



Periodic Review BNSF Hillyard Lead Soil Site

**5201 North Ferrall Street, Spokane
Facility Site ID: 960924, Cleanup Site ID: 1371**

Toxics Cleanup Program, Eastern Region

Washington Department of Ecology
Spokane, Washington

November 2025, Publication 25-09-030

Document Information

This document is available on the Department of Ecology's [BNSF Hillyard Lead Soil Site cleanup site page](#).¹

Related Information

- Facility Site ID: 960924
- Cleanup Site ID: 1371

Contact Information

[Toxics Cleanup Program](#)²

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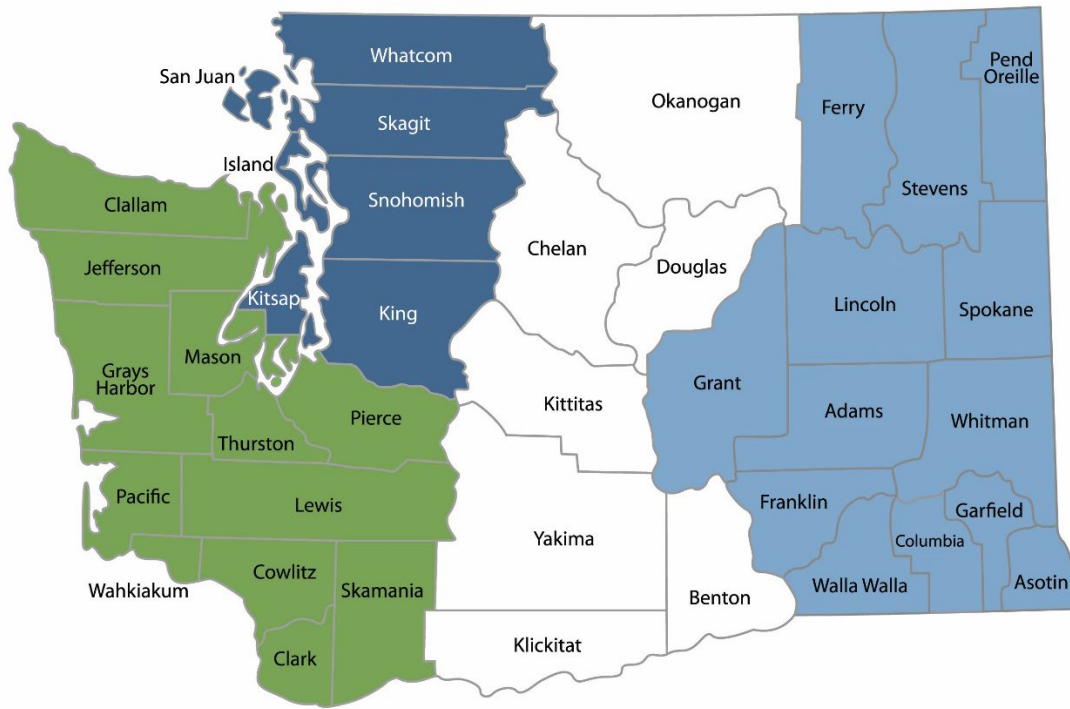
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¹ <https://apps.ecology.wa.gov/cleanupsearch/site/1371>

² <https://ecology.wa.gov/About-us/Who-we-are/Our-Programs/Toxics-Cleanup>

Department of Ecology's Region Offices

Map of Counties Served



Southwest Region 360-407-6300	Northwest Region 206-594-0000	Central Region 509-575-2490	Eastern Region 509-329-3400
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Region	Counties served	Mailing Address	Phone
Southwest	Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Mason, Lewis, Pacific, Pierce, Skamania, Thurston, Wahkiakum	PO Box 47775 Olympia, WA 98504	360-407-6300
Northwest	Island, King, Kitsap, San Juan, Skagit, Snohomish, Whatcom	PO Box 330316 Shoreline, WA 98133	206-594-0000
Central	Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, Yakima	1250 W Alder St Union Gap, WA 98903	509-575-2490
Eastern	Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman	4601 N Monroe Spokane, WA 99205	509-329-3400
Headquarters	Across Washington	PO Box 47600 Olympia, WA 98504	360-407-6000

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Introduction

The Washington Department of Ecology (Ecology) reviewed post-cleanup site conditions and monitoring data to ensure human health and the environment are being protected at the BNSF Hillyard Lead Soil cleanup site (Site). Site cleanup was implemented under the Model Toxics Control Act (MTCA) regulations, Chapter 173-340 Washington Administrative Code (WAC). This is the first periodic review conducted for this Site.

