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## Moab Project

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# Moab Project Site Fugitive Dust Control Plan

March 2002



Prepared for U.S. Department of Energy Grand Junction Office  
under DOE Contract Number DE-AC13-96GJ87335.  
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**Moab Project**

**Moab Project Site  
Fugitive Dust Control Plan**

**March 2002**

Prepared for  
U.S. Department of Energy  
Idaho Operations Office  
Grand Junction Office

Work Performed Under DOE Contract Number DE-AC13-96GJ87335  
Task Order Number MAC02-16

## Contents

1.0 Introduction.....	1
1.1 Site Location .....	1
1.2 Site History .....	1
1.3 Climatology .....	2
1.4 Regulatory Requirements .....	2
1.5 Environmental Monitoring .....	7
2.0 Site Source Information .....	9
2.1 Site Ownership and Physical Location .....	9
2.2 Source Information .....	9
3.0 Description of Fugitive Dust Emission Activities .....	13
4.0 Description of Fugitive Dust Emission Controls On-Site.....	15
4.1 High Potential Source Areas.....	15
4.2 Moderate Potential Source Areas .....	15
4.3 Low Potential Source Areas .....	15
4.4 Standards, Action Levels, and Response Actions .....	16
4.5 Best Management Practices.....	17
5.0 Description of Fugitive Dust Emission Controls Off-Site.....	21
6.0 References.....	23

## Figures

Figure 1. Area Location Map for the Moab Site.....	3
Figure 2. Site Features Map for the Moab Site.....	5
Figure 3. Location Map for the Moab Site Fugitive Dust Sources.....	11
Figure 4. Air Particulate Monitoring Locations.....	19

## Tables

Table 1. Summary of Fugitive Dust Controls for the Moab Site.....	16
Table 2. Fugitive Dust Standards, Action Levels, and Response Actions.....	17

## Appendix A Material Safety Data Sheets

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## 1.0 Introduction

The State of Utah, Division of Air Quality rules for the control of fugitive dust and emissions require that all sources whose activities or equipment have the potential to produce fugitive or airborne dust, must prepare and implement a Fugitive Dust Control Plan. Accordingly, this Fugitive Dust Control Plan (Plan) is prepared to address the control of fugitive and airborne dust emissions from the Moab Project Site (Moab Site) located in Moab, Utah. Specifically, this Plan complies with the State of Utah rules for controlling fugitive dust emissions as specified in the Utah Administrative Code (U.A.C.) R307-205, *Emission Standards; Fugitive Emissions and Fugitive Dust*. This Plan has been prepared to address activities and operations conducted by the U.S. Department of Energy's Grand Junction Office (DOE-GJO) at the Moab Site. The primary objective of this plan is to formulate a strategy for controlling, to the greatest extent practicable, fugitive or airborne dust emissions at the Moab Site. This will be accomplished by identifying specific sources and activities which have the highest potential to produce or generate fugitive or airborne dust emissions. This plan describes the engineering controls necessary to minimize and control dust emissions from those sources and activities. This plan is prepared to address the control of fugitive dust emissions at the Moab site which are a result of current DOE activities. As necessary, the scope of this plan will be revised to reflect changes in DOE's dust control strategy as site conditions or activities may change in the future.

### 1.1 Site Location

The Moab Site is a former uranium-ore-processing facility located approximately 3 miles northwest of the city of Moab in Grand County, Utah (Figure 1). The Moab Site is irregularly shaped; a uranium mill tailings pile occupies much of the western portion of the site. The Moab Site is bordered on the north and southwest by steep sandstone cliffs. The Colorado River forms the southeastern boundary of the site. U.S. Highway 191 parallels the northern site boundary, and State Highway 279 crosses the western portion of the property. Arches National Park is located adjacent to the northern site boundary, and Canyonlands National Park is located approximately 12 miles to the southwest. The Union Pacific Railroad traverses a small section of the site just west of Highway 279, then enters a tunnel and emerges several miles to the southwest. Moab Wash runs in a southeasterly direction through the center of the site and joins with the Colorado River. The wash is an ephemeral stream that flows only after precipitation or during snowmelt. The entire site covers approximately 400 acres of which 130 acres are covered by the tailings pile. Figure 2 shows the major physiographic features of the Moab Site.

### 1.2 Site History

Originally, the property and facility were owned by the Uranium Reduction Company (URC) and were regulated by the Atomic Energy Commission, predecessor agency to DOE. In 1956, URC began operation of the Moab mill. In 1962, the Atlas Minerals Corporation acquired URC and operated the mill until operations ceased in 1984. Between 1956 and 1984, uranium mill tailings were disposed of on site in an unlined impoundment. Decommissioning of the mill began in 1988; between 1989 and 1995, an interim cover was placed on the impoundment. In 1996, Atlas proposed to reclaim the tailings pile for permanent disposal in its current location. However, Atlas declared bankruptcy in 1998, and subsequently, the U.S. Nuclear Regulatory Commission (NRC) appointed Pricewaterhouse Coopers (PwC) as the trustee of the Moab Mill Reclamation Trust and licensee for the site. Ownership and responsibility of the Moab Site was effectively transferred from PwC to DOE by passage of the Floyd D. Spence National Defense

Authorization Act (H.R. 5408, 2001). This act further designates that the Moab Site undergo remediation in accordance with Title I of the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA; 42 U.S.C. 7912) (as amended). The DOE-GJO took possession of the Moab Site on October 24, 2001.

### 1.3 Climatology

The climate of the Moab region is semiarid. Average annual temperature is approximately 14 degrees Celsius (°C) (57 degrees Fahrenheit [°F]). January is the coldest month, averaging -1°C (30°F), and July is the warmest month, averaging 28°C (82°F). Extreme temperatures have ranged from -28°C (-18°F) in January 1963 to 44°C (111°F), which has occurred more than once (in July 1953 and on earlier occasions). Temperatures of 32°C (90°F) or higher occur about 100 days per year, with about 80 percent of those occurring during June, July, and August. Temperatures below freezing 0°C (32°F) occur on the average of 123 days of the year with about 80 percent of those occurring during November through February. The effects of high temperature on human comfort are moderated by the low relative humidity, which is often less than 50 percent during the daytime hours.

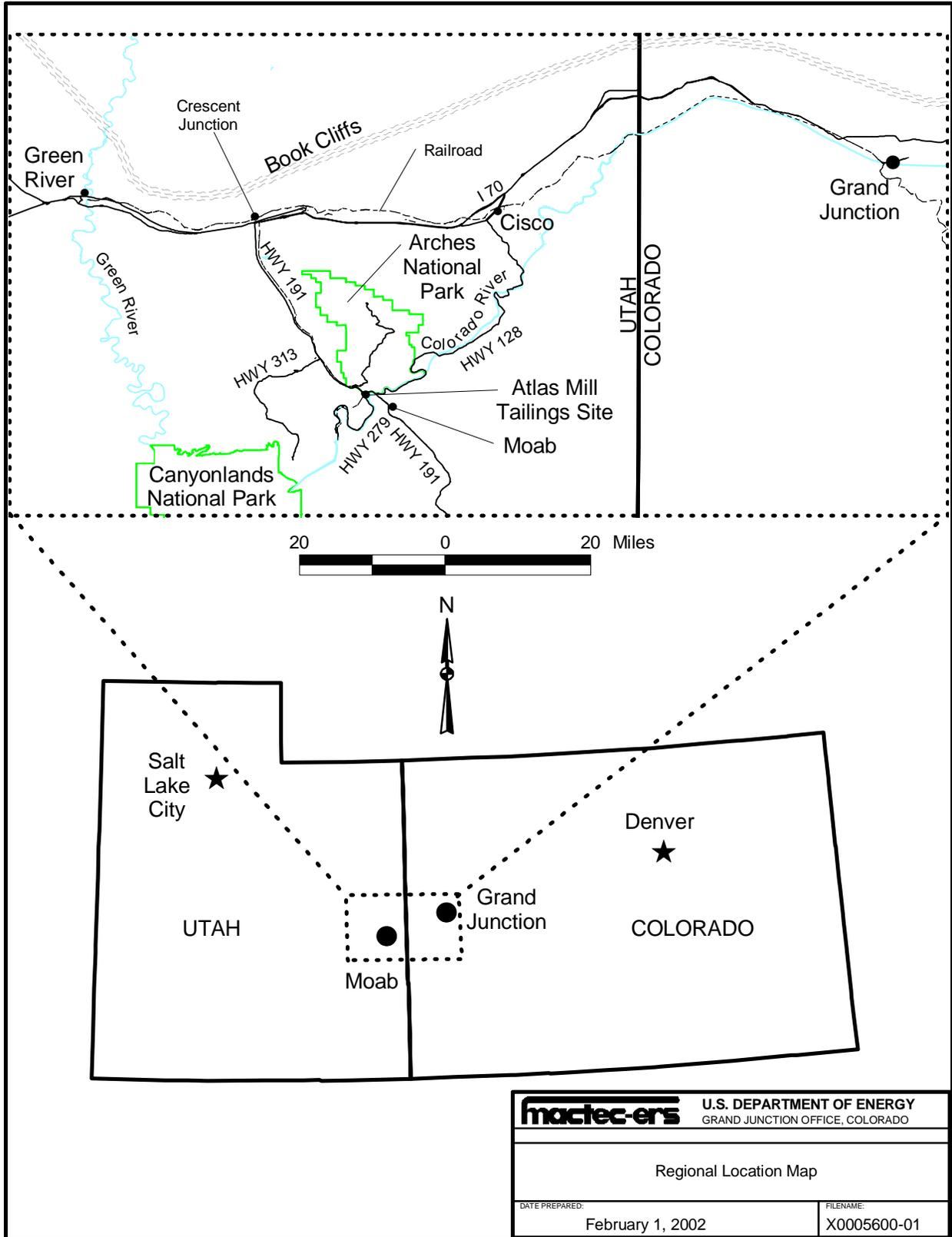
Average annual precipitation at Moab is 20 centimeters (cm) (8 inches), distributed approximately equally among the seasons with slight peaks during the spring and fall. Potential evapotranspiration (about 127 cm [50 inches] per year) greatly exceeds annual precipitation. Mean pan evaporation (about 140 cm [55 inches] per year) and lake evaporation (about 97 cm [38 inches] per year) also greatly exceeds the total annual precipitation.

