

PINE CANYON DEVELOPER GUIDELINES

Future Development within the Lincoln Removal Action Area

Introduction

These Developer Guidelines are written for developers and homeowners who plan to develop or build on property that may have been impacted by historic activities related to the International Smelting & Refining Company's Tooele Smelter (IS&R).

The former smelter property and Pine Canyon residential properties affected by smelter activities have been remediated through various EPA monitored actions since 1986. Specifically, Atlantic Richfield Company (Atlantic Richfield), under the direction of the US Environmental Protection Agency (EPA), has completed a series of remedial actions in Pine Canyon wherein soil with elevated lead and arsenic concentrations was removed from residential properties and replaced with clean soil. Environmental studies conducted in 2001-2003 by Atlantic Richfield indicate lead and arsenic concentrations, which are above acceptable residential cleanup levels, may exist in soils on some undeveloped properties in the Pine Canyon area.

In order to monitor future development in Pine Canyon and confirm that properties are adequately remediated, Tooele County has created the Pine Canyon Environmental Overlay Zone (See Figure 1). Within the Overlay Zone a review of the environmental condition and possible remedial action is required as part of the development or building construction approval process. Applicants anticipating development within the Pine Canyon Area should first meet with the Tooele County Planning and Zoning Department (TCPZ) to determine if the property to be developed or otherwise improved is subject to the requirements of the Overlay Zone. The initial request should include the following information:

- Physical address or parcel number
- Vicinity Map
- Concept Map showing planned development or construction

The TCPZ will review previous sampling data (See Figure 2 for sampling completed to date in undeveloped areas in Pine Canyon) to determine if additional sampling and remedial action is required. Steps for completing this process are described below under "Steps to Completing Development in the Overlay Zone."

These guidelines are designed to assist with:

- Providing background information and giving a basic understanding of the risks of lead and arsenic in soil
- Describing steps required to develop in the Overlay Zone
- Providing requirements and procedures for completing additional sampling
- Selecting a remedial construction technique for cleanup
- Documenting the sampling and construction completed

Background Information

How do soils become impacted?

In 1910, IS&R began processing ore from local mines. Metals processing continued at the smelter until the early 1970's when the smelter was closed and demolished shortly thereafter. The smelter process produced four types of waste as by-products:

- **Waste Rock or unprocessed ore:** Waste rock consists of the rock set aside during mining or mineral processing that did not contain sufficient amounts of target metals to be economically viable.
- **Tailings:** Tailings are created by grinding mine ore into sand and removing the metal-bearing portion of that sand, called concentrate, by gravity. Concentrate is then further processed through the smelter leaving behind the lower metal content tailings. Since tailings had no productive use at IS&R, they were deposited into tailings impoundments west of the smelter.
- **Slag:** At IS&R, the concentrate was conveyed through blast furnaces to "drive off" the sulfur and further separate the target metals from the concentrate leaving a by-product waste known as slag. The slag waste was disposed of east of the former smelter.
- **Stack Emissions:** Stack emissions consist of finite particles discharged from smelter smoke stacks.

What are the Health Concerns associated with impacted soils?

The primary environmental concern in Pine Canyon is soil containing higher than normal amounts of lead and arsenic. In the Oquirrh Mountains, lead and arsenic occur naturally in varying concentrations, which is the reason for its attractiveness as a mining area. These natural concentrations generally do not pose a significant health risk. Since the milling and smelting operation is designed to concentrate lead and arsenic, waste materials or soils impacted by the waste may contain higher amounts of these elements than those found in the natural environment.

Some studies conclude that elevated concentrations of lead and arsenic may affect human health. According to EPA health concerns associated with exposure to lead and arsenic are wholly dependent on how much contact there is with affected material (soil, tailings, etc.). Because young children are more likely to play on the ground they generally have greater potential exposure to lead and arsenic in soil (inadvertently swallowing soil by sticking their fingers or other objects into their mouths). In comparison, adults who typically spend less time outside in direct contact with the soil and have better hygiene habits, have less exposure. Accordingly, cleanup levels (the maximum allowable concentration of lead and/or arsenic in soil) established by the EPA for the Pine Canyon area are based on the potential exposure of a young child. The Agency for Toxic Substance & Disease Registry states describes the following health concerns associated with lead and arsenic:

Lead: Exposure to lead can happen from breathing workplace air or dust, eating contaminated foods, or drinking contaminated water. Children can be exposed from eating lead-based paint chips or playing in contaminated soil. Lead can damage the nervous system, kidneys, and reproductive system.

Arsenic: Exposure to lower levels can cause nausea and vomiting, decreased production of red and white blood cells, abnormal heart rhythm, damage to blood vessels, and a sensation of “pins and needles” in hands and feet. Ingesting or breathing low levels of inorganic arsenic for a long time can cause a darkening of the skin and the appearance of small “corns” or “warts” on the palms, soles, and torso.

How Land Use affects Clean up Levels

As stated above the primary type of **use** of an area and the **frequency** with which people are exposed to its soils, determine acceptable lead and arsenic cleanup levels. The EPA, after completing a Health Risk assessment for the IS&R site originated lead and arsenic cleanup levels for various land use types.