Cleanup activities were completed under the Voluntary Cleanup Program (VCP). Residual concentrations of heavy metals and polycyclic aromatic hydrocarbons (PAHs) in soil that exceeded MTCA cleanup levels remain on the property. The MTCA cleanup levels for air, soil, sediment, surface water, and groundwater are established under [WAC 173-340-750](https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-750),³ [WAC 173-340-740](https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-740),⁴ [WAC 173-340-760](https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-760),⁵ [WAC 173-340-730](https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-730),⁶ and [WAC 173-340-720](https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-720),⁷ respectively.

Ecology determined institutional controls in the form of an environmental covenant would be required as part of the cleanup action for the Site. [WAC 173-340-420\(2\)](https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-420(2))⁸ requires Ecology to conduct a periodic review of certain sites every five years. For this Site, a periodic review is required because the department issued a no further action opinion, and institutional controls were required as part of the cleanup action.

When evaluating whether human health and the environment are being protected, Ecology must consider the following factors (WAC 173-340-420(4)):

- a) The effectiveness of ongoing or completed cleanup actions, including the effectiveness of engineered controls and institutional controls in limiting exposure to hazardous substances remaining at the site
- b) New scientific information for individual hazardous substances or mixtures present at the site
- c) New applicable state and federal laws for hazardous substances present at the site
- d) Current and projected site and resource uses
- e) The availability and practicability of more permanent remedies
- f) The availability of improved analytical techniques to evaluate compliance with cleanup levels

³ <https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-750>

⁴ <https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-740>

⁵ <https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-760>

⁶ <https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-730>

⁷ <https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-720>

⁸ <https://app.leg.wa.gov/wac/default.aspx?cite=173-340-420>

Summary of Site Conditions

Site description and history

The Site is 11.5 acres and includes part of Spokane County tax parcel 36343.0005. The Site is bounded by BNSF Railroad tracks, vacant land, and the North Spokane Corridor (US 395) to the west, vacant land to the north, North Ferrall Street and residential and commercial properties to the east, and East Wellesley Avenue to the south.

The Site was part of the former Hillyard Rail Yard, which was owned and operated by the Great Northern Railroad Company from 1890 to 1960 then purchased by Burlington Northern Railroad in 1960 and operated until the 1970s. Site facilities and structures were demolished in the early 1980s, and the Site has remained vacant since. The present owner is BNSF, a successor company to Burlington Northern Railroad. The area contains historical accumulations of soil, clinker, ash, and metallic debris containing elevated levels of lead, arsenic, cadmium, and petroleum products. Prior to cleanup activities, several concrete pads were present on the north end of the Site; likely former building slabs and service roads.

A vicinity map is in Appendix A, and a Site plan is in Appendix B.

Site investigations

In December 2001, contaminated soil was discovered at the Site while extracting borrow soil for cover material for the Aluminum Recycling Corp cleanup site (CSID 1133) located south of the Site. The contaminated soil was a dark, sandy silt that was visually distinct from surrounding native soil. From December 2001 through January 2002, about 13,000 cubic yards of soil were excavated, screened, and 8,640 cubic yards of contaminated soil were stockpiled onsite.

In June 2002, Environmental Management Resources, Inc. (EMS) conducted a preliminary investigation to determine the lateral and vertical extent of contaminated soil. Nineteen surface soil samples (SA-1 through SA-19) from the source area were analyzed for total lead using a portable x-ray fluorescence (XRF) instrument, and six test pits were excavated throughout the source area to measure the thickness of the contaminated soil layer, collect additional samples at two-foot intervals, and collect samples of native soil below the contaminated soil layer. Depth of the contaminated soil in the test pits ranged from 1.5 to 9 feet below ground surface (bgs). Five composite samples were collected from the contaminated stockpile and analyzed for gasoline-, diesel-, and oil-range total petroleum hydrocarbons (TPH-G, TPH-D, and TPH-O) and Resource Conservation and Recovery Act (RCRA) heavy metals, and eight composite stockpile samples were analyzed for leachable lead using the Toxicity Characteristic Leaching Procedure (TCLP, EPA Method 1311). Eleven discrete soil samples were also collected from the stockpile and analyzed for total lead in the field using the XRF.

