

BUNKER HILL SUPERFUND SITE

**INSTITUTIONAL CONTROLS PROGRAM;
BARRIER DESIGN CRITERIA
&
PERMITTING REQUIREMENTS**

MARCH, 1995

Prepared By:

Welch, Comer & Associates, Inc.
Consulting Engineers and Surveyors
Coeur d'Alene, Idaho

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TABLE OF CONTENTS

1 INSTITUTIONAL CONTROLS PROGRAM	2
2 PERMITTING	3
2.1 Contractor Licensing.....	4
2.2 Barrier Option Plan.....	4
2.3 Building Renovation - Interior Projects	5
2.4 Large Projects - Exterior.....	6
2.5 Right-of-Way Work.....	6
2.6 Small Exterior Work (ROC).....	7
3 IC BARRIER PERFORMANCE STANDARDS	8
3.1 Overview.....	8
3.2 Building Renovation - Interior Projects	8
3.3 Large Projects - Exterior.....	9
3.4 Clean Soil Barriers.....	11
3.5 Vegetation.....	11
3.6 Gravel and Rock Caps.....	11
3.7 Sand	12
3.8 Clay Caps.....	12
3.9 Paving.....	13
3.10 Access Controls	14
3.11 Temporary Site Barriers.....	14
4 OTHER CONSIDERATIONS	15
4.1 Stormwater and Dust Control.....	15
4.2 Disposal	16
4.3 Decontamination.....	17
4.4 Demolition	17
4.5 Emergencies	18
REFERENCES.....	19

INSTITUTIONAL CONTROLS PROGRAM; BARRIER DESIGN CRITERIA & PERMITTING REQUIREMENTS

1 Institutional Controls Program

The Institutional Controls Program (ICP) is the program designed to protect the public residing and working in the Bunker Hill Superfund Site (The Site). Although large amounts of soil have been removed from residential and business impacted areas and replaced with clean soils, heavy metal contaminants will remain through out the Site's soils.

IC's or barriers are placed and maintained to eliminate contact between contaminants and the public by blocking the three major areas of risk to humans: air (dust) inhalation, and water and soil ingestion. Barriers are the physical structures put into place to limit contact and may include, but are not limited to:

- Clean soil caps;
- Fences and other access limitation devices;
- Plastic liners (4 and 6 mil visqueen);
- Impervious surfaces such as asphalt and concrete;
- Building Footprints;
- Rock mulches.

The objective of the ICP is to see that barriers are created, maintained, and a system of activity controls and standards is instituted to keep the remaining contaminants from migrating to any barriers or remediated areas. It is difficult to overstate the importance of maintaining the integrity of all barriers. The breaching of any barrier poses a potential health risk to humans, especially children and pregnant women, and creates a possible source of contamination to existing clean barriers and remediated soils. Lending institutions will likely rely on PHD's barrier tracking information when considering loan applications, which may make it more difficult to obtain financing for properties which are unlisted or are not in compliance with the ICP. Construction activities which require storm water management and erosion and sedimentation control are also activities which are capable of breaching existing barriers or exposing contaminated soil to the migratory effects of wind and water. Using proper storm water and dust control techniques goes a long way towards achieving the goals of the ICP, however there are some additional considerations and practices which should be followed.

2 Permitting

All excavation and grading construction and certain interior remodeling projects proposed for any land or structure within the boundaries of the Site must have an approved permit(s) from the Permit Authorities (PA) which have jurisdiction over land use issues requiring permit issuance. There are seven (PA)'s within the Site, and a minimum of two of them will have authority over any given project. They are:

- The Panhandle Health District (PHD)
- The County of Shoshone
- The City of Kellogg
- The City of Pinehurst
- The City of Wardner
- The City of Smelterville
- The State of Idaho

The County or the Cities will issue the primary permits for buildings, site development, streets etc., as required by law, however the PHD will also issue a permit, at no cost to the applicant, for all work which is affected by the ICP. **The PHD permit must be issued and valid before any work permit issued by any of the other (PA)'s is valid.** Similarly, the PHD must inspect the job and sign its permit off as final before any certificate of occupancy or certificate of completion will be issued for any work permit issued by the other (PA)'s.

The ICP utilizes different permits for various types of projects.

- Large excavations, defined as removal or disturbance of one cubic yard or more of soil containing contaminants.
- New building construction.
- Demolition of existing buildings.
- Construction of subdivisions and planned unit developments (PUD's) including the infrastructure necessary to serve them.
- Construction in or maintenance of rights-of-way.
- Building renovation involving excavation, ceiling or insulation removal, or disturbance of soil in basements or crawl spaces.
- A proposed use change for a property which contains contaminants to a use requiring additional or more substantial barrier protection.

Forty eight hours prior notice is required for all PHD inspections, excluding weekends and holidays.

Work performed in compliance with the provisions and requirements of the ICP shall not be considered a substitute for compliance with any other applicable federal, state, or local regulation or permit requirements.

2.1 Contractor Licensing

Any contractor performing an activity requiring an ICP permit or transporting or disposing of contaminated material which is likely to expose the contractor, workers, the public, or others to the contaminants, must be licensed by PHD.

To obtain a license, the contractor will have to provide proof that its owner or representative has participated in an educational program and passed an examination focusing on the reasons for, and methods of, contaminant management within the Site. The purpose of the examination is to insure that the contractor is aware of and observes the procedures and standards that will protect it and the public from contaminants. The contractor will be provided with an educational packet and will be responsible for ensuring that its employees are aware of the conditions on the project site as well as all pertinent requirements for dealing with contaminated soils and materials thereon. Testing and subsequent licensing of individual employees may be done at the employer's discretion.

2.2 Barrier Option Plan

A Barrier Option Plan (BOP) may be required on larger projects in conjunction with an ICP permit. All projects which require engineered plans, including PUD's and new subdivisions, must include a detailed BOP prepared by a qualified professional (engineer or architect). Information pertinent to the BOP will be on file in the ICP tracking system. At PHD's direction, the Applicant may be required to submit any or all of the following information:

- Name, signature, license number, seal and address of engineer, land surveyor, architect, professional planner, landscape architect, or contractor as applicable, involved in preparation of the permit application or any materials or documents pertaining thereto;
- Copies of other government permits or permit applications (i.e. County or City) and the supporting documents and materials pertaining thereto;
- A key map showing location of tract with reference to surrounding properties including owners, streets and city boundaries;
- Standardized sheet size;
- North arrow and scale;
- Existing and/or proposed zoning;
- Site plan showing dimensions, boundaries, existing and/or proposed structures;
- Date of current property survey;
- Copies of existing and/or proposed restrictions or covenants;
- List of ordinance variances required or requested (PHD or local government);
- Requested or obtained design waivers or exceptions;
- Identification of onsite and surrounding environmentally sensitive areas such as water courses, flood plains (floodway and 100 year floodplain), or wetlands within 200 feet;
- Soil information as required to determine levels of contamination;

- Location and description of all existing Barriers on-site and bordering the site;
- Existing rights-of-way and/or easements on and adjacent to the tract (i.e. streets, utilities);
- Existing and proposed contour intervals based on U.S.G.S. datum, contours to extend 50 feet beyond the project site borders (additional distance may be required in the case of subdivisions, PUD's and special use permit situations), contour intervals shall be as follows:
 - for sites with grades of less than 3% - 1 foot intervals,
 - for sites with grades of 3% to 10% - 2 foot intervals,
 - for sites with grades over 10% - 5 foot intervals;
- Existing system of site drainage and of any larger tract or basin of which the site is a part;
- Drainage calculations;
- Existing and proposed utility infrastructure locations;
- Locations of existing and/or proposed activities on-site (i.e. lawn, garden, landscaping areas, pathways, driveways, storage areas, structure locations, etc.);
- Soil erosion and sedimentation control plan (temporary and permanent) if surface is to be disturbed;
- Dust control plan if surface is to be disturbed;
- Plan for transporting Contaminants, means for transportation, proposed disposal site, and proposed route;
- Access control plan for construction period;
- Construction schedule;
- List of, and locations for, all proposed temporary and permanent barriers to be used in the project;
- Contractor bonding information;
- Health and safety plan, including equipment and personnel decontamination protocols.