Low humidity in the region limits fog occurrences (visibility less than 0.5 kilometer [km] [0.3 mi]) to fewer than 10 days per year. Thunderstorms occur about 40 days per year. Hail occurs approximately 3 days per year.

Prevailing winds in the Moab region are southeasterly. Cold air drainage at the Moab Site can occur from the northwest under very stable conditions. The probability of a tornado is very small. One tornado with wind speeds of 160 km/hour (hr) (100 miles/hr) would be expected only once in approximately 100,000 years (NRC 2001).

### 1.4 Regulatory Requirements

This Fugitive Dust Control Plan is prepared in response to State of Utah, Division of Air Quality regulations for the control of fugitive dust, as found in Section R307-205 (U.A.C., September 2001). Dust control plans are required to minimize fugitive dust on-site from various types of pits, yards, and storage areas. The Fugitive Dust Rule (R307 - 309 U.A.C.) also addresses storage and handling of aggregate materials, construction / demolition activities, mining activities, and tailings piles and ponds. The portion of the Fugitive Dust Rule that specifically applies to the Moab Site is found at R307-205-6(1-2), and requires that "... any person owning or operating an existing tailings operation where fugitive dust results from grading, excavating, depositing, or natural erosion or other causes in association with such operation shall take steps to minimize fugitive dust from such activities." This site specific Fugitive Dust Control Plan will be submitted to the Executive Secretary for the Utah Air Quality Board in Salt Lake City, Utah, for approval, and will be updated and revised as necessary to reflect dust controls which correspond to current and on-going site activities and operations.



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Figure 1. Area Location Map for the Moab Site

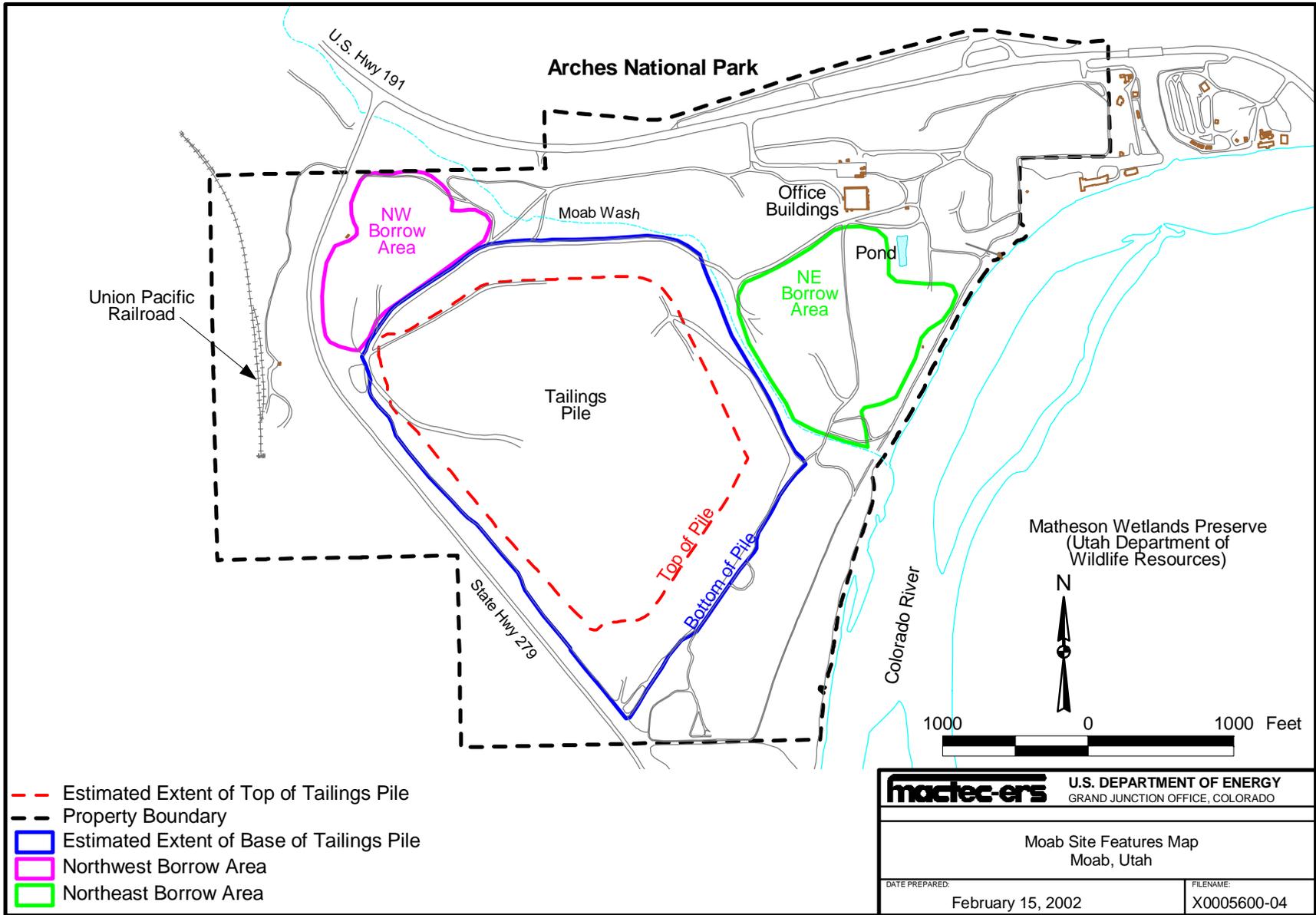


Figure 2. Site Features Map for the Moab Site

## 1.5 Environmental Monitoring

In addition to the implementation of physical dust controls, the DOE-GJO has developed and implemented an environmental air monitoring program for the Moab Site. This environmental air monitoring program consists of sampling airborne particulates, radon, and direct gamma radiation at various locations along the site perimeter and at various off-site locations.

Background monitoring locations also have been established to provide ambient air quality data. The background or ambient air quality data will be compared to air quality data collected from the on-site monitoring locations, for the purposes of determining compliance with various DOE Orders, and Federal and State air quality regulations.

As part of DOE's environmental air monitoring and fugitive dust control strategy, a meteorological monitoring station has been established at the Moab Site. Wind speed and wind direction data collected from this monitoring station will be used to determine when site-specific action levels have been exceeded and specific dust controls (e.g., the application of dust suppression techniques) must be initiated. In addition, personnel certified in reading opacity measurements in the State of Utah will also be used to determine when active dust control measures should be initiated, and when specific dust generating activities (i.e., excavating, hauling, grading, etc.) should be discontinued.

In addition to complying with the State of Utah Fugitive Dust Rule, this Fugitive Dust Plan is consistent with the intent of complying with various DOE Orders. U.S. Department of Energy (DOE) Order 5400.1, *General Environmental Protection Program*, specifies that effluent monitoring and environmental surveillance be conducted to determine the effect of DOE activities upon "...on-site and offsite environmental and natural resources," and to "...verify compliance with applicable Federal, State, and local effluent regulations and DOE Orders." Similarly, DOE Order 5400.5, *Radiation Protection of the Public and the Environment*, requires that DOE control and monitor radiological exposures from its facilities and activities.

The physical form of the radioactive contaminants (i.e., uranium mill tailings) at the Moab Site is primarily best described as a fine-grained, sand-like material, which is highly susceptible to wind erosion. Consequently, one of DOE's major objectives at the Moab Site is to control and contain the off-site transportation of radiological contaminants resulting from the erosive forces of wind and storm water. This Fugitive Dust Control Plan outlines DOE's strategy for controlling airborne dust emissions and minimizing/controlling the off-site transport of mill tailings resulting from wind erosion.

## 2.0 Site Source Information

### 2.1 Site Ownership and Physical Location

As required by the Utah Division of Air Quality, the following site-specific source information is provided:

- 1) **Name of Operation**—Moab Site Project, formerly known as the Atlas Mining Corporation Uranium Mill.
- 2) **Owner/Operator Information**—U.S. Department of Energy, Grand Junction Office. 2597 B3/4 Road, Grand Junction, Colorado, 81503. DOE Contact: Joel Berwick (970) 248-6020. On-Site Contact: Irwin Stewart (435) 259- 5131.
- 3) **Physical Address of Operations**—1871 N. Highway 191, Moab, Utah, 84532.
- 4) **UTM Coordinates or Longitude/Latitude of Operations:**
  - Latitude:** 38 degrees, 36 minutes, 17.53329 seconds - North
  - Longitude:** 109 degrees, 35 minutes, 23.47893 seconds - West
  - Elevation:** 3977.624 US feet above MSL

### 2.2 Source Information

**Type of Material Processed or Disturbed**—The materials of concern with respect to fugitive dust emissions at the Moab Site are residual uranium mill tailings and unstable native soils/sand. Although the former Atlas mill is no longer active, a total of approximately 11.8 million tons of uranium mill tailings and surface contaminated soils remain on site. The majority of the mill tailings are contained within an on-site tailings pile, the footprint of which covers approximately 136 acres. An interim cover of the tailings pile was completed in 1995. Soils from on-site borrow areas were used as the source of material for the temporary cover. Some of the soils used for the cover are contaminated with low-level residual radioactive contamination resulting from previous milling activities conducted at the site. A portion of the cover was seeded in 1999; however, presently, there is no established vegetative growth on the cell.

