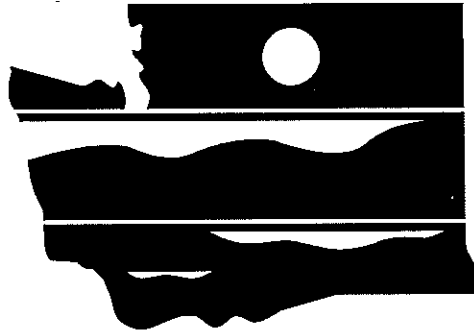




WASHINGTON STATE
DEPARTMENT OF
E C O L O G Y

**INTERIM REMEDIAL ACTION PLAN
BARGE-LINCOLN ELEMENTARY SCHOOL
YAKIMA, WASHINGTON**

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Toxics Cleanup Program
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1.0 INTRODUCTION

1.1 PURPOSE OF THIS DOCUMENT

The purpose of this Interim Remedial Action Plan is to fulfill the requirements of Washington Administrative Code (WAC) 173-340-430, which includes a requirement that, except in certain circumstances, a report be prepared before conducting an interim action under the Model Toxics Control Act.

1.2 SUMMARY OF PROPOSED INTERIM ACTION

The Department of Ecology proposes to excavate and haul away some of the soil contaminated with lead and arsenic for disposal at a permitted landfill, place a geotextile membrane over any remaining contaminated soil, import clean soil to the elementary school, and establish new grass in this clean soil. The plan includes modification of the existing irrigation system (underground solid set sprinklers) to maintain the turf cover.

2.0 BACKGROUND

2.1 AREA-WIDE SOIL CONTAMINATION TASK FORCE

In response to increasing public concerns on lead/arsenic contamination, the 2001 Washington State Legislature requested that Ecology prepare a statewide strategy to address lead and arsenic soil contamination. The project's main focus was on areas with low to moderate levels of lead and arsenic that have been developed into residential neighborhoods, schools, daycares, and parks.

Ecology's strategy includes the findings and recommendations of the Area-Wide Soil Contamination Task Force, a 17-person panel chartered by the Washington State Departments of Agriculture, Ecology, Health, and Community, Trade and Economic Development (the Agencies) to offer advice about a statewide strategy to respond to low- to moderate-level arsenic and lead soil contamination in Washington State. The completed report, **Area-Wide Soil Contamination Task Force Report**, Ross & Associates Environmental Consulting, Ltd., Landau Associates, Inc., Hubbard Gray Consulting, Inc., June 30, 2003, can be found on the world-wide web at http://www.ecy.wa.gov/programs/tcp/area_wide/Final-Report/PDF/TF-Report-final.pdf.

Task Force deliberations focused on understanding the nature and extent of area-wide soil contamination, making recommendations about effective, practical, and affordable steps individuals and organizations can take to reduce their potential for exposure to area-wide soil contamination, and on creating an alternate, more streamlined approach under MTCA for properties affected by area-wide soil contamination.

Specifically, the Task Force recommendations and Ecology's implementation strategy for schools affected by area-wide soil contamination include the following:

- implement individual protection measures such as appropriate hygiene, precautionary measures when working in soil, and cleaning methods, as recommended by the Department of Health
- maintain good grass and landscaping cover over soil in areas where children play
- conduct qualitative evaluations to increase the understanding of where exposure could occur
- test soils where qualitative evaluations indicate the potential for exposure to contaminated soil, and
- implement additional protection measures such as installing geotextile barrier fabric between contaminated soils and surfacing materials in play areas or more permanent protection measures if contamination is found.

2.2 CONTAMINANTS OF CONCERN

The main contaminants of concern at these sites are the toxic metals, lead and arsenic. Long-term exposure to elevated levels of arsenic may cause cancer, whereas long-term exposure to lead may affect and impair the human nervous system and proper brain function. More information on the short- and long-term effects of lead and arsenic can be found at http://www.doh.wa.gov/Topics/childhood_lead_poisoning.htm.

2.3 AREA SOIL TESTING AND INITIAL INTERIM ACTIONS

Between 2001 and 2005, Ecology assisted school districts in conducting soil sampling for lead and arsenic contamination at school sites. A total of 35 schools located in Okanogan, Douglas, Chelan, and Yakima counties had soil contamination significantly higher than Washington State cleanup standards.

During the summer of 2009, Ecology began implementing interim cleanup actions in Yakima County. Two schools within the Yakima School District, Gilbert Elementary and Robertson Elementary, were capped with clean soil during the summer of 2009. Ecology provided funding for the entire project at both schools, including design, contracting, and oversight of construction.

2.4 BARGE-LINCOLN ELEMENTARY SCHOOL SITE ASSESSMENT

Of 20 soil samples taken from the Barge-Lincoln Elementary School playfield in August 2005, 13 samples exceeded the state cleanup standards for arsenic and four exceeded for lead. The 20 arsenic samples showed an average concentration of 34.0 milligrams per kilogram (mg/kg). The maximum concentration detected for arsenic was 78.8 mg/kg, almost four times the state cleanup standard of 20 mg/kg. For lead, the 20 samples showed an average concentration of 183.0 mg/kg, with a maximum concentration of 595.2 mg/kg. The state cleanup standard for lead is 250 mg/kg.