The criteria for requiring application for the ICP permits are listed below:

2.3 Building Renovation - Interior Projects

An Interior Work Permit is required for work involving any of the following activities:

- Insulation (add to existing or remove);
- Work in basement or crawl space with bare soil having lead levels exceeding 1000 ppm;
- Ceiling or attic work which is likely to disturb settled dusts which have accumulated over time;
- Excavation of soil from any interior space with lead levels exceeding 1000 ppm;

2.4 Large Projects - Exterior

A Large Project Work Permit is required for exterior work involving any of the following activities:

- Exposure or excavation of more than 1 cy of any soil or other material with lead levels exceeding 1000 ppm;
- Improvement of any property which is adjacent to accessible exposed soil with lead levels exceeding 1000 ppm;
- All new subdivisions and PUD's;
- All building demolition.

At PHD's discretion, a Large Exterior Work Permit may be required if clearing and grubbing activities on a project involve removal (uprooting) of sufficient native vegetation to cause a dust or storm water problem.

2.5 Right-of-Way Work

An ROW Work Permit is required for work involving any of the following activities:

Installation of any underground utility including but not limited to;

- Gas
- Water
- Storm Sewer
- Sewer
- Power
- Cable
- Telephone
- Installation of any pole for the use by a utility;
- Any underground work within the public ROW;
- Any work which will permanently alter any public ROW;
- Any work which adds or connects to any existing public roadway;
- Construction of any new road to allow public access to any commercial or residential development;
- Resurfacing or repair of existing roads (i.e. unpaved to paved);
- Any activity disturbing existing barriers in any ROW owned by a city, the county or private corporation or utility. Examples include city and county streets, WWP powerline ROW, Northwest Pipeline ROW, etc.

In lieu of individual project permits, a public utility or government entity can obtain an annual license covering a specific list of projects for the given year. Upon demonstration that the employees of public utilities or government entities involved in contaminant management issues have participated in an education program approved or provided by

PHD, the public utility or government entity may be issued an annual license. The license will require the public utility or government entity to:

- Comply with performance standards and all other contaminant management requirements of PHD.
- Maintain a log of all excavations on a form provided by PHD and forward the log to PHD at the end of the construction season (October - December, weather depending).
- Allow spot inspections by PHD of any pertinent ongoing work.

A PHD employee will meet with a management representative from each individual utility / agency to review the upcoming projects for the next construction season. Expected problems and concerns and their associated remedial solutions will be addressed. The licensee will be responsible for all subcontractors and their personnel while working on the site. All subcontractors are subject to the same restrictions and requirements as the licensee. Additions to the project list may be made during the year at the request of the licensee and the approval of PHD. PHD will review all added projects with the licensee's representative to evaluate the specific proposal and associated concerns.

The license can be renewed annually in the spring upon a showing that the utility or government has operated in compliance with all contaminant management standards during the previous season.

2.6 Small Exterior Work (ROC)

A permit is not required for Small Exterior Projects (work involving less than one cubic yard of disturbed soil), however, upon request, a Record of Compliance (ROC) will be prepared by PHD for entry into the tracking database. The ROC is intended to signify that the property owner or tenant was informed of, and provided with, the applicable performance standards and has complied with them. As such, an ROC will only be prepared if the owner or tenant requests an inspection of the work by PHD and such inspection confirms the work complied with the relevant performance standards.

Examples of Small Exterior Projects include the following:

- Fencing
- Footings for decking or other structures
- Landscaping or gardening

PHD will provide a 1 cy dumpster for disposal of contaminated soil and 1 cy of clean replacement soil upon request. This service is provided free of charge to the owner or tenant.

3 IC BARRIER PERFORMANCE STANDARDS

3.1 Overview

Barrier selection and design is the responsibility of the permit applicant for any given project and is subject to review and approval by PHD and the other PA's during the permit application process. The following standards shall be viewed as a minimum for performance for barrier design. They are in no way meant to limit innovation of new technologies or strategies by designers, however any deviation will be subject to review by PHD and the other PA's. PHD and the other PA's reserve the right to engage outside experts to review any such design to insure it meets the minimum performance standards spelled out herein. The expenses of such reviews will be charged to the permit applicant.

Tables A1 - A4 are appropriate barrier use matrices which may be helpful in selecting barrier technologies for municipal and residential purposes.

All barrier material such as soil, gravel, sand, etc., must test below the maximum allowable specification for lead content (100 ppm), arsenic content (100 ppm), and cadmium content (5 ppm), with no single load exceeding 150 ppm lead, to be used as a cap or clean fill. Use of on site fill materials with elevated lead levels may be allowed, pending PHD approval, if adequate dust and access control measures are employed during installation and the material is covered with an approved barrier in its finished state.

3.2 Building Renovation - Interior Projects

Protection from contamination in interior areas involves two stages; normal habitation, and when construction or remodeling is in progress. Normal habitation is best protected by placing barriers, both interior and exterior, during construction and then maintaining control of dust as it settles in the house by consistent vacuuming, wet mopping, and dusting. Construction in interior areas creates some special concerns because it tends to stir up dusts which have accumulated over time (and may be contaminated with lead or other heavy metals) in out of the way spaces such as basements, wall interiors, ceiling interiors, under floor boards, etc. Using personal protective measures during interior construction is very important for worker safety, however it is equally important to limit the migration of contaminated dusts while work is in progress in order to minimize exposure risk to residents. Use of plastic covers to block off work areas and walk ways can be very effective if done properly and maintained for the duration of the construction activities. PHD may make respirators, coveralls, plastic, gravel and vacuums available to homeowners upon request for use on interior projects.

- Plastic covering (visqueen) for soil crawl spaces, basements, or floors in areas where ceiling and/or walls are being replaced shall be 6 mil thickness. Plywood or other suitable decking shall be placed over any plastic covering to protect it from wearing through or being punctured when it is in an area where it may be exposed to foot traffic during construction.

- Plastic sheeting shall be used as temporary barriers to seal off portions of the house during construction or to seal heating or air vents and shall be 4 mil minimum thickness. The edges of the plastic shall be securely anchored and sealed with duct tape, tacking strips or other suitable means. All soft surface areas shall be sealed off or, preferably, removed from the work area, including furniture, carpeted areas, bedding, drapes, etc. Sharp objects which may come into contact with the plastic should be removed before the plastic is installed.
- Gravel to cover soil crawl spaces or basements shall be well graded, crushed with fractured surfaces to promote secure interlocking. The gravel shall be 2" if compacted and 3" if loose. The gradation of gravel shall generally be as follows:

Table 1

Sieve Size	Percent Passing
1"	100%
3/4"	85 - 100%
#4	40 - 75%
#40	10 - 30%
#200	5 - 15%

Foot traffic in basements or crawl spaces which have been covered with uncompacted gravel is highly undesirable and shall be avoided unless a geotextile is used as an underlying delineator.