Total lead in the composite samples exceeded the MTCA Method A cleanup level, with a maximum concentration of 1,900 milligrams per kilogram (mg/kg). Cadmium also exceeded the Method A cleanup level with a maximum concentration of 3.32 mg/kg. Total lead in the XRF

measurements of the contaminated stockpile ranged from 1,340 to 3,120 mg/kg, while XRF measurements of the source area ranged from 470 to 4,600 mg/kg. Leachable lead was analyzed by three separate laboratories due to suspect results, with results ranging from 0.74 to 145 milligrams per liter (mg/L), exceeding Washington State Dangerous Waste (DW) criteria. The extent of contaminated soil remaining in the source area was estimated at 300 feet by 700 feet (210,000 square feet), with a volume of 20,000 cubic yards.

In May 2003, GeoEngineers excavated 39 test pits (TP-1 through TP-39) throughout the source area and nine test pits (SP-1 through SP-9) throughout the contaminated soil stockpile. Test pit depths ranged from 3.5 to 12 feet bgs and extended through contaminated soil to native soil beneath. Ninety-one soil samples were collected from the test pits and analyzed for RCRA heavy metals.

Metals concentrations in the native soil did not exceed MTCA Method A cleanup levels. The maximum lead concentration in the contaminated fill was 35,400 mg/kg, while the maximum lead concentration in the stockpiled soil was 4,040 mg/kg. Maximum concentrations of arsenic, cadmium, and chromium in the contaminated fill were 237 mg/kg, 8 mg/kg, and 43.8 mg/kg. Hexavalent chromium in fill did not exceed the Method A cleanup level.

GeoEngineers conducted additional soil assessment sampling to further characterize the types of soil contaminants present at the Site. In October 2006, eight test pits (TP-40 through TP-47) were excavated and sampled, surface soil samples were collected from three former test pit locations (TP-2, TP-5, and TP-10), and one composite stockpile sample was collected. Soil samples were analyzed for arsenic, cadmium, total lead, leachable lead, TPH-D, TPH-O, PAHs, and volatile organic compounds (VOCs). In January 2007, test pit locations TP-5, TP-10, and TP-43 were resampled due to unreliable PAH results, and another composite stockpile sample was collected. In February 2008, 14 surface soil samples (TP-48 through TP-61) and six stockpile samples (SP-10 through SP-15) were collected from areas with the highest lead concentrations.

Samples were analyzed for ignitibility, total cyanide, total sulfide, semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), total arsenic and cadmium, leachable arsenic and cadmium, and VOCs. The results confirmed total lead, arsenic, cadmium, TPH-D, TPH-O, and PAHs exceeding MTCA Method A cleanup levels. PCBs and VOCs including trichloroethene (TCE), 1,2-dichloroethene (1,2-DCE), and methylene chloride were detected below cleanup levels. Leachable lead was confirmed, but leachable arsenic and cadmium did not exceed DW criteria. GeoEngineers performed a statistical analysis using the TCLP data, which indicated that soil with total lead concentrations over 2,500 mg/kg would exceed the toxicity characteristic of 5 mg/L and designate as DW.

Based on the soil assessments in 2006, 2007, and 2008, the estimated lateral extent and volume of in-situ contaminated soil were revised to 283,000 square feet and 36,900 cubic yards. Combined with the estimated stockpile volume of 8,640 cubic yards, the total volume of contaminated soil onsite was about 45,540 cubic yards.

Cleanup actions

The selected cleanup action included chemical stabilization of soil with lead concentrations greater than 2,500 mg/kg, consolidation of contaminated soil to an onsite containment area on the northwest portion of the Site, construction of an engineered cap over the containment area, and institutional controls to restrict land use and protect the cleanup action.

