list-style-type: none"> • <i>Lead Awareness and Lead Worker training.</i> • <i>Level D PPE</i> • <i>Dust suppression with water.</i> • <i>Personnel will work with closed cabs.</i> • <i>Personnel will work upwind from visible dust.</i> 	NIOSH 7300 (air samples) NIOSH 9100 (wipe samples)	<ul style="list-style-type: none"> • <i>Baseline personnel and area sampling. At least two personal samples taken each day at the start of each task for the first three days of work. Additional samples may be collected as necessary. Area samples will be taken at H&S Lead's or Competent Person's discretion.</i> • <i>If air monitoring levels are > AL collect wipe samples from designated eating areas, inside cabs, and from PPE.</i>⁵
Excavation, Stockpiling, and Screening of Lead-Contaminated Soil ²	Lead ³ - airborne Lead - skin contamination	< AL			
Vehicle Loading ²	Lead ³ - airborne	< AL			
Final Grading and Revegetation of Disturbed Areas ¹	Lead ³ - airborne	< AL	<ul style="list-style-type: none"> • <i>Lead Awareness and Lead Worker training.</i> • <i>If deemed necessary, dust suppression with water.</i> 	NA	No sampling. ⁴
Demobilization ¹	Lead ³ - airborne	< AL	<i>Lead Awareness and Lead Worker training.</i>	NA	No sampling.
<ol style="list-style-type: none"> 1. Little or no disturbance anticipated. 2. Moderate to heavy disturbance anticipated. 3. Applicable standard: 29 CFR 1926.62, Lead. 4. Sampling will occur if results from other activities >AL (AL=30µg/m³). 5. Frequency of wipe samples will occur at the direction of the <i>Health and Safety Lead or Competent Person.</i> 					

Vendor Data Review System Final Disposition Screen

This vendor data item has been given the following disposition codes

Reviewer	Revision Level	Date	Disposition Code	Comments
TUOTT LEE C	0	02-06	OCT- D	
TUOTT LEE C	0	02-06	OCT- D	
FRITZ KURT D	0	04-06	OCT- D	
LANDIS JOSEPH A	0	05-06	OCT- A	no comments
MCMANAMON LAWRENCE E	1	17-06	OCT- B	<p>1. Reference to the construction Lead standard is identified as 29CFR 1910.62 on footnote 3 of Table 1. Suggest change to 29CFR 1926.62, "Lead". 2. Section 5 suggest delete incidental lead work. 3. Section 12, Note 2 and Note 3, delete "INL construction Management and INL Construction Management IH" and change to "Miscellaneous Sites Completion Project Point of contact" 4. Section 12, Number 5, change to PRD-1501, "Work Control". 5. Section 15, Level D PPE is prescribed for this project. Personnel working in close proximity to lead contaminated materials may need to wear some type of coveralls to ensure we don't allow contaminated clothing to leave controlled areas. Suggest this is not the same clothing they wear home every evening. 6. editorial only: Section 13, last sentence, insert "wear" or "continue with" between the words "to" and respirator" and change respirator to "respiratory" . 7. Since we are to use respiratory protection, PRD-2109, Respiratory Protection" applies and section 3.1.1 requires each subcontractor to have a written Respiratory Protection Program that complies with all requirements of 29 CFR 1926.103, 29 CFR 1910.134, and American National Standards Institute (ANSI) Z88.2 standard. Both medical exams and fit test records will need to be submitted as part of the training documentation.</p>
MCMANAMON LAWRENCE E	2	18-06	OCT- A	
VANDEL DOUG S	0	02-06	OCT- A	
DRIEVER		02-		