3.2.1 Recommendations

Prior to performing interior or attic work, any insulation which is to be disturbed must be removed and bagged and the area must be thoroughly vacuumed before further work or new insulation is installed. Carpeting should be rolled and wrapped in plastic and then disposed of appropriately before work begins. Personal protection (respirators, coveralls etc.) should be used during removal of all insulation or carpeting.

3.3 Large Projects - Exterior

Exterior areas pose a wider and more involved range of issues and options for creating effective barriers. Barrier types are to be selected with the intended use of the area in mind and shall conform to the following minimum standards:

The minimum Barrier requirements for residential properties and other properties that are frequently used by children (0 to 12 years) and/or pregnant women are as follows;

- All soil which contains lead in excess of 1000 ppm and lies within 12” of the final grade shall be removed, replaced, or covered as appropriate with clean earthen material such that, after all work is completed, the soil remaining in the top 12” has less than 1000 ppm lead, and the replacement material meets the requirements for clean fill described above. Acceptable soil removal and Barrier thicknesses for these properties are set forth in Table 2-A below.
- Any such property with unrestricted access to an adjacent property not meeting the contaminant requirements listed above shall restrict access to such adjacent property.

Table 2-A

If the soil interval tests out equal to or greater than 1000 ppm lead		The soil interval tests out less than 1000 ppm lead		The minimum soil removal and replacement depth is
0 - 1"	AND	1 - 6", 6 - 12"	THEN	6"
1 - 6"		0 - 1", 6 - 12"		6"
6 - 12"		0 - 1", 1 - 6"		12"
12 - 18"		0 - 1", 1 - 6", 6 - 12"		No Action
0 - 1", 1 - 6"		6 - 12"		6"
0 - 1", 6 - 12"		1 - 6"		12"
1 - 6", 6 - 12"		0 - 1"		12"
None		0 - 1", 1 - 6", 6 - 12"		No Action

The minimum Barrier requirements for properties that are not frequently used by children (0 to 12 years) and/or pregnant women are as follows;

- All soil which contains lead in excess of 1000 ppm and lies within 6” of the final grade shall be removed, replaced, or covered as appropriate with clean earthen material such that, after all work is completed, the soil remaining in the top 6” has less than 1000 ppm lead, and the replacement material meets the requirements for clean fill listed above. Acceptable soil removal and Barrier thicknesses for these properties are set forth in Table 2-B.

Table 2-B

If the soil interval tests out equal to or greater than 1000 ppm lead		The soil interval tests out less than 1000 ppm lead		The minimum soil removal and replacement depth is
0 - 1"	AND	1 - 6"	THEN	6"
1 - 6"		0 - 1"		6"
6 - 12"		0 - 1", 1 - 6"		No Action
None		0 - 1", 1 - 6"		No Action

No soil sampling will be required in areas which obviously have lead levels in excess of 1000 ppm. Examples include locations which have mine tailings, mine waste rock, or strong evidence of the presence of such material, and areas within the flood plain areas that have deep alluvial deposits derived from drainages in the Site. The assumption of contamination and the resulting remediation or construction will be noted in the ICP tracking system.

3.4 Clean Soil Barriers

Soil barrier thickness shall conform with tables 2-A and 2-B except in garden areas where residents plant and grow produce. In these areas the barrier depth must be a minimum of 24" of clean top soil. The PHD will arrange for up to 11 cy of clean soil (enough for 150 sf @ 24" depth) for residential produce gardens through PHD **if it is requested while remediation activities are being conducted in the area.**

3.5 Vegetation

Vegetation to be considered as part of a cap must have a minimum of 85% coverage. Vegetation alone is not suitable as a barrier, however it does protect soil barriers from wind and stormwater erosion, when used in conjunction with them. Vegetation without a barrier may be used as a soil stabilizer on contaminated soils only in areas which are not frequently used by children under 12 years of age or pregnant women and have an acceptable system of access control. All soil barriers must be revegetated with sod, native grasses, shrubs, or other suitable protective plant growth. Reseeding or replanting must be undertaken if 85% cover has not been achieved within three years after initial planting.

3.6 Gravel and Rock Caps

Gravel covering areas of occasional foot traffic shall be compacted to 90% relative compaction minimum and shall conform to Tables 1-A, 2-A, and 2-B. Rock barriers in non-traffic areas and road sub-bases may be composed of material with a D_{50} of 3" with no individual particle larger than 6". Areas of heavy foot traffic shall have impermeable barriers. Residential and small driveways may be constructed from 12" of clean unpaved crushed rock (6" of sub-base and 6" conforming with Table 1-A) compacted to 95% relative compaction. Chip seal, lignosite, or some other durable form of dust control is recommended for unpaved driveways. At PHD's discretion, documentation of compaction from a qualified geotechnical or engineering consultant may be required.

Use of bare crushed gravel as a road surface shall not be permitted except as follows:

Table 3

Road Classification	Daily Traffic Load	3" minus Sub Base	Clean 3/4" Crushed Rock Base
Local Access Road	<100	6"	6"
Driveway	<50	6"	6"
Auto Parking		6"	6"
Truck Parking		12"	8"

Annual or biannual testing of unpaved gravel roads may be required, at PHD's discretion, to assure that recontamination of roads or breach of crushed rock barriers has not occurred.

Sub-base material underlying unpaved crushed rock in roads, parking lots and driveways shall be clean to a minimum depth of 12" below final grade. Compacted sub base material below 12" may contain contaminants, however it should be a structurally sound material.

Gravel used in drainage ditches can serve as a permeable drainage medium and/or as a durable protection against erosion of the native soils. Drain rock for sump drains shall be clean, uniformly graded 1" to 1.5" rounded rock. The drain rock used as a barrier shall be underlain with a non-woven geotextile fabric to exclude the intrusion of the surrounding contaminated soils. Selection of the appropriate geotextile shall be properly matched to the fine portion of the native soil gradation to adequately filter the surrounding soils and prevent clogging of the drain rock.

Rock used to restrict erosion in ditches and channels (rip rap) shall be sound, durable, angular rock. The required particle sizes and the thickness of the rip rap blanket are functions of the flow velocities in the channel and must be determined on a case-by-case basis.

3.7 Sand

Sand is effective if used at the required barrier thickness in areas which will not see foot or vehicular traffic of any kind. Sand barriers may be used in landscaping and other non-access areas. Sand barriers shall have a vegetative cover for erosion protection when possible and shall be jetted or rolled to 90% relative compaction.

3.8 Clay Caps

Tight sealing clays are an acceptable barrier on vacant lots and exposed building footprints and as a temporary barrier over contaminated soil stockpiles which will be left for less than six months in areas not subject to vehicular or pedestrian traffic. The clay must be a

minimum of 6" thick and must have a non-woven geotextile delineator underlying. The clay must be compacted until it seals but not to the point of "pumping" and it must have enough moisture in it to be plastic but not saturated.

