

**Health and Safety Plan  
for the the Remediation of the Blake Court  
And Black Material Areas  
Former Solano County Sanitary Landfill  
Benicia, California**

June 29, 2001

prepared by  
Northgate Environmental Management, Inc.  
on behalf of  
Granite Management Corporation



**northgate  
environmental  
management, inc.**

June 29, 2001

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Subject: Health and Safety Plan for the Remediation of the Blake Court and Black  
Material Areas, Former Solano County Landfill, Benicia, California

Dear Mr. Nations:

Enclosed are three copies of the Health and Safety Plan prepared for the Remediation of the Blake Court and Black Material Areas, Former Solano County Sanitary Landfill. Northgate Environmental Management, Inc. (Northgate) has prepared this document on behalf of Granite Management Corp. The intent of this plan is to provide procedures to protect the health and safety of workers in the work area during site-related field activities. This plan addresses DTSC's comments on the draft plan, which were provided to Ted Splitter of Northgate on May 30, 2001.

If there are any questions concerning this plan, please contact the Project Coordinator, Mr. Ted Splitter, at (415) 492-0310.

Sincerely,

Alan Leavitt, P.E.  
Project Engineer

Attachment

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## ACRONYMS AND ABBREVIATIONS

ACGIH	American Conference of Governmental Industrial Hygienists
atm.	atmosphere
bgs	below ground surface
Cal-EPA	California Environmental Protection Agency
Cal-OSHA	California Occupational Safety and Health Administration
CCP	Community Contingency Plan
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CGI	combustible gas indicator
City	City of Benicia
CIWMB	California Integrated Waste Management Board
DTSC	Department of Toxic Substances Control
FLPM	Field and Laboratory Procedures Manual
GISO	General Industry Safety Order
H <sub>2</sub> S	hydrogen sulfide
HCN	hydrogen cyanide
HSC	California Health and Safety Code
HSP	Health and Safety Plan
IDLH	immediate danger to life or health
LFR	Levine-Fricke-Recon, Inc.
LEL	lower explosive limit
MCE	mixed cellulose ester
mg/kg	milligrams per kilogram
mg/m <sup>3</sup>	milligrams per cubic meter
MSDS	material safety data sheets
NCOU	North Canyon Operable Unit
NH <sub>3</sub>	ammonia
NIOSH	National Institute for Occupational Safety and Health
Northgate	Northgate Environmental Management, Inc.
O <sub>2</sub>	oxygen

OCPs	organochlorine pesticides
OEHHA	Office of Environmental Health Hazard Assessment
OSHA	Occupational Safety and Health Administration
PEL	permissible exposure limit
PID	photoionization detector
ppbv	parts per billion by volume
PPE	personal protective equipment
ppm	parts per million
ppmv	parts per million by volume
PVC	polyvinyl chloride
RAO	remedial action objective
RDR	Remedial Design Report
REL	recommended exposure level
RWQCB	Regional Water Quality Control Board
SCDEM	Solano County Department of Environmental Management
SSO	Site Safety Officer
STEL	short-term exposure limit
SVOC	semivolatile organic compound
TLV	threshold limit value
TTLC	total threshold limit concentration
TWA	time weighted average
U.S. EPA	U.S. Environmental Protection Agency
USCG	U.S. Coast Guard
VOC	volatile organic compound

## 1.0 INTRODUCTION

Northgate Environmental Management, Inc., (Northgate) has prepared this Health and Safety Plan (HSP) on behalf of Granite Management Corporation for workers implementing work described in Northgate's Remedial Action Plan for the Former Solano County Sanitary Landfill (June 2001). The Site is located in Benicia, California (see Figure 1). This HSP addresses possible hazards to workers associated with field work completed during remedial activities as described in the RAP and the Remedial Design Document (RDD, Northgate June 2001).

The HSP presents a brief overview of Site investigations to date, summarizes the work to be performed under the RDD, and then details procedures to protect worker health and safety. It presents baseline requirements for establishing and maintaining the health and safety of workers during implementation of work related to remediation activities as described in the RDD, including pre-construction field work; construction access preparation; excavation of overburden fill; stabilization of Black Material; removal of stabilized Black Material; and removal of fill with fragments of refuse and Blake Court Refuse in the Blake Court Area and Parcel C-1. Reconstruction of the houses on Lots 50 and 51 are not considered under this HSP.

The HSP also describes the level of personal protective equipment (PPE) to be worn by workers. The number of personnel that will be in the work area is estimated to range from three to fifteen, depending on the task. The appropriate level of protection depends on the chemical concentrations indicated by field monitoring and sampling, as described in Section 6.0.

The appendices provide additional information on protection of workers from potential chemical hazards. Appendix A presents material safety data sheets (MSDSs) for dust control and odor control materials that may be used in the work area. Appendix B provides descriptions of chemicals of interest potentially present in the work area.

A copy of this HSP will be kept in the work area in a location easily accessible to employees and agency personnel. If new information is obtained or work area conditions change, and if the information or conditions could affect the health and safety of workers in the work area, the Site Safety Officer (SSO) or Project Engineer will immediately inform the Health and Safety Director the Project Coordinator, and the Department of Toxic Substances Control (DTSC), and appropriate changes will be made to the HSP.

This plan will be provided to all employers having personnel onsite. Each employer is required to work under an HSP and may adopt this one, or develop a new plan which is at least as stringent as this plan. Each employer is specifically responsible for the health and safety of their employees and is specifically prohibited from creating unsafe work conditions that affect other employers. Each employer must immediately correct any

unsafe conditions resulting from their work and must comply with any instructions provided by the health and safety director or SSO.

The HSP was prepared using the following documents:

- 29 Code of Federal Regulations (CFR) 1910, Occupational Safety and Health Standards
- 29 CFR 1926, Safety and Health Regulations for Construction
- Title 8 California Code of Regulations (CCR), including General Industry Safety Orders (GISO) and Construction Safety Orders (CSO)
- 8 CCR 5155, California Occupational Safety and Health Administration (Cal-OSHA) Air Contaminants, Permissible Exposure Limits (PELs)
- 8 CCR 5192, Hazardous Waste Operations & Emergency Response
- Threshold Limit Values and Biological Exposure Indices for 2000 American Conference of Governmental Industrial Hygienists (ACGIH), Cincinnati, Ohio
- National Institute for Occupational Safety and Health (NIOSH) Pocket Guide to Chemical Hazards, U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control. NIOSH, 1996
- Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities: NIOSH; Occupational Safety and Health Administration (OSHA); U.S. Coast Guard (USCG); U.S. Environmental Protection Agency (U.S. EPA). Washington, D.C.: U.S. Government Printing Office, October 1985
- 1993 update to Dangerous Properties of Materials, 8th edition, N. Irving Sax. New York: Van Nostrand Reinhold Company, Inc., 1992
- Standard Operating Safety Guides, U.S. EPA, Office of Emergency and Remedial Response, Hazardous Response Support Division, November 1984

## **2.0 WORK DESCRIPTION**

### **2.1 Work Area Description**

The work area is located in the vicinity of Blake Court in Benicia, California (see Figures 1 and 2).

Predevelopment topographic contours and ground surface elevations indicate that portions of two valleys previously occupied the work area. A creek, formerly located in the larger of the two valleys, ran under what is now the location of a section of Rose Drive and sloped down to the south; a tributary ravine ran under what is now the location of a small cul-de-sac called Blake Court and sloped down to the west. The valley beneath Rose Drive was graded by filling in the valley, and level house pads

were created perpendicular to the valley centerline. Houses were constructed on the fill except in Blake Court.

The work area includes the vicinity of Lots 41 through 51, a portion of the backyard of Lot 52, portions of Parcel C-1 where fill with fragments of refuse has been encountered below ground surface and where overburden will be stockpiled and soils may be borrowed. Black Material has been encountered below ground surface in the vicinity of Lots 47, 49, 50, 51, and a portion of Parcel C-1.

## 2.2 Climate

The climate in Benicia is generally mild, with warm dry summers and cool winters. Average temperatures in this area are as follows:

January	47°F	July	84°F
April	72°F	October	73°F

Mean annual precipitation is 16 inches, occurring mainly from October to May (DWR 1981). The prevailing wind direction is from the west and south, and mean wind speeds range from about 7 to 14 miles per hour (Okin 1992).

## 2.3 Results of Previous Investigations

Since June 1991, when ground subsidence was first noted near the rear of the property at 876 Rose Drive (Lot 50), numerous investigations have been performed to identify media containing elevated concentrations of organic and inorganic substances. A chronology and summary of previous investigations are included in the document prepared by LFR entitled, "Prior Investigations Report and Remedial Investigation Work Plan, North Canyon OU, Former Solano County Sanitary Landfill, Benicia, California," dated June 7, 1996 and revised September 11, 1996 (LFR 1996). Remedial field investigations were completed in August of 1996. Remedial investigations are summarized in the Remedial Investigation Report dated March 17 and revised April 30, 1997 (RI, LFR 1997a).

The Black Material consists of soil interbedded with a black, odorous, sometimes viscous material that may contain glass, wood, paper, ash, cement, brick, leather/hide scraps, or other refuse material. The Black Material often exhibits a strong odor.

The Blake Court Refuse primarily consists of soil with approximately 20 to 60 percent of glass, brick, wood, cinders, ash, concrete, metal, ceramic, mortar, and gypsum. Investigations have shown that groundwater is present at times within the Blake Court Refuse in the lowest levels of the western edge (portion) of the landfill. The fill with fragments of refuse in Parcel C-1 is similar to Blake Court Refuse and consists primarily of glass, brick, wood, cinders, ash, concrete, metal, ceramic, mortar, and

gypsum. In Parcel C-1 the refuse fragment content is usually a few percent of the fill by volume and may occasionally approach 10 percent.

The following paragraphs briefly summarize the occurrence of organic and inorganic chemicals found in Black Material and Blake Court Refuse. Although the chemicals mentioned below were detected in the work area, this does not necessarily indicate that all of these chemicals are at a level that poses a health risk to workers.

**Black Material.** Antimony, arsenic, barium, cadmium, calcium, chromium, copper, lead, mercury, molybdenum, nickel and zinc were detected at concentrations exceeding background levels in Black Material samples. Only lead, nickel, pentachlorophenol, and dioxin were detected above their respective remedial action objective (RAO's). The median concentrations of these chemicals in Black Material samples were well below their respective RAO's. Semivolatile organic compounds (SVOCs), volatile organic compounds (VOCs), organochlorine pesticides (OCPs), and hydrocarbons were also detected in some samples. Methane, hydrogen sulfide (H<sub>2</sub>S), and hydrogen cyanide (HCN) were detected in the subsurface gases in the Black Material Area. Methane was detected at concentrations above the lower explosive limit (LEL) of 5 percent by volume in air. H<sub>2</sub>S (up to 4,000 parts per million by volume [ppmv]; median 4.55 ppmv) and HCN (up to 42.2 ppmv; median 21 ppmv) were detected in some wells associated with the Black Material in the middle and deep well intervals. In general, VOCs detected in soil gas were low (in the parts per billion by volume [ppbv] range), with the exception of toluene.

**Blake Court Refuse.** The maximum concentrations of cadmium, copper, lead, and nickel were above their respective RAO's in the Blake Court Refuse. The median concentrations for these chemicals were well below their respective RAO's. SVOCs, VOCs, OCPs, and dioxins were detected in some of the Blake Court Refuse samples.

## 2.4 Proposed Work

The proposed work includes a number of tasks associated with the in place stabilization and removal of the Black Material, removal of refuse and fill with fragments of refuse from Blake Court and Parcel C-1. These specific tasks are described briefly in this section. The RDD contains a more detailed description of the tasks (Northgate 2001).

### 2.4.1 Description of Work

Figures 1 and 2 shows the designated work areas for the removal activities. Underground utility locations will be identified in these areas. After worker safety meetings have been conducted, mobilization of equipment will begin. Equipment anticipated to be necessary for the work includes a drill rig, excavator, backhoe, soil mixing auger, crane, vibratory pile hammer, compactor, water truck, trucks, and hand equipment.

Soil borings will be drilled at the work area with drilling rigs to detail the specific soil stabilization area. A temporary soil-gas extraction and treatment system will be installed to extract gas before and during in place soil mixing.

The houses on Lots 50 and 51 will be removed and rebuilt after the remediation is completed.

Temporary shoring will be installed on Lots 47, 48, 49, and 51 using driven sheet piles. An access corridor and stockpile areas will be constructed in the vicinity.

The overburden soil will be removed from above the fill with fragments of refuse and Blake Court Refuse on Parcel C-1 and to within approximately 3 feet above the Black Material.