MIKEL K 0 OCT- D
06

JOLLEY 0 03-
WENDELL L OCT- D
06

MCMANAMON 0
LAWRENCE E OCT- C
06

1. The assumption in this plan is there will be no potential for lead exposure at or above the action level or exposure limits and therefore no respiratory protection is anticipated unless dusty conditions are generated. It is recommended personnel with potential lead exposure that are to be monitored for lead exposure begin wearing respiratory protection until exposure levels are known. Once known, PPE could be downgraded if exposure levels are controlled by work practices, ect. If levels are found to be in excess of teh AL or PEL, then additional controls may be instituted and the personnel were protected by the respiratory protection. We don't want to start without respiratory protection; over expose workers to lead; and prove it by monitoring. We need to be proactive, not reactive. 2. General I would make sure that they include a statement that if the subcontractor has an unprotected exposure over the AL or PEL they are required to inform you with in the required time frame as listed in PRD-2111. 3. Section 8 I would add that this person is responsible for all exposure monitoring activities and ensuring that samples are sent to an AIHA accredited lab. 4. Section 12 I would rename EXPOSURE MONITORING OR SAMPLING and DATA COLLECTION. I would then state that all sampling will be performed as outlined in TABLE 1. Here is where an expanded decision logic could be incorporated if sample results are >AL but PEL then In section 12 it also talks about written compliance documentation shall be provided using any of the following: They need to be sure that if they do exceed the PEL and have to create a compliance plan that they are able to cover all of the code driven requirements of the plan in those documents listed. I doubt that can be done with a SWP. 5. TABLE 1 The information in the column Sample Frequency should indicate number of and how often samples will be taken. Is 1 sample enough or should 5 samples be taken? They also talk about medical surveillance, which could be removed since it really isn't sampling. They also have listed in the footnotes that 29 CFR 1910.62 is the applicable standard. 6. Section 14 They say all of the work is incidental work (I am assuming that this means they believe all exposures will be below the AL, but the mention that respirators will be used in dusty environments. I would better define expected dusty environments maybe even to the task and worker level because they don't want an unprotected over exposure. They could expand section 5 to include a little more detail and expected exposures and to whom for each of the task listed in this section.

VDR Number: VDR-153751
Revision Level: 2
Project Number: 23368 - 152173
Transmittal Number: S-507296-05R.2
Transmittal Status: Mandatory Approval
Line Item: 1

Disposition Code::

A

Final Comments::

VDS #12_153756

VENDOR DATA
TRANSMITTAL & DISPOSITION FORM

ORIGINAL

To be completed by Supplier/Subcontractor

Purchase Order or Subcontract Number: 00507296 - 06 B.1 Project Title/Number: Remediation of The STF - 02 Gun Range
 Submittal Number: 6131 - 04 R - 01 Supplier/Subcontractor Name: Phenix Construction
 Submittal Date: 10-10-06 Address: P.O. Box 1626 Idaho Falls Idaho 83403 23368 - 152173

INEEL VDS Item No.	VDT Item No.	Specification/ Drawing Reference	Tag Number	Submittal Status	Revision Level	Supplier/ Subcontractor Document Number (if applicable)	Description	INEEL VDR Number	Disp Code
12		SC - 3		M.A.	R - 01	6131 - 04	Job Safety Analysis	153756	A

Remarks

 10-10-06
 Supplier/Subcontractor Authorized Signature / Date

To Be Completed by Contractor/AE

 INEEL Authorized Signature / Date

F-219

CONSTRUCTION MANAGEMENT JOB SAFETY ANALYSIS

JSA #: 607024

Sequence Of Basic Job Steps	Potential Hazards	Hazard Control/PPE
3. Survey work	3.A Heavy machinery working i.e.: struck by noise	3. A1 Ensure back-up alarms are operational or use spotter. 3. A2 Be aware of equipment movement at all times, ground people will wear highly visible safety vests. 3. A3 Employees wear proper P.P.E. hard hats, safety glasses with side shields, sturdy leather above the ankle work boots, leather gloves and hearing protection using previous data.
	3.B Possible eye and hand injury	3. B1 Use proper eye protection safety glasses with side shields and leather gloves.
	3.C Potential slips, trips falls while working on slopes	3.C1 Ensure good footing while working on slopes no running up and down slopes.
4. Grading and excavation of berm soil to leach pond.	4.A Existing utilities possible electrical shock, contamination	4.A1 Layout excavation area and notify CWI for S.I.T. to locate and identify existing utilities. Review utility plan as needed. 4.A2 Use 2' , 5' method in locating existing lines in excavation area. 4.A3 If unidentified utilities or unknowns are encountered during excavation activities, stop work and notify CWI POC. 4.A4 Obtain clearance from power management follow direction from power management while working under overhead electrical.
	4.B Heavy machinery i.e.: struck by, noise	4.B1 Stay out of way of pinch points, swing and working areas of equipment. Workers to wear high visibility vests. 4.B2 Ensure backup alarms are operational or use spotter. 4.B3 Be aware of equipment movement at all times. Operators maintain eye contact with ground people. Ground people will wear highly visible safety vests. 4.B4 Ensure equipment is in safe condition – backup alarms working, no broken windows, fire extinguishers in place etc. (Equipment inspection tag by CWI prior to equipment use.) 4.B5 Employees wear proper P.P.E. equipment such as: hard hats, safety glasses with side shields, sturdy leather above the ankle work boots, and hearing protection using previous data.
	4.C Flammable Burns.	4.C1 No open flames or burning. turn off equipment while refueling equipment (avoid any spills)
	4.D Heavy machinery accident, roll over (bodily injury)	4.D1 Ensure equipment is equipped with proper roll over protection per 1926 Subpart " W " Wear seat belts. Follow operators manual
	4.E Cave - inn's	4.E1 Implement OSHA procedures for class C soil Subpart "P" 4.E2 Excavation checklist completed daily by competent person prior to excavation. 4.E3 If trench exceeds 5' in depth, 1.5 to 1 sloping required. 4.E4 Place excavated material minimum 2' away from edge of trench. 4.E5 Slope trench over 4' deep 1.5 to 1 for access and egress.