Cleanup activities began in August 2008 and concluded in February 2010. About 106,120 square feet of concrete were demolished and stockpiled onsite. Between September and October 2008, about 194,000 tons of soil were excavated from 10 areas (A through J), with 307 discrete confirmation samples collected from the excavation boundaries to ensure MTCA cleanup levels were met. Following a successful pilot test, soil with total lead greater than 2,500 mg/kg was treated with a phosphorous-based stabilizing compound and mixed with cement for additional stabilization. Five discrete performance monitoring samples were collected from 500-ton batches of treated soil, with three samples analyzed using the TCLP method to demonstrate stabilization of leachable lead and two samples held for further analysis. Leachable lead was detected in 8 of 48 batches, with three exceeding 5 mg/L and requiring a second treatment to meet stabilization criteria. Analytical results showed stabilization criteria could be met without the use of cement, and the use was discontinued in December 2008. About 26,600 tons of soil were stabilized.

The containment area was excavated to 17 feet bgs, with surface dimensions at ground level of 610 feet by 320 feet and an approximate volume of 104,450 cubic yards. Concrete rubble, treated soil, and untreated soil were placed into the containment area and capped with a low permeability, 40-mil high density polyethylene (HDPE) liner and a minimum of two feet of native soil. The containment area was graded to allow precipitation to drain away from the cap toward infiltration basins to the south and east of the containment area, compacted to meet 90% of the maximum dry density, and hydroseeded with a mixture of native grasses. A permanent chain-link fence was installed around the perimeter of the containment area, with a locked gate on the east side.

Approximately 2,192 tons of petroleum-contaminated soil, construction debris, and limited amounts of lead-contaminated soil generated after the containment area was capped were stockpiled onsite and subsequently disposed at Allied Waste's Roosevelt Regional Landfill.

Cleanup standards

Cleanup standards include cleanup levels, the location where these cleanup levels must be met (point of compliance), and any other regulatory requirements that apply to the Site.

[WAC 173-340-704](https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-704)⁹ states MTCA Method A may be used to establish cleanup levels at sites that have few hazardous substances, are undergoing a routine cleanup action, and where numerical standards are available for all indicator hazardous substances in the media for which the Method A cleanup level is being used. Method B may be used at any site and is the most common method for setting cleanup levels when sites are contaminated with substances not

⁹ <https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-704>

listed under Method A. Method C cleanup levels may be used to set soil and air cleanup levels at industrial sites.

MTCA Method A cleanup levels were appropriate for contaminants at this Site. The cleanup actions were routine, few hazardous substances were found, and numerical standards were available in the MTCA Method A table for each hazardous substance. The Site is zoned heavy industrial by the City of Spokane; therefore, Method A industrial land use soil cleanup levels were selected for the Site. However, Method A unrestricted land use soil cleanup levels were applied to areas of the Site within 200 feet of residential property; generally, the eastern half of the Site. For contaminants at this Site, the difference in unrestricted and industrial soil cleanup levels only apply to lead and PAHs. Table 1 contains soil cleanup levels established for the Site.

Table 1. MTCA soil cleanup levels

Contaminant	Unrestricted soil cleanup level (mg/kg)	Industrial soil cleanup level (mg/kg)
Arsenic	20	20
Cadmium	2	2
Chromium (hexavalent/total)	19/2000	19/2000
Lead	250	1,000
Polycyclic aromatic hydrocarbons (PAHs)	0.1	2
TPH- diesel and heavy oil	2,000	2,000

mg/kg = milligrams per kilogram
MTCA = Model Toxics Control Act

The point of compliance is the area where the cleanup levels must be attained. For soil cleanup levels based on the protection of groundwater, as they are for this Site, the point of compliance is established as soils throughout the Site (standard point of compliance).

Environmental Covenant

Ecology decided institutional controls would be required as part of the cleanup action to document the remaining contamination, protect the cleanup action, and protect human health and the environment. On February 28, 2019, institutional controls in the form of an [environmental covenant](https://apps.ecology.wa.gov/cleanupsearch/document/1996)¹⁰ (Covenant) were recorded for the Site.

