



Periodic Review

Terrace Heights Elementary School

4300 Maple Court, Yakima, Yakima County

Facility Site ID: 221207, Cleanup Site ID: 3874

Toxics Cleanup Program, Central Region

Washington State Department of Ecology
Union Gap, Washington

May 2021

Document Information

This document is available on the Department of Ecology's [Terrace Heights Elementary School cleanup site page](#).¹

Related Information

- Facility Site ID: 221207
- Cleanup Site ID: 3874

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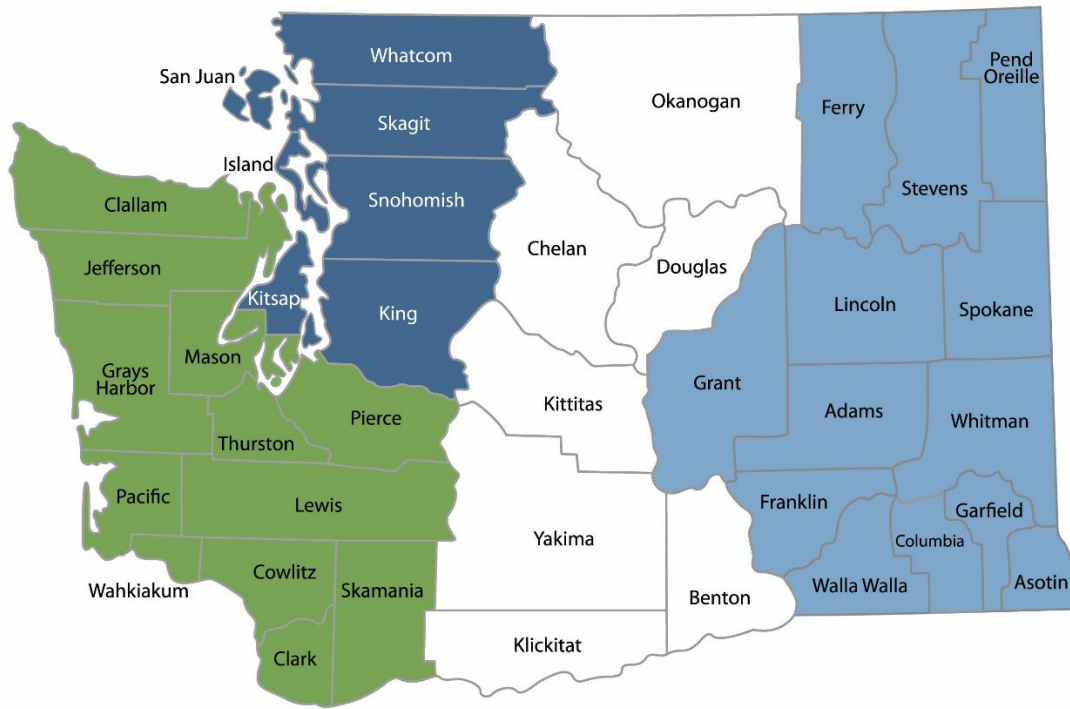
¹ <https://apps.ecology.wa.gov/cleanupsearch/site/3874>

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

³ <https://ecology.wa.gov/About-us/Accountability-transparency/Our-website/Accessibility>

Department of Ecology's Regional 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 46700 Olympia, WA 98504	360-407-6000

Table of Contents

Introduction	1
Summary of Site Conditions	2
Site description and history	2
Site investigations	2
Cleanup actions	3
Cleanup standards	3
Environmental Covenant	4
Periodic Review	5
Effectiveness of completed cleanup actions	5
New scientific information for individual hazardous substances or mixtures present at the Site	6
New applicable state and federal laws for hazardous substances present at the Site.....	6
Current and projected site and resource uses.....	6
Availability and practicability of more permanent remedies	6
Availability of improved analytical techniques to evaluate compliance with cleanup levels.....	6
Conclusions	6
Next review	7
References	8
Appendix A. Vicinity Map	9
Appendix B. Site Plan	10
Appendix C. Pre-Remediation Sampling Data	11
Pre-Remedial Sampling using XRF	11
Appendix D. Photo Log	13
Photo 1: Front of Terrace Heights ES - from the west	13
Photo 2: Play Equipment Area - from the north	13
Photo 3: Ballfield Area - from the northeast	14
Photo 4: Rear of Terrace Heights ES - from the southeast	14

Introduction

The Washington State Department of Ecology (Ecology) reviewed post-cleanup site conditions and monitoring data to ensure human health and the environment are being protected at the Terrace Heights Elementary School (Site). Site cleanup was implemented under the Model Toxics Control Act (MTCA) regulations, Chapter 173-340 Washington Administrative Code (WAC).