F-222

CONSTRUCTION MANAGEMENT JOB SAFETY ANALYSIS

JSA #: 607024

Sequence Of Basic Job Steps	Potential Hazards	Hazard Control/PPE
	4.F Possible confined space	4.F1 Competent persons perform a confined space evaluation for excavations deeper than 4 feet.
	4.G Laser work possible eye injury.	4.G1 Don't let eyes come in direct contact with laser beam. 4.G2 Set laser above or below eye level. 4.G3 Properly post area " laser in use " 4.G4 Ensure personnel running laser have proper training.
5. Remove electrical circuits and poles.	5.A Possible eye, hand and foot injury	5.A1 Employees wear proper P.P.E. equipment such as: hard hats, safety glasses with side shields, sturdy leather above the ankle work boots, adequate hearing protection and leather gloves.
	5.B Back strain, pinch point and setting on employee.	5.B1 Be aware of equipment movement at all times, operators maintain eye contact with ground people at all times. Ground people wear highly visible safety vests. 5.B2 Use proper lifting procedures for lifting and setting material. (DOE hoisting and rigging standard Chapter 15) 5.B3 Ensure equipment is in safe condition - backup alarms working, no broken windows, fire extinguishers in place, etc. (Equipment inspection tag by CWI prior to equipment use.)
	5.C Electrical shock	5.C1 Insure CWI has performed zero energy.
	5.D Remove telephone poles containing carcinogen creosote.	5.D1 Use heavy equipment to remove telephone poles to eliminate personnel exposure. Follow direction of lift in packaging of telephone poles for disposal.
	5.D Existing utilities possible electrical shock, contamination	5.D1 Layout excavation area and notify CWI for S.I.T. to locate and identify existing utilities. Review utility plan as needed. 5.D2 Use 2' , 5' method in locating existing lines in excavation area. 5.D3 If unidentified utilities or unknowns are encountered during excavation activities, stop work and notify CWI POC. 5.D4 Obtain clearance from power management follow direction from power management while working under overhead electrical.
6. Asphalt removal	6.A Heavy machinery i.e.; struck by, noise	6.A1 Stay out of way of pinch points, swing and working areas of equipment. 6.A2 Ensure that backup alarms are operational. 6.A3 Be aware of equipment movement at all times, operators maintain eye contact with ground people. High visibility vests to be worn. 6.A4 Ensure equipment is in safe condition -- backup alarms working, no broken windows, fire extinguishers in place, (Equipment inspection tag by CWI prior to equipment use.) 6.A5 Employees wear proper P.P.E. equipment such as: hard hats, safety glasses with side shields, sturdy leather above the ankle work boots, hearing protection to be worn using previous data, and leather gloves.
	6.B Possible eye, face injury, noise	6.B1 Wear full face shield, foot protection, hearing protection to be worn using previous data, and leather gloves while running jack hammer. 6.B2 Check equipment for safety and functionally, make sure all guards, whip lines etc. are in place.