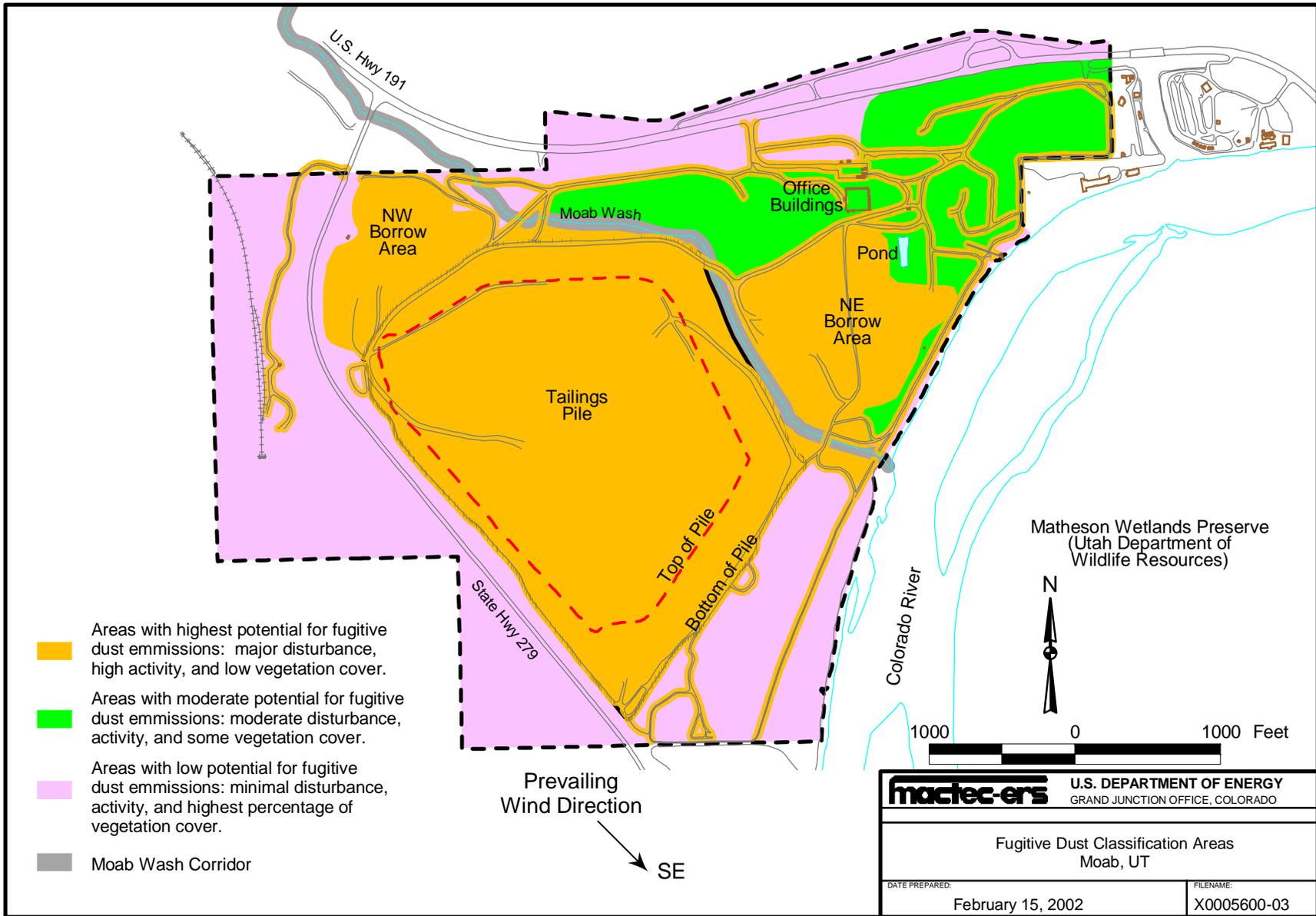
The majority of materials on the surface of the tailings pile consist of poorly consolidated soils, and therefore is considered to be a "high-potential" source of fugitive dust emissions at the Moab Site. Similarly, the two on-site borrow areas (i.e., the north west and the north east borrow areas) are essentially void of any plant or vegetation cover; the soils are poorly consolidated, and are considered to be major sources for fugitive dust emissions at the Moab Site (Figure 3). Combined, the tailings pile and the two borrow areas comprise approximately 40 percent of the total land surface of the Moab Site. The remainder of site is not considered to be a significant source of fugitive dust emissions due to: 1) The low level of past disturbances in these areas; 2) The low levels and quantity of contaminated soils identified within these areas; 3) The low levels of anticipated activity occurring in these areas; and, 4) A greater percentage of vegetative cover present within these areas.

Source areas identified as a "moderate-potential" consist of areas that have been partially disturbed in the past (approximately 20 percent of the total site area); however, soils and surface sediments in these areas are typically better consolidated and are more stable due to varying degrees of vegetative cover. If these areas prove to be a source for fugitive dust emissions in the future, appropriate control measures will be implemented.

Most of the "low-potential" areas are found along the site perimeter and consist of steep, rocky terrain (i.e., sandstone slopes and cliffs) in the west, and wetland/river bottom areas along the south and eastern margins of the site boundary. Typically, there is little to no activity occurring or planned in these areas, nor have these areas been disturbed by past milling activities. The "low-potential" areas comprise approximately 40 percent of the total site area. Consequently, DOE does not anticipate that these areas will be a significant source of dust emissions from the facility, and no controls are planned for these areas.

**Length/Duration of Construction Project**—The DOE is in the process of evaluating remedial action alternatives for the mill tailings currently stockpiled at the Moab Site. Depending upon which remedial action alternative is ultimately selected, DOE's responsibility for monitoring and controlling fugitive dust emissions from this site will range in duration from approximately three to eleven years.

**Description of Processes/Site Activities**—Currently, the activities occurring at the Moab Site include: 1) Site characterization (including radiological assessments, surveying, environmental sampling and monitoring, biological surveys, etc.); 2) Site stabilization (securing unsafe conditions/structures/utilities); 3) Implementing fugitive dust and storm water controls; 4) Waste management activities (cleaning up oil spills, consolidating drums and petroleum products, addressing excess chemical inventory, etc.); 5) Site security (fence installation/repair, postings, barricades, etc.); and, 6) Installation of a Construction Office and an equipment staging area.



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Figure 3. Location Map for the Moab Site Fugitive Dust Sources

### 3.0 Description of Fugitive Dust Emission Activities

A description of the on-site activities which may contribute to, or generate fugitive dust emissions at the Moab Site are discussed below:

**Site Characterization**—DOE is currently in the process of performing various types of environmental characterization activities at the Moab Site. These activities include: radiological characterization, surface and ground water monitoring, radon and direct gamma radiation monitoring, environmental air/particulate monitoring, meteorological monitoring, floodplain and wetlands assessment and delineation, threatened and endangered species surveys and critical habitat identification, and various engineering studies and surveys. Most of these types of activities are non-intrusive and result in little to no fugitive dust emissions. Vehicles, used to transport personnel and equipment from one location to another, may result in minimal generation of fugitive dust.

**Interim and Initial Remedial Actions**—DOE will be engaged in various remedial efforts to mitigate immediate threats to the environment (i.e., ground water). Specifically, an Initial Remedial Action will be initiated during the summer months of 2002 while the Interim Action may be initiated in 2003. Activities associated with these remedial actions will necessitate the use of heavy equipment for clearing and grading purposes. These actions will have the potential to generate moderate levels of fugitive dust emissions.

**Site Stabilization Activities**—DOE will be securing a former mill building and associated structures (i.e., pump houses, electrical breaker panels, electrical transmission and distribution systems, etc.) that were left behind by the Atlas Milling Corporation. Many of these structures were left in an unsafe condition and need to be stabilized with the increased level of activity at the site. Although the mill buildings will be eventually demolished, all structures and appurtenances will simply be secured (i.e., buildings will be locked, live utilities will be de-energized, etc.) for the present time. These activities may also include the installation or repair of site fences, installing signs and postings, and setting up various site boundaries and barricades. The stabilization activities planned for the near future will not result in significant fugitive dust emissions.

**Implementation of Fugitive Dust and Storm Water Runoff Controls**—DOE recognizes that mill tailings and residual contaminated soils are especially vulnerable to wind and storm runoff. In an effort to contain these contaminants and prevent their migration off-site, establishing fugitive dust and storm water runoff controls is a priority for DOE. Implementation of these controls will necessitate the use of heavy equipment to construct or strengthen berms, construct sediment retention basins, dig borrow ditches, install culverts, apply dust suppressant materials, etc.; however, fugitive emissions expected as a result of these activities are expected to be minimal.

**Waste Management Activities**—DOE will be performing various housekeeping activities at the site, which will include the consolidation of various materials. These activities will consist of consolidating miscellaneous fuels, drums of used oil and lubricants, and cleaning up miscellaneous spills and leaks that have accumulated near the maintenance shop over the years. For safe storage and to prevent the spread of contaminants into the environment, petroleum contaminated soils will be excavated and placed into a Best Management Practice Area (BMPA)

along with other consolidated waste materials. Any on-site wastes requiring special handling or management will be identified and addressed by DOE's waste management policy and procedures developed specifically for the Moab Project Site.

The BMPA will be a bermed temporary storage area that will be constructed with a polyethylene liner. Materials will be temporarily stored at this location until a permanent disposal option has been defined. The construction of this area and the removal and excavation of various petroleum contaminated soils will involve the use of heavy equipment. Moderate fugitive dust emissions can be expected from these activities.

**Establishing Construction Office and Equipment Staging Areas**—DOE is in the process of setting up construction office and support trailers, various storage facilities, a decontamination pad, and an equipment staging area. To complete this task, mobile office buildings will be set-up on-site, security fencing and gates will be installed, and utilities will be extended to the new facilities. This effort will require the use of heavy equipment; however, the duration is relatively short-term, and is not expected to result in significant fugitive dust emissions.

## **4.0 Description of Fugitive Dust Emission Controls On-Site**

The fugitive dust emission controls to be used at the Moab Site are discussed for each of the potential source areas. All sources of fugitive dust emissions at the Moab Site are related to site activities and site conditions. The routine operation of heavy equipment (until remediation occurs) is not considered to be a significant source of emissions at this site.

### **4.1 High Potential Source Areas**

Certain portions of the Moab Site are considered to be significant sources of fugitive dust emissions, and require more active controls than other areas. These areas are characterized by: loose, poorly consolidated sediments, poor vegetative cover, high levels of previous disturbance, high levels of future/anticipated activity or disturbance, or areas with significant residual radioactive contamination remaining. Because both the native soils and uranium mill tailings possess a sand-like texture, these materials can easily become airborne given sufficient climatic conditions (i.e., low soil moisture content, sufficient wind speeds, etc.). Consequently, DOE has designated these areas as having the highest priority in their dust control strategy. Cumulatively, these high-potential areas comprise approximately 40 percent of the total site surface area. The specific "high-potential" source areas and the planned dust controls to be implemented for each of these areas are summarized Table 1.

### **4.2 Moderate Potential Source Areas**

Other portions of the Moab Site are considered to be moderate sources of fugitive dust emissions and will require a less aggressive approach to dust control. These areas are characterized by more stable soil conditions, a greater percentage of vegetative cover, lesser quantities of radiologically contaminated materials, and moderate levels of activity. As shown in Figure 3, these areas are found mostly in the north east and north central portions of the Moab Site. Cumulatively, these moderate-potential areas comprise approximately 20 percent of the total site surface area. A summary of the anticipated dust control measures to be used in these areas is found in Table 1.

### **4.3 Low Potential Source Areas**

Approximately 40 percent of the site is considered to be a low potential source for fugitive dust emissions. These areas include the river bottom and wetland areas along the eastern and southern site boundaries; the Moab Wash corridor; the sandstone cliffs and rocky slopes along the southern and western site boundaries; and the Highway 191 and 279 corridors. These areas are designated as having a low potential for fugitive dust emissions because there is very little surface disturbances in these areas; some areas contain dense vegetative cover; these areas are relatively uncontaminated; and/or there is little to no activity occurring in these areas. No dust controls are planned for these areas, as shown in Table 1.

Table 1. Summary of Fugitive Dust Controls for the Moab Site

Fugitive Dust Source		Dust Controls								
		Water Truck	Sprinkler Irrigation	Vegetative Cover	Lignum Sulfate (Soil Conditioner)	WENDON (Surfactant)	Magnesium/Calcium Chloride	Gravel	Other (Fiber Mat, Tackifier)	No Controls
<b>High Potential Areas</b>	Tailings Pile (Top)	X	X	X	X	X	X		X	
	Tailings Pile (Side Slopes)			X	X				X	
	Northeast Borrow Area	X		X	X					
	Northwest Borrow Area			X	X	X				
	Site Roads	X			X		X	X		
<b>Moderate Potential Areas</b>	North and east portions of Moab Site	X			X					
<b>Low Potential Areas</b>	Moab Wash Corridor									X
	River bottom/wetland areas (south/east)									X
	Sandstone slopes/cliffs (east/south)									X
	Highway 191 and 279 corridors (east and north)									X

#### 4.4 Standards, Action Levels, and Response Actions

Table 2 outlines the applicable regulatory standards and action levels relative to controlling fugitive dust emissions at the Moab Site, and the appropriate response actions to be implemented once it is determined that standards or actions levels have been exceeded.

An air particulate monitoring network has been implemented at the Moab Site in accordance with DOE Order 5400.5, *Radiation Protection of the Public and Environment* and DOE's *Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance* (DOE 1991). As per the *Moab Site Project Environmental Air Monitoring Sampling and Analysis Plan* (DOE 2002), air quality monitoring data are routinely collected and reviewed to ensure compliance with DOE Orders and applicable federal and state air quality regulations. Air particulate sample locations are shown in Figure 4.

Table 2. Fugitive Dust Standards, Action Levels, and Response Actions

Standard / Site-Specific Action Level	Method of Determination	Response Action
Opacity cannot exceed 20 percent at any on-site location or source (R307-309 U.A.C.). DOE's goal at the site boundary is 0 percent opacity.	Visual observation by a Certified Opacity Reader (EPA Method 9 - Visual Determination of Opacity Emissions from Stationary Sources)	Initiate immediate dust control measures as outlined in Table 1. Cease all dust generating activities.
Sustained Wind Speeds Exceeding 20 mph (miles per hour). (EPA Method 9 - Visual Determination of Opacity Emissions from Stationary Sources)	Real time meteorological monitoring.	Monitor visible emissions; Cease all dust generating activities if necessary to maintain 20 percent opacity or less. If needed, initiate immediate dust control measures as outlined in Table 1.
Cannot exceed public exposure standards (DOE Order 5400.5)	Analysis of filters collected by continuous air samplers.	Reassess dust control plan and controls.

## 4.5 Best Management Practices

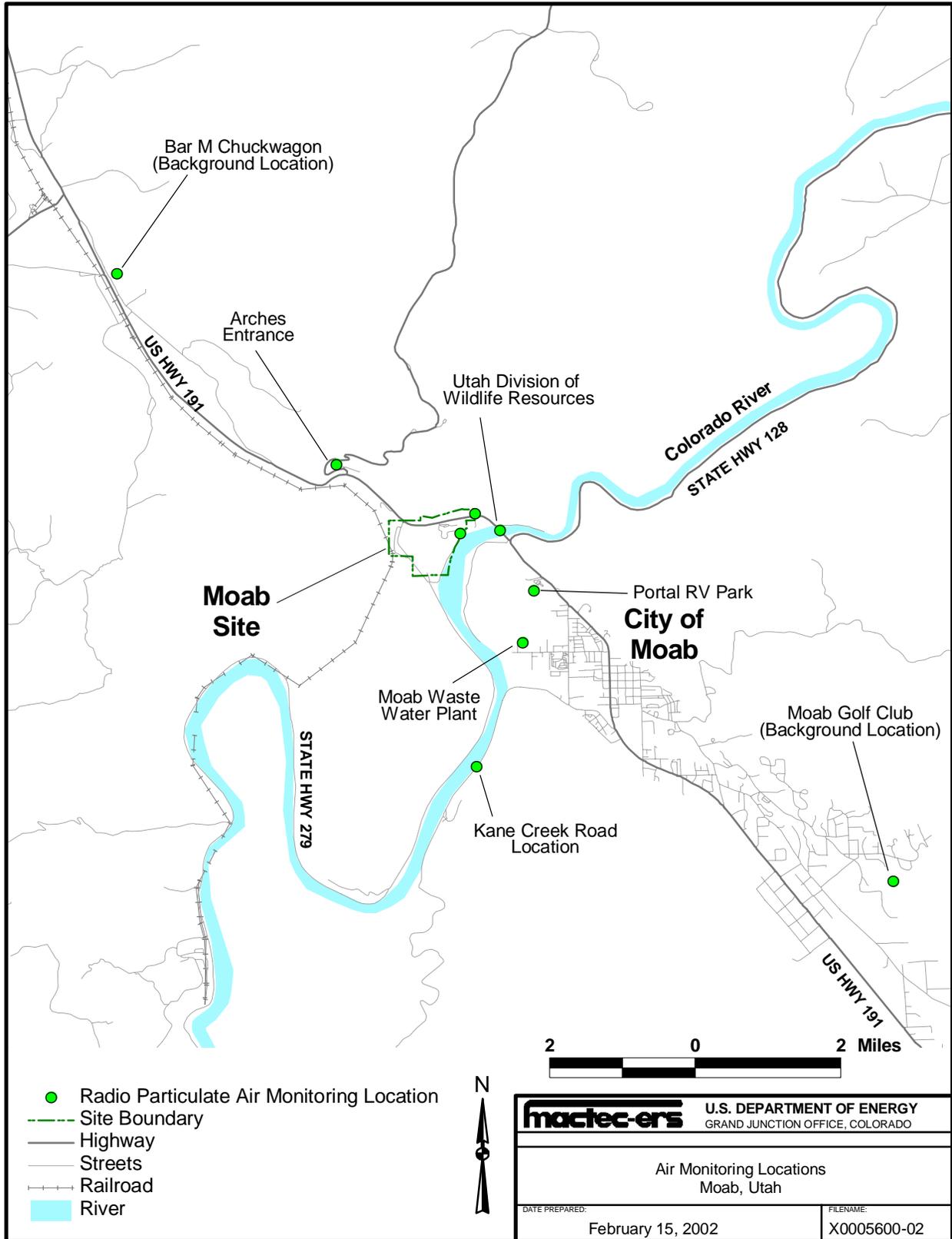
The following Best Management Practices (BMPs) will also be followed to help minimize and control dust emissions at the Moab Site to the greatest extent possible:

**Roads**—All onsite traffic will be restricted to specific designated roads. Off-road travel will only be authorized on a case-by-case basis (e.g., access to a remote monitoring well, etc.). Traffic on the tailings pile will be restricted to designated roads to minimize disturbance of previously treated/stabilized areas. Traffic speed will also be restricted to an appropriate level on all designated roads. All designated roads will be considered as high potential dust source areas, and as such, will be a priority for dust controls utilizing magnesium/calcium chloride, watering, or gravel.

**Hours of Operation**—This Plan will be in effect during all hours of operation at the Moab Site. During non-business hours, there will be no activities generating dust; therefore, dust control actions will be restricted to hours of operation only. However, as a best management practice, if high winds are evident at the close of a business day (or immediately prior to a weekend, holiday, etc.), site personnel should evaluate vulnerable areas and implement controls as appropriate to minimize off-hours emissions.

**Use of Chemical Suppressants**—Use of various chemical dust suppressants (e.g., surfactants, salt-based soil conditioners, etc.) shall be done in accordance with the recommended end-uses for those products. Site personnel shall not exceed the manufacturer recommended application rates. Material Safety Data Sheets (MSDSs) for all dust suppressant materials used at the Moab Site shall be reviewed and approved by the Environmental Services organization. Prior to application, site personnel shall determine and evaluate if the use of the dust suppressant could interfere with other site monitoring activities, or cause other harm to the environment (e.g., runoff into critical habitat for threatened or endangered fish). The MSDSs for dust suppressants to be used at the Moab Site are included in Appendix A.

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Figure 4. Air Particulate Monitoring Locations

## 5.0 Description of Fugitive Dust Emission Controls Off-Site

To minimize the potential for off-site releases or emissions, the following controls will also be implemented:

**Decontamination and Tracking Pad**—Prior to leaving designated contamination areas at the Moab Site, all vehicles and equipment will be thoroughly washed and decontaminated at a decontamination pad using a high pressure water wash. This practice should minimize the potential for any off-site tracking of sediment or contaminants.

**Covered Loads**—Any trucks hauling materials off-site shall be tarped and covered to minimize the loss of materials in-transit / off-site. All loads shall be inspected to ensure that they are properly covered prior to departure.

**Spill Response**—In the event of a spill or release of contaminated materials off-site, the spilled materials will be immediately contained and cleaned up. Emergency spill response actions are outlined in Section 13.0 of the *Moab Site Project Health and Safety Plan* (DOE 2001).

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## 6.0 References

Grand Junction Office, Moab Site Project Environmental Air Monitoring Sampling and Analysis Plan, February 2002, GJO-2001-274-TAR, MAC-MOA 1.6-1, Grand Junction, Colorado

\_\_\_\_\_, 2001, Moab Site Project Health and Safety Plan, December 2001, GJO-2001-281-TAR, MAC-MOA 1.3 (continuously updated), Grand Junction, Colorado

U.S. Department of Energy (DOE) Order 5400.1, General Environmental Protection Program

\_\_\_\_\_, DOE Order 231.1, Environment, Safety, and Health Reporting

\_\_\_\_\_, DOE Order 5400.5, Radiation Protection of the Public and the Environment

\_\_\_\_\_, Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance, DOE/EH-0173T, January 1991

U.S. Nuclear Regulatory Commission, Final Environmental Impact Statement Related to Reclamation of the Uranium Mill Tailings at the Atlas Site, Moab, Utah, NUREG-1531, Vol.1 C.2, March 1999, Washington, DC

Utah Administrative Code (U.A.C.), R307-205-6: Emission Standards: Fugitive Emissions and Fugitive Dust, September 2001, Salt Lake City, UT

\_\_\_\_\_, R313-15-301: Standards for Protection Against Radiation, Dose Limits for Individual members of the Public, September 2001, Salt Lake City, UT

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## **APPENDIX A**

### **Material Safety Data Sheets for Dust Suppressants Used at the Moab Project Site**

103

# MATERIAL SAFETY DATA SHEET

**PRODUCT NAME: CALCIUM CHLORIDE, LIQUID**

CAS NUMBER: 10043-52-4

HBCC MSDS NO. CC06000



**HILL BROTHERS CHEMICAL CO.**

1675 No. Main Street  
Orange, California 92667

Telephone No: 714-998-8800  
Outside Call: 800-821-7234  
CHEMTREC: 800-424-9300

Revision issued: 8/12/93      Supersedes: 5/27/92      First issued: 12/01/85  
**IMPORTANT!** Read this MSDS before use or disposal of this product. Pass along the information to employees and any other persons who could be exposed to the product to be sure that they are aware of the information before use or other exposure. This MSDS has been prepared according to the OSHA Hazard Communication Standard [29 CFR 1910.1200]. The MSDS information is based on sources believed to be reliable. However, since data, safety standards, and government regulations are subject to change and the conditions of handling and use, or misuse are beyond our control, HILL BROTHERS CHEMICAL COMPANY makes no warranty, either expressed or implied, with respect to the completeness or continuing accuracy of the information contained herein and disclaims all liability for reliance thereon. Also, additional information may be necessary or helpful for specific conditions and circumstances of use. It is the user's responsibility to determine the suitability of this product and to evaluate risks prior to use, and then to exercise appropriate precautions for protection of employees and others.

**SECTION I - PRODUCT IDENTIFICATION**

SYNONYMS / COMMON NAMES: CALCIUM CHLORIDE, LIQUID  
CHEMICAL FAMILY / TYPE: INORGANIC SALT  
DOT PROPER SHIPPING NAME: N/A  
DOT HAZARD CLASS / I.D. NO.: N/A  
REPORTABLE QUANTITY: N/A  
NFPA RATING: HEALTH - 1; FIRE - 0; REACTIVITY - 0  
0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

**SECTION II - HAZARDOUS INGREDIENTS**

Chemical Name	CAS Number	%	Exposure Limits (TWAs) In Air		
			ACGIH TLV	OSHA PEL	Other
CALCIUM CHLORIDE	10043-52-4	24-40	N/A	N/A	N/A

**SECTION III - PHYSICAL AND CHEMICAL PROPERTIES**

Physical State: LIQUID    pH: 9-10    Melting Point/Range: N/A  
Appearance/Color/Odor: CLEAR LIQUID, ODORLESS  
Boiling Point/Range: N/A    Solubility In Water: 100%  
Vapor Pressure(mmHg): N/A    Specific Gravity(Water = 1): 1.347 60°F  
Molecular Weight: 110.99    Density(Air = 1): N/A  
% Volatiles: N/A    How to detect this compound: N/A

**SECTION IV - FIRE AND EXPLOSION**

Flash Point: Not flammable      Autoignition Temperature: Not flammable  
Lower Explosive Limit: N/A      Upper Explosive Limit: N/A

**SECTION IV - FIRE AND EXPLOSION-CONTINUED**

Unusual Fire and Explosion Hazards: N/A

Extinguishing Media: N/A

Special Firefighting Procedures: N/A

**SECTION V - REACTIVITY**

Stability: Stable

Hazardous Polymerization: Will not occur

Conditions to Avoid: N/A

Materials to Avoid: Metals will slowly corrode in aqueous solutions. Boric acid and calcium oxide are incompatible.

Hazardous Decomposition Products: None

**SECTION VI - HEALTH HAZARDS**

Routes of Exposure: Calcium chloride can affect the body if it is ingested or if it comes in contact with the eyes or skin.

Summary of Acute Health Hazards:

INGESTION: Causes irritation of mouth and stomach.

INHALATION: Causes irritation of nose and throat.

SKIN: Causes mild irritation.

EYES: Causes irritation and possible transient corneal injury.

Carcinogenicity Lists: NO NTP: NO IARC Monograph: NO OSHA Regulated: NO

Summary of Chronic Health Hazards: N/A

Effects of Overexposure: Possible superficial burns and transient corneal injury.

Emergency and First Aid Procedures:

INGESTION: If swallowed will cause nausea and vomiting. If victim is conscious, have victim drink water or milk. If victim is unconscious or having convulsions, do nothing except keep victim warm -- call for medical help.

INHALATION: Move to fresh air; if discomfort persists, get medical attention.

SKIN: If necessary, remove contaminated clothing and shoes. Flush affected areas with plenty of water.

EYES: Promptly flood with water and continue washing for at least 15 minutes. Consult an ophthalmologist.

Medical Conditions Generally Aggravated by Exposure: N/A

**SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE**

Steps To Be Taken In Case Material Is Released Or Spilled: Dike the spilled liquid, and either pump back into original container or cover with clay-type substance for absorption.

Handling and Storing Precautions: Store at ambient temperature. Prevent possible eye and skin contact by wearing protective clothing and equipment.

Waste Disposal Methods: Add to large volume of water. Stir in light excess soda ash. (Add slaked lime in presence of fluoride.) Decant and neutralize in second container with 6M-HCL. Route to sewage plant. Use as landfill sludge. Notify local sewage plant and solid waste authority.

Other Precautions: N/A

**SECTION VIII - CONTROL MEASURES**

Respiratory Protection: N/A

Ventilation: N/A

Protective Clothing: Employees should be provided with and use impervious clothing, rubber gloves, and rubber boots.

Eye Protection: Employees should be provided with and required to use splash-proof safety goggles where there is any possibility of calcium chloride contacting the eyes.

Other Protective Clothing or Equipment: N/A

Work/Hygiene Practices: Avoid contact with the eyes, skin, and mucous membranes.



Envirotac II is at work in  
 Afghanistan aiding  
**Operation Enduring  
 Freedom**  
 Stabilizing Runways,  
 Landing Pads & More!

(Download/Print a MSDS copy from the References tab)

**Home**

Material Safety Data Sheet

**Envirotac II**

# Envirotac II®

**Photo Gallery**

## SECTION 01 IDENTIFICATION

**Equipment**

Manufacturer: Environmental Products and Applications, Inc.  
 Address: 10722 Arrow Route, Suite 116  
 Rancho Cucamonga, CA 91730

**Color/Additives**

Date Prepared: 07-30-87  
 Emergency Phone #: (909) 980-1422  
 Product Trade Name: Envirotac II®

**Shipping/Storage**

## SECTION 02 HAZARDOUS INGREDIENTS

Hazardous Components: This product is non-hazardous under OSHA Hazard Communication Standard 29 CFR 1910.1200  
 Chemical Family: Vinyl acrylic copolymer  
 Product Solids: 39.43% (active solids)

**MSDS**

## SECTION 03 PHYSICAL/CHEMICAL CHARACTERISTICS

**Downloads**

State: Liquid  
 Appearance and Color: Milky White  
 pH: 5.0 to 9.5  
 Boiling Point: 212F/100C Water  
 Melting Point: 32F/0C Water  
 Vapor Pressure: (mm Hg) 17mg Hg @20C/68F Water  
 Vapor Density: < 1 Water  
 Solubility in Water: Dilatable  
 Specific Gravity: (H2O=1) 1.0 to 1.2  
 Evaporation Rate: (Butyl Acetate=1) < 1 Water

**FAQ**

## SECTION 04 FIRE AND EXPLOSION HAZARD DATA

**Links**

Unusual Hazards: Material can splatter above 212F. Dried product can burn  
 Extinguishing Media: Use extinguished media appropriate for surrounding fire  
 Unusual Fire & Explosion Hazards: None Known  
 Specific Fire Fighting Procedures: Wear self-contained breathing apparatus and full protective gear.

**Contact Us**

## SECTION 05 REACTIVITY DATA

Stability: Stable (Avoid temperatures above 350F and open flames)  
 Hazardous Polymerization: Will not occur  
 Materials to Avoid: None Known  
 Hazardous Decomposition Products: Thermal decomposition may yield acrylic monomers or vinyl acetate monomer

## SECTION 06 HEALTH HAZARD DATA

### ROUTES OF EXPOSURE:

Inhalation: Inhaling vapor or mist can cause headaches, nausea and irritation of the nose, throat and lungs.  
 Ingestion: Yes  
 Eye Contact: Slightly irritating to eyes  
 Skin Contact: Irritating to skin upon repeated or prolonged contact.

### EMERGENCY & FIRST AID PROCEDURES:

Inhalation: Move subject to fresh air  
 Eye and Skin Contact: Flush eyes with a large amount of water for at least fifteen minutes. See a physician if irritation persists.  
 Ingestion: If swallowed, dilute by giving 2 glasses of water to drink. Consult a physician. Never give anything by mouth to an unconscious person.  
 ACUTE/CHRONIC (or carcinogenic): None established

## SECTION 07 PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be taken in case material is released of spilled: Dike and contain spill with inert material (i.e., sand, earth). Cover spill with polyethylene sheeting. Collect and store for proper disposal.  
 Waste Disposal Method: Coagulate by the stepwise addition of ferric chloride acid and lime. Collect clear supernatant and store for proper disposal.  
 Precautions to be taken in handling and storage: Handle with protective gloves and store at temperatures above freezing.

## SECTION 08 CONTROL MEASURES

Respiratory Protection: None indicated under normal conditions of use.  
 Local Exhaust: If needed to control mist.  
 Mechanical (General): N/A  
 Protective Gloves: Use gloves impervious to water and soap.  
 Eye Protection: Use chemical splash goggles.  
 Other Protective Clothing: N/A  
 Work/Hygienic Practices: N/A

10 2.5 35 Abate Abatement Abatement Abates Abating Acetate Acetate-Acrylic Acidulated acre Acryl  
 comprized Conditioned Conditioner Conditioning Constructing Construction Consultants Consulting C  
 Enviroshot Enviro-shot Envirotac Envirotack envirowise Enviro-Wise Enzyme Enzymes Equiped equ  
 Lab laboratories Laboratory land Land Landfill Landfills landing Landing landings lands Lane Lane La  
 penzoil Penzsuppress PenzsuppressD Performed Performing Performs Permazyme Petro Petrobond P  
 Soapstock Soapstock Sod Soded Soding Soil Soiloc SOILOC-MQ Soils SoilSement Soil-Sement sokle

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Send mail to [info@envirotac.com](mailto:info@envirotac.com) with questions about Envirotac II or comments about this web site.

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Last modified: 2/7/02



# SOIL STABILIZATION PRODUCTS COMPANY, INC.

P.O. Box 2779, Merced, CA 95344  
 Phone: (209) 383-3296 or (800) 523-9992  
 Fax: (209) 383-7849 E-mail: Info@sspco.com  
 Webpage: http://www.sspco.com

## SOIL SEAL® CONCENTRATE

### PRICE LIST

Effective Date: January 1, 2001

<u>Number of Drums</u>	<u>Number of Gallons</u>	<u>Price Per Gallon</u>
1 - 9	55 - 495	\$11.00
10 - 49	550 - 2,695	\$10.70
50 - 199	2,750 - 10,945	\$10.40
200 and up	11,000 and up	FACTORY QUOTE

Prices quoted above are F.O.B. our Pico Rivera warehouse and are subject to change without notice.

Post-it® Fax Note	7671	Date	1/2/01	# of pages	1
To	GARY BAUR	From	MARSH PITMAN		
Co./Dept.	MACTEC	Co.	SSPCO		
Phone #		Ph	(800) 523-9992		
Fax	(970) 248-7682	Fax #			

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6063.SS

Ref: January 1, 2001

TOTAL P. 01



# SOIL SEAL™ - A PROVEN PERFORMER

**WHEN YOU NEED TO HOLD SOIL WHERE IT BELONGS**  
*When you need to stop dusting, erosion and siltation.*

**F**or over twenty years, this unique copolymer formulation has been setting the standard for soil surface stabilization. SOIL SEAL® has been specified for the most environmentally sensitive sites by agencies such as the National Park Service, the Forest Service and the Environmental Protection Agency. When EPA remedial action clean-ups or Superfund sites need reliable dust control, erosion control or protection of hydroseeding and hydromulching applications, SOIL SEAL® fits the bill.

While the environmental acceptability of SOIL SEAL® is an outstanding attribute for projects where environmental cleanliness is carefully reviewed, the *durability and cost-effectiveness* of the treatment is equally important. For agencies or industries with a requirement to control large expanses of bare soil, partially vegetated land, mine and mill tailings, or newly planted seed on erosive soils or steep slopes, *cost-effectiveness must be a priority concern.*

### Why is SOIL SEAL® Unique In Effectiveness and Unique In Durability?

There are three primary natural erosive forces at work with which a soil surface stabilizer must contend - wind, water and sun. Whether the goal is to control dust or to stop wind and water erosion, an effective treatment must be well integrated with the soil to hold against high winds, rain impact and heavy sheet-flow of water. The treatment also needs to be resistant to the erosive force of the sun; ultraviolet degradation. The patented high grade copolymer formulation of the SOIL SEAL® product meets the three forces of nature head-on with three unique capabilities. Use of the high grade copolymer base allows SOIL SEAL® to be highly diluted with water for penetration during application, yet still able to polymerize and form a cohesive matrix within the soil once the water evaporates. Special additives further improve the ability of the SOIL SEAL® solution to first penetrate the soil materials and then to harden for maximum holding power. **PENETRATION** and **HOLDING POWER** - two of the three unique factors.

Cheaper polymers may briefly hold against wind and water, but the sun (force number three) passes final judgement. When it comes to an environmentally acceptable base material that is effective for soil surface stabilization, a pure acrylic copolymer is unsurpassed in its resistance to breakdown under ultraviolet exposure. SOIL SEAL® is formulated with a pure acrylic base, allowing for maximum dilution, maximum penetration and durability. We have single treatments still providing dust control and erosion control over four years after application.

### SOIL SEAL® PROMOTES VEGETATION!

If you want to keep an area of bare earth "in control" and free of vegetation, first apply an appropriate pre-emergent herbicide. Otherwise, naturally dispersed seed will be given a major boost in effectiveness as the soil surface is held in place by the SOIL SEAL® treatment, providing a stable germination bed. SOIL SEAL® is formulated to reinforce the ability of the soil surface to shed sheet water flow, yet still be permeable to the gradual moisture infiltration needed to support vegetation.

For a more active approach to revegetation, SOIL SEAL® is state-of-the-art as a tackifier for seed, mulch and soil. SOIL SEAL® has been effective in promoting vegetation on near vertical, crumbling slopes, turning them green with growing grass cover. When success of a revegetation program is critical, SOIL SEAL® is your best insurance.

### DUST CONTROL AND WATER CONSERVATION

Federal PM<sub>10</sub> Regulations and local county and city regulations for the control of fugitive dust are putting pressure on anyone with a lot of disturbed ground to hold in place. Agencies, industry, developers and contractors can call on SOIL SEAL® to provide a dollar saving alternative to ineffective spray treatments and to provide a water-conserving alternative to daily dust control watering.

### PRODUCT APPLICATIONS:

#### BARE EARTH

- Dust Control & Blow Sand Stabilization
- Erosion Control for Temporary & Permanent Closure Caps
- Maintenance of Easements & Right of Ways
- Maintenance of Test Ranges
- Mine & Mill Tailings Stabilization
- Protection of Desert Earthworks
- Runway Perimeter Maintenance
- Stabilization of Material & Topsoil Stockpiles
- Surface Stabilization of Barris & Dikes
- Temporary Stabilization of Contaminated Soils
- Whitening of Construction Sites

#### VEGETATION

- Promotion of Natural Revegetation
- Reclamation & Erosion Restoration
- Revegetation for Slopes & Erosive Soils
- Tackifier for Hydroseeding & Hydromulching

### WHO is using SOIL SEAL®?

- Highway & Public Works Departments
- Federal & State Land Management Agencies
- Military Facilities & Military Contractors
- Petroleum & Petrochemical Industries
- Developers & Contractors
- Mines, Mills & Quarries
- Public Utilities & Power Plants
- Landfills & Waste Containment Closures
- Railroads & Port Facilities
- Environmental Clean-up Contractors
- Airports & Test Ranges
- Hydroseeding & Hydromulching Contractors
- Parks & Conservation Departments

**SOIL SEAL® Easy to Apply, Environmentally Acceptable, Tenacious in Holding Soil In Place.**

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# Soil Stabilization Products™

Co., INC.

Call Toll Free at 1 (800) 523-9992

P.O. Box 2779, Merced, CA 95344 (209) 383-3296 Fax (209) 383-7849



# SOIL STABILIZATION PRODUCTS COMPANY, INC.

P.O. Box 2779, Merced, CA 95344  
Phone: (209) 383-3296 or (800) 523-9992  
Fax: (209) 383-7849 E-mail: staff@sspco.org

*Environmentally Appropriate Product Technologies  
for Pavements, Dust Control, Erosion Control & Soil Stabilization*

## MATERIAL SAFETY DATA SHEET SOIL SEAL® CONCENTRATE

MSDS # 7701  
Reviewed: 01/04/99

### SECTION 01: IDENTIFICATION

INFORMATION FURNISHED BY: Soil Stabilization Products Company, Inc.  
ADDRESS: P.O. Box 2779, Merced, CA 95344  
DATE PREPARED: 01/04/99  
EMERGENCY PHONE #: (800) 523-9992 or (209) 383-3296  
PRODUCT OR TRADE NAME: SOIL SEAL® Concentrate

### SECTION 02: HAZARDOUS INGREDIENTS

Components	% by Wt	CAS#	OSHA PEL	ACGIH TLV
ACRYLIC POLYMER +	46-48%	Non Haz	NE	NE
WATER	54-52%	Non Haz	NE	NE
AMMONIA	.2% Max	7664-41-7	NE	25 ppm

### SECTION 03: PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING POINT > 212° F  
MELTING POINT N/A  
VAPOR PRESSURE (mm Hg) Same as water  
VAPOR DENSITY (Air = 1) < 1  
SOLUBILITY IN WATER Dilutable  
APPEARANCE & COLOR Greenish Liquid with slight ammoniacal odor  
SPECIFIC GRAVITY (H<sub>2</sub>O = 1) 1.06  
EVAPORATION RATE (Butyl Acetate = 1) < 1

### SECTION 04: FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method Used) None (TCC)  
FLAMMABLE LIMITS Not Applicable  
EXTINGUISHING MEDIA Not Applicable  
SPECIAL FIRE FIGHTING PROCEDURES Not Applicable  
UNUSUAL FIRE FIGHTING PROCEDURES Product will not burn but may splatter if temperature exceeds boiling point. Polymer films are capable of giving off oxides of carbon/nitrogen.

**SECTION 05: REACTIVITY DATA**

STABILITY Stable under Normal Conditions  
HAZARDOUS POLYMERIZATION Will Not Occur  
CONDITIONS AND MATERIALS TO AVOID: N/A  
HAZARDOUS DECOMPOSITION PRODUCTS: If involved in a fire, dried film capable of burning giving off oxides of carbon/nitrogen.

**SECTION 06: HEALTH HAZARD DATA**

**ROUTES OF EXPOSURE:**

Inhalation Vapor or mist can cause headache, nausea, and irritation of the nose, throat and lungs.  
Absorption Contact-yes; Absorption-unlikely.  
Ingestion Yes  
Eye Contact Slightly Irritating to eyes.  
Skin Contact Irritating to skin upon repeated or prolonged contact.

**EMERGENCY & FIRST AID PROCEDURES:**

Inhalation Move subject to fresh air.  
Eye and Skin Contact Flush eyes with a large amount of water for at least 15 minutes. See a physician if irritation persists. Wash affected skin areas with soap and water.  
Ingestion If swallowed, dilute by giving 2 glasses of water to drink. See a physician. Never give anything by mouth to an unconscious person.

**SECTION 07: PRECAUTIONS FOR SAFE HANDLING AND USE**

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:** Keep spectators away. Floor may be slippery. Use care to avoid falling. Dike and contain spill with inert material (e.g., sand, earth). Transfer liquid to containers for recovery or disposal and solid diking material to separate containers for disposal. Keep spills and cleaning runoffs out of municipal sewers and open bodies of water.

**WASTE DISPOSAL METHOD:** Coagulate the emulsion by the stepwise addition of ferric chloride and then lime. Remove the clear supernatant liquid and flush to a chemical sewer. Incinerate the solids and contaminated diking material at a permitted facility in accordance with local, state and federal regulations.

**PRECAUTIONS TO BE TAKEN IN HANDLING & STORAGE:** Proper ventilation and keep from freezing.

**SECTION 08: CONTROL MEASURES**

RESPIRATORY PROTECTION None should be required. Use OSHA/NIOSH-approved respirator in poorly ventilated areas.  
LOCAL EXHAUST If needed to control mist or vapor.  
MECHANICAL (General) Is expected to be satisfactory.  
PROTECTIVE GLOVES Use gloves impervious to water and soap.  
EYE PROTECTION Safety Glasses and available eye bath.  
OTHER PROTECTIVE CLOTHING N/A  
WORK/HYGIENIC PRACTICES N/A

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Page 2 of 2

Ref: 5/21/99

# SOIL SEAL APPLICATION

## WHAT IS SOIL SEAL?

SOIL SEAL is a soil stabilizer which prevents erosion by creating a large mass of stabilized soil not easily disturbed by wind and water. SOIL SEAL penetrates the soil surface and forms an excellent cohesive bond between the soil particles. It can be used as a sole treatment in combating dusting and soil erosion, or it can be used as a tackifier in hydroseeding and hydromulching applications. SOIL SEAL is a non-toxic, non-corrosive, non-flammable auxiliary soil chemical formulated to provide safe and economical surface soil stabilization. The SOIL SEAL solution may be applied over vegetation or seeded areas without harmful effects.

## APPLICATION PROCEDURES

SOIL SEAL can be applied by nearly all types of equipment designed to apply liquids, ranging in size from small garden sprayers up to large hydroseeding trucks and water trucks. In all cases, the equipment should be capable of distributing the material in a uniform pattern, applying the solution in large droplets instead of fine mists.

Once the application rate of the concentrate in gallons per acre has been established, the dilution of the concentrate with water can begin. The standard dilution ratio is 30 gallons of water per gallon of SOIL SEAL. The normal turbulence of adding water to the mixing tank will provide adequate mixing of the solution. Further agitation is not required. Pour the SOIL SEAL concentrate into the mixing tank with no more than 50% of the water required for its proper mixture already in the tank. Add the remaining water after the concentrate has been added. For loading material, you can use one of several methods: 5 gallon buckets, elevating the drum up to the height of the fill hole by use of a front-end loader or fork lift, or setting up a sump pump or trash pump that can move a fairly thick liquid. Always hose down any spillage that occurs while loading the concentrate into the truck.

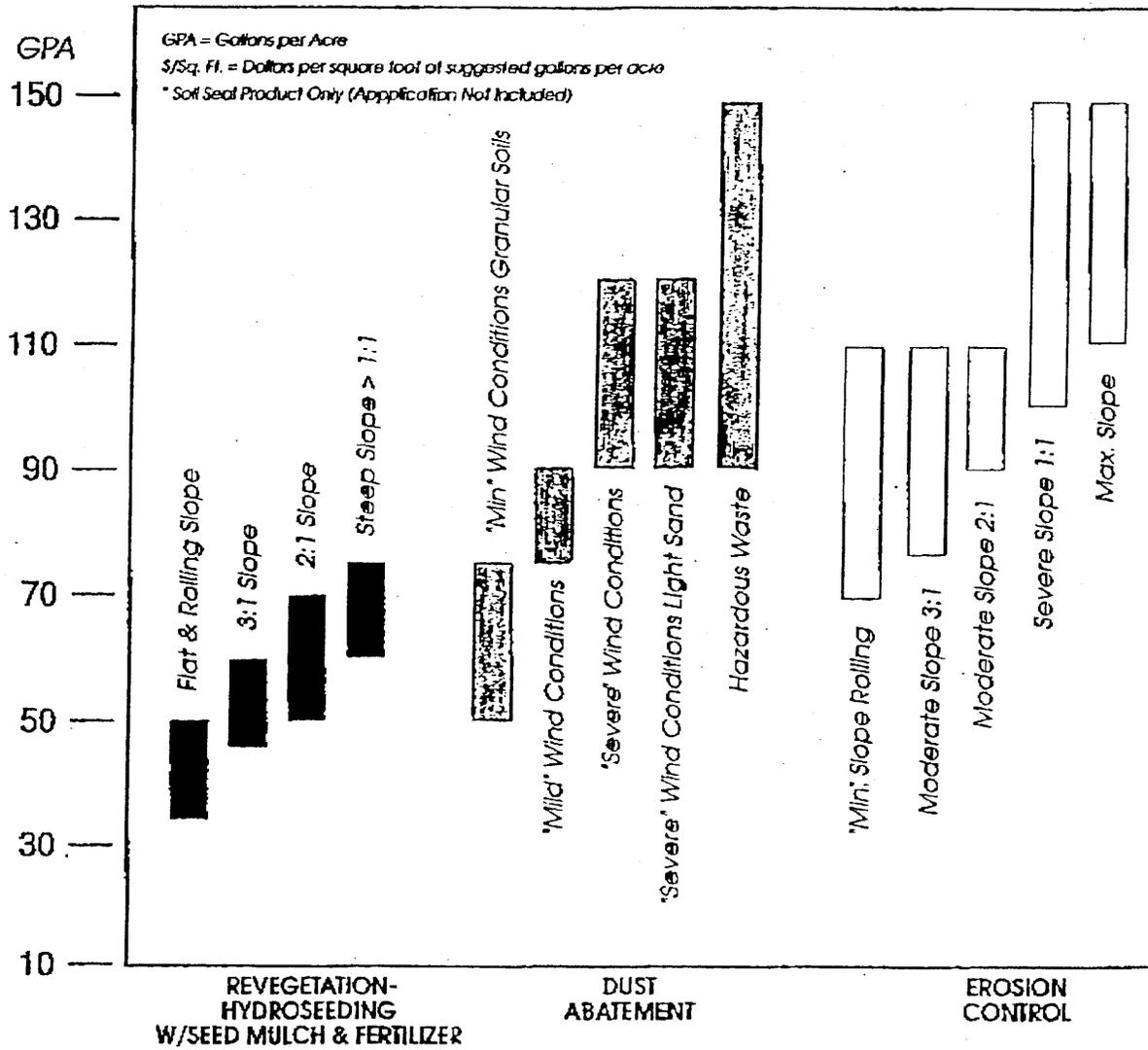
Suggested clothing for your crew is disposable uniforms or old clothes and old shoes. If any of the crew wear eye glasses, safety goggles can be used to protect glasses from overspray. This is particularly important on windy days. For clean-up of clothing and equipment, use a water wash to clean up this water-base product.

When possible, try to schedule application of the product when wind conditions are below 5 mph. The SOIL SEAL product is applied in multiple spray passes to minimize runoff of the solution and to maximize penetration. The full amount of solution planned for application to a specific area should be applied in a continuous series of spray passes (it is not possible to apply part of the product on a second day to a partially treated area as the existing product would already be cured and would inhibit penetration of the second application). Curing time can range from a few hours in hot summer weather to 24 hours or more during periods of high humidity or cold weather. Allow a 24 to 36 hours drying period for the treated area to develop maximum crust strength.

**CAUTION:** Care must be exercised to prevent damage that can result from improper application of SOIL SEAL. Each site should be evaluated prior to application for factors such as wind speed and direction. Equipment, vehicles, buildings and other items on-site which require protection from overspray should be moved or properly protected prior to the SOIL SEAL application.

The proper application of SOIL SEAL is essential to its performance. The owner and consulting engineer should insure that the application crew is thoroughly familiar with all technical data and installation instructions for the SOIL SEAL product. The seller, The Soil Stabilization Products Company, is not responsible for product application or supervision of the SOIL SEAL application.