The Covenant imposes the following limitations:

1. General Restrictions and Requirements. The following general restrictions and requirements shall apply to the Property:

¹⁰ <https://apps.ecology.wa.gov/cleanupsearch/document/1996>

a. Interference with Remedial Action. The Grantor shall not engage in any activity on the Property that may impact or interfere with the remedial action and any operation, maintenance, inspection or monitoring of that remedial action without prior written approval from Ecology.

b. Protection of Human Health and the Environment. The Grantor shall not engage in any activity on the Property that may threaten continued protection of human health or the environment without prior written approval from Ecology. This includes, but is not limited to, any activity that results in the release of residual contamination that was contained as a part of the remedial action or that exacerbates or creates a new exposure to residual contamination remaining on the Property.

c. Continued Compliance Required. Grantor shall not convey any interest in any portion of the Property without providing for the continued adequate and complete operation, maintenance and monitoring of remedial actions and continued compliance with this Covenant.

d. Leases. Grantor shall restrict any lease for any portion of the Property to uses and activities consistent with this Covenant and notify all lessees of the restrictions on the use of the Property.

e. Preservation of Reference Monuments. Grantor shall make a good faith effort to preserve any reference monuments and boundary markers used to define the areal extent of coverage of this Covenant. Should a monument or marker be damaged or destroyed, Grantor shall have it replaced by a licensed professional surveyor within 30 days of discovery of the damage or destruction.

2. Specific Prohibitions and Requirements. In addition to the general restrictions in Section 1 of this Covenant, the following additional specific restrictions and requirements shall apply to the Property.

a. Containment of Soil. Any activity on the Property that will compromise the integrity of the cap including: drilling; digging; piercing the cap with sampling device, post, stake or similar device; grading; excavation; installation of underground utilities; removal of the cap; or, application of loads in excess of the cap load bearing capacity, is prohibited without prior written approval by Ecology. The Grantor shall report to Ecology within forty-eight (48) hours of the discovery of any damage to the cap. Unless an alternative plan has been approved by Ecology in writing, the Grantor shall promptly repair the damage and submit a report documenting this work to Ecology within thirty (30) days of completing the repairs.

c. Cap Monitoring. The Grantor covenants and agrees that it shall biannually, or until site development protective of the cap occurs, inspect the cap and report within thirty (30) days of the inspection the condition of the cap and any changes to the cap that would impair its performance.

3. Access.

- a. The Grantor shall maintain clear access to all remedial action components necessary to construct, operate, inspect, monitor and maintain the remedial action.
- b. The Grantor freely and voluntarily grants Ecology and its authorized representatives, upon reasonable notice, the right to enter the Property at reasonable times to evaluate the effectiveness of this Covenant and associated remedial actions, and enforce compliance with this Covenant and those actions, including the right to take samples, inspect any remedial actions conducted on the Property, and to inspect related records. All persons who access the Property shall comply with any applicable health and safety plan(s) and will be required to complete BNSF's Contractor Safety Training Program (www.BNSFcontractor.com), unless they are escorted by someone who has completed the program.
- c. No right of access or use by a third party to any portion of the Property is conveyed by this instrument.

Periodic Review

Effectiveness of completed cleanup actions

During the Site visit Ecology conducted on November 4, 2025, the soil cap appeared to be in satisfactory condition and continues to provide a barrier to residual contamination, which prevents direct human or animal contact. The Site remains undeveloped with the exception of the 6-ft chain-link fence installed around the perimeter of the containment area.

There is evidence of human foot traffic around and within the containment area, as observed in garbage piles inside and outside the fence. This traffic does not appear to be adversely impacting the cap or posing a risk of exposing contaminated soils contained at the Site. Ecology also observed where fencing has undergone repair due to vandalism and/or theft. These incidents have been reported to Ecology by BNSF since 2022. These damaged areas have been reinforced through additional welding. A photo log is in Appendix C.

Direct contact

The cleanup actions were intended to eliminate exposure to contaminated soil at the Site. Exposure pathways to contaminated soils by ingestion and direct contact were reduced by installing a cap over the remaining contaminated soil, which consists of clean soil and a 40-mil HDPE liner. The cap appears to be in satisfactory condition, and no repair, maintenance, or contingency actions are required at this time.