3.9 Paving

Asphalt or concrete paving as a barrier/surface treatment shall be used on all roads with a classification of collector or higher: parking lots, commercial driveways, and bike/pedestrian paths. Paving is preferred but not required on local roads, residential and light commercial driveways. Unpaved roads and driveways shall meet the requirements of section 3.6. Pavement structures shall be designed in accordance with good engineering practice, taking into account traffic loading, road geometry, local soil conditions, local groundwater and surface drainage conditions and other appropriate parameters. As a minimum, however, pavement standards for barrier purposes shall generally be as follows:

Table 4

Road Classification	Daily Traffic Load	3" minus Sub Base	3/4" minus Base	Concrete Paving	Asphalt Paving
Local Access Road	<100	8"	4"	4"	2" (1 lift)
Collector Road	100-1000	12"	6"	4"	2" (1 lift)
Arterial Road	>1000	18"	8"	6"	4" (2 lifts)
Auto Parking		8"	4"	4"	2" (1 lift)
Truck Parking		12"	6"	6"	4" (2 lifts)
Pedestrian/Bike Paths		N/A	4"	N/A	2" (1 lift)

Three inch minus sub-base material underlying impervious paving may be contaminated (i.e. reuse of existing onsite material), however the 3/4" base rock must meet the clean fill standards.

For purposes of establishing appropriate pavement design criteria for road shoulders, they may be treated as a road of one lesser classification.

Patches in existing pavement must be of equal or better quality than the pavement which is being removed, including materials, thickness and compaction.

Road and pavement construction aggregates shall be well graded materials conforming to the following size limitations and descriptions:

- Sub Base 3" minus pit run gravel
- Base 3/4" minus crushed aggregate
- Asphalt 3/4" minus crushed aggregate (surface course)
 1" minus crushed aggregate (leveling course)

Sidewalks shall be constructed of concrete, typically 4" thick on a 2-4" base of compacted 3/4" minus crushed aggregate. Concrete thickness at driveway crossings in sidewalks shall be increased to 6" with 6" of base rock unless listed differently in the applicable roads standards. If the sidewalk is cast monolithically with the curb and gutter section, it shall include a thickened transition section extending approximately one foot back from the face of the curb with a control joint running parallel to the edge of the curb at the edge of the transition.

3.10 Access Controls

Access control is another form of contaminant management. For residential properties and other properties that are frequently used by children ages 0 to 12 years and/or pregnant women, access to adjacent properties must be restricted if such adjacent properties have not been remediated.

Fencing provides an effective control to access while remaining very cost effective. Fences should be a minimum of 6' high, taut, sturdy, and have no gaps underneath them large enough to allow children to crawl under them. Cyclone fencing is the most desirable as a temporary or permanent fencing barrier. Wood fences are acceptable if they have no gaps large enough to pass a 6" sphere through them.

Temporary access control is required for all temporary barriers. The specific design is left up to the permit applicant, however it must be approved by PHD prior to installation. Some recommended options for temporary access control are listed below.

For inactive periods in excess of one (1) week:

- T-Posts and construction fencing
- Temporary cyclone fencing
- Concrete guard rail sections

For inactive periods of less than one (1) week:

- Barricades and warning tape
- Cones and delineators will not be permitted as acceptable access barriers unless used in conjunction with one of the methods listed above.

3.11 Temporary Site Barriers

Work in progress will require temporary barriers when soils with lead levels exceeding the action level are exposed during the progress of a project. Permanent barriers are required if the work site is to remain inactive for longer than six months. Temporary barriers must be used in conjunction with temporary stormwater and erosion management techniques (as

found in the Best Management Practices; BMP's) to prevent the migration of contaminants off of any active worksite. Temporary barriers include the following:

- Six mil plastic (visqueen) placed evenly and smoothly and adequately anchored such that expected winds will not lift it. Seams must be overlapped such that any water flowing across the seam will flow onto the next sheet and not under it. The plastic may be reused from day to day, however it must remain free of tears or excessive seams due to small sized pieces. Plastic may not be used as a temporary barrier on a site which will remain inactive for longer than two weeks. Some form of approved access control which prohibits all vehicular and pedestrian traffic is required when using this technique. All contaminated plastic must be handled safely and disposed of properly at the conclusion of the job.
- Three inches of crushed base rock (3/4" minus) layer placed evenly. The rock must be clean and free of contaminated soil when laid. Rock which has been used as a temporary barrier will be considered as contaminated after a single use and must either be disposed of in an approved manner and location or incorporated into a permanent barrier later. Crushed rock is recommended for use on sites which will remain inactive for longer than two weeks (but less than six months) during the dry portion of the year (May through September). Some form of approved access control is required prohibiting all vehicular traffic and access by children at play when using this technique. Limited pedestrian traffic may be allowed.
- Three inch clay layer placed evenly and lightly rolled or compacted to form a seal. Clay which has been used as a temporary barrier will be considered as contaminated after a single use and must either be disposed of in an approved manner and location or capped by a permanent barrier later. Clay is recommended for use on sites which will remain inactive for longer than two weeks but less than six months during the wet season (October through April). Some form of approved access control is required which prohibits all pedestrian and vehicular traffic from crossing a temporary clay barrier.
- Contaminated sites or stockpiles which will be left exposed overnight must have adequate access controls and measures to control contaminant migration due to wind or stormwater.

4 Other Considerations

4.1 Stormwater and Dust Control

All of the activities requiring IC permits must comply with the permit BOP with respect to controlling runoff, sediment migration, erosion and dust during and after the work. All of the permits forms issued by PHD, except for Building Renovation-Interior Projects, have requirements for drainage calculations, a soil erosion and sedimentation control plan, and a

dust control plan, which may be waived at the District's discretion. The plans, if required, must address, but are not limited to, the following items;

- Protection of trees and other vegetation
- Traffic control
- Stream environment protection
- Slope configuration
- Temporary soil stabilization
- Permanent soil stabilization
- Dust control
- Temporary runoff management
- Sedimentation collection and control
- Re vegetation

More information on these topics is available in the **Bunker Hill Superfund Site Stormwater Management Criteria and Engineering Standards** and the **Handbook of Best Management Practices for Stormwater Management and Sedimentation Control Revised for the Environmental Conditions of the Bunker Hill Superfund Site**.

4.2 Disposal

Contaminated materials must be disposed of in a safe and appropriate manner. Soils with elevated levels of heavy metals may be disposed of at the Page Repository or other PHD approved disposal location.

- If a homeowner within the Bunker Hill Superfund Site wishes to dispose of one cubic yard or less, PHD will supply a bin and haul the soil to the Page Site for no charge.
- Quantities of contaminated soil greater than one yard may be disposed of at the Page Site but the homeowner is responsible for transporting it. PHD requires prior notice of the disposal in order to make arrangement for access. Filing of a hauling plan and route may be required if sufficient quantities are involved. The vehicle must be lined with plastic and the load covered before hauling and it must be brushed clean before leaving the repository.
- Soils with lead levels in excess of 1000 ppm must either be disposed of at the Page Soil Repository or other PHD authorized repository, or used as fill material on projects if those soils will be covered by an approved barrier in their finished state. Soils with lead levels in excess of 350 ppm but less than 1000 ppm should be disposed of at the Page Site or other PHD authorized repository unless they are capped by an approved barrier.

- Contaminated soils will be hauled in covered dump trucks to the Page Repository. Truck bed liners will be used when free water is present in the soils or if the soil is flowable. All hauling will be conducted during daylight hours and with the knowledge and permission of PHD. Loads will be dumped in a drive away manner and all trucks will be dry brushed before leaving the repository.
- Non soil contaminated materials such as insulation, carpeting, etc., shall be disposed of in a location approved by PHD.