CONSTRUCTION MANAGEMENT JOB SAFETY ANALYSIS

JSA #: 607024

Sequence Of Basic Job Steps	Potential Hazards	Hazard Control/PPE
	6.C Flammable burns,	6.C1 No open flames or burning, turn off equipment while refueling equipment (avoid any spills) Ensure that a fire extinguisher is in area during re-fueling.
	6.D Vehicle accidents	6.D1 Drivers obey all traffic signs and use extreme caution while entering or exiting local roadways. 6.D2 Place proper traffic control (signs) on local roadways.
7. Remove creosote railroad ties.	7. A Shock, fire cuts and scrapes.	7.A1 Ensure that cords and tools are inspected prior to use. If tools are found to be defective then remove from service. 7.A2 When refueling generator ensure that engine is cooled. A fire extinguisher will be in area for use. 7.A3 Leather gloves will be worn when using power tools and hand tools
	7.B Heavy machinery i.e.: struck by, noise	7.B1 Stay out of way of pinch points, swing and working areas of equipment. Workers to wear high visibility vests. 7.B2 Ensure backup alarms are operational or use spotter. 7.B3 Be aware of equipment movement at all times. Operators maintain eye contact with ground people. Ground people will wear highly visible safety vests. 7.B4 Ensure equipment is in safe condition – backup alarms working, no broken windows, fire extinguishers in place etc. (Equipment inspection tag by CWT prior to equipment use.) 7.B5 Employees wear proper P.P.E. equipment such as: hard hats, safety glasses with side shields, sturdy leather above the ankle work boots, and hearing protection using previous data.
	7.C Possible eye and hand injury.	7.C1 Use proper eye protection safety glasses with side shields and (gloves as required)
	7.D Back strain and pinch point	7.D1 Use proper lifting procedures for lifting and setting material, do not lift more than 50 lbs or 1/3 body weight.
	7.E Remove rail road ties containing carcinogen creosote.	7.E1 Use heavy equipment to remove rail road ties to eliminate personnel exposure. Follow direction of IH in packaging of rail road ties for disposal.
8. Remove burn barrel and test stand.	8. A Shock, fire cuts and scrapes.	8.A1 Ensure that cords and tools are inspected prior to use. If tools are found to be defective then remove from service. 8.A2 When refueling generator ensure that engine is cooled. A fire extinguisher will be in area for use. 8.A3 Leather gloves will be worn when using power tools and hand tools

F-224

CONSTRUCTION MANAGEMENT JOB SAFETY ANALYSIS

JSA #: 607024

Sequence Of Basic Job Steps	Potential Hazards	Hazard Control/PPE
	8.B Heavy machinery i.e.: struck by, noise	8.B1 Stay out of way of pinch points, swing and working areas of equipment. Workers to wear high visibility vests. 8.B2 Ensure backup alarms are operational or use spotter. 8.B3 Be aware of equipment movement at all times. Operators maintain eye contact with ground people. Ground people will wear highly visible safety vests. 8.B4 Ensure equipment is in safe condition – backup alarms working, no broken windows, fire extinguishers in place etc. (Equipment inspection tag by CWI prior to equipment use.) 8.B5 Employees wear proper P.P.E. equipment such as: hard hats, safety glasses with side shields, sturdy leather above the ankle work boots, and hearing protection using previous data.
9. Excavation of lead contaminated soil.	9.A Existing utilities possible electrical shock, contamination	9.A1 Layout excavation area and notify CWI for S.I.T. to locate and identify existing utilities. Review utility plan as needed. 9.A2 Use 2' , 5' method in locating existing lines in excavation area. 9.A3 If unidentified utilities or unknowns are encountered during excavation activities, stop work and notify CWI POC. 9.A4 Obtain clearance from power management follow direction from power management while working under overhead electrical. 9.A5 Follow direction of the HSO and exposure monitoring plan. 9.A6 Take air samples to establish potential project exposures and controls.
	9.B Heavy machinery i.e.: struck by, noise	9.B1 Stay out of way of pinch points, swing and working areas of equipment. Workers to wear high visibility vests. 9.B2 Ensure backup alarms are operational or use spotter. 9.B3 Be aware of equipment movement at all times. Operators maintain eye contact with ground people. Ground people will wear highly visible safety vests. 9.B4 Ensure equipment is in safe condition – backup alarms working, no broken windows, fire extinguishers in place etc. (Equipment inspection tag by CWI prior to equipment use.) 9.B5 Employees wear proper P.P.E. equipment such as: hard hats, safety glasses with side shields, sturdy leather above the ankle work boots, and hearing protection using previous data.
	9.C Flammable Burns,	9.C1 No open flames or burning, turn off equipment while refueling equipment (avoid any spills)
	9.D Heavy machinery accident, roll over (bodily injury)	9.D1 Ensure equipment is equipped with proper roll over protection per 1926 Subpart "W " Wear seat belts. Follow operators manual
	9.E Fugitive dust	9.E1 Spray excavated material with water from water truck to minimize dust. 9.E2 Cover stockpiled excavated material end of each day with 10 mil liner.
10. Screening of lead contaminated soil.	10.A Possible contamination	10.A1 Follow direction of HSO and exposure monitoring plan. 10.A2 Take air samples to establish potential project exposures and controls.