Protection of groundwater

Soils with arsenic, cadmium, lead, and PAH concentrations exceeding MTCA Method A cleanup levels remain at the Site. The cleanup action was designed to prevent lead from leaching to groundwater by stabilizing soil with high lead concentrations and installing the soil cap with

drainage controls to prevent stormwater infiltration through residual contaminated soil. These controls appear to be in satisfactory condition, and no repair, maintenance, or contingency actions are required at this time.

Institutional controls

Institutional controls in the form of a Covenant were implemented at the Site in 2019. The Covenant remains active and discoverable through the Spokane County Assessor's Office. Ecology found no evidence a new instrument has been recorded that limits the effectiveness or applicability of the Covenant. This Covenant prohibits activities that will result in the release of contaminants contained as part of the cleanup action and prohibits any use of the property that is inconsistent with the Covenant, unless approved by Ecology in advance. This Covenant ensures the long-term integrity of the cleanup action will be protected. The property owner is required to inspect the cap biannually and notify Ecology the cap has been inspected, received necessary repairs due to erosion, and that it remains in place. Due to vandalism to the perimeter fencing, BNSF has performed annual inspections since 2022. The last inspection report was received on March 27, 2025, and all standards are being met and damage to the perimeter fencing has been repaired.

New scientific information for individual hazardous substances or mixtures present at the Site

There is no new relevant scientific information for the hazardous substances remaining at the Site.

New applicable state and federal laws for hazardous substances present at the Site

There are no new applicable or relevant state or federal laws for hazardous substances remaining at the Site.

Current and projected Site and resource uses

The Site is vacant, and the containment area is fenced to prevent access. There have been no changes in current or projected future Site or resource uses. The current Site use is not likely to have a negative impact on the protectiveness of the cleanup action.

Availability and practicability of more permanent remedies

The remedy implemented included containing hazardous substances, and it continues to be protective of human health and the environment. While more permanent remedies may be available, they are still not practicable at this Site.

Availability of improved analytical techniques to evaluate compliance with cleanup levels

The analytical methods used at the time of the cleanup action were capable of detection below the selected MTCA cleanup levels. The presence of improved analytical techniques would not affect decisions or recommendations made for the Site.

Conclusions

- The cleanup actions completed at the Site appear to be protective of human health and the environment.
- Soil cleanup levels have not been met at the Site; however, the cleanup action is determined to comply with cleanup standards under WAC 173-340-740(6)(f), since the long-term integrity of the containment system is ensured and the requirements for containment technologies have been met.
- The Covenant for the property is in place and is effective in protecting human health and the environment from exposure to hazardous substances and the integrity of the cleanup action.

Based on this periodic review, Ecology decided the Covenant requirements are being followed. No additional cleanup actions are required by the property owner at this time. The property owner is responsible for continuing to inspect the Site to ensure the integrity of the cleanup action is maintained.

Next review

Ecology will schedule the next Site review five years from the date of this periodic review. If additional cleanup actions or institutional controls are required, the next periodic review will be scheduled five years after those activities are completed.

References

Ecology. Site visit. November 4, 2025.

GeoEngineers. Remedial Action Report: BNSF Hillyard Rail Yard Lead Site. December 5, 2011.

GeoEngineers. Revised Sampling and Analysis Plan: BNSF Hillyard Lead Site. September 17, 2008.

GeoEngineers. Soil Characterization Sampling: BNSF Hillyard Rail Yard. April 11, 2008.

GeoEngineers. Sampling and Analysis Plan: BNSF Hillyard Lead Site. December 19, 2007.

GeoEngineers. Feasibility Study and Cleanup Action Plan: BNSF Hillyard Lead Site. August 2, 2005.