If land use is recreational or agricultural and small children are not likely to be regularly exposed to the soil, the allowable cleanup level is higher than those established for areas surrounding homes in residential areas. In addition, these areas are normally covered with crops or native grasses which reduce the likelihood of dust migration or inhalation. However, when a proposed development and new building changes the type of land use, it is important to evaluate the lead and arsenic levels against cleanup levels established for the proposed future use. Thus, when an agricultural or open space area is developed into a residential use, actions to reduce lead and arsenic concentrations on the property may be required.

Table of Cleanup Levels for Pine Canyon

Land-Use	Average Concentration (mg/kg) ¹⁾	
	Lead	Arsenic
Recreation/Open Space	2,230	900
Agricultural	2,230	900
Residential (40,000 ft ² surrounding house)	580	100

¹⁾ parts per million (mg/kg)

Residential cleanup levels apply to the average soil concentrations on the 40,000 sf immediately surrounding a house. The land use type (recreation/open space, etc.) would then apply for the remaining portions of the property. (See Figure 3)

Steps for Completing a Development or Building within the Overlay Zone

When developing or building within the Overlay Zone the process is similar to the standard approval process with the additional step of working with the Tooele County Health Department (TCHD) to determine the environmental status of the property (See Figure 4 and 5). If the environmental assessment completed on the property determines soil concentrations of lead or arsenic exceed cleanup levels, then a remedial action is warranted. Obviously, the goal of any

cleanup action is to reduce the potential exposure to humans from impacted soils. There are multiple methods to accomplish this; sometimes the most effective method is simply to remove the impacted soil. Other times, it is more effective to place a layer of clean material, or a “cap,” between the impacted soils and the people. An environmental professional can assist in determining what the best option is for individual properties.

Information provided in the subsequent paragraphs describes the steps unique to the environmental aspects of the Overlay Zone.

Step 1: Prepare Concept Plan of the proposed improvement

All required drawings and documents prepared by the Applicant shall be submitted to TCPZ who will distribute to the other agencies as needed. To begin the environmental approval process the applicant should prepare and submit to TCPZ a Concept Plan of the development or new building showing where the property is and what the proposed improvements will be (residential, open space, roads, buildings, etc.). The TCPZ will review the plan, confirm that it is within the Overlay Zone and will discuss with the Applicant what Cleanup Levels apply for the proposed land use. If the proposed project is not within the Overlay Zone, TCPZ will inform the Applicant that there are no environmental review requirements and that the project may proceed through the standard approval process.

Step 2: Submit a Sampling and Analysis Plan

When a property to be improved is within the Overlay Zone, a Sampling and Analysis Plan (SAP) prepared by the Applicant or its consultant is required. The purpose of the SAP is to define a plan of how an environmental assessment will evaluate the current environmental condition of the property relative to established Cleanup Levels. The TCHD will then review the SAP to evaluate sampling design, sampling methods, sample handling and data quality objectives. Sampling may begin once authorization to move forward is obtained from the TCHD. The plan should include the intended Scope of Work and details on how it will be accomplished. Soil analysis for lead and arsenic should be performed by XRF with a minimum 5% Quality Assurance duplicate samples analyzed by ICP methods or as otherwise approved by TCHD. At a minimum, the sampling frequency defined in the SAP shall include one 5-point composite for each 40,000 sq ft area (200' X 200' grid) or for each planned or existing lot within a subdivision, whichever is less. Collect one composite sample and analyze for depths representing 0-6", 6"-12" and 12"-18".

Remedial Objectives and Acceptance Criteria:

The minimum criterion for acceptance of a property to proceed towards development is:

The area average for any given residential building pad and the adjacent 40,000 sq ft (residential portion) of a planned or an existing subdivided lot as determined by the composite samples shall not exceed the Cleanup Level of 580 ppm lead or 100 ppm arsenic. In addition, no one sample within the residential area shall exceed 900 ppm lead or 150 ppm arsenic. Evaluation of the minimum criteria shall be applied at each of the three sampling depths.

The area average outside the residential portion of each planned or existing subdivided lot as determined by the composite samples shall not exceed the Cleanup Levels of 2,230 ppm lead and 900 ppm arsenic. In addition, no one sample shall exceed 14,850 ppm lead or 4,545 ppm arsenic. Evaluation of the minimum criteria shall be applied at each of the three sampling depths.

Step 3: Submit Sampling Results and Remedial Plan

After completion of field sampling, the Applicant prepares and submits a summary of all sampling completed and associated analytical results. If sampling indicates that lead and/or arsenic concentrations are below Cleanup Levels, the Applicant will then proceed by working with TCPZ through the standard approval process.

If the field sampling indicates soil concentration levels of lead and/or arsenic are above established Cleanup Levels, the Applicant will prepare a Remedial Work Plan (RWP). Prepare the RWP in accordance with the Table of Contents shown below and submit to TCPZ for approval prior to implementation. (Possible methodologies may include those described below under "Remedial Construction."):

RWP Table of Contents:

- I. Purpose and Objectives of Remedial Work Plan
- II. Discussion of Investigation Findings
 - a. data summary
 - b. areal extent map
- III. Roles and Responsibilities
- IV. Remedial Construction Methods and Procedures
 - proposed remedial methods
 