F-225

**CONSTRUCTION MANAGEMENT
JOB SAFETY ANALYSIS**

JSA #: 607024

Sequence Of Basic Job Steps	Potential Hazards	Hazard Control/PPE
	10.B Heavy machinery i.e.: struck by, noise	10.B1 Stay out of way of pinch points, swing and working areas of equipment. Workers to wear high visibility vests. 10.B2 Ensure backup alarms are operational or use spotter. 10.B3 Be aware of equipment movement at all times. Operators maintain eye contact with ground people. Ground people will wear highly visible safety vests. 10.B4 Ensure equipment is in safe condition – backup alarms working, no broken windows, fire extinguishers in place etc. (Equipment inspection tag by CWI prior to equipment use.) 10.B5 Employees wear proper P.P.E. equipment such as: hard hats, safety glasses with side shields, sturdy leather above the ankle work boots, and hearing protection using previous data.
	10.C Flammable Burns,	10.C1 No open flames or burning, turn off equipment while refueling equipment (avoid any spills)
	10.D Heavy machinery accident, roll over (bodily injury)	10.D1 Ensure equipment is equipped with proper roll over protection per 1926 Subpart "W " Wear seat belts. Follow operators manual
	10.E Fugitive dust	10.E1 Spray screened material with water from water truck to minimize dust. 10.E2 Cover stockpiled screened material end of each day with 10 mil liner.
	10.F Moving conveyers and rollers bodily injury.	10.F1 Insure all belt and roller guards are in place. 10.F2 Stay clear of moving belts. 10.F3 Post area as high noise area. 10.F4 Insure that screen plant has been lockout/ tag out before performing any internal maintenance and or changing out of screens.
11. Removal of shoot house.	11.A Possible contamination	11.A1 Follow direction of HSO and exposure monitoring plan. 11.A2 Take air samples to establish potential project exposures and controls.
	11.B Heavy machinery i.e.: struck by, noise	11.B1 Stay out of way of pinch points, swing and working areas of equipment. Workers to wear high visibility vests. 11.B2 Ensure backup alarms are operational or use spotter. 11.B3 Be aware of equipment movement at all times. Operators maintain eye contact with ground people. Ground people will wear highly visible safety vests. 11.B4 Ensure equipment is in safe condition – backup alarms working, no broken windows, fire extinguishers in place etc. (Equipment inspection tag by CWI prior to equipment use.) 11.B5 Employees wear proper P.P.E. equipment such as: hard hats, safety glasses with side shields, sturdy leather above the ankle work boots, and hearing protection using previous data.
	11.C Flammable Burns,	11.C1 No open flames or burning, turn off equipment while refueling equipment (avoid any spills)
	11.D Heavy machinery accident, roll over (bodily injury)	11.D1 Ensure equipment is equipped with proper roll over protection per 1926 Subpart "W " Wear seat belts. Follow operators manual