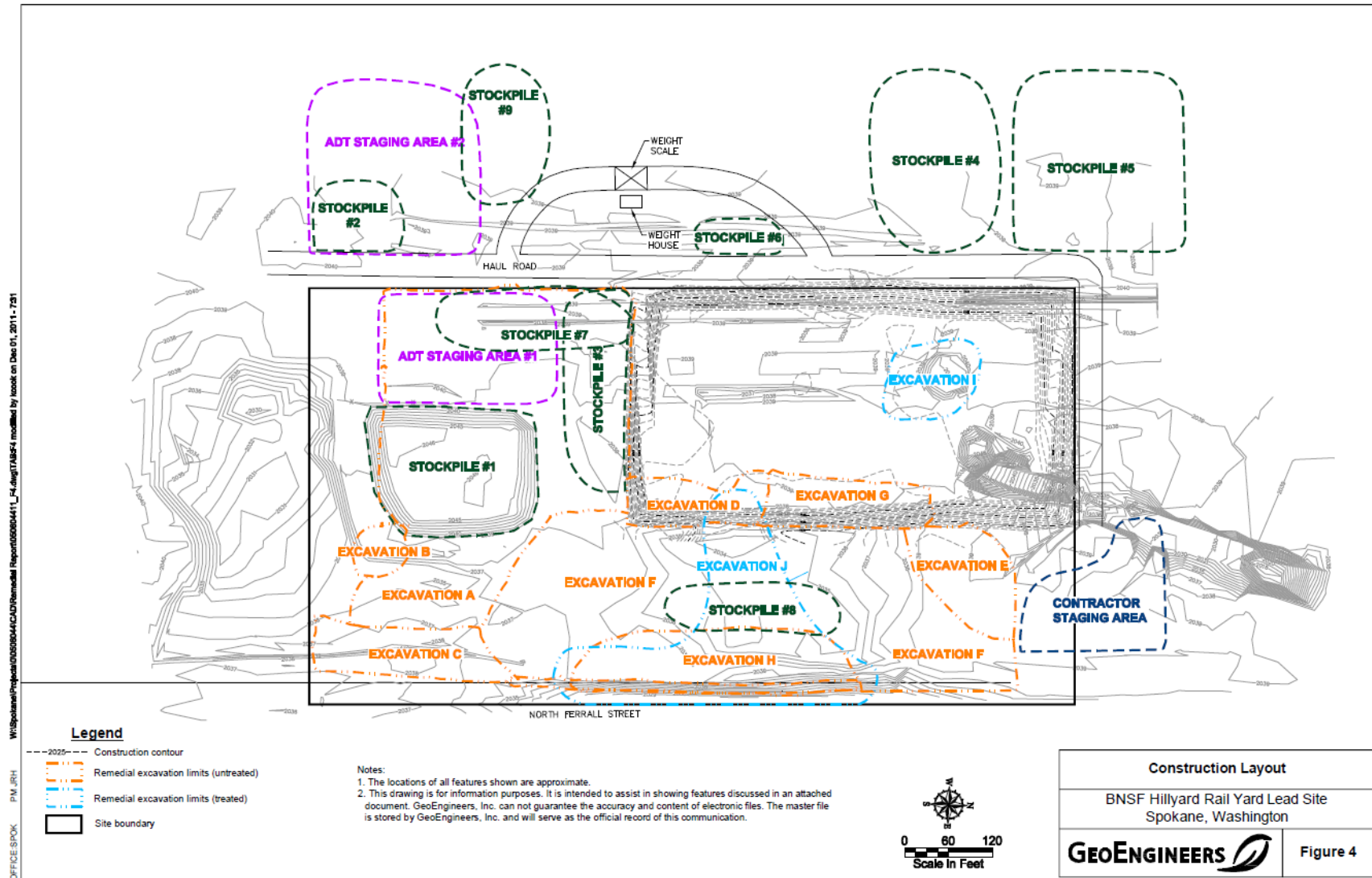
GeoEngineers. Soil Sampling Report: Hillyard Lead Soil Pile Site. October 29, 2003.

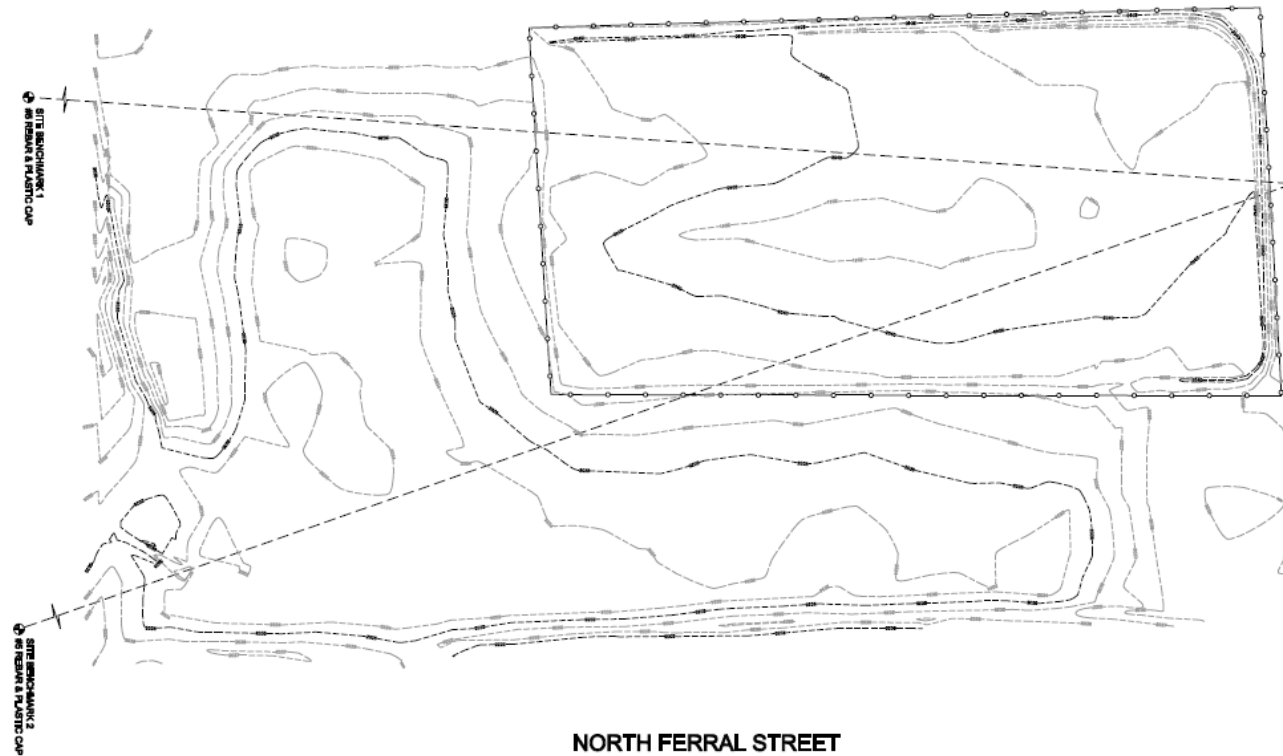
Environmental Management Resources, Inc. Site Characterization Report: Southeast Portion of Former Hillyard Railyard Lead Contaminated Soil. September 2002.

Appendix A. Vicinity Map



Appendix B. Site Plans





NORTH FERRAL STREET

LEGEND	
---	EXISTING 5' CONTOUR
---	EXISTING 1' CONTOUR
△ CP #3	TD&H CONTROL POINT
●	GEOENGINEERS SITE BENCHMARK
---	EXISTING 6' CHAIN LINK FENCE

Notes:
 1. The locations of all features shown are approximate.
 2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Reference: Base drawing provided by Thomas, Dean and Hoskins titled "BNSF Hillyard Lead Pile (Filled pit), Hillyard, Washington, Topographic Base Map" dated 9/21/09

BASIS OF BEARING
 GEOENGINEERS SITE CONTROL

TEMPORARY BENCHMARKS
 TD&H CONTROL POINT #9 (1" IN CONCRETE)

COORDINATE DATA

CONTROL POINT #9
 N 276622.26
 E 2485173.72
 ELEVATION = 2038.94

SITE BENCHMARK #1
 N 275273.59
 E 2485081.45
 ELEVATION = 2040.25

SITE BENCHMARK #2
 N 275136.67
 E 2485092.15
 ELEVATION = 2039.64



Site Plan As-built (2009)	
BNSF Hillyard Rail Yard Lead Site Spokane, Washington	
GEOENGINEERS	Figure 10

Appendix C. Photo Log

Photo 1: Capped containment area with sloped perimeter — from the north



Photo 2: Western perimeter fence and BNSF railway — from the north



Photo 3: Eastern perimeter fence with welded reinforcement — from the north



Photo 4: Containment area access gate — from the east



Photo 5: Southeast corner of perimeter fence with debris — from the southeast



Photo 6: Welded post to reinforce perimeter fence — from the south