4.3 Decontamination

Decontamination of all tools and equipment used on sites with contaminated soils is required before being moved off of the site. Decontamination will consist of a dry brush down of all remediation equipment (tires, backhoe buckets, shovels, chassis, etc.) in a designated area on the construction site. The use of water will be required if it is necessary to remove all contaminated residue. The equipment will be washed on the site to minimize the migration of contaminated mud and water to neighboring areas. All rinsate from wash-down procedures will be diverted to a contaminated area on the site or collected and disposed of in an appropriate location. No rinsate shall be allowed to enter any storm drain or sewer, nor shall it be allowed to pass onto a remediated site, street, or otherwise clean area. All spillage, wet or dry, will be cleaned promptly and disposed of properly (capped by an approved barrier or hauled to a PHD authorized repository).

Workers will be required to decontaminate daily or whenever leaving a site which has not been completely remediated or capped. A decontamination protocol will be supplied by the contractor in the Site Health and Safety Plan (see appendix A for an example) and shall be strictly adhered to. Personnel decontamination procedures on projects performed by homeowners and small contractors will be accomplished according to the conditions listed on the ICP permit issued by PHD.

4.4 Demolition

Demolition of existing structures can create a lead bearing fugitive dust problem if adequate dust control measures are not taken. Use of heavy equipment in bringing down a building is an easy and common demolition method, but it is also a dust generator. Continual misting with a fire hose can be effective in controlling dust but care must be taken to avoid overwetting and causing contaminant migration by runoff. If there is reason to believe that fugitive dust cannot be adequately controlled by spray misting or only a portion of a building is to be demolished, the following precautions shall be taken prior to beginning demolition;

- All insulation and carpeting shall be removed and bagged for disposal.
- Vacuum all interior surfaces, particularly those areas which underlie carpets and insulation.

- No burning of buildings or parts thereof shall occur without proper prior decontamination.
- Adequate dust control measures shall be taken during demolition to insure that minimal airborne contaminants leave the site.
- Temporary runoff and sedimentation controls must be employed promptly after the demolition to limit, as far as possible, the amount of sediment leaving the site while it remains exposed.
- Determination of disposal site for all contaminated materials to be generated. All disposal sites shall be approved by PHD prior to dumping.

4.5 Emergencies

If a barrier is compromised by an unforeseen event such as a ruptured pipeline, or it is required that a barrier be compromised immediately to protect the health and welfare of the public, PHD may, at its discretion, waive the need for a permit. Should such an event occur, PHD must be notified as soon as possible, and their resident inspector visit the site to assess the situation. Once the emergency has been abated, all pre-existing barriers must be repaired to a state of compliance with the ICP, and all contaminated soil disturbed by, or for, said emergency must be removed from the site and disposed of, or capped by an approved barrier. The cost of this work shall be borne by the party responsible for the emergency, should that party be identifiable. After the barriers have been repaired and the surrounding area cleaned of contaminants to a level of compliance, PHD will certify that the situation has been addressed and enter the pertaining data into the tracking system.

References

Final Commercial Properties Remedial Design Report for the Bunker Hill Superfund Site, January 1994; prepared for ASARCO Inc., Hecla Mining Company, Sunshine Mining Co.

Final Residential Yards Remedial Design Report for the Bunker Hill Superfund Site, January 1994; prepared for ASARCO Inc., Hecla Mining Company, Sunshine Mining Co.

Final Rights-Of-Way Remedial Design Report for the Bunker Hill Superfund Site, January 1994; prepared for ASARCO Inc., Hecla Mining Company, Sunshine Mining Co.

Institutional Controls Program for the Bunker Hill Superfund Site, Regulatory and Performance Standards Component, September 20, 1993; Murray Lamont & Associates, Inc.

Institutional Controls Program Overview, Permitting, and Contaminant Management Standards and Guidelines, June 22, 1994; Hecla Mining Company

APPENDIX A

BARRIER USE/TYPE TABLES

APPENDIX B
PERMIT FORMS

BUNKER HILL SUPERFUND SITE BUILDING RENOVATION PERMIT - INTERIOR

Date: _____

Permit No. _____
 County Property ID No. _____
 County/City Permit No. _____

Jobsite Address: _____

	Name	Mailing Address	Phone
Owner:	_____		
Contractor:	_____		

Contaminated Material

Disposal Dates	Qty (cy)
1) _____	_____
2) _____	_____
3) _____	_____

Type of Work	
Any existing IC barriers involved?:	Y / N
Any IC barriers present on the lot?:	Y / N
Recarpeting / Reflooring:	Y / N
Insulation:	Y / N
Ceiling or Attic Work:	Y / N
Moving or Removing Walls:	Y / N
Work Which Will Disturb Dust/Bare Soil:	Y / N
Crawl Space & Basements:	Y / N
Furnace/AC Installation:	Y / N
Other _____:	Y / N

Personal Protection & Equipment Provided

	Y / N	Date Returned
HEPA Vacuum	Y / N	_____
Respirator	Y / N	_____
Overalls	Y / N	_____
Plastic Tarp	Y / N	N/A

List All Contaminated Materials Types to be Disposed

Job Description

Special Provisions & Comments

Inspections:	Date	Initials
1) _____	_____	_____
2) _____	_____	_____
3) _____	_____	_____
4) _____	_____	_____
5) _____	_____	_____

Tracking Data Entry: _____

Sign-Offs	Signature	Date
Permit Issued:	_____	_____
Permit Final:	_____	_____

BUNKER HILL SUPERFUND SITE BUILDING RENOVATION PERMIT - INTERIOR

Required Inspections

3)

Permit No:

4)

County ID No:

5)

City/County Permit No:

I understand that this permit is part of the general permitting process for all construction within the Bunker Hill Superfund Site, regardless of city or county jurisdiction, and that the conditions of this permit must be satisfied before any city or county work permit is deemed valid.
I understand that this permit is null and void if work has not commenced within, or is suspended for, 180 days.
I understand that the granting of this permit does not give authority to violate the provisions of any federal, state, or local law regulating construction, environmental protection or Institutional Controls and that all governing ordinances will be obeyed.

Owner / Authorized Agent

Date

48 Hours prior notice required for all inspections, excluding weekends and holidays.

BUNKER HILL SUPERFUND SITE LARGE EXTERIOR PERMIT - DEMOLITION

Date: _____

Permit No. _____
 County Property ID No. _____
 County/City Permit No. _____

Jobsite Address: _____

	Name	Mailing Address	Phone
Owner:	_____		
Contractor:	_____		

Existing Barriers Types	Area (sf)	Required Submittals	Chk By
1) _____	_____	Demolition Plan: Y / N	_____
2) _____	_____	Equip Decon Plan: Y / N	_____
3) _____	_____	Stormwater Plan: Y / N	_____
4) _____	_____	BOP: Y / N	_____
5) _____	_____	Dust Cntrl Plan: Y / N	_____
		Access Control Plan: Y / N	_____
		Health & Safety Plan: Y / N	_____
		_____ : Y / N	_____

Pre Removed Materials	vol. (cy)	
1) _____	_____	
2) _____	_____	
3) _____	_____	
4) _____	_____	
5) _____	_____	

Disposal Information

Est. vol. to be disposed (cy): _____	Haul Dates: 1) _____
No. of Trucks to be used: _____	2) _____ 3) _____

Haul Route: _____

Job Description

Special Provisions & Comments

Inspections: Descriptions	Date	Initials
1) _____	_____	_____
2) _____	_____	_____
3) _____	_____	_____

Tracking Entry: _____

Sign-Offs	Signature	Date
Permit Issued: _____	_____	_____
Permit Final: _____	_____	_____

BUNKER HILL SUPERFUND SITE LARGE EXTERIOR PERMIT - DEMOLITION

Permit No: _____

County ID No: _____

City/County Permit No: _____

Required Inspections

2)

1)

I understand that this permit is part of the general permitting process for all construction within the Bunker Hill Superfund Site, regardless of city or county jurisdiction, and that the conditions of this permit must be satisfied before any city or county work permit is deemed valid.

I understand that this permit is null and void if work has not commenced within, or is suspended for, 180 days.

I understand that the granting of this permit does not give authority to violate the provisions of any federal, state, or local law regulating construction, environmental protection or Institutional Controls and that all governing ordinances will be obeyed. I hereby certify that the information given is true and accurate to the best of my knowledge.

Owner / Authorized Agent

Date

48 Hours prior notice required for all inspections, excluding weekends and holidays.

BUNKER HILL SUPERFUND SITE LARGE EXTERIOR PERMIT - EXCAVATION

Date: _____

Permit No. _____
 County Property ID No. _____
 County/City Permit No. _____

Jobsite Address: _____

	Name	Mailing Address	Phone
Owner:	_____		
Contractor:	_____		

Soil Test Results (ppm)

Lead (0'-1"): _____
 Lead (1"-6"): _____
 Lead (6"-12"): _____
 Lead (12"-18"): _____
 Lead (Import Fill): _____
 Cadmium (Import Fill): _____
 Arsenic (Import Fill): _____

Required Submittals

BOP:	Y / N	_____
Plot Plan:	Y / N	_____
Stormwater Plan:	Y / N	_____
Dust Control Plan:	Y / N	_____
Access Control Plan:	Y / N	_____
Health & Safety Plan:	Y / N	_____
Equipment Decon Plan:	Y / N	_____

Chk By

Soil Disposal Info

Est. volume to be disposed (cy): _____
 No. of Trucks to be used: _____
 Haul Route: _____

Existing Barriers Types

Existing Barriers Types	Area (sf)
1) _____	_____
2) _____	_____
3) _____	_____
4) _____	_____
5) _____	_____
Garden Installation	Y / N

Haul Dates

1) _____ 3) _____
 2) _____ 4) _____

Job Description

Special Provisions & Comments

Inspections: Description

	Date	Initials
1) _____		
2) _____		
3) _____		
4) _____		
5) _____		

Tracking Entry: _____

Sign-Offs

	Signature	Date
Permit Issued:	_____	_____
Permit Final:	_____	_____

BUNKER HILL SUPERFUND SITE LARGE EXTERIOR PERMIT - EXCAVATION

Required Inspections

3)

4)

5)

Permit No:

County ID No:

City/County Permit No:

I understand that this permit is part of the general permitting process for all construction within the Bunker Hill Superfund Site, regardless of city or county jurisdiction, and that the conditions of this permit must be satisfied before any city or county work permit is deemed valid.

I understand that this permit is null and void if work has not commenced within, or is suspended for, 180 days.

I understand that the granting of this permit does not give authority to violate the provisions of any federal, state, or local law regulating construction, environmental protection or Institutional Controls and that all governing ordinances will be obeyed. I hereby certify that the information given is true and accurate to the best of my knowledge.

Owner / Authorized Agent

48 Hours prior notice required for all inspections, excluding weekends and holidays.

Date

BUNKER HILL SUPERFUND SITE RECORD OF COMPLIANCE

Date: _____

ROC No. _____

County Property ID No. _____

County/City Permit No. _____

Jobsite Address: _____

Name	Mailing Address	Phone
Owner: _____	_____	_____
Contractor: _____	_____	_____

Existing Barriers Types	Area (sf)	Site Considerations	
1) _____	_____	Temporary Barriers	Y / N
2) _____	_____	Stormwater Control	Y / N
3) _____	_____	Contaminant Tracking	Y / N
4) _____	_____	Dust Control	Y / N
		Access Control	Y / N
Soil Disposal		Decontamination	Y / N
Bin Drop Off Date: _____		Produce Garden	Y / N
Bin Pick Up Date: _____		Plot Plan Provided	Y / N

Health & Safety / Personal Protection

Job Description

Special Provisions & Comments

Inspections: Descriptions	Date	Initials
1) _____	_____	_____
2) _____	_____	_____
3) _____	_____	_____
4) _____	_____	_____
5) _____	_____	_____

Tracking Data Entry: _____

Sign-Offs

Signature

Date

Permit Issued: _____

Permit Final: _____

Required Inspections

3)

ROC No:

4)

County ID No:

5)

City/County Permit No:

I understand that this permit is part of the general permitting process for all construction within the Bunker Hill Superfund Site, regardless of city or county jurisdiction, and that the conditions of this permit must be satisfied before any city or county work permit is deemed valid.
I understand that this permit is null and void if work has not commenced within, or is suspended for, 180 days.
I understand that the granting of this permit does not give authority to violate the provisions of any federal, state, or local law regulating construction, environmental protection or Institutional Controls and that all governing ordinances will be obeyed. I hereby certify that the information given is true and accurate to the best of my knowledge.

Owner / Authorized Agent

Date

48 Hours prior notice required for all inspections, excluding weekends and holidays.

BUNKER HILL SUPERFUND SITE RIGHT-of-WAY PERMIT

Date: _____

Permit No. _____
 County Property ID No. _____
 County/City Permit No. _____

Jobsite Address: _____

	Name	Mailing Address	Phone
Owner:	_____		
Contractor:	_____		

Soil Test Results	(ppm)	Utilities Involved	Required Submittals	Chk By
Lead (0'-1"):	_____	Water: Y / N	Area Contour Map: Y / N	_____
Lead (1"-6"):	_____	Sewer: Y / N	Site Plan & Profile: Y / N	_____
Lead (6"-12"):	_____	Gas: Y / N	X-Sections: Y / N	_____
Lead (Import Fill):	_____	Electrical: Y / N	Equip Decon Plan: Y / N	_____
Cadmium (Import Fill):	_____	Phone: Y / N	Stormwater Plan: Y / N	_____
Arsenic (Import Fill):	_____	Cable: Y / N	BOP: Y / N	_____
		Storm Sewer: Y / N	Dust Cntrl Plan: Y / N	_____
		:	Access Cntrl Plan: Y / N	_____
			Health & Safety Plan: Y / N	_____
			:	_____
			: Y / N	_____

Soil Disposal Information	Existing Barriers Types	Area (sf)
Est. vol. to be disposed (cy): _____	1) _____	_____
No. of Trucks to be used: _____	2) _____	_____
Haul Dates	3) _____	_____
1) _____ 3) _____	4) _____	_____
2) _____ 4) _____	5) _____	_____

Haul Route: _____

Job Description

Special Provisions & Comments

Inspections: Descriptions	Date	Initials
1) _____	_____	_____
2) _____	_____	_____
3) _____	_____	_____
4) _____	_____	_____
5) _____	_____	_____

Tracking Entry: _____

Sign-Offs	Signature	Date
Permit Issued:	_____	_____
Permit Final:	_____	_____

BUNKER HILL SUPERFUND SITE RIGHT-OF-WAY WORK PERMIT

Required Inspections

3)

Permit No:

4)

County ID No:

5)

City/County Permit No:

1)

I understand that this permit is part of the general permitting process for all construction within the Bunker Hill Superfund Site, regardless of city or county jurisdiction, and that the conditions of this permit must be satisfied before any city or county work permit is deemed valid.

I understand that this permit is null and void if work has not commenced within, or is suspended for, 180 days.

I understand that the granting of this permit does not give authority to violate the provisions of any federal, state, or local law regulating construction, environmental protection or Institutional Controls and that all governing ordinances will be obeyed.

I hereby certify that the information given is true and accurate to the best of my knowledge.

Owner / Authorized Agent

Date

48 Hours prior notice required for all inspections, excluding weekends and holidays.

APPENDIX C

EXAMPLE HEALTH & SAFETY PLANS

SITE PERSONNEL HEALTH AND SAFETY PROTECTION PLAN
for
EXTERIOR PROJECTS
(Example)

Date: _____
Permit No: _____
County ID No: _____

Project Applicant: _____

Project Street Address: _____

Applicant Mailing Address: _____

Project Engineer/Contractor: _____

Start up Date: _____

All employees who will work on-site will receive a copy of the Health and Safety Plan and are expected to read, initial and return it to the project engineer or contractor.

Initials: _____

Date: _____

Project Description:

Personnel

Approximately _____ temporary and _____ full time contractors and _____ full-time personnel will be working at the site.

POTENTIAL HAZARD AND EXPOSURE

Background Environment

Air Quality - recent data indicate that air quality levels are in compliance with National Ambient Air Quality Standards (NAAQS).

Water Quality - domestic water supplies in the area are in compliance with drinking water standards.

Soil - soils in the area are estimated at maximum concentrations of:

Lead	60,000 ppm
Cadmium	1,000 ppm
Arsenic	1,000 ppm
Antimony	1,000 ppm
Zinc	12,000 ppm
Mercury	10 ppm

Range of typical levels:

Lead	7,000 - 26,000 ppm
Cadmium	20 - 400 ppm
Arsenic	60 - 400 ppm
Antimony	10 - 150 ppm
Zinc	500 - 15,000 ppm

Other unknown metals may be present at similar levels. No organic contaminants are anticipated.

Task Specific Toxic Materials Exposure

Personnel will be handling and working in the soils referenced above. Potential exposure routes are via inhalation, dermal contact and incidental ingestion. No exposure applicable to industrial or occupational standards are anticipated. (Measured concentrations of airborne heavy metals did not approach or exceed NIOSH occupational health guidelines

during soil removal activities associated with the 1986 Bunker Hill Superfund fast Track Site)

Signs and Symptoms of Overexposure:

Lead: Inhalation of an excessive amount of inorganic lead compounds will result in a buildup of lead in various body tissues including the kidneys, liver, and bone. Lead is eliminated very slowly from the body.

Symptoms of excessive short term exposure include motor weakness, weight loss and insomnia.

Lead can also be ingested during hand to mouth activity (eating, smoking, chewing tobacco, etc.), especially if poor hygiene is employed. Inorganic lead is not absorbed through the skin.

Cadmium: Inhalation of excessive amounts of cadmium can produce kidney and liver damage and abnormal lung function. Cadmium is excreted very slowly from the body. Excessive exposure may also be indicated by yellowing of the teeth and loss of smell.

Cadmium can also be ingested during hand to mouth activity (eating, smoking, chewing tobacco, etc.), especially if poor hygiene is employed. Cadmium is not absorbed through the skin.

Zinc: Inhalation of zinc dust is not viewed as posing a significant health hazard and is considered as an essential element in human metabolism.

Arsenic: Inhalation of excessive amounts of inorganic arsenic can adversely affect red and white blood cells, the heart, liver and kidneys.

Symptoms of excessive exposure include a "pins and needles" sensation in the hands and feet and gastrointestinal irritation.

Arsenic can also be ingested during hand to mouth activity (eating, smoking, chewing tobacco, etc.), especially if poor hygiene is employed.

Direct skin contact with arsenic compounds can cause mild to severe skin irritation but no reliable dose estimates are available on exposure levels at which these symptoms begin to appear.

Precautionary Measures

- Prior to coffee and lunch breaks all employees must thoroughly wash their hands.
- Avoid hand to mouth activities while working in or around excavations and other soil handling activities including; smoking, chewing tobacco, or eating.
- Wear coveralls when working in or around excavations or other soil handling activities.
- Launder soiled coveralls and other garments separately from other household laundry. Soiled clothes should be bagged in plastic and kept away from young children.
- Boots should be brushed off or washed prior to leaving the work site. Boots should also be kept in plastic bags and kept away from young children.
- In all cases avoid taking contaminated clothing, tools, etc. home where others, especially children or pregnant women may be exposed.
- Control dust by wetting soil prior to and during excavating or other soil disturbing activities. An approved and fitted respirator should be worn if the work area is subject to airborne dust.
- Control dust by wetting established access routes and other sources of wind blown dusts. Avoid over wetting soils and causing runoff.
- Control runoff from entering the site.

Decontamination Procedures

Heavy equipment, tools, and work crews used on the project will be decontaminated on site. Cleaning will first involve a brush down in the staging area designated for decontamination of all items requiring decontamination. Crew members shall work in groups of two to brush all soil, dust, and particulates off of each other. Backhoes, dozers, and Bobcat tracks, tires, and buckets will be dry brushed. Use of water should be avoided whenever possible. If soil is tacky or muddy and resists brushing, washing with water will be permitted. Washing must be done in a designated decontamination area. This area should be clearly marked and should be in an area which will be capped with an impervious IC barrier at the completion of the work. No wash water should be allowed to flow off of the decontamination site. Workers are required to decontaminate daily or whenever leaving the site.

Soil Disposal Procedures

All contaminated soils and debris excavated from the site will be transported to the Page Soil Repository in 10 cy end dumps. Loads will be kept within the struck height of the truck and covered prior to transport to minimize the dispersal of contaminated material through airborne emission or spillage. Any spillage that may occur will immediately be cleaned and removed. Access to the site will be arranged through Panhandle Health District. All haul trucks will follow a predetermined haul route filed with PHD. All soil and debris disposal activities will comply with the Residential and Commercial Soil RDR's.

Additional Information

For additional information on heavy metals, potential health effects, decontamination or soil disposal procedures, all employees are encouraged to contact Panhandle Health District.

Emergency Telephone Numbers

Sheriff	<u>911</u>
Fire	<u>911</u>
Police	<u>911</u>
Ambulance	<u>911</u>
Hospital	<u>784-1221</u>
Panhandle Health District	<u>783-0707</u>

POTENTIAL HAZARD AND EXPOSURE

Background Environment

Air Quality - recent data indicate that air quality levels are in compliance with National Ambient Air Quality Standards (NAAQS).

Water Quality - domestic water supplies in the area are in compliance with drinking water standards.

Soil - soils in the area are estimated at maximum concentrations of:

Lead	60,000 ppm
Cadmium	1,000 ppm
Arsenic	1,000 ppm
Antimony	1,000 ppm
Zinc	12,000 ppm
Mercury	10 ppm

Range of typical levels:

Lead	7,000 - 26,000 ppm
Cadmium	20 - 400 ppm
Arsenic	60 - 400 ppm
Antimony	10 - 150 ppm
Zinc	500 - 15,000 ppm

Other unknown metals may be present at similar levels. No organic contaminants are anticipated.

Task Specific Toxic Materials Exposure

Personnel working in buildings or homes will be at greater risk of exposure, as will site residents, than during normal exterior types of projects. While the routes of entry into the human body remain the same for interior work as for exterior work, the potential for exposure is greater because work will be conducted in a confined space. In addition to worker exposure, the risk of exposing those who may be occupying the building is also high. Young children and expectant mothers are especially susceptible to the effects of heavy metals. The remodeling of building attics which contain large quantities of metals laden dust and dirt are of particular concern. In all cases special precautions must be taken when working in working interiors.

Those areas of greatest concern associated with interior projects include; removal of attic insulation, ceiling removal, attic remodeling, work in dirt floor crawl spaces, and carpet removal.

Signs and Symptoms of Overexposure:

Lead: Inhalation of an excessive amount of inorganic lead compounds will result in a buildup of lead in various body tissues including the kidneys, liver, and bone. Lead is eliminated very slowly from the body.

Symptoms of excessive short term exposure include motor weakness, weight loss and insomnia.

Lead can also be ingested during hand to mouth activity (eating, smoking, chewing tobacco, etc.), especially if poor hygiene is employed. Inorganic lead is not absorbed through the skin.

Cadmium: Inhalation of excessive amounts of cadmium can produce kidney and liver damage and abnormal lung function. Cadmium is excreted very slowly from the body. Excessive exposure may also be indicated by yellowing of the teeth and loss of smell.

Cadmium can also be ingested during hand to mouth activity (eating, smoking, chewing tobacco, etc.), especially if poor hygiene is employed. Cadmium is not absorbed through the skin.

Zinc: Inhalation of zinc dust is not viewed as posing a posing a significant health hazard and is considered as an essential element in human metabolism.

Arsenic: Inhalation of excessive amounts of inorganic arsenic can adversely affect red and white blood cells, the heart, liver and kidneys.

Symptoms of excessive exposure include a "pins and needles" sensation in the hands and feet and gastrointestinal irritation.

Arsenic can also be ingested during hand to mouth activity (eating, smoking, chewing tobacco, etc.), especially if poor hygiene is employed.

Direct skin contact with arsenic compounds can cause mild to severe skin irritation but no reliable dose estimates are available on exposure levels at which these symptoms begin to appear.

Precautionary Measures

For Workers

- Prior to coffee and lunch breaks all employees must thoroughly wash their hands.
- Avoid hand to mouth activities while working in or around excavations, interior construction or other soil handling activities including; smoking, chewing tobacco, or eating.
- Wear coveralls and a hat when working in or around excavations, interior construction, or other soil handling activities. An approved and fitted respirator should be worn if the work area is subject to airborne dust.
- Launder soiled coveralls and other garments separately from other household laundry. Soiled clothes should be bagged in plastic and kept away from young children and pregnant women.
- Boots should be brushed off or washed prior to leaving the work site. Boots should also be kept in plastic bags and kept away from young children.
- In all cases avoid taking contaminated clothing, tools, etc. home where others, especially children or pregnant women may be exposed. Workers should shower at the site or as soon as possible after work.
- Control dust by vacuuming the work area with a high efficiency vacuum. HEPA vacuums, supplied by PHD are recommended. An approved and fitted respirator should be worn if the work area is subject to airborne dust.
- Bag insulation, carpeting, or other materials coated with attic dust or soils form crawl spaces.
- Vacuum and or wet mop the work area to control dust and residue. Dispose of mop water properly.

For Occupants

- Occupants of homes being remodeled should make arrangements to be out of the house during remodeling activities whenever possible.
- Young children and expectant mothers must be kept away from all remodeling activities.

- Remove all furniture and other removable soft surfaced materials prior to the beginning of construction. Cover all carpets which will remain after the completion of the project. Old carpets which will not remain after construction should be rolled and covered with plastic prior to disposal. All rooms which will not be subject to construction must be sealed off with plastic sheets.
- Keep pets out of construction areas.
- Vacuum and or wet mop the work area at the end of each day to control dust and residue. Dispose of mop water properly. Bag all contaminated building materials as soon as possible.
- Control dust whenever possible.
- Keep the building area ventilated to the outside when possible.

Decontamination Procedures

Heavy equipment, tools, and work crews used on the project will be decontaminated on site. Cleaning will first involve a brush down in the staging area designated for decontamination of all items requiring decontamination. Crew members shall work in groups of two to brush all soil, dust, and particulates off of each other. Backhoes, dozers, and Bobcat tracks, tires, and buckets will be dry brushed. Use of water should be avoided whenever possible. If soil is tacky or muddy and resists brushing, washing with water will be permitted. Washing must be done in a designated decontamination area. This area should be clearly marked and should be in an area which will be capped with an impervious IC barrier at the completion of the work. No wash water should be allowed to flow off of the decontamination site. Workers are required to decontaminate daily or whenever leaving the site.

Soil Disposal Procedures

All contaminated soils and debris excavated from the site will be transported to the Page Soil Repository in 10 cy end dumps. Loads will be kept within the struck height of the truck and covered prior to transport to minimize the dispersal of contaminated material through airborne emission or spillage. Any spillage that may occur will immediately be cleaned and removed. Access to the site will be arranged through Panhandle Health District. All haul trucks will follow a predetermined haul route filed with PHD. All soil and debris disposal activities will comply with the Residential and Commercial Soil RDR's.

Additional Information

For additional information on heavy metals, potential health effects, decontamination or soil disposal procedures, all employees are encouraged to contact Panhandle Health District.

Emergency Telephone Numbers

Sheriff	<u>911</u>
Fire	<u>911</u>
Police	<u>911</u>
Ambulance	<u>911</u>
Hospital	<u>784-1221</u>
Panhandle Health District	<u>783-0707</u>

APPENDIX D

**CORPORATE PERMIT HEALTH & SAFETY
REQUIREMENTS**

CORPORATE PERMIT HEALTH AND SAFETY REQUIREMENTS

Purpose

The Institutional Controls Program (ICP) was developed to insure heavy metals that remain on-site do not become a threat to human health or the environment. To that end, it is important that site workers and residents be aware of how contaminants can become a source of exposure and how to protect themselves at the jobsite.

Program Requirements

In all cases, contractors and workers must obtain work permits and be aware of Health and Safety (H&S) concerns associated with protecting themselves and the community from exposure to heavy metals during construction activities. These include; excavation of soils, soils transportation and disposal, interior remodeling, and building demolition. H&S information is available through PHD and will be a requirement of the permitting process. H&S information will be provided to all contractors and their employees as part of the contractor licensing program. Employers and employees must be familiar with the H&S concerns and pass a corresponding examination. A passing score of 70% or higher will be required of all employees. The licensee is responsible for insuring that all H&S requirements are met by all employees and subcontractors. These items will be reviewed as part of the project inspection process. Non-compliance will be cause for permit revocation, the issuance of a stop work order, responsibility for clean up of any migrant contamination caused, or possibly even legal action.

Basic H&S plans will be available from PHD. Because a single site safety plan cannot be developed to cover all projects, the plans provided must be considered to provide the minimum required. Additional items may be required of the contractor in order to cover site specifics. All plans must be approved before prior to commencing work.

In Summary

- H&S issues will be addressed as part of the contractor licensing procedure.
- Testing will be required for all contractors and workers.
- Site specific safety plans will be required as part of each work permit.
- The licensee as well as individual workers will be held responsible for adhering to the project H&S plan.

APPENDIX E

SOIL SAMPLING CRITERIA