F-226

CONSTRUCTION MANAGEMENT JOB SAFETY ANALYSIS

JSA #: 607024

Sequence Of Basic Job Steps	Potential Hazards	Hazard Control/PPE
	11.E Fugitive dust	11.E1 Spray demolished material with water from water truck to minimize dust.
	11.F Pigeon/Bird feces in shooting shack.	11.F1 Use heavy equipment to demolish shooting shack to eliminate personnel exposure. Such as excavator with thumb.
	11.G Over head hazards during removal of shoot house.	11.G1 Use heavy equipment to demolish shooting shack to eliminate personnel exposure. Such as excavator with thumb.
	11.H Remove rail road ties containing carcinogen creosote.	11.H1 Use heavy equipment to remove rail road ties to eliminate personnel exposure. Follow direction of IH in packaging of rail road ties for disposal.
	11.F Vehicle accidents	11.F1 Drivers obey all traffic signs and use extreme caution while entering or exiting local roadways. 11.F2 Place proper traffic control (signs) on local roadways.
12. De con pad construction.	12.A Heavy machinery i.e.: struck by, noise	12.A1 Stay out of way of pinch points, swing and working areas of equipment. Workers to wear high visibility vests. 12.A2 Ensure backup alarms are operational or use spotter. 12.A3 Be aware of equipment movement at all times. Operators maintain eye contact with ground people. Ground people will wear highly visible safety vests. 12.A4 Ensure equipment is in safe condition – backup alarms working, no broken windows, fire extinguishers in place etc. (Equipment inspection tag by CWI prior to equipment use.) 12.A5 Employees wear proper P.P.E. equipment such as: hard hats, safety glasses with side shields, sturdy leather above the ankle work boots, and hearing protection using previous data.
	12.B Flammable Burns,	12.B1 No open flames or burning, turn off equipment while refueling equipment (avoid any spills)
	12.C Heavy machinery accident, roll over (bodily injury)	12.C1 Ensure equipment is equipped with proper roll over protection per 1926 Subpart " W " Wear seat belts. Follow operators manual
	12.D Possible eye and hand injury.	12.D1 Use proper eye protection safety glasses with side shields and (gloves as required)
	12.E Back strain and pinch point	12.E1 Use proper lifting procedures for lifting and setting material, do not lift more than 50 lbs or 1/3 body weight.

**CONSTRUCTION MANAGEMENT
JOB SAFETY ANALYSIS**

JSA #: 607024

Sequence Of Basic Job Steps	Potential Hazards	Hazard Control/PPE
13. Remove perimeter fence.	13.A Heavy machinery i.e.: struck by, noise	13.A1 Stay out of way of pinch points, swing and working areas of equipment. Workers to wear high visibility vests. 13.A2 Ensure backup alarms are operational or use spotter. 13.A3 Be aware of equipment movement at all times. Operators maintain eye contact with ground people. Ground people will wear highly visible safety vests. 13.A4 Ensure equipment is in safe condition – backup alarms working, no broken windows, fire extinguishers in place etc. (Equipment inspection tag by CWI prior to equipment use.) 13.A5 Employees wear proper P.P.E. equipment such as: hard hats, safety glasses with side shields, sturdy leather above the ankle work boots, and hearing protection using previous data.
	13.B Flammable Burns,	13.B1 No open flames or burning, turn off equipment while refueling equipment (avoid any spills)
	13.C Heavy machinery accident, roll over (bodily injury)	13.C1 Ensure equipment is equipped with proper roll over protection per 1926 Subpart "W" * Wear seat belts. Follow operators manual
	13.D Possible eye and hand injury.	13.D1 Use proper eye protection safety glasses with side shields and (gloves as required)
	13.E Back strain and pinch point	13.E1 Use proper lifting procedures for lifting and setting material, do not lift more than 50 lbs or 1/3 body weight.
14. Reclaim borrow area	14.A Heavy machinery i.e.: struck by, noise	14.A1 Stay out of way of pinch points, swing and working areas of equipment. Workers to wear high visibility vests. 14.A2 Ensure backup alarms are operational or use spotter. 14.A3 Be aware of equipment movement at all times. Operators maintain eye contact with ground people. Ground people will wear highly visible safety vests. 14.A4 Ensure equipment is in safe condition – backup alarms working, no broken windows, fire extinguishers in place etc. (Equipment inspection tag by CWI prior to equipment use.) 14.A5 Employees wear proper P.P.E. equipment such as: hard hats, safety glasses with side shields, sturdy leather above the ankle work boots, and hearing protection using previous data.
	14.B Flammable Burns,	14.B1 No open flames or burning, turn off equipment while refueling equipment (avoid any spills)
	14.C Heavy machinery accident, roll over (bodily injury)	14.C1 Ensure equipment is equipped with proper roll over protection per 1926 Subpart "W" * Wear seat belts. Follow operators manual