A batch plant will be set up in the vicinity for the Black Material stabilization work. Admixtures (Portland Cement, lime, and possibly Fly ash) will be mixed with Black Material, in accordance with the treatability study, as the auger used to treat the Black Material is rotated. Soil gas from the Black Material mixing will be collected by a hood covering the mixing auger and treated to remove soil gas constituents, including H<sub>2</sub>S and ammonia.

The stabilized Black Material will be excavated after the mixture has gained sufficient strength. The Blake Court Refuse and fill with fragments of refuse in Parcel C-1 will be excavated after the overburden soils have been removed. During the excavation and loading process, dust and odor will be controlled as discussed in Section 2.5. During excavation of the stabilized Black Material, trucks will access the loading area via the ramp leading from Blake Court. Trucks will enter the work area, where they will be loaded. The trucks will then pull to a staging area where the loads will be sprayed with odor-suppressing foam, if appropriate, and covered with tarps. The trucks will be cleaned before they leave the work area.

After confirmation samples are collected and the excavation activities are shown to be complete, the excavations will be backfilled with clean overburden and imported fill soil and compacted, the houses on Lots 50 and 51 will be reconstructed, and the work area will be restored to conditions similar to those that existed before the work was performed.

## **2.5 Dust and Odor Control**

Stringent dust and odor control measures will be implemented to reduce potential emissions of airborne particulates and odors generated during in place stabilization and earth-moving operations. These measures will consist of applying water and other dust and odor suppressants as necessary. Water will be obtained from a fire hydrant equipped with a City of Benicia ("City") water meter, pending City approval.

During earth moving or mixing activities, airborne dust will be monitored using a Mini-RAM real-time total dust meter. Action levels for the project are presented in Table 1 and discussed in Sections 6.1.2 and 6.1.3. Spraying equipment will consist of a standard water truck or water pull with spray nozzles located approximately 4 feet above the ground surface. The spray nozzles can be adjusted to water the material from several different positions (i.e., from one side, or with a full rear spray). A spray hose will also be maintained in the work area for manual spraying of less accessible areas and spraying of material as it is loaded into trucks. The spraying technique will consist of providing a medium-fine spray over the material without over-watering and causing runoff. The material will be kept moist by spraying water on an as-needed basis.

In the event that water spraying is inadequate to maintain dust control, dust palliatives or other methods of dust control may be used. If necessary, Dust-Off, a dust suppressant, will be used to control fugitive dust emissions. An MSDS for Dust-Off is included in Appendix A. The PPE described in Section 6.1.1 is suitable for working with the dust suppressant.

Odors will be controlled as necessary during stabilization, excavation, and loading of the stabilized Black Material by spraying a nontoxic, biodegradable foam over odorous materials during the work. MSDSs for the foam are included in Appendix A. The PPE described in Section 6.1.1 is suitable for working with the foam.

The use of such foams is expected to adequately control emissions of ammonia and other odorous gases, if present. However, in the unlikely event that foam suppressants do not adequately control odors during the excavation and loading, then the work zone would be tented with a portable structure to further contain emissions. With this contingency, the stabilized Black Material would be excavated and loaded under cover. The structure would be equipped with sliding or roll-up doors to control air flow when vehicles are not entering or leaving the structure. Air would be circulated through the portable structure and treated with activated carbon and other emission controls, as necessary, prior to discharge.

## **2.6 Transportation of Stabilized Black Material, Blake Court Refuse, and Fill with Fragments of Refuse from Work Area**

Blake Court Refuse and fill with fragments of refuse will be stockpiled at the designated area (see Figure 2) or directly loaded and offhauled from the Site. Stabilized Black Material will be excavated and loaded directly into trucks to be transported to a landfill facility.

Loading of Black Material will take place within the Black Material excavation area. Loading of the Blake Court Refuse and fill with fragments of refuse will take place within the excavation area. Materials will generally be loaded into containers or trucks with sliding steel covers or tarpaulin covers. If materials are spilled during loading, they will be immediately contained and subsequently loaded and hauled from the work

area in accordance with the procedures outlined herein. After loading, equipment will be decontaminated, as necessary, as described in Section 6.5.

Materials removed will be transported in DOT-approved bins, placarded trucks, and/or rail car containers. The type of vehicles used to transport material from the work area will depend on the material characterization results and may include end-dump trucks, truck tractors that transport bins, and/or pin trailers pulled by a tractor. Vehicles will be inspected by Northgate on-site technical staff before leaving the area, to verify that they are properly registered, operated, and placarded in compliance with DOT guidelines, and in accordance with CCR Title 22 regulations, if appropriate. The Northgate-designated inspector will use an information form for departing transportation vehicles to guide and document the inspection. Documentation carried by the driver will include bills of lading or nonhazardous or hazardous waste manifests; proof of insurance; valid registration and current driver's license; material profile information; material weight records, if measured; a copy of the Transportation Plan; a copy of this HSP; and the transporter contingency plan.

Materials to be removed from the work area will be transported using the haul roads from the Black Material and Blake Court areas to Rose Drive, left (south) on Rose Drive, then straight onto Highway 780.

### **3.0 KEY PROJECT PERSONNEL AND RESPONSIBILITIES**

Key project personnel contacts and phone numbers, including those of agencies and community representatives, are included in Section 11. These and other appropriate emergency phone numbers will be kept readily available at the work area.

#### **3.1 Minimum Requirements for Contractors and Subcontractors**

Once construction commences, all Contractors and Subcontractors in the work Area must have met, as a minimum, the following requirements:

- Read and understood this HSP
- Completed all training requirements contained in 29 CFR 1910.120 and 8 CCR 5192
- Been provided with the health and safety equipment indicated in this HSP for personnel and complied with the minimum requirements established by this HSP. If a contractor or subcontractor has prepared its own HSP, the HSP must meet the minimum requirements contained in this HSP, as well as all applicable federal, state, and local health and safety requirements.

## 3.2 Personnel and Responsibilities

### 3.2.1 Site Safety Personnel

Name	Title
Ted Splitter	Project Coordinator
Alan Leavitt	Project Engineer
Irene Fanelli	Director of Health and Safety
Michael Stoll	Site Safety Officer (SSO)

### 3.2.2 Responsibilities

**Project Coordinator.** The Project Coordinator's responsibilities will be to receive all notices, comments, approvals, and other communications from DTSC. The Project Coordinator will be the primary on-site representative of Granite.

**Project Engineer.** The Project Engineer has ultimate responsibility for the health and safety of workers in the work area, and will be responsible for ensuring that:

- the Director of Health and Safety is informed of project developments
- work area personnel receive appropriate training, and are informed of potential hazards and of procedures and precautions to be implemented on the job
- contractors and subcontractors are informed of potential hazards and appropriate protective measures, and that subcontractors are given a copy of this HSP for review
- resources are made available to work area personnel to ensure their health and safety in the work area environment

**Director of Health and Safety.** The Director of Health and Safety will be responsible for:

- monitoring the project's health and safety impacts on personnel in the work area and monitoring public health and safety as indicated in perimeter monitoring results at the boundaries of the exclusion zone
- assessing potential health and safety hazards
- recommending appropriate safeguards and procedures
- modifying the HSP when necessary
- approving changes in safeguards used or operating procedures employed at the work area
- coordinating modification to this HSP or CCP with DTSC

- coordinating orientation of emergency response personnel

The Director of Health and Safety will have the authority to:

- require that additional safety precautions or procedures be implemented
- order shut down of any operation in response to a temporary stop-work condition as defined in Section 6.1.2 or in accordance with the procedures outlined in the CCP (Northgate, 2001) if the Director of Health and Safety believes a health or safety hazard exists, or under any other imminent hazard condition
- deny unauthorized personnel access to the work area
- require that any worker obtain immediate medical attention
- approve or disapprove any proposed modifications to safety precautions or working procedures

**Site Safety Officer.** The SSO will have experience/knowledge of protective systems and health and safety regulations for excavation, trenching and shoring. The SSO will also be familiar with the chemical hazards for the Site and all air monitoring procedures. The SSO or a trained designated alternate will be present at the work area during work. The SSO will be responsible for:

- making sure personnel at the work area comply with the requirements of the HSP
- limiting access to the work area
- reporting unusual or potentially hazardous conditions to the Director of Health and Safety and the Northgate Project Engineer
- reporting injuries, exposures, or illnesses to the Director of Health and Safety and the Project Engineer
- notifying the Director of Health and Safety of proposed changes in work scope or procedures, so that the Director of Health and Safety may approve or disapprove such changes
- recommending additional safety procedures or precautions that might be implemented to the Director of Health and Safety and the Northgate Project Engineer
- observing Site conditions for Health and Safety hazards and notify the contractor/subcontractor superintendents of any deficiencies requiring corrective actions

The SSO will have the authority to:

- order shut down of any operation, in response to a temporary stop-work condition as defined in Section 6.1.2, or a shut-down alert in accordance with the CCP (Northgate, 2001, Section 5.0)

- deny work area access to unauthorized personnel
- initiate a community alert
- initiate a community relocation
- notify the appropriate City emergency response agency when appropriate

**Contractor/Subcontractor Superintendents.** The Contractor superintendent shall be responsible for implementing the Contractor's Site Health and Safety Plan. Specific responsibilities include:

- assure compliance of Contractor personnel with the Contractor's health and safety plan
- the excavation contractor superintendent or his designated alternate shall function as the Competent Person for excavation purposes
- correct all unsafe conditions created in the work area
- comply with all instructions from the Health and Safety Director/SSO regarding Site health and safety

### **3.3 The State of California**

The Department of Toxic Substances Control (DTSC) is the lead agency and will act as the public liaison. State personnel when present in the work area will monitor adherence to the plan.

### **3.4 City of Benicia**

The City of Benicia interacts with the State and the County and participates in technical meetings; it will also oversee portions of the work that may encroach on public use areas. The City will be notified immediately if an emergency requires community notification, as described in the CCP.

### **3.5 Granite Management Corporation**

Granite Management Corporation is responsible for necessary implementation of and updates to the HSP and appendices during field work, and for maintaining communication with the State.

## **4.0 WORK AREA SECURITY AND CONTROL**

To provide safety to workers and the surrounding community, a 6-foot-high chain-link fence will be installed around the work area. Additional procedures to ensure security and limit access to the work area are as follows.

### **4.1 Work Area Security**

Heavy machinery and equipment will be stored in a secured area on completion of each day's work. Material that contains residues of Black Material or Blake Court Refuse will be secured within the fenced area as described in the Draft Remedial Design Document (Northgate, 2001) to prevent accidental contact or unauthorized tampering.

Security will be provided during non-working hours, including nights and weekends.

### **4.2 Work Area Access**

The entire Work Area within the perimeter fence and/or sound wall, excluding the structures on lots 48 and 49, will be designated for restricted access as an exclusion zone (see Figure 2). Additional other areas may be designated and secured as work proceeds. Only project personnel and visitors who meet the training/medical requirements of this Plan will be allowed access to the Site.

The Exclusion Zone includes all designated construction areas. There are two decontamination areas designated for the Site.

The Support Areas include the structures on Lots 48 and 49, and any areas outside of the fencing for the Site. These areas do not have restricted access.

Access to the exclusion zones will be limited to authorized personnel with the appropriate health and safety training, and wearing appropriate PPE, including:

- Northgate employees
- designated Granite representatives
- DTSC and other agency personnel
- designated contractors and subcontractors

The SSO will monitor the exclusion zone to verify personnel do not enter without proper personal protection. Sign-in procedures may also be implemented, if necessary, to ensure that only authorized personnel are allowed access to an exclusion zone.

## **5.0 HAZARD ANALYSIS**

Potential chemical and physical hazards may exist during field activities related to in place stabilization and removal activities for Black Material, and removal activities in Blake Court and a portion of Parcel C-1.

### **5.1 Potential Chemical Hazards**

The primary potential chemical hazards are contact with or inhalation of soil containing metals and SVOCs, and skin contact, absorption, or inhalation of VOCs, H<sub>2</sub>S, HCN, ammonia (NH<sub>3</sub>), lime, Portland cement, and possibly Fly ash.

Soils or materials containing elevated concentrations of chemicals may contact skin or clothing during the following activities:

- drilling soil borings
- sampling soils
- trenching during installation of a temporary soil-gas extraction system
- installation of temporary shoring
- stabilization of the Black Material
- excavation, loading, and removal of the Black Material, Blake Court Refuse, and fill with fragments of refuse

If any of the conditions or action levels described in Section 6.1.2 of this HSP and Section 5.1.1 of the CCP are encountered, the appropriate response will be taken.

### **5.2 Potential Physical Hazards**

Potential physical hazards at the work area include those common to investigation and construction sites, including:

- noise
- flammability hazards
- electric shock
- heavy equipment
- ground instability near excavations
- back safety/lifting hazard
- heat stress

Procedures for protecting workers from chemical and physical hazards are discussed in Section 6.0, as follows.