# Suggested Application Rates of Soil Seal Concentrate



**SOIL SEAL CORPORATION**

Soil Seal Corporation has conducted extensive laboratory and field testing in order to determine the benefits of Soil Seal Concentrate. The information and suggestions presented in this brochure are based on those tests and the best technical information available at the time of printing. No representation or inducement is made guaranteeing results indicated in this brochure will be obtained by anyone using such information or suggestions. Further, the information and suggestions presented in this brochure are not intended to serve as any basis for warranties, express or implied, as to merchantability, fitness for purpose, sale, description, quality, productivity, or any other matter on Soil Seal Concentrate.

Distributed by:

**SOIL STABILIZATION PRODUCTS COMPANY, INC.**  
 P.O. Box 2778, Merced, CA 95344  
 (209) 383-5296 (FAX) 209) 383-7849

CODE 1

MATERIAL SAFETY DATA SHEET

REILLY INDUSTRIES, INC

PAGE 1 OF 4

PRODUCT INFORMATION

\*\*\*\*\*  
 \* PRODUCT NAME: DUS-TOP Dust Control Agent and Road Stabilizer  
 \* CHEMICAL NAME: Not applicable  
 \* PRODUCT NUMBER: Not applicable  
 \* SYNONYMS: Not applicable  
 \* MANUFACTURERS NAME: Reilly Wendover  
 \* a Division of Reilly Industries, Inc.  
 \* CAS NUMBER: Not applicable MOLECULAR WEIGHT: Not applicable  
 \* ADDRESS: 1510 Market Square Center  
 \* 151 North Delaware Street  
 \* Indianapolis Indiana 46204  
 \* CHEMICAL FORMULA: Not applicable DOT NUMBER: Not regulated  
 \* PRODUCT USE: Dust control. IMO: Not regulated  
 \* EMERGENCY TELEPHONE NUMBER: 317-247-8141 HEALTH: 1 FLAMMABILITY: 0 REACTIVITY: 0  
 \* SUPPLIER INFORMATION: Reilly Industries, Inc HAZARD CODE( 0 = NONE; 1 = SLIGHT; 2 = MODERATE; 3 = SEVERE; 4 = EXTREME)\*  
 \*\*\*\*\*

HAZARDOUS INGREDIENTS

HAZARDOUS INGREDIENTS	CAS #	CONCENTRATIONS (%)	EXPOSURE LIMITS		LD 50 (ORAL)/LC 50
			OSHA PEL	ACGIH TLV	
Magnesium chloride	7786-30-3	28 - 34	Not applicable	Not applicable	2800 mg/kg (rat) ; Not available

PHYSICAL DATA

\*\*\*\*\*  
 \* PHYSICAL STATE: SOLID LIQUID X GAS pH: 7 VAPOR PRESSURE: Not applicable  
 \* ODOR & APPEARANCE: Clear liquid. FREEZING POINT: -13 F SPECIFIC GRAVITY: 1.30 @ 68 F  
 \* SOLUBILITY (WATER): Miscible  
 \* ODOR THRESHOLD: Not available DENSITY: See specific gravity. EVAPORATION RATE: Not available VAPOR DENSITY: Not available  
 \* MELTING POINT: Not applicable  
 \* BOILING POINT: 244.6 F  
 \* COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available  
 \*\*\*\*\*

REACTIVITY DATA

\*\*\*\*\*  
 \* PHYSICAL (REACTIVITY) HAZARD WARNING: Not applicable  
 \* STABLE: Yes IF NO, UNDER WHICH CONDITIONS:  
 \* INCOMPATIBILITIES Mildly corrosive to metals.  
 \* REACTIVE: No IF YES, UNDER WHAT CONDITIONS:  
 \* HAZARDOUS DECOMPOSITION PRODUCTS: If evaporated to dryness, and heated to a minimum of 500 C, HCl vapors could be liberated.  
 \*\*\*\*\*

DUS-TOP<sup>®</sup> Dust Control Agent and Road Stabilizer

FIRE AND EXPLOSION HAZARDS

- \* PHYSICAL HAZARD WARNING: Not applicable
- \* SENSITIVITY TO > STATIC DISCHARGE: No ; MECHANICAL IMPACT: No
- \* FLAMMABLE: No IF YES, UNDER WHICH CONDITIONS:
- \* FLASHPOINT (METHOD): Not applicable FLAMMABLE LIMITS (% BY VOL.): UEL: Not applicable LEL: Not applicable
- \* AUTO IGNITION TEMPERATURE: Not applicable
- \* HAZARDOUS COMBUSTION PRODUCTS: Not applicable
- \* MEANS OF EXTINCTION: Water spray, carbon dioxide, dry chemical. As this material is virtually non-flammable, use proper equipment to fight surrounding fire.

UNUSUAL FIRE/EXPLOSION HAZARDS: None

SPECIAL FIRE FIGHTING PROCEDURES: Firefighters should wear full protective equipment and use normal firefighting procedures.

TOXICOLOGICAL PROPERTIES

- \* HEALTH HAZARD WARNING: Irritant.
- \* ROUTES OF ENTRY > SKIN CONTACT: X SKIN ABSORPTION: EYE CONTACT: X INHALATION: X INGESTION:
- \* EFFECTS OF ACUTE EXPOSURE: This material may be irritating to the skin and eyes on contact. If inhaled it may also be irritating to the respiratory tract.

- \* IRRITANCY OF PRODUCT: Skin/eye irritant. SENSITIZATION TO PRODUCT: Not applicable
- \* EFFECTS OF CHRONIC EXPOSURE: Not applicable

CARCINOGEN: REPRODUCTIVE EFFECTS: ) BRIEF DESCRIPTION: Not applicable

TERATOGENICITY: MUTAGENICITY: )

SYNERGISTIC MATERIALS: None known

MEDICAL CONDITIONS AGGRAVATED: None known

# DUS-TOP<sup>TM</sup> Dust Control Agent and Road Stabilizer

## FIRST AID MEASURES

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- \* **SKIN:** Wash exposed area twice with soap and water. The exposed area should be examined by medical personnel if irritation or pain persists after the area has been washed.
- \* **EYE:** Rinse eyes immediately with large amounts of water for at least 15 minutes, occasionally lifting the eyelids. GET MEDICAL ATTENTION.
- \* **INHALATION (BREATHING):** Remove from exposure area to fresh air immediately. If breathing has stopped, give artificial respiration. Keep affected person warm and at rest. GET MEDICAL ATTENTION.
- \* **INGESTION (SWALLOWING):** If conscious induce vomiting to prevent further absorption. Give oxygen if respiration is shallow. GET MEDICAL ATTENTION. Do not give anything by mouth to an unconscious person.

VII

**DECONTAMINATION PROCEDURES:** Use emergency shower if available. Remove all contaminated clothing to prevent further irritation. Wash all clothing and exposed areas of the body twice with soap and water.

## PREVENTIVE MEASURES

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VIII

- \* **PERSONAL PROTECTIVE EQUIPMENT:** GLOVES (SPECIFY): Impervious gloves      FOOTWEAR (SPECIFY): Boots
- \* **EYE (SPECIFY):** Safety glasses or chemical goggles.      CLOTHING (SPECIFY): Not applicable
- \* **RESPIRATORY (SPECIFY):** NIOSH approved chemical cartridge respirator, if necessary.
- \* **OTHER (SPECIFY):** Use protective equipment as conditions necessitate.
- \* **PERSONAL HYGIENE PRACTICES:** Contact lenses should not be worn when handling this material. Do not smoke or eat in areas where this material is handled. Wash hands thoroughly before eating or smoking.
- \* **ENGINEERING CONTROLS:** All operations should be conducted in well-ventilated conditions. Local exhaust ventilation should be provided.
- \* **LEAK AND SPILL PROCEDURE:** For small spills use suitable absorbent material and collect for later disposal. For large spills the area may require diking to contain the spill. Material can then be collected (eg. suction) for later disposal. Wear protective equipment as needed during clean-up. After collection of material flush area with water.
- \* **WASTE DISPOSAL METHOD:** Dispose of the material in accordance with standard practice for disposal of potentially hazardous materials as required by applicable federal, state, or local laws. Wear protective equipment as necessary.
- \* **HANDLING PROCEDURES AND EQUIPMENT:** Protect containers against physical damage. Wear protective equipment as necessary when performing maintenance on contaminated equipment.
- \* **STORAGE REQUIREMENTS:** Store in dry, well ventilated area. Keep away from strong acids.
- \* **SPECIAL SHIPPING INFORMATION:** Chemicals, NOI (DUS-TOP<sup>TM</sup> Dust Control Agent and Road Stabilizer), Non-Hazardous

DUS-TCP™ Dust Control Agent and Road Stabilizer

ADDITIONAL COMMENTS

- \* Hazardous Materials Guide Number - Not applicable
- \* No OSHA or ACGIH exposure limits have been established for this compound.

"FOR CHEMICAL EMERGENCY"  
 Spill, Leak, Fire, Exposure, or Accident  
 Call CHEMTREC - Day or Night  
 800-424-9300  
 Toll free in the U.S., Puerto Rico, Virgin Islands,  
 and Canada. For calls originating outside the U.S.:  
 202-483-7616 (collect calls are accepted).

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\* SECTION 313 SUPPLIER NOTIFICATION> this product contains  
 \* the following toxic chemicals subject to the reporting  
 \* requirements of section 313 of the Emergency Planning  
 \* and Community Right-To-Know Act of 1986 and of 40 CFR 372:

Based upon the criteria set forth in section 34 through 36  
 of the Controlled Products Regulations of Canada this Product  
 is classified as:  
 Not applicable

CAS #	CHEMICAL NAME	% BY WEIGHT
Not appl.	Not applicable	Not appl.

PRECAUTIONARY STATEMENT: PLEASE NOTE that the information contained herein is furnished without warranty of any kind.  
 Users should consider these data only as a supplement to other information gathered by them and  
 must make independent determinations of suitability and completeness of information from all  
 sources to assure proper use and disposal of these materials and the safety and health of  
 employees and customers.

PREPARATION INFORMATION

- \* Prepared under the direction of Paul M. Rivers Ph.D., Director of Corporate Environmental Affairs
- \* PHONE NUMBER 317-247-8141
- \* DATE: December 7, 1992 - Original date of issue: April 18, 1990