F-228

CONSTRUCTION MANAGEMENT JOB SAFETY ANALYSIS

JSA #: 607024

Sequence Of Basic Job Steps	Potential Hazards	Hazard Control/PPE
15. Re vegetation work	15.A Heavy machinery i.e.; struck by, noise etc.	15. A1 Stay out of way of pinch points, swing and working areas of equipment. 15. A2 Be aware of backup alarms. 15. A3 Be aware of equipment movement at all times, operators maintain eye contact with ground people. Ground people will wear highly visible safety vests. 15. A4 Ensure equipment is in safe condition-backup alarms working, no broken windows, fire extinguishers in place etc. (equipment inspection tag by CWI prior to equipment use.) 15.A5 Employees wear proper P.P.E. equipment such as: hard hats, safety glasses with side shields, sturdy leather above the ankle work boots, adequate hearing protection and (gloves as required)
	15.B Flammable burns etc.	15.B1 No open flames or burning, turn off equipment while refueling equipment (avoid any spills)
	15. C Vehicle accidents.	15. C1 Drivers obey all traffic signs and use extreme caution while entering or exiting local roadways. 15. C2 Place proper traffic control (signs) on local roadways.
16. Working in hot/cold environments	16.A. Hot weather/working outside in cold environment	16. A1 Workers need to monitor each other for heat/cold stress symptoms. Ensure that no person works alone. Use the buddy system. Stay times will be determined by Job Supervisor following PRD'S
17. Field work	17.A Injuries and fire	17. A1 Ensure two means of communication at work site always cell phones and or two way radio. 17.A2 Insure fire extinguisher and shovel at work site at all times. 17.A3 Insure 2 medic first aid trained individuals on project.

F-229

Vendor Data Review System Final Disposition Screen

This vendor data item has been given the following disposition codes

Reviewer	Revision Level	Date	Disposition Code	Comments
VANDEL DOUG S	0	02-OCT-06	A	
DRIEVER MIKEL K	0	02-OCT-06	D	
TUOTT LEE C	0	02-OCT-06	D	
JOLLEY WENDELL L	0	03-OCT-06	D	
LANDIS JOSEPH A	0	05-OCT-06	A	no comments
FRITZ KURT D	0	04-OCT-06	D	
MCMANAMON LAWRENCE E	0	09-OCT-06	B	Missing hazards need ing to be addressed include the following: 1. Performing work on steep slopes with gravel creating a potential slip, trip, and fall hazard. Uneven walking/working surfaces. (suggest 3c) 2. CERCLA/HAZWOPER hazards and postings on perimeter. 3. Lack of connumication, proper emergency supplies for field work as this is field work. 4. Conveyor belts and machinery specialized for this operation- hazards including rollers, inrunning nip points, noise, vibration, moving with other equipment including setup and adjustments. 5. Striking unidentified lines- subsurface utilities (Suggest 5d) 6. Independant verification that lines have had zero energy verification per PRD-2011, Appendix A 7. Pigeon/bird feces in shooting shack (suggest 7E) 8. Chemical exposure to rail-road ties and telephone poles containing a Carcinogen Creosote wood preservative- have IH provide proper controls (suggest 7F) 9. Overhead hazards during removal of shoot house in addition to Creosote wood preservative Training section : Add 2-medic first-aid minimal; Industrial Ergonomics; Lead Competent person; Excavation competent person; UXO; and must diffrenciate training between zones to identify what a visitor will need to enter zone who will not be conducting work. Assign JSA number 607024 as this is the work order number.

TUOTT LEE C	1	12- OCT- D 06	no comments
LANDIS JOSEPH A	1	26- OCT- A 06	no comment
FRITZ KURT D	1	26- OCT- A 06	
DRIEVER MIKEL K	1	11- OCT- A 06	
VANDEL DOUG S	1	11- OCT- A 06	
MCMANAMON LAWRENCE E	1	17- OCT- A 06	
JOLLEY WENDELL L	1	26- OCT- D 06	

VDR Number:	VDR-153756
Revision Level:	1
Project Number:	23368 - 152173
Transmittal Number:	S-507296-06R.1
Transmittal Status:	Mandatory Approval
Line Item:	1

Disposition Code::
A

Final Comments::