Cleanup activities at this Site were completed as an independent cleanup action by the East Valley School District, with overview and partial funding by Ecology. Residual concentrations of lead and arsenic that exceeded MTCA cleanup levels remain on the property. The MTCA cleanup levels for soil and groundwater are established under [WAC 173-340-740](https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-740)⁴ and [WAC 173-340-720](https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-720),⁵ 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))⁶ requires Ecology to conduct a periodic review of certain sites every five years. For this Site, a periodic review is required because an institutional control and/or financial assurance is 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

Ecology publishes a notice of all periodic reviews in the *Site Register* and provides an opportunity for public comment.

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

⁵ <https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-720>

⁶ <https://app.leg.wa.gov/wac/default.aspx?cite=173-340-420>

Summary of Site Conditions

Site description and history

Terrace Heights Elementary is located at 4300 Maple Court, Yakima, Washington. The school is situated in a residential area in the Terrace Heights neighborhood of Yakima. The portion of the school grounds remediated for lead and arsenic includes virtually all of the grass area surrounding the school buildings, including the sports fields and grass courtyards between buildings.

According to a Geotechnical Survey conducted by GN-Northern, Inc., soil at the site is predominantly classified as silty sand loam (SM) brown, fine to medium grained, dry to moist, medium dense, with trace gravel, with moderate calcareous cementation (caliche) and cobbles up to 24 inches in diameter after 2.0 - 2.5 feet.

Prior to construction of the elementary school, the Site had been cultivated as fruit orchard. Prior to 1948, pear and apple orchards used lead arsenate as a pesticide to control the codling moth. By 1948, lead arsenate use generally ceased because the codling moth had developed resistance to the arsenate compound, and dichlorodiphenyltrichloroethane (DDT) was found to be a much more effective control agent.

The application of lead arsenate over several decades resulted in the accumulation of lead and arsenic in surface soils at levels that are hazardous to human health and the environment. Lead and arsenic are relatively immobile in soil and generally remain in the top 12 inches of the soil column, even though application ceased prior to 1950.

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

Site investigations

This Site was included in an area-wide lead and arsenic sampling program which involved collecting samples from schools suspected of having a history of past pesticide use. Prior to the mid-1940s, lead arsenate was the most widely used chemical used to control codling moths on fruit trees. Lead and arsenic are known to be very stable in soil and tend to stay near the surface. Because of this historical background, it was suspected that the soil in the school playground might be contaminated with lead and arsenic. Ecology obtained permission from the Yakima School District to sample and test the soils from Terrace Heights Elementary School for lead and arsenic.

The soils throughout the property were sampled by Ecology. Samples were taken at various depths from the surface using a core sampler. The samples were analyzed for lead and arsenic using X-Ray Fluorescence (XRF) Spectroscopy. The analytical results of initial sampling at Terrace Heights Elementary indicated that contaminant levels in soil exceeded the Model Toxics Control Act (MTCA) Method A cleanup levels for lead (250 parts per million [ppm]) and/or arsenic (20 ppm) in preliminary samples.

Additional soil sampling was conducted by GN-Northern, Inc., in order to further delineate contamination in soil for remediation. The results of the 55 soil samples taken from the property at Terrace Heights Elementary School showed that the lead and arsenic contamination above Method A cleanup levels extends in the upper 12 to 18 inches of soil but was observed as deep as 24 inches below ground surface. The highest level of arsenic detected at the site was 189 ppm, compared to the Method A cleanup level of 20 ppm for arsenic. For lead, the highest level detected was 865 ppm, compared to the Method A cleanup level of 250 ppm. These concentrations required the Site be scored and ranked under the Washington Ranking Method (WARM). The Site was ranked a “5” and placed on Ecology’s Hazardous Sites List in 2007.

A table containing pre-remediation sampling data is available as Appendix C.

Cleanup actions

Capping of existing soil with clean soil was the selected remedial option for the site. The remedial process was carried out as follows: The existing grass turf was tilled to a depth of approximately six inches with a tractor-drawn rototiller. The tilled surface was flattened with a roller, and a permeable geotextile fabric was installed over the existing soil surface. The geotextile was rolled out and staked in place with 12 inches of overlap at the seams. At hardscape edges such as pavement and foundations, contaminated soil was excavated to allow the clean soil cap to meet existing grade.