3.0 DESIGN CONSIDERATIONS

3.1 STATE CLEANUP REGULATION

According to the state cleanup regulation¹, an “interim action” is distinguished from a “cleanup action” in that an interim action only partially addresses the cleanup of a site. (The remediation conducted under an interim action may end up constituting the complete cleanup action for a site, however, if the interim action subsequently is shown to meet requirements in the rule for a complete cleanup action.) The state regulation defines three categories of interim actions.

The interim action proposed for the Yakima school sites qualifies under the following one of the three categories defined in the state rule. WAC 173-340-430 (a) defines an interim action as “A remedial action that is technically necessary to reduce a threat to human health or the environment by eliminating or substantially reducing one or more pathways for exposure to a hazardous substance at a facility.” By reducing the proximity of school children to the hazardous substances, the interim action will reduce the threat to human health posed by the pathways of contact and ingestion.

WAC 173-340-430 (2) states that interim actions may:

- (a) Achieve cleanup standards for a portion of the site
- (b) Provide a partial cleanup, that is, clean up hazardous substances from all or part of the site, but not achieve cleanup standards; or
- (c) Provide a partial cleanup of hazardous substances and not achieve cleanup standards, but provide information on how to achieve cleanup standards for a cleanup; for example, an unproven cleanup technology demonstration project.

Additional requirements of an interim action, as stated in WAC 173-340-430, are that the interim action will be consistent with the cleanup action and that the interim action shall not foreclose reasonable alternatives for the cleanup action. (The rule provides the following qualifier to the latter requirement: “This is not meant to preclude the destruction or removal of hazardous substances.”) A Cleanup Action Plan has not yet been written for the Yakima school sites, but this interim action is consistent with the cleanup typical alternatives considered for lead/arsenic contaminated sites in Central Washington.

3.2 INTERIM ACTION ALTERNATIVES

The following cleanup action alternatives were considered for the Barge-Lincoln Elementary School Site:

- No action – This option was not selected because the situation has not been stabilized at a status that gives sufficient assurance of on-going isolation of the contaminated soil from school children.

¹WAC 173-340-430(1)

- **Capping the contaminated soil with a barrier such as permeable geotextile fabric, and clean imported soil** – This option was selected because it provides protection equal to the other options at a greatly reduced cost. Excavation would be ~300% more costly and deep mixing is not technically feasible at the site.
- Institutional controls do not address the contamination in the soil but rely on practices to control exposure to the contamination. Examples could include educating students and others about soil contamination; maintaining features such as existing grass which provide some barrier to contamination; preventing digging in the school yard; restricting access to the school yard; requiring students to wash hands following recess; having school maintenance staff wet-mop floors and use high efficiency particulate air (HEPA) filter vacuum cleaners; fencing; signage; and restrictive covenant limiting use of the land – Institutional controls was not selected as the sole option because it is not considered as effective as other alternatives due to the difficulty in enforcing 100 percent compliance with some of the practices. Also, one institutional control (restricting access to the playfield) would render the playfield useless as a playfield even if could be accomplished successfully. Despite these shortcomings, some institutional controls such as hand washing and prevention of digging do provide additional benefit when used in conjunction with more universally effective measures.
- **Deep Mixing** – Contaminated soil would be mixed with underlying clean soils to a depth of four feet. Mixing of contaminated soils may reduce the overall soil contamination to a “clean” standard if area contaminant concentrations are not too high and do not extend too deep. Deep mixing requires large, specialized machinery which cannot be operated efficiently in small areas. The use of deep mixing is also limited to areas where deep soils are present and terrain is relatively flat and open. Deep mixing was not selected because the size and layout of the school would not justify the use of equipment necessary to accomplish the task.
- **Removal of Contaminated Soil** – Physical removal by excavation was not selected due to the large quantities of soil that would need to be removed and replaced with clean topsoil for successful remediation.

4.0 INTERIM CLEANUP ACTION PLAN

A qualified and experienced contractor will perform the following work during summer 2010:

Modification of existing irrigation equipment; placement of a geotextile fabric across all areas of the property that require remediation; placement of clean imported topsoil; placement of topsoil amendment as needed; and, establishment of new turf.

4.1 SAFETY AND HEALTH

Public access to the site will be restricted during the construction period. The Safety and Health Plan will address construction hazards and hygiene. No other known or special hazards exist at this site. The contractor will be required to provide a specific Safety & Health Plan for the site construction activities.

4.2 OPERATION AND MAINTENANCE PLAN

Yakima School District will develop an operation and maintenance plan which describes work practices to limit child and employee exposure to lead and arsenic contaminated soil.

5.0 ABBREVIATIONS AND ACRONYMS

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act – a federal law
CFR	Code of Federal Regulations – federal regulations
Ecology	Washington State Department of Ecology
EPA	United States Environmental Protection Agency
MTCA	Model Toxics Control Act – a Washington state law
RCRA	Resource Conservation and Recovery Act – a federal law
WAC	Washington Administrative Code – Washington state regulations