## **6.0 PROCEDURES TO MITIGATE HAZARDS**

### **6.1 Protection from Potential Chemical Hazards**

The primary potential routes of exposure to chemicals are through dermal contact and inhalation. This section discusses procedures to protect workers from these possible hazards. Table 2 presents the selection criteria for PPE in accordance with 8 CCR 5192. The Upgraded Level D PPE described herein covers employees working in the exclusion zone. Different job classifications have varying degrees of potential exposure. The PPE in Section 6.1.1 and the action levels in Section 6.1.2 are established to conservatively protect all workers in all job categories. Appendix B describes chemicals that are potentially present at the work area.

#### **6.1.1 Personal Protective Equipment**

As a minimum requirement, the upgraded Level D PPE will be worn by all personnel in the work area. The PPE may be further upgraded as necessary, as specified in Section 6.1.2.

Upgraded Level D:

- hard hats
- steel-toed/steel-shank boots
- disposable nitrile index gloves
- chemical resistant neoprene or nitrile outer boots
- disposable nitrile outer gloves when handling treated Black Material or soil stabilization admixtures
- safety glasses or goggles
- regular Tyvek coveralls
- hearing protection (when within 25 feet of excavation or heavy equipment)
- respiratory protection if there are instrument readings above the action levels in Table 1 (with the exception of methane action level) (this would upgrade PPE to Level C or Level B in the case of HCN or H<sub>2</sub>S)
- when handling the admixture, appropriate gloves will be worn. If visible admixture dust is seen, respiratory protection equipped with p100 HEPA filters will be used by personnel in the immediate vicinity of the silo/mix areas. MSDSs for potentially

hazardous substances in the admixture (Portland cement and lime) are included in Appendix A

(Note: Nitrile inner and outer gloves will not be required PPE for personnel in the work area who do not contact Black Material, Blake Court Refuse, or fill with fragments of refuse, unless otherwise indicated by the Director of Health and Safety.)

### 6.1.2 Air Monitoring – Breathing Zone in the Exclusion Zones

Air monitoring for VOCs, methane, H<sub>2</sub>S, NH<sub>3</sub>, HCN, and total dust will be conducted during ground-intrusive activities in the work area in accordance with Table 3. For the purpose of this Health and Safety Plan, ground-intrusive activity is considered to be drilling soil borings, trenching during installation of the soil-gas extraction and treatment system, installation of temporary shoring, removal of overburden soil, treatment and removal of Black Material, removal of Blake Court Refuse and fill with fragments of refuse from Parcel C-1, and loading of trucks with excavated material.

VOC concentrations in the breathing zone will be monitored using a photoionization detector (PID). Methane and oxygen levels will be monitored using a combustible gas indicator/oxygen (CGI/O<sub>2</sub>) meter, to protect against explosion hazards and oxygen-deficient atmospheres (methane is an asphyxiant and is not considered to be an inhalation hazard except in confined spaces). This meter will be calibrated to methane in accordance with the manufacturer's specifications. H<sub>2</sub>S, HCN, and NH<sub>3</sub> will be monitored with direct-reading instruments to determine air concentrations of these compounds in worker breathing zones. In addition, a real-time aerosol monitor will be used to measure worker exposure to total airborne dust. Action levels established for air monitoring with direct-reading instruments are presented in Table 1.

Table 1 provides information on the monitoring equipment, frequency, duration, location, and action levels for work performed under this HSP. The monitoring instruments have been chosen based on the potential airborne hazards that may be present in the work area. The total dust equivalent action level is based on the results of laboratory analysis of soil samples collected previously in the work area.

Additional air monitoring with personal air sampling pumps will be conducted to evaluate potential exposure to workers. The personal air sampling pumps will be equipped with appropriate filter cassettes pinned in the area of the breathing zone on two workers expected to have the highest potential exposures to dust that may contain elevated levels of lead. In addition, one personal air sampling pump equipped to sample dust for total metals will be strapped to the backhoe or excavator used in excavation activities at a location close to the backhoe or excavator operator's breathing zone to obtain additional samples for analysis.

The samples collected with the personal air pumps will be submitted to an AIHA-accredited laboratory for analysis at the end of each of the first two days of each new

ground-intrusive activity. Samples will be analyzed on a 24-hour turnaround in the laboratory. Sampling and analysis methods will follow those established by NIOSH in the NIOSH Manual of Analytical Methods, 4th edition, dated August 15, 1994 or equivalent methods. Samples will be analyzed for lead. Additional samples may be collected at the direction of the Health and Safety Director based on work area monitoring.

Upon review of the results of the laboratory analysis of the samples collected with the personal air monitoring pumps, if lead is present at greater than the Cal-OSHA PELs (see Appendix B), then airborne dust will be monitored using an MIE Mini-RAM total dust meter located on a backhoe, excavator, or on a stake in the area of activity likely to provide a real-time sampling of maximum dust concentrations. The meter will be read during the time when the highest levels of dust are generated, such as during excavation and backfilling and during loading of materials to be removed from the work area. In addition, the action level for total dust will be modified, as appropriate, based on the laboratory analysis of results.

Dust monitoring using the Mini-RAM real-time total dust meter will be done at the beginning of ground-intrusive activities to determine the potential that the activity has to generate dust. After initial monitoring (i.e., when dust control has been implemented and readings are below 5 milligrams per cubic meter [ $\text{mg}/\text{m}^3$ ]), dust will be monitored again only if visual dust is observed or if dust suppression methods appear inadequate.

Results for the samples collected using the personal air pumps will be compared to Cal-OSHA permissible exposure limits (PELs) for the metals to determine whether established total dust action levels at the work area are adequate for protection of workers in the work area, and the surrounding community.

To correlate the chemical concentration of soil samples collected in the work area to the real-time total dust airborne concentration action level the following equation was used:

$$C_t = C_s * CF * AL$$

where:

$C_t$  = estimated equivalent metal dust concentration  $\text{mg}/\text{m}^3$  ( $\text{mg}/\text{m}^3$ )

$C_s$  = chemical concentration in soil (milligrams per kilogram [ $\text{mg}/\text{kg}$ ]);

$CF$  = weight conversion factor from kg to mg of soil ( $1 \times 10^{-6}$   $\text{kg}/\text{mg}$ );

$AL$  = action level ( $5 \text{ mg}/\text{m}^3$ )

$C_t$  is then compared to the occupational PEL of the chemical. Note that the PEL must be in units of  $\text{mg}/\text{m}^3$ .

### ***Upgrade to Level C Protection***

If the action levels in Table 1 (with the exception of the methane action level) are reached in the exclusion zones, PPE will be upgraded to Level C or Level B in the case of HCN or H<sub>2</sub>S. The respirators will be equipped with NIOSH-approved P100 high-efficiency particulate/organic vapor/acid gas combination cartridges. Table 2 shows the type of respirator and articles of clothing that must be worn to conform to each of the PPE levels.

### ***Temporary Stop-Work***

The SSO will impose a temporary stop-work if any of the following action levels are reached:

- VOC concentrations exceeding 25 parts per million (ppm) in ambient air in the breathing zone of workers in the immediate work zone
- an LEL reading for methane exceeding 10 percent LEL in the trenches or breathing zone
- an H<sub>2</sub>S reading exceeding 5 ppm in the breathing zone
- an HCN reading exceeding 2 ppm in the breathing zone
- an NH<sub>3</sub> reading exceeding 15 ppm in the breathing zone
- uncontrolled dust generation in the breathing zone

A stop-work may also be issued if:

- a chemical exposure or injury has occurred
- heat stress is observed
- changes are observed in the general health profile of personnel in the work area including symptoms such as headaches; dizziness; breathing difficulties; irritation to the eyes, nose, throat, or hands; or those discussed in Appendix B.

If a stop-work is imposed, work shall be temporarily halted until the SSO, the Director of Health and Safety and DTSC (if available) agree that it is safe to continue.

### ***Shutdown Alert, Community Alert, and Community Relocation Alert***

In accordance with the Community Contingency Plan (CCP, Northgate 2001), air monitoring will be conducted to protect the community. If air emission action levels presented in the CCP are exceeded, Shutdown Alert, Community Alert, or Community Relocation Alert response actions may be initiated.

In the event of a Shutdown Alert, workers will be moved upwind of the immediate work area, to a location where readings are below action levels, until concentrations decrease. Inspectors and individuals not directly involved in the work will be directed to leave the work area.

In the event of a Community Alert or Community Relocation Alert, the SSO will alert workers to leave the work area by sounding three consecutive blasts of a vehicle horn, repeated three times in succession with five seconds between each group of blasts. On-site personnel are to exit the work area using the nearest gate, unless doing so would expose any worker to potential hazards.

After exiting the work area, personnel should assemble in an area that will be designated as a meeting location (during tailgate session held prior to start of field work, report to the SSO or designated alternate so that everyone can be accounted for, and await further instructions.

### **6.1.3 Air Monitoring – Breathing Zone at the Perimeter Fence**

To protect the health and safety of the surrounding community, air monitoring will be conducted downwind and upwind of the exclusion zones at the exclusion zone boundary for the work area. To protect the health and safety of the surrounding community, air monitoring will be conducted at a minimum of three locations: (1) upwind of the active work area; (2) immediately downwind of the active work area at the perimeter fence; and, (3) at the property line of the nearest inhabited residence. Details of the ambient air monitoring program are presented in the CCP (Northgate, 2001).

## **6.2 Protection from Physical Hazards**

### **6.2.1 Noise**

Workers will wear ear protection, as necessary, when working within 25 feet of drill rigs, excavators, or other heavy equipment. Noise monitoring will be conducted as different types of equipment are used. On the first day that heavy or loud equipment is used in the work area, the SSO will conduct a noise survey to determine the radius from the source at which the Cal-OSHA permissible exposure limit time weighted average (PEL-TWA) of 90 decibels for an eight-hour day would be exceeded if hearing protection were not employed. The SSO will then designate this area with flags, tape, or other appropriate means and, during the daily tailgate meeting, will inform workers of the location of the designated area and of any changes that may occur from day to day.

If the same equipment is used from day to day, then the SSO may measure the distance in linear feet within which hearing protection is necessary and reestablish that distance

each time the equipment is moved (as with trenching). This can be done instead of conducting a noise meter survey every day.

### **6.2.2 Flammability and Electric Shock**

Electrical equipment used during the project will be inspected before use, to ensure that it is in good repair and has no frayed or loose connections. All electrical connections will be made in accordance with National Electric Code practices, properly grounded to an adequate grounding mechanism, and insulated. All equipment connected with extension cords will have a GFCI in line at the end of the extension cord. A CGI/O<sub>2</sub> meter will be used by the SSO to monitor the area for combustible gases and oxygen levels (see Section 6.1.2). A sheet of plywood or a sandbag will be maintained within the drilling area during drilling activities to serve as emergency equipment.

### **6.2.3 Heavy Equipment**

Hazards related to drilling and earth-moving equipment require the exclusion zones to be secured. All relevant requirements pursuant to 29 CFR 1926.602 and Subpart W, Rollover Protective Structures: Overhead Protection, and applicable Cal-OSHA standards, shall be observed during drilling and operation of heavy equipment. All personnel will wear orange or green traffic vests for visibility when working near heavy equipment. Heavy equipment shall always have the right of way.

### **6.2.4 General Hazards**

All Northgate, contractor, subcontractor, agency, and visitor personnel will wear PPE in accordance with this Plan when in the active work area. The fenced area will be locked at the end of each day. All open holes and trenches shall be barricaded to prohibit unauthorized entry. Fire hydrants and electrical and underground lines and pipes will be identified before drilling or excavation begins. One ABC fire extinguisher and first aid kit will be kept at the work area during work hours. Fire extinguishers will also be on each piece of heavy equipment. Personnel will not smoke or eat in areas where work is being performed.

### **6.2.5 Ground Instability Near Excavations**

To mitigate the hazard posed by ground instability near open excavations, these procedures will be followed:

- Under no circumstances will any worker enter an excavation that is greater than 4 feet in depth unless the excavation has been stabilized by shoring or sloping the sidewalls and evaluated for a hazardous atmosphere in accordance with OSHA standards.

- Personnel are not permitted to stand within 2 feet of the perimeter of any excavation extending greater than 4 feet bgs. Caution tape or flags will be placed at the 2-foot mark or at a greater distance to alert personnel of excavation danger.
- Any material, refuse, and/or soil may be stockpiled beginning at a horizontal distance from a sloped excavation perimeter equal to half the expected vertical depth of the excavation (as measured from the toe of the excavation) except that in no event will stockpiles be located farther from the trench than is accessible by swinging the backhoe bucket. No stockpiling will be permitted behind sheet pile shoring.
- Air monitoring with the CGI/O<sub>2</sub> meter at the ground surface near excavations will be performed using a remote probe or tube.
- Any necessary sloping to increase sidewall stability will be performed in accordance with OSHA 1926.650-652 Subpart P and Cal-OSHA regulations.

#### **6.2.6 Heat Stress**

The SSO will watch workers for signs of heat stress. Potable water, sanitation facilities, shade, and chairs will be available to personnel in the work area to rest and cool off.

#### **6.3 Marking the Exclusion Zone**

A fence will be used to delineate and secure the work area.

#### **6.4 Entry Procedures**

At a minimum, those visitors with permission to enter the work areas must wear the protective clothing and equipment described in Section 6.1.1. The SSO may authorize adjustment of PPE requirements in Section 6.1.1. Permission to enter the work area must be obtained from at least one of the persons named in Section 3.2.1. Permission to enter the work area will be limited to instances in which one of the individuals listed in Section 3.2.1 believes that the health and safety of the visitor and on-site workers will not be compromised by such visitation and in which the presence of the visitor will not interrupt the work being performed within the exclusion zone. All visitors' names and their reasons for visiting will be recorded in the field notes.

#### **6.5 Decontamination Procedures**

Disposable gloves and other disposable clothing or equipment worn by Northgate and other personnel in the work area will be placed in a suitable disposal container at the work area at the end of each workday. Personnel decontamination procedures are to wash, rinse, and remove PPE in the following order: outer boots, outer gloves, Tyvek, respirator, and inner gloves. Protective clothing and equipment will be replaced if they have holes or tears. This decontamination will be done just outside the exclusion zone

at the designated decontamination station. Workers will wash their hands before eating or drinking. Workers are advised to shower when they reach home after work.

Equipment that comes in contact with work area soils will be cleaned before removal from the work area. Water used to wash or clean equipment will be collected and placed in a storage tank temporarily, until disposal.

The equipment decontamination area will consist of a rectangular sloped area enclosed by four asphalt berms or wood walls about 1-foot high around the perimeter, with a trough to contain decontamination rinsate at one corner of the lower end. A central berm/wall will be constructed across the middle of the enclosed area and perpendicular to the longitudinal berms/walls. The lateral berms/walls will support the ends and middle of two steel grates as tracks for trucks. The berms/walls and the enclosed area and trough will be covered with either plastic sheeting or asphalt.

Earthen ramps covered with gravel will ramp up to the decontamination area on opposite ends. If truck tires, flaps, or other parts come in contact with Black Material, trucks will drive up one ramp and onto the steel grates for their tires, flaps, and lower parts to be washed free of residual dust and soil picked up during loading so that the rinsate flows down the asphalt or plastic-lined slope and into the trough at the lower corner of the area. Rinsate in this trough will be pumped out as necessary to a storage tank located nearby. Rinsate in the storage tank will be sampled before reaching tank capacity and analyzed for waste characterization. When the sampling results have been received and evaluated, the rinsate will be disposed of appropriately. Chemical analyses of samples will depend on the analytical requirements of the potential receiving facility.

Equipment that cannot be driven onto the decontamination pad will be cleaned with shovels, scrapers, brushes, and brooms before leaving the exclusion zone of the work area.

## **7.0 WORKER MEDICAL MONITORING**

Northgate personnel will undergo appropriate medical monitoring to meet the following requirements:

- 29 CFR 1910.120 (f) and 8 CCR 5192(f), Hazardous Waste Operations and Emergency Response
- 29 CFR 1910.134, and 8 CCR 5144, Respiratory Protection

These regulations help ensure occupational health of workers.

A signed physician's statement qualifying the individual for the work to be performed will be required as part of the medical monitoring program.

## **8.0 EMERGENCY MEDICAL TREATMENT AND FIRST AID**

The procedures in this section are to be followed to provide emergency medical treatment or first aid or if a life-threatening condition exists. The CCP has also been developed to cover emergency conditions during this project. If an emergency condition (as defined in the CCP) arises, on-site personnel are instructed to follow the procedures provided in the CCP.

As defined in the CCP an emergency condition is defined as follows:

- air emissions that exceed action levels
- an on-site fire, explosion, or any unplanned release of hazardous waste or hazardous waste constituents that may be an imminent health hazard
- a natural disaster that may occur during the conduct of this work

### **8.1 Accidents and Injuries**

In the event of a safety or health emergency at the work area, appropriate emergency measures will immediately be taken to assist those who have been injured or exposed and to protect others from hazards. All work in the immediate area of those injured will cease until the situation is brought under control. The SSO will be immediately notified and will respond according to the seriousness of the injury. Personnel trained in first aid will be present while work is in progress to provide appropriate treatment of injuries or illnesses incurred during operations. The Northgate Project Engineer, the Project Coordinator, and DTSC will be immediately informed of any serious injuries. Cal OSHA will be notified by the Health and Safety Director for any injury requiring reporting under the Cal OSHA regulation.

### **8.2 General Injury**

- Use first aid kit kept in the support area, if appropriate
- Call for professional help and/or assistance, if appropriate (e.g., call paramedics, hospital, CCP Section 8.0)
- Notify the SSO, Project Engineer, Director of Health and Safety, the Project Coordinator, and DTSC.

### **8.3 Specific Treatments/Response**

- Eye exposure: flush eye with eyewash; call emergency service, (707) 745-3411 (Benicia Fire Department)
- Skin exposure: wash immediately with soap and water; call emergency service, (707) 745-3411 (Benicia Fire Department), if necessary

- Fire (localized): use fire extinguisher and activate alarm system; call (707) 745-3411 (Benicia Fire Department)
- Smoke inhalation: move to well-ventilated area; call emergency service, (707) 745-3411 (Benicia Fire Department)
- Ingestion: call emergency service, (707) 745-3411 (Benicia Fire Department)

#### **8.4 Medical Treatment Facilities**

Work area personnel will be instructed to go to the appropriate facility, if professional medical attention is required. Medical personnel at the facility listed below will be informed of work area hazards and activities, and work schedule, before the project begins, so that emergency situations can be handled efficiently.

Medical care will be provided by Sutter Solano Medical Care, approximately 15 minutes from the work area in Vallejo, California. Figure 3 shows the route from the work area to this hospital and includes written directions.

Sutter Solano Medical Care  
300 Hospital Drive  
Vallejo, California  
(707) 554-4444

#### **9.0 TRAINING PROGRAM**

Work area personnel and any other personnel seeking access to the Work Area shall have fulfilled all appropriate training requirements of 29 CFR 1910.120 (e) and 8 CCR 5192(e), including the initial training requirement and required refresher and supervisory courses, as appropriate.

A tailgate session to discuss this HSP will be held for workers and representatives of the Benicia Fire Department before field activities begin and when a new worker (with the exception of truck drivers), begins at the work area. Representatives of the Benicia Fire and Police Departments will be invited to participate in the tailgate session. All Northgate, contractor, and subcontractor personnel shall receive, as a minimum, information about the following:

- the names of personnel and alternates responsible for work area safety and health
- safety, health, and other hazards in the work area
- instructions for using PPE
- action levels
- employee work practices for minimizing risks from work area hazards

- instructions for safe use of engineering controls and equipment at the work area
- work area control measures
- emergency plans

## 10.0 PROPOSITION 65 WARNING

Under California's Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65), individuals who may be exposed to chemicals that may cause cancer or reproductive harm in the workplace must be warned of such hazards.

Pursuant to California Health and Safety Code (HSC) Section 25249.6 and 22CCR Sections 12601(c)(3) (A) and 12601(c)(3)(B), the following warning must be given to each individual entering the exclusion zone:

"This area may contain chemicals known to the State of California to cause cancer and/or reproductive harm. This is a Proposition 65 notice."

## 11.0 CRITICAL CONTACTS TELEPHONE LIST

### EMERGENCY RESPONSE NUMBERS

<b>All Medical Emergencies</b>	<b>(707) 745-3411</b>
Sutter Solano Medical Center, Vallejo	(707) 554-4444
Benicia Fire Department	(707) 745-3411
Benicia Police Department	(707) 745-3411
State Office of Emergency Services Hotline	(800) 852-7550 (emergencies only)
National Emergency Response Center Hotline (emergencies only)	<i>inside state</i> (800) 424-8802 <i>outside state</i> (916) 262-1621
<b>Northgate Environmental Management</b>	
Ted Splitter, Project Coordinator	office (415) 492-0310 mobile (510) 435-4609
Alan Leavitt, Project Engineer	office (510) 839-0415 mobile (510) 381-2334

Michael Stoll, Site Safety Officer

office 510-839-0688  
mobile 510-381-2330

Irene S. Fanelli, CIH/Health and Safety Director

office 650-347-9205  
pager 888-881-5128  
mobile 650-906-7397

**Pacific States Environmental Contractor**

Bryan Evans, Superintendent

office  
pager 925-396-1054  
mobile 925-786-0179

Jeff Rankin, Project Manager,

office 925-803-4333 x 134  
pager 925-734-2494  
mobile 925-785-0581

Jim Hughes, Corporate Safety

office 925-803-4333 x 173  
pager 925-396-1477  
mobile 925-785-5453

**Department of Toxic Substances Control**

Paul Ruffin, Project Manager

office (916) 323-3369

Roman Racca, Public Participation Specialist

(916) 445-9543

**City of Benicia**

Otto Giuliani, City Manager  
Incident Commander

(707) 746-4210  
24-hr. (707) 746-3412

**Office of Environmental Health Hazard Assessment**  
Case Officer

(916) 324-2829

**California Integrated Waste Management Board**

Jacque Graber, Case Officer

(916) 341-6353

**Solano County Department of Environmental Health**

Cliff Covey, Case Officer (707) 421-6770 ext. 164

Department of Transportation (Caltrans) (800) 427-7623

**Granite Management Corporation**

Jason Keadjian, Community Liaison (707) 745-2112

Relocation Center (707) 747-8340

Benicia Middle School  
1100 Southampton Road, Benicia, California 94510  
Contact: Guy Creighton, Benicia Unified School District,  
Maintenance Group (707) 747-8300 ext. 1296

**Relocation Transportation**

Michael's Transportation (707) 643-2099

**Supplemental Emergency Response Personnel**

DECON Environmental Services  
23490 Connecticut Street, Hayward, CA 94545 (510) 732-6444  
Contact: Wayne Pelletier, Account Representative

**12.0 REFERENCES**

Levine-Fricke-Recon Inc. (LFR). 1996. Prior Investigation Report and Remedial Investigation Work Plan, North Canyon Operable Unit, Former Solano County Sanitary Landfill, Benicia, California. June 7, and revised on September 11.

\_\_\_\_\_. 1997a. Remedial Investigation Report. March 17 and revised on April 30.

Northgate Environmental Management, Inc. (Northgate). 2001. Remedial Action Plan, Former Solano County Sanitary Landfill, Benicia, California. June 25.

\_\_\_\_\_. 2001. Remedial Design Document for the Remediation of the Blake Court and Black Material Areas, Former Solano County Sanitary Landfill, Benicia, California. June 29.

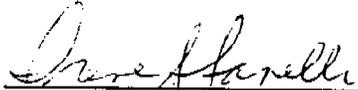
\_\_\_\_\_. 2001. Community Contingency Plan for the Remediation of the Blake Court and Black Material Areas, Former Solano County Sanitary Landfill, Benicia, California. June 29.

- 29 Code of Federal Regulations (CFR) 1910, Occupational Safety and Health Standards.
- 29 CFR 1926, Safety and Health Regulations for Construction.
- Title 8 California Code of Regulations (CCR), Including General Industry Safety Orders (GISO) and Construction Safety Orders (CSO).
- 8CCR 5155, California Occupational Safety and Health Administration (Cal-OSHA) Air Contaminants, Permissible Exposure Limits (PELs).
- 8CCR 5192, Hazardous Waste Operations & Emergency Response.
- Threshold Limit Values and Biological Exposure Indices for 1996 American Conference of Governmental Industrial Hygienists (ACGIH), Cincinnati, Ohio.
- National Institute for Occupational Safety and Health (NIOSH) Pocket Guide to Chemical Hazards, U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control. NIOSH, December 1996
- Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities: NIOSH; Occupational Safety and Health Administration (OSHA); U.S. Coast Guard (USCG); U.S. Environmental Protection Agency (U.S. EPA). Washington, D.C.: U.S. Government Printing Office, October 1985
- 1993 update to Dangerous Properties of Materials, 8th edition, N. Irving Sax. New York: Van Nostrand Reinhold Company, Inc., 1992
- Standard Operating Safety Guides, U.S. EPA, Office of Emergency and Remedial Response, Hazardous Response Support Division, November 1984

### 13.0 SIGNATURES

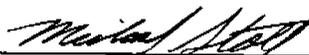
#### 13.1 Northgate Personnel

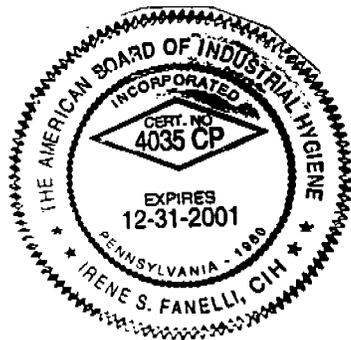
This HSP for the work to be conducted the vicinity of Blake Court in the former Solano County Sanitary Landfill, Benicia, California, is approved by the following Northgate or Northgate subcontract personnel:

  
Irene Fanelli, C.I.H. 6/18/01  
Director of Health and Safety Date

  
Ted Splitter, P.E. 6/18/01  
Project Coordinator Date

  
Alan Leavitt, P.E. 6/18/01  
Project Engineer Date

  
Michael Stoll, P.E. 6-27-01  
Site Safety Officer Date



## 13.2 Contractor and Subcontractor Personnel

### Contractor and Subcontractor Agreement

1. Contractor certifies that the following personnel, noted below, to be employed in the work area in Benicia, California, have met the requirements of the OSHA Hazardous Waste Operations and Emergency Response Standard 29 CFR 1910.120, 8 CCR 5192, and other applicable OSHA Standards.
2. Contractor certifies that in addition to meeting the OSHA requirements, it has received a copy of this HSP, and will ensure that its employees are informed of and will comply with OSHA requirements and the guidelines in this HSP.
3. Contractor further certifies that it has read, understands, and will comply with all provisions of this HSP, and that it will take full responsibility for the health and safety of its employees and subcontractors, if any.

CONTRACTOR

SIGNATURE

DATE

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### 13.3 Visitors

I have read this Health and Safety Plan (HSP) and will comply with it.

NAME	COMPANY/AGENCY	SIGNATURE	DATE
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_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Table 1: Site Air Monitoring (Workers Area)

INSTRUMENT	FREQUENCY	DURATION	LOCATION	UPGRADE ACTION LEVEL (2)	ACTION
Methane (LEL) Combustible Gas Meter (2, 3)	30 Min. or as appropriate during excavation; continuous during drilling	During excavation and drilling	Work area breathing zone, trenches	> 10% LEL >20% LEL	Initially stop work to assess conditions. If levels do not decrease, initiate measures to mitigate. Shut down the work and evaluate possible work practices
H <sub>2</sub> S meter (2, 3)	15 min.	5 min.	Work area breathing zone, trenches	> 5ppm	Initially stop work to assess conditions. If levels do not decrease, upgrade to Level B protection.
VOC (OVM-PID) (2, 3)	30 min.	5 min.	Work area breathing zone	> 25 ppm	Upgrade to Level C using a fullface respirator with organic vapor cartridges.
Aerosol monitor	As described in Section 6.1.2 of text	5 min.	Work area breathing zone	> 5 mg/m <sup>3</sup> or Total Dust Equivalent Level	Upgrade to Level C using a fullface respirator with P100 High Efficiency Dust Cartridges.
Ammonia meter and/or drager tubes (2, 3)	15 min.	5 min.	Work area breathing zone	> 15 ppm	Upgrade to Level C using a fullface respirator with ammonia cartridges.
HCN meter and/or drager tubes (2, 3)	15 min.	5 min.	Work area breathing zone	> 2 ppm	Initially stop work to assess conditions. If levels do not decrease, upgrade to level B protection.

LEL = lower explosive limit

H<sub>2</sub>S = hydrogen sulfide

VOC = volatile organic compound

OVM-PID = organic vapor meter photoionization detector

HCN - hydrogen cyanide

Note : 1) When concentrations of H<sub>2</sub>S, ammonia, HCN, or VOCs are detected above background levels, and/or irritations and odors are noted, continuous monitoring for those compounds with the appropriate instruments will be conducted.

2) The upgrade action levels assume these compounds are present singularly, and not together. If any of these action levels occur concurrently, the upgrade must be to Level B.

3) Methane, H<sub>2</sub>S, VOCs, ammonia, and HCN will only be monitored during remediation of Black Material Area. Following removal of the stabilized Black Material Area, airborne dust will continue to be monitored.

Table 2: Personal Protective Equipment Selection Criteria

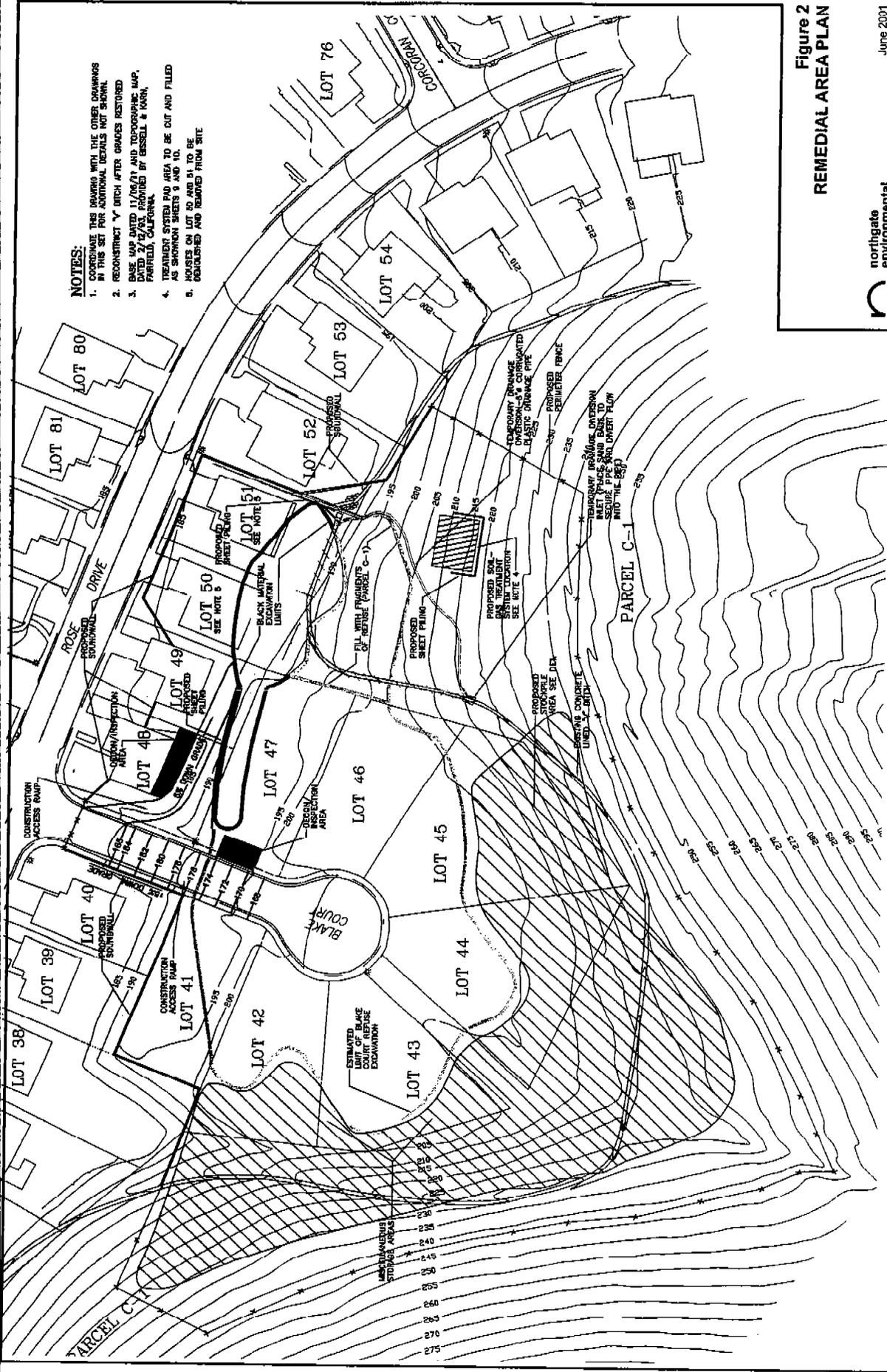
LEVEL USAGE	DESCRIPTION	SELECTION CRITERIA FOR EQUIPMENT
<p><b>Level A</b> - To be selected when the greatest level of skin, respiratory, and eye protection is required.</p>	<ol style="list-style-type: none"> <li>1. Positive pressure, full face-piece self-contained breathing apparatus (SCBA), or positive pressure-supplied air respirator with escape SCBA, approved by the National Institute for Occupational Safety and Health (NIOSH).</li> <li>2. Totally-encapsulating chemical-protective suit</li> <li>3. Coveralls</li> <li>4. Long Underwear</li> <li>5. Gloves, outer, chemical-resistant</li> <li>6. Gloves, inner, chemical-resistant</li> <li>7. Boots, chemical-resistant, steel-toed, and shank</li> <li>8. Hard hat (under suit)</li> <li>9. Disposable protective suit, gloves, and boots (depending on suit construction, may be worn over totally encapsulating suit)</li> </ol>	<ol style="list-style-type: none"> <li>1. The hazardous substance has been identified and requires the highest level of protection for skin, eyes, and the respiratory system based on either the measured (or potential for) high concentration of atmospheric vapors, gases, or particulates; or the site operations and work functions involve a high potential for splash, immersion, or exposure to unexpected vapors, gases, or particulates of materials that are harmful to skin or capable of being absorbed through the skin.</li> <li>2. Substances with a high degree of hazard to the skin are known or suspected to be present, and skin contact is possible; or</li> <li>3. Operations must be conducted in confined, poorly ventilated areas, and the absence of conditions requiring Level A have not yet been determined.</li> </ol>
<p><b>Level B</b> - The highest level of respiratory protection is necessary but a lesser level of skin protection is needed.</p>	<ol style="list-style-type: none"> <li>1. Positive pressure, full face-piece self-contained breathing apparatus (SCBA), or positive pressure-supplied air respirator with escape SCBA (NIOSH-approved)</li> <li>2. Hooded chemical-resistant clothing (overalls and long-sleeved jacket; coveralls; one or two-piece chemical-splash suit; disposable chemical-resistant overalls</li> <li>3. Coveralls (1)</li> <li>4. Gloves, outer, chemical-resistant</li> <li>5. Gloves, inner, chemical-resistant</li> <li>6. Boots, outer, chemical-resistant, steel-toed, and shank</li> <li>7. Boot covers, outer, chemical-resistant (disposable) (1)</li> <li>8. Hard hat (under suit)</li> <li>9. [Reserved]</li> <li>10. Face shield (1)</li> </ol>	<ol style="list-style-type: none"> <li>1. The type and atmospheric concentration of substances have been identified and require a high level of respiratory protection, but less skin protection</li> <li>2. The atmosphere contains less than 19.5 percent oxygen; or</li> <li>3. The presence of incompletely identified vapors or gases is indicated by a direct-reading organic vapor detection instrument, but vapors and gases are not suspected of containing high levels of chemicals harmful to skin or capable of being absorbed through the skin.</li> </ol>

Note: This involves atmosphere with immediately dangerous to life or health (IDLH) concentrations of specific substances that present severe inhalation hazards and do not represent a severe skin hazard; or that do not meet the criteria for use of air-purifying respirators.

PPE for the Site is Modified Level D. PPE upgrade will result in Level C protection or Level B protection in the case of H<sub>2</sub>S or HCN. Level C and B will require the use of respiratory protective equipment. PPE upgrades will be based upon conditions as described herein and in the HSP. PPE selection is based upon visual assessment of site and available information. PPE will be upgraded if any of the conditions in the "Upgrade Action Level" column of Table 1 are encountered.

(1) Optional, as applicable





**NOTES:**

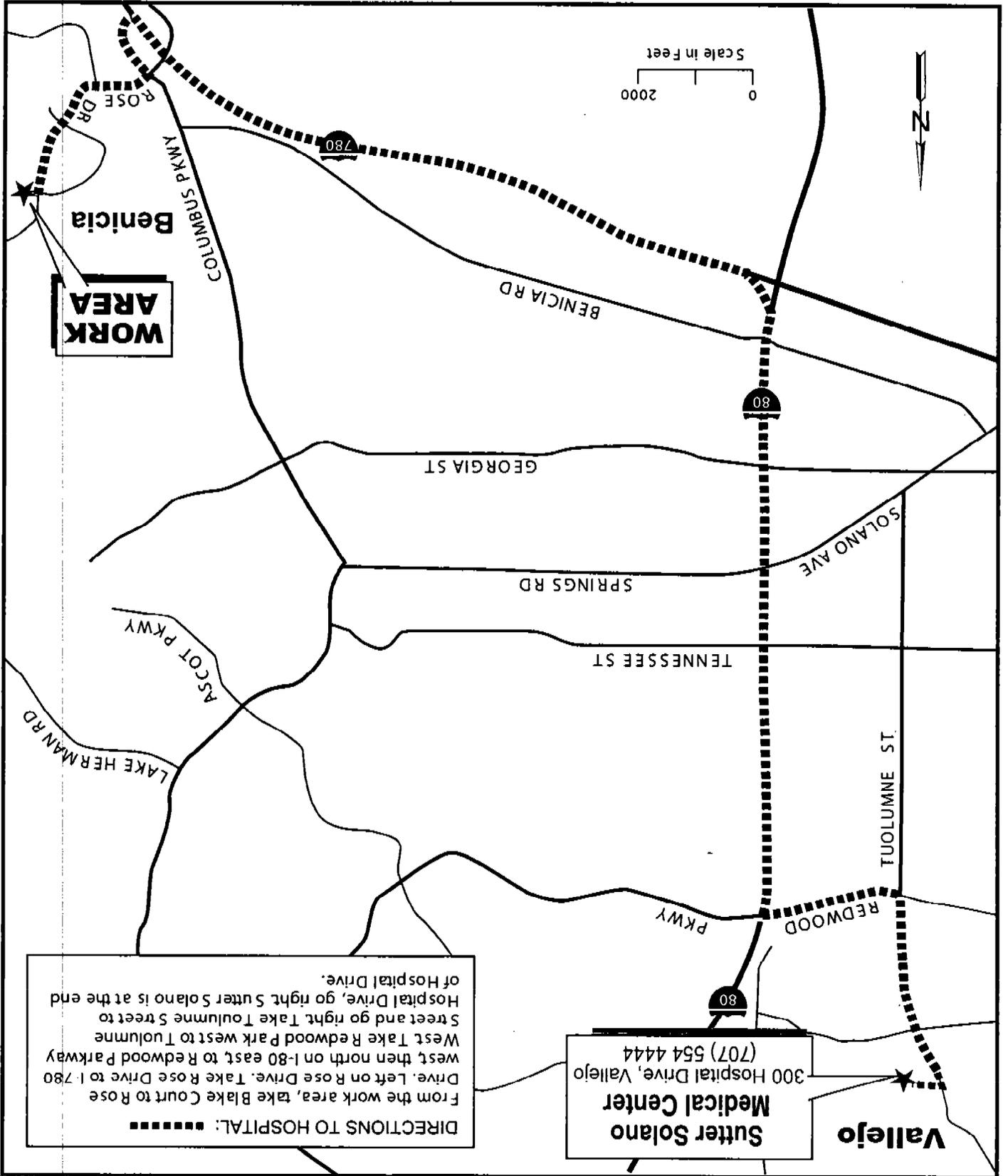
1. COORDINATE THIS DRAWING WITH THE OTHER DRAWINGS IN THIS SET FOR ADDITIONAL DETAILS NOT SHOWN.
2. RECONSTRUCT V DITCH AFTER GRADES RESTORED.
3. BASE MAP DATED 11/86 BY THIS TOPOGRAPHIC MAP, DATED 2/12/88, PROVIDED BY BRIDGES & TOWNS, FAIRFIELD, CALIFORNIA.
4. TREATMENT SYSTEM PAD AREA TO BE CUT AND FILLED AS SHOWN ON SHEETS 9 AND 10.
5. HOUSES ON LOT 40 AND 41 TO BE DEMOLISHED AND REMOVED FROM SITE.

**Figure 2  
REMEDIAL AREA PLAN**



Northgate Environmental, Inc.

Figure 3  
HOSPITAL ROUTE MAP  
Sutter Solano Medical Center, Vallejo, California  
May 2001 & Proj. No. 1056.01



Material Safety Data Sheets

APPENDIX A



### Material Safety Data Sheet

**PRODUCT: FLY ASH**

Hazardous Nature: This product is potentially classified as hazardous depending on jurisdiction and use.

#### PRODUCT IDENTIFICATION

Pozzolan, Fly Ash, Class F Fly Ash, Class C Fly Ash

Use

Supplementary cementitious material for concrete and concrete products. Also used in soil stabilization and as a fine filler in asphalt and other products.

Hazardous Chem Code

Not Applicable

Poisons Schedule

Not Scheduled

Dangerous Goods Class

Not Applicable

#### PHYSICAL DESCRIPTION / PROPERTIES

Appearance: Fine powder - light to dark grey or shades of brown or buff in color.

Boiling/Melting Point: Melting point > 1400 ° C

Vapour Pressure: Not Applicable

Percent Volatiles: Not Applicable

Specific Gravity: 2.05 to 2.8

Flash Point: Not Applicable

Flammability Limits: Not Applicable

Auto Ignition Temp: Not Applicable

Solubility In Water: Essentially insoluble. Some Class C fly ashes may have soluble sodium sulfate (1-8%).

Respirable Fraction: Approximately 20% - 40% of particles are below 7 micron in diameter (i.e. in the respirable range).

Other Properties: Not Applicable

**Ingredients**

Chemical Entity Proportions

Silica-Crystalline, as Quartz 1-5%

Mullite 1 - 5%

Note: Fly ash is a by product of coal combustion. The material is composed primarily of complex aluminosilicate glass, mullite, hematite, magnetite spinel and quartz. The proportion of quartz (crystalline silica) in the fly ash varies depending on the quartz content of the coal. Class C fly ash may have 1-7% free CaO and calcium sulfate as well as calcium aluminosilicate glass.

**HEALTH HAZARD INFORMATION**

Short Term Exposure

Swallowed: Unlikely under normal conditions of use. Swallowing fly ash may cause abdominal discomfort.

Eyes: Irritating to eyes causing watering and redness.

Skin: Irritating to skin - can cause irritant/contact dermatitis from mechanical abrasion or alkaline composition(Class C fly ash).

Inhaled: Irritating to the nose, throat and respiratory tract causing coughing and sneezing.

Long Term Exposure

Swallowed: Not Applicable

Eyes: Not Applicable

Skin: Not Applicable

Inhaled: Repeated inhalation of dust containing crystalline silica can cause bronchitis, silicosis (scarring of the lung) and lung cancer. It may also increase the risk of scleroderma (a disease affecting the connective tissue of the skin, joints, blood vessels and internal organs). Studies have shown that smoking increases the risk of bronchitis, silicosis and lung cancer in persons exposed to crystalline silica. It is recommended that all storage and work areas should be smoke free zones. Inhalation of high levels of fly ash dust may result in severe inflammation of the small airways of the lung and asthma-like symptoms.

**First Aid**

Swallowed: Give plenty of water to drink. If any acute gastrointestinal distress, seek medical attention.

Eyes: Flush thoroughly with flowing water for 15 minutes. If symptoms or irritation persist, seek medical attention.

Skin: Wash thoroughly with mild soap and water. Some Class C fly ashes are quite hydraulic and alkaline; contact with wet skin may result in burns.

Inhaled: Remove to fresh air, away from dusty area. If symptoms persist, seek medical attention.

**Exposure Limits**

Crystalline Silica (Quartz): 0.2 mg/m<sup>3</sup> TWA (time-weighted average) as respirable dust.

Dust (NOS - not otherwise specified): 10 mg/m<sup>3</sup> TWA as inspirable dust. However, where a state, territory or local authority prescribes a lower exposure standard, the lower standard applies. Recommendations: Keep exposure to dust as low as practicable. Respirable crystalline silica levels should be kept below 0.1 mg/m<sup>3</sup> TWA, and respirable dust below 5 mg/m<sup>3</sup> TWA.

**Engineering Controls**

Avoid generating dust. When handling fly ash, use local mechanical ventilation or extraction in areas where dust could escape into the work environment. For bulk deliveries, closed pumping systems are recommended. For handling of individual bags, follow instructions below if no local exhaust ventilation is available. Work areas should be cleaned regularly by wet sweeping or vacuuming. If generating dust cannot be avoided, follow personal protection recommendations below.

Personal Protection: Skin: Wear loose comfortable clothing. Wash work clothes regularly. Apply barrier cream to hands or wear cotton or light duty leather gloves or equivalent.

Eyes: Safety spectacles with side shields or safety goggles should be worn if dust likely to be generated.  
Respiratory: None required if engineering and handling controls are adequate. If dust is generated wear a suitable particulate respirator. Use only respirators which bear the standards mark and are fitted correctly. Note that persons with facial hair will have difficulty in obtaining a satisfactory face seal.

Ventilation: Refer to Engineering Controls

Flammability: Non-flammable

**Storage and Transport**

Keep in a dry place. When handled pneumatically use standard dust filters on vehicles and silos.

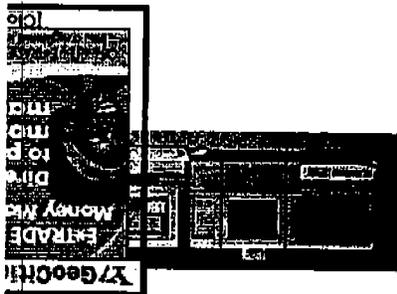
Spills and Disposal: Follow above safety requirements under "Precautions for Use" and wet sweep or vacuum dust with industrial vacuum cleaner. A fine water spray should be used to suppress dust when sweeping. Collect in containers and dispose of as trade waste in accordance with local authority

guidelines. Keep out of stormwater and sewer drains.

Fire/Explosion Hazard: Not flammable. Does not decompose on heating.

Note

The provision of this information should not be construed as a recommendation to use this product in violation of any patent rights or in breach of any statute or regulation. Users are advised to make their own determination as to the suitability of this information in relation to their particular purposes and specific circumstances. Each user should read this MSDS and consider the information in the context of how the product will be handled and used in the workplace and in conjunction with other substances or products. Individual responsibility must be taken as to proper use and handling of product.



### Typical Chemistry of Coal Fly Ash (in Wt.%)

ClassF	ClassC	ClassI	ClassF	ClassC	ClassI
SI02	46-57	42-54	25-42	46-59	
Al2O3	18-29	16.5-24	15-21	14-22	
Fe2O3	6-16	16-24	5-10	5-13	
CaO	1.8-5.5	1.3-3.8	17-32	8-16	
MgO	0.7-2.1	0.3-1.2	4-12.5	3.2-4.9	
K2O	1.9-2.8	2.1-2.7	0.3-1.6	0.6-1.1	
Na2O	0.2-1.1	0.2-0.9	0.8-6.0	1.3-4.2	
SO3	0.4-2.9	0.5-1.8	0.4-5.0	0.4-2.5	
LOI	0.6-4.8	1.2-5.0	0.1-1.0	0.1-2.3	
TIO2	1-2	1-1.5	<1	<1	

Chemical composition of bituminous coal ash SRM 2689, subbituminous coal ash SRM 2691, and lignite coal ash (North Dakota) in weight %:

SRM 2689	SRM 2691	Lignite
SI02	51.5	35.8
Al2O3	24.4	18.1
Fe2O3	13.3	6.4
CaO	3	24.7
MgO	1	5.3
Na2O	0.3	1.4
K2O	2.6	0.4
SO3	0.7	2.1
LOI	1.8	0.2
Total	98.6	94.4

Note: Chemical analysis by atomic absorption, ICP, or "wet" methods. Most of SiO2 and Al2O3 and Fe2O3 is present in glassy amorphous form. SO3 is usually present as Calcium sulfate or Alkali sulfates. Most of the CaO/MgO is not free. Check with chemical methods. LOI is presumed to be Carbon (check with LECO Carbon Analyzer.) Class C fly ashes are usually self-cementing (hydraulic.)

Class F fly ash has a glassy phase and inert crystalline phases: quartz, mullite, ferrite spinel, hematite.

Class C fly ash may have the above as well as: anhydrite, alkali sulfates, dicalcium silicate, tricalcium aluminate, lime(Portlandite if ash has been exposed to moisture), melilitite, merwinite, periclase, sodalite. See properties of Japanese fly ash.

**Trace Elemental Analysis Coal Fly Ash (Class F)**

in mg/kg(NA= Not Available)

	(Range)	
aluminum	140000	(80000-140000)
arsenic	286	(100-300)
barium	1003	(100-1000)
boron	290	(NA)
cadmium	<0.5	(NA)
chromium	218	(NA)
cobalt	NA	(10-90)
copper	185	(30-200)
lead	114	(120-270)
lithium	270	(NA)
manganese	290	(NA)
molybdenum	46	(NA)
nickel	169	(30-200);
selenium	11	(5-30);
silver	14	(NA);
P2O5	3800	(NA);
strontium	NA	(200-2600);
titanium	8500	(NA);
zinc	254	(200-450);

The

**FLY ASH RESOURCE CENTER**

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



SPPCO

**MATERIAL SAFETY DATA SHEET: DUST-OFF® Anticorrosive Dust Suppressant**

**SECTION 01: GENERAL INFORMATION**

INFORMATION FURNISHED BY: Cargill Solarchem Resources - Soil Stabilization Products Co., Inc.  
 ADDRESS: P.O. Box 2778, Merced, CA 95344  
 DATE EFFECTIVE: 07/23/81, Revised 03/14/94  
 CHEMICAL NAME(S): Aqueous Magnesium Chloride (MgCl<sub>2</sub>) and magnesium sulfate (MgSO<sub>4</sub>) and a proprietary ingredient  
 CONTACT/PHONE #: Director-Quality Admin/(800) 523-9992  
 PRODUCT OR TRADE NAME: DUST-OFF® Anticorrosive Dust Suppressant  
 CAS #: 7786-30-3, 7487-88-9  
 HAZARDOUS INGREDIENTS: N/A, identity of proprietary ingredient withheld as trade secret

**SECTION 02: PHYSICAL/CHEMICAL CHARACTERISTICS**

BOILING POINT (760mm Hg) (°C): 108-123  
 VAPOR PRESSURE (mm Hg/30°C): 7.5  
 VAPOR DENSITY (Air = 1): N/A  
 SOLUBILITY IN WATER (g/cc.%): 100%  
 SPECIFIC GRAVITY (H<sub>2</sub>O = 1): 1.306  
 MELTING POINT (°C): N/A  
 EVAPORATION RATE (Butyl Acetate = 1): < 1  
 APPEARANCE & ODOR: Slightly viscous, brown/amber liquid with a slight saline odor.

**SECTION 03: FIRE AND EXPLOSION HAZARD DATA**

FLASH POINT: Not Applicable  
 EXTINGUISHING MEDIA: Not Applicable. This product is nonflammable.  
 SPECIAL FIRE-FIGHTING PROCEDURES/EQUIP.: May use a self-contained breathing apparatus if temperatures exceed 300°F (149°C)  
 UNUSUAL FIRE & EXPLOSION HAZARDS: None.

**SECTION 04: REACTIVITY DATA**

STABILITY: Stable  
 CONDITIONS TO AVOID: Contact with strong acids  
 INCOMPATIBILITY (Materials to Avoid): incompatible with sulfuric and nitric acids, caustics, ammonia and cyanides. A hazardous reaction involving magnesium chloride and 2-turan percarboxylic acid has been reported.  
 HAZARDOUS DECOMPOSITION OR BYPRODUCTS: May evolve chlorine gas when in contact with strong acids or upon heating above 300°F (149°C). Under normal applications, decomposition should not occur.  
 HAZARDOUS POLYMERIZATION: Will not occur

**SECTION 05: HEALTH HAZARD DATA**

ROUTES OF ENTRY: Inhalation?  
 Skin?  
 Ingestion?  
 HEALTH HAZARDS (Acute and Chronic):  
 Mist may cause mild irritation of nose and throat, unlikely entry route.  
 May cause minor irritation to sensitive person.  
 Ingestion of large amounts may cause gastrointestinal upset.  
 Ingestion of large amounts can cause gastrointestinal upset and irritation of the stomach. No information found for chronic systemic effects.

**Soil Stabilization Products Company, Inc.**

P O Box 2778, Merced, CA 95344 U.S.A.  
 (800) 523-9992 Phone (209) 383-2296 FAX (209) 383-7849

**CARCINOGENICITY:**

NTP?  
IARC Monographs?  
OSHA Regulated?  
Not listed as a carcinogen or mutagen.  
Not listed as a carcinogen or mutagen.  
Not listed as a carcinogen or mutagen.

**SIGNS AND SYMPTOMS OF EXPOSURE:**

Inhalation:  
Skin Contact:  
Ingestion:  
Mist may cause slight irritation of nose; unlikely entry route.  
May cause minor irritation to sensitive persons.  
May cause nausea or vomiting.

**MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:** Possible skin irritation to sensitive persons.

**EMERGENCY AND FIRST AID PROCEDURES:**

Inhalation: Remove to fresh air. Inhalation is an unlikely entry route.  
Skin Contact: Flush with water. For eye contact, flush eyes with large amounts of water, lifting eyelids occasionally.  
Ingestion: Less than a few grams would not be harmful. For larger quantities, drink large amounts of water or milk.

**EMERGENCY TELEPHONE NUMBERS:**

Daytime: (800) 523-8982  
Evening: (612) 476-1127 (MN) or (510) 781-0775 (CA)

**SECTION 06: PRECAUTIONS FOR SAFE HANDLING AND USE**

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:**

Contain spills to prevent contamination of water supply or sanitary sewer system. Dispose of according to local requirements.

**WASTE DISPOSAL METHOD:**

For disposal of this material as a waste, act in accordance with all applicable Federal, state, and local waste management regulations.

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:**

Prolonged storage or subjecting the materials to temperatures below 30°F (-1°C) can result in the formation of magnesium sulfate crystals. Incompatible with sulfuric and nitric acids, caustics, ammonia and cyanides.

**OTHER PRECAUTIONS:**

Do not apply directly to plant foliage or root zones, as concentrated magnesium chloride solutions may cause partial or complete defoliation. This product is designed to control dust on unpaved surfaces. Application of excessive amounts of DUST-OFF directly adjacent to or directly upon paved surfaces may result in slippery conditions which present a safety hazard for foot and vehicular traffic.

**SECTION 07: CONTROL MEASURES**

**RESPIRATORY PROTECTION: (Specify Type) N/A**

**VENTILATION:**

Local Exhaust  
Mechanical (General)  
Special  
Not necessary  
Not necessary  
N/A

**PERSONAL PROTECTIVE EQUIPMENT:**

Protective Gloves:  
Eye Protection:  
Other Protective Clothing/Equipment:  
Work/Hygiene Practices:  
Normal work gloves are adequate.  
Eyeglasses or goggles may be worn.  
Protective clothing may be worn, but is generally not required.  
Warm water showering and handwashing is suggested if in direct contact with product, but is generally not required.

All statements, technical information and recommendations contained herein are, to the best of our knowledge, reliable and accurate, however, no warranty, either express or implied, is made with respect thereto. We will not be held liable for damages resulting from the use of the material described. It is the responsibility of the user to comply with all applicable Federal, state, and local laws and regulations. It is also the responsibility of the user to maintain a safe workplace. The user should consider the health hazards and safety information provided herein as a guide and should take the necessary steps to protect employees and to develop work practices to ensure a safe work environment. This information is not intended as a license to operate under, or a recommendation to practice or refrain from any part of the Company or other covering any process, composition or matter of use.

DUST-OFF is a registered trademark of Carbide, Inc.

MATERIAL SAFETY DATA SHEET

AC-645



SECTION I: GENERAL INFORMATION

Manufacturer's Name: RUSMAR INCORPORATED  
Manufacturer's Address: 216 Garfield Avenue  
West Chester, PA 19380  
Manufacturer's Phone No: 610-436-4314  
Chemical Family: Aqueous anionic surfactant mixture  
Trade Name: RUSMAR AC-645

SECTION II: HAZARDOUS INGREDIENTS

Paints, Preservatives, and Solvents -- None  
Alloys and Metallic Coatings -- None  
Hazardous Mixtures and Other Materials -- None

SECTION III: PHYSICAL DATA

Boiling Point: 100° C  
Specific Gravity: 1.01 to 1.06  
Vapor Pressure: 25mm Hg at 25° C  
% Volatile, By Volume: None  
Evaporation Rate: N/A  
Water Solubility: Complete  
Appearance/Odor: Translucent, white, milk-like, odorless, viscous liquid

SECTION IV: FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method): Nonflammable  
Flammable Limits: N/A  
Extinguishing Media: N/A  
Special Fire Fighting Procedures: None  
Unusual Fire and/or Explosion Hazards: None

## SECTION V: HEALTH HAZARD DATA

Threshold Limit Value: Not Determined

Effects of Overexposure: This material is not expected to present an inhalation or ingestion hazard. It may cause an eye or skin irritation upon direct contact.  
Emergency and First Aid Procedures: Wash thoroughly with clean water.

## SECTION VI: REACTIVITY DATA

Material is stable

No material incompatibility

Hazardous Decomposition Products: Low levels of sulfur oxides on exposure to high temperatures (concentrate). Foam is noncombustible.  
Polymerization will not occur

## SECTION VII: SPILL OR LEAK PROCEDURES

Steps to be taken in case material is released or spilled: If spilled indoors on a hard surface, the spill area may be slippery and should be thoroughly washed with water. Contain spill and absorb material with dirt or other appropriate absorbent.  
Waste Disposal Method: This material is completely biodegradable and can be disposed of in a sanitary landfill according to local regulations.

## SECTION VIII: SPECIAL PROTECTION INFORMATION

Respiratory Protection: None required for normal operations

Ventilation: No special requirements

Protective Gloves: Not required, but recommended

Eye Protection: Not required, but recommended

Other Protective Equipment: None

## SECTION IX: SPECIAL PRECAUTIONS

Storing/Handling Precautions: Avoid excessive heat. Material will freeze, but thawing will not cause changes in the product.

Other Precautions: None



**SECTION I: GENERAL INFORMATION**

Manufacturer's Name: RUSMAR INCORPORATED  
Manufacturer's Address: 216 Garfield Avenue  
West Chester, PA 19380  
Manufacturer's Phone No.: 610-436-4314  
Chemical Family: Aqueous anionic surfactant, polymer latex mixture  
Trade Name: RUSMAR AC-900

**SECTION II: HAZARDOUS INGREDIENTS**

Paints, Preservatives, and Solvents - None  
Alloys and Metallic Coatings - None  
Hazardous Mixtures and Other Materials - None

**SECTION III: PHYSICAL DATA**

Boiling Point: 100° C  
Vapor Pressure: 25mm Hg at 25° C  
Vapor Density (Air = 1): N/A  
Water Solubility: Complete  
Appearance/Odor: Opaque, grey, viscous liquid  
Specific Gravity: 1.01 to 1.06  
% Volatile, By Volume: None  
Evaporation Rate: N/A

**SECTION IV: FIRE AND EXPLOSION HAZARD DATA**

Flash Point (Method): Nonflammable  
Flammable Limits: N/A  
Extinguishing Media: N/A  
Special Fire Fighting Procedures: None  
Unusual Fire and/or Explosion Hazards: None

**SECTION V: HEALTH HAZARD DATA**

Threshold Limit Value: Not Determined

Effects of Overexposure: This material is not expected to present an

inhalation or ingestion hazard. It may cause

an eye or skin irritation upon direct contact.

Emergency and First Aid Procedures: Wash thoroughly with clean water.

**SECTION VI: REACTIVITY DATA**

Stability: Material is stable. This material will likely coagulate if frozen.

Incompatibility: Addition of other materials may cause coagulation.

Hazardous Decomposition Products: Low levels of sulfur oxides on

combustion. Dense, black smoke

Polymerization will not occur

**SECTION VII: SPILL OR LEAK PROCEDURES**

Steps to be taken in case material is released or spilled: If spilled

indoors on a hard surface, the spill area may be slippery and

should be thoroughly washed with water. Contain spill and absorb

material with dirt or other appropriate absorbent.

Waste Disposal Method: This material has only a modest BOD and can

be deposited in sewers and should be flushed with copious

amounts of water. The material can be disposed of in approved

landfill; dried waste may be incinerated.

**SECTION VIII: SPECIAL PROTECTION INFORMATION**

Respiratory Protection: None required for normal operations

Ventilation: No special requirements

Protective Gloves: Not required, but recommended.

Eye Protection: Not required, but recommended.

Other Protective Equipment: None

**SECTION IX: SPECIAL PRECAUTIONS**

Storing/Handling Precautions: Avoid excessive heat. Material will freeze,  
thawing will NOT return product to usable form in most cases.

Other Precautions: None



**Section V - Reactivity Data**

Stability	Unstable	
	Stable	X
Conditions to Avoid		
Material is stable		

Acids: React violently and produces heat Maleic Anhydride: May react explosively Nitro Organic Compounds: May react to form explosive salts Phosphorous: May form Flammable products when heated [Hazardous Decomposition or Byproducts] None

**Section VI - Health Hazard Data**

Hazardous Polymerization	May Occur	
	Will Not Occur	X

Health Hazards (Acute and Chronic) Mild to moderate corrosive: Avoid skin and eye contact as irritation will occur. Inhalation will cause coughing, sneezing, or inflammation of the respiratory system.

Free crystalline silica is classified by IARC as "probably carcinogenic to humans" Signs and Symptoms of Exposure Skin or eye irritation; coughing or breathing problems.

Medical Conditions Generally Aggravated by Exposure Respiratory problems, asthma Dermatitis or skin or eye sensitivity.

Emergency and First Aid Procedure Flush contaminated area with excess water. If eye contact, rinse eye with warm water for 30 minutes, and seek medical attention immediately.

Section VII - Precautions for Safe Handling and Use Steps to be taken in Case Material is Released or Spilled Protect skin from contact and avoid inhalation of dust. If material is dry pick up and keep away from acids or organic materials. Place in metal drums. If wet collect and place in metal drums.

Waste Disposal Method Carefully add water and flush to sewer. Consult local, state, or federal regulations. Precautions to be Taken in Handling and Storage Store in tightly closed containers. Keep dry and away from acids or other incompatible substances. Other Precautions

**Section VIII - Control Measures**

Respiratory Protection (Specify Type) NIOSH approved dust filter respirator in dusty conditions.

Ventilation	Local Exhaust	
	Mechanical (General)	Vent to dust collector
	Other	Vent to meet TLV requirements

Protective Gloves Clean dry rubber gloves

Other Protective Clothing or Equipment Full clothing to cover arms and legs, safety glasses or face shield.

Work/Hygiene Practices Eye wash and shower station should be readily available. References: Sax, N.I. & R.J. Lewis Sr. (1989) "Dangerous Properties of Industrial Materials", New York: Van Nostrand Reinhold Co. Ltd.



MATERIAL SAFETY DATA SHEET  
IOSHA 29 CFR 1910.12001

6601 Koll Center Parkway  
P.O. Box 5252  
Pleasanton, CA 94566  
(510) 426-8787

SECTION 1 - NAME AND PRODUCT

Manufacturer: RMC LONESTAR  
6601 Koll Center Parkway  
P.O. Box 5252  
Pleasanton, CA 94566  
Emergency Telephone Number: 510-426-2113  
Information Telephone Number: 510-426-8787

Product: PORTLAND AND RELATED CEMENTS (CAS #65977-15-1)

Description: Product family common names include Portland Cement (Type I, Type II, Type V), Type II PC, Well Cement; sold as a dense gray powder in bulk or packaged in heavy paper sacks.

Date Prepared: February 25, 1988; Revised: August 5, 1994

SECTION 2 - CHEMICAL COMPOSITION

Components & Chemical Formulas  
ACGIH TLV PEL OSHA PEL

Portland Cement:	ACGIH TLV PEL	OSHA PEL
Trialcium silicate	3CaO · SiO <sub>2</sub>	65997-15-1
Dicalcium silicate	2CaO · SiO <sub>2</sub>	12168-85-3
Trialcium aluminate	3CaO · Al <sub>2</sub> O <sub>3</sub>	10034-77-2
Tetracalcium aluminoferrite	4CaO · Al <sub>2</sub> O <sub>3</sub> · Fe <sub>2</sub> O <sub>3</sub>	12042-78-3
Gypsum	CaSO <sub>4</sub> · xH <sub>2</sub> O	12068-35-8
		13397-24-5
Also may contain CaO, MgO, Na <sub>2</sub> SO <sub>4</sub> , K <sub>2</sub> SO <sub>4</sub> , non-hazardous proprietary mineral additives, and trace amounts of heavy metals		

SECTION 3 - PHYSICAL/CHEMICAL CHARACTERISTICS

Solubility in Water: < 1% Specific Gravity: 3.15 (special mixes can vary). Gray colored powder with no odor. Following properties are not applicable because product is a solid: Boiling point, vapor pressure, vapor density, melting point, evaporation rate.

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

SECTION 5 - HEALTH HAZARD DATA

Portland Cements are classified as nuisance dusts by OSHA, MSHA and ACGIH.

Acute Exposure: Wet Portland Cement in unhardened concrete, mortar or slurries, can dry the skin and cause caustic burns. Direct contact of dry cement with skin or eyes is likely to cause alkali irritation or chemical burns. Inhalation can irritate the upper respiratory system.

Chronic Exposure: Cement dust can cause inflammation of the lining tissue of the interior of the nose and inflammation of the cornea. Hypersensitive individuals may develop an allergic dermatitis.

Emergency First Aid Procedures: Irrigate (flush) eyes immediately and repeatedly with clean water. Wash exposed skin areas with soap and water. In case of acute inflammation or irritation apply sterile dressings and consult physician. If ingested consult physician immediately. Drink water.

## SECTION 6 - REACTIVITY DATA

Portland Cement powder is reactive to acids. Aluminum powder and other alkali and alkaline earth elements will react in wet mortar or concrete, liberating hydrogen gas. Product is otherwise stable and will not decompose into hazardous by-products nor polymerize.

## SECTION 7 - STORAGE, HANDLING AND USE

In case of spill: Clean up using dry methods that do not disperse dust into the air. Emergency procedures are not required.

Waste management/disposal: Treat as common waste for disposal or return to container for later use if product is not contaminated or wet. Do not dispose of Portland Cements or cement slurries by washing into storm drains. (See Section 10.)

Keep dry until used in order to protect product utility.

## SECTION 8 - PERSONAL PROTECTION INFORMATION

Respiratory protection and ventilation: Avoid breathing dust. In dusty environments use OSHA, MSHA or NIOSH approved respirator and tight fitting goggles. Control airborne dust levels with local exhaust system.

Skin protection: The use of barrier creams or Imperious gloves, boots and clothing to protect the skin from contact with wet Portland Cement is recommended. Shower with soap and water following any exposure.

Eye protection: Use safety glasses with side shields when working with wet Portland Cement. Use tight fitting goggles when exposed to product as dry powder.

## SECTION 9 - SPECIAL PRECAUTIONS

Protect skin and eyes from contact with Portland Cement. Cement burns with little warning - little heat is sensed.

## SECTION 10 - ADDITIONAL INFORMATION

Due to its high alkalinity, Portland Cement can be toxic to aquatic organisms. Use and disposal of Portland and Related Cements and cement slurries should be carefully managed in compliance with applicable environmental regulations.

Chemical Descriptions

APPENDIX B

## CHEMICAL DESCRIPTIONS

This appendix describes chemical substances that may present, in some form, in the work area in the former Solano County Sanitary Landfill, Benicia, California.

- Ammonia
- hydrogen cyanide
- methane
- hydrogen sulfide

The following descriptions are derived from the toxicological references included in the list of documents in Section 1.0 of the HSP. The calculations are based on the equation presented in Section 6.1.2 of this HSP. Table B1 presents a reference chart for exposure limits, route of entry, and properties for chemicals of potential interest in the work area. This appendix shows that, at the maximum concentrations thus far observed in soil samples from this area, the action level for nuisance dust of 5 mg/m<sup>3</sup> results in concentrations of substances of interest, borne by the dust, that would not exceed one-tenth of the occupational level.

This HSP provides for safe practices in responding to the presence of these substances as if the substances are present in the physical and chemical form and in sufficient quantities and concentrations to elicit the health effects described herein.

However, there is no present indication that any of the chemicals are present in the physical or chemical form and in sufficient quantities to elicit these health effects.

## Ammonia

Ammonia is a colorless gas. There is no indication that mobile ammonia is available in significant quantities to elicit the health effects described herein.

Ammonia has a slight pungent odor. The odor threshold values for ammonia are from 0.32 to 55 ppm. The irritation threshold values for ammonia are from 55 to 140 ppm. The vapor pressure for ammonia is less than 1 atmosphere (atm.) at 68°F. The routes of exposure to ammonia include inhalation for gases. The exposure to ammonia can cause irritation to the eyes, nose, and throat, dyspnea, bronchospasm, chest pains, pulmonary edema, pink frothy sputum, skin burns, and vesiculation. Target organs are the respiratory system and the eyes.

The Cal-OSHA PEL for ammonia is 25 ppm, NIOSH recommended exposure level (REL) is 25 ppm, the ACGIH threshold limit value (TLV) is 25 ppm, and the immediate danger to life and health (IDLH) level is 500 ppm.

## Hydrogen Cyanide

HCN is a colorless to pale blue liquid or gas with a bitter, almond-like odor. There is no indication that mobile HCN is available in significant quantities to elicit the health effects described herein. The odor threshold values for HCN are from 0.00027 to 5 ppm. The vapor pressure for HCN is 0.013 atm. at 68°F. Routes of exposure to HCN can include inhalation, ingestion, direct skin contact, and absorption. Exposure to HCN can cause asphyxia and death at high concentration, weakness, headaches, confusion, nausea, vomiting, increase rate and depth of respiration or slowing of respiration and gasping. Target organs are the central nervous system, cardiovascular system, liver, and kidneys.

The Cal-OSHA PEL for HCN is 4.7 ppm (short-term exposure limit [STEL]), the NIOSH REL is 4.7 ppm (STEL), the ACGIH is 10 ppm (ceiling), and the IDLH level is 50 ppm.

## Hydrogen Sulfide

It is expected that in place soil stabilization of the Black Material prior to removal will raise the pH and cause H<sub>2</sub>S in the Black Material to be converted into stable non-hazardous compounds.

H<sub>2</sub>S is a colorless, flammable gas with an offensive odor similar to the odor of rotten eggs. The odor threshold values for H<sub>2</sub>S are from 0.012 to 0.06 ppm. The irritation threshold values for H<sub>2</sub>S are from 50 to 100 ppm. The vapor pressure for H<sub>2</sub>S is 20 atm. at 78°F. Inhalation of high concentrations of H<sub>2</sub>S can cause irritation of eyes and upper respiratory tract; at very high concentrations, asphyxiation may result. Target organs are the eyes and central nervous system. External exposure can cause severe irritation to eyes and mucous membranes. H<sub>2</sub>S is a very dangerous fire hazard in the presence of oxygen.

The Cal-OSHA PEL for H<sub>2</sub>S is 10 ppm, the NIOSH REL is 10 ppm, the ACGIH is 10 ppm, and the IDLH level is 300 ppm.

## Lead

Lead rarely occurs in the elemental state, but exists widely in a number of ores. Lead ores generally occur in nature associated with silver and zinc. Inorganic lead is a generally ubiquitous element present in land, water, air, and food, hence measurable amounts exist in all adult body tissues and fluids. There is no indication that mobile inorganic lead is available in significant quantities to elicit the health effects described herein.

The health aspects of inorganic lead are focused on lead dust in the work area. Inorganic lead is a bluish-white, silver, or gray odorless solid. The vapor pressure for lead is approximately 0 atm.

Based on observation in occupational settings, certain toxicological effects have been associated with inorganic lead. Routes of exposure to lead include ingestion, inhalation, and direct skin contact. Major adverse human health effects caused by lead exposure include alterations in the hematopoietic and central nervous systems. Short-term exposure can cause decreased appetite, insomnia, weakness, exhaustion, headache, muscle and joint pain, facial pallor, pale eyes, colic, abdominal pain, constipation, anemia, gingival lead line, and paralysis of wrists. Target organs are the gastrointestinal tract, central nervous system, kidneys, blood, and gingival tissue.

The NIOSH RFL is 0.1 mg/m<sup>3</sup>, the ACGIH-TLV is 0.15 mg/m<sup>3</sup>, and the IDLH level is 700 mg/m<sup>3</sup>.

Analytical results from soil samples suggest lead levels in total dust at the work area that are not expected to exceed the Cal-OSHA PEL for lead of 0.05 mg/m<sup>3</sup>, with a total dust action level of 5 mg/m<sup>3</sup>. The maximum concentration of lead detected in soil samples from the work area was 3700 mg/kg. The CI was calculated to be 0.019 mg/m<sup>3</sup>. Therefore, the lead concentration in 5 mg/m<sup>3</sup> of total dust would be 0.019 mg/m<sup>3</sup>, which is 38 percent of the Cal-OSHA PEL of 0.05 mg/m<sup>3</sup> for lead. Unless future sample results indicate otherwise, Northgate believes the dust action level is protective for lead exposure via airborne dust at total dust concentrations no greater than 5 mg/m<sup>3</sup>. In order to reach the PEL for lead in dust (assuming the action level of 5 mg/m<sup>3</sup> for dust is attained), the concentration of lead in soil would have to be 1 percent.

## Methane

Methane is a colorless, odorless, tasteless natural gas formed by the decay of organic materials. It may be found in the vicinity of swampy areas, landfills, sewage lines, and sewage treatment plants. The vapor pressure for methane is 1 atm. at -256°F. The lower explosive limit for methane in air is 5.0 percent. Methane is non-toxic, but it can act as a simple asphyxiant by displacing or partially displacing oxygen. Workers exposed to an oxygen-deficient atmosphere become cyanotic and experience diminished mental alertness and impaired muscular coordination. Methane can displace oxygen in a significant way only in a confined area, not in the open space. Since methane is non-toxic, its effect would be the same as any inert gas that displaces oxygen.