A minimum of eight inches of clean topsoil was placed on top of the geotextile and lightly compacted. The imported topsoil was tested for the presence of lead, arsenic, pesticides and petroleum products prior to import. Neither lead nor arsenic were detected above background concentrations. Following topsoil import and grading, sod was installed on the remediated area and hydroseeding was used where growth had not established.

Approximately 99.9% of the field area was treated with sod rather than hydro-seed and fenced off to allow it to germinate and establish.

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)⁷ 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.

⁷ <https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-704>

MTCA Method A cleanup levels for unrestricted land use were determined to be appropriate for contaminants at this Site. The cleanup actions conducted at the Site were determined to be routine, few hazardous substances were found at the Site, and numerical standards were available in the MTCA Method A table for each hazardous substance. The MTCA Method A cleanup level for arsenic is 20 mg/kg and the MTCA Method A cleanup level for lead is 250 mg/kg.

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 determined that 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 June 16, 2015, institutional controls in the form of an [environmental covenant](#)⁸ (Covenant) were recorded for the Site.

The Covenant recorded for the Site imposes the following limitations:

1. **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.
2. **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.
3. **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.
4. **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.
5. **Amendment to the Covenant.** Grantor must notify and obtain approval from Ecology at least sixty (60) days in advance of any proposed activity for use of the Property in a manner that is inconsistent with this Covenant. Before approving any proposal, Ecology must issue a public notice and provide an opportunity for public comment on the

⁸ <https://apps.ecology.wa.gov/cleanupsearch/document/47898>

proposal. If Ecology approves the proposal, the Covenant will be amended to reflect the change.

6. 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.

The remedial action for the Property is based on containing remaining contaminated soil under a cap consisting clean soil and geotechnical fabric and located as illustrated in Exhibit B. The primary purpose of this cap is to prevent exposure and direct contact to contaminated soils. As such, the following restrictions shall apply within the area illustrated in Exhibit B.

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.

Periodic Review

Effectiveness of completed cleanup actions

Based upon the Site visit conducted on March 22, 2021, the clean soil cap on the Site continues to reduce the human exposure pathway to contaminated soils to acceptable levels. The Site is currently operating as an elementary school. A photo log is in Appendix D.

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 the cleanup soil cap. The cap appears 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 2015. The Covenant remains active and discoverable through the Yakima County Auditor. 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.

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 used as a public school. 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 has determined the requirements of the Covenant 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 cap is maintained.

Next review

Ecology will schedule the next review for the Site 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

Loofburrow Wetch Architects. *Interim Action Report – Terrace Heights Elementary School Yakima, WA*. December 17, 2014.

Ecology. *Environmental Covenant*. June 17, 2015.

Ecology. “No Further Action Determination.” December 20, 2016.

Ecology. Site visit. March 22, 2021.

Appendix A. Vicinity Map

Figure A-1: Vicinity Map



Appendix B. Site Plan

Figure A-2: Remediation Area Map



Appendix C. Pre-Remediation Sampling Data

Pre-Remedial Sampling using XRF

SAMPLE ID	As (mg/kg)	Pb (mg/kg)
<i>Method A CUL*</i>	20	250
B1	35	174
B2	136	170
B3	102	515
B4	61	625
B5	62	632
B6	65	364
B7	70	180
B8	98	517
B9	44	197
B10	39	125
B11	86	814
B12	12	21
B13	43	423
B14	43	48
B15	74	540
B16	43	197
B17	37	165
B18	77	675
B19	32	122
B20	48	148
B21	63	511
B22	125	598
B23	16	67
B24	99	270
B25	84	673
B26	29	18
B27	189	865
B28	14	23
B29	37	152
B30	15	77

B31	28	210
B32	23	97
B33	49	460
B34	23	90
B35	11	16
B36	13	104
B37	19	16
B38	ND	209
B39	46	354
B40	56	128
B41	15	21
B42	42	225
B43	ND	52
B44	ND	144
B45	71	319
B46	ND	204
B47	ND	ND
B48	ND	64
B49	ND	ND
B50	ND	321
B51	41	ND
B52	29	34
B53	40	118
B54	65	216
B55	50	73

*Bold results indicate Method A cleanup level (CUL) exceedance.

Appendix D. Photo Log

Photo 1: Front of Terrace Heights ES - from the west



Photo 2: Play Equipment Area - from the north



Photo 3: Ballfield Area - from the northeast



Photo 4: Rear of Terrace Heights ES - from the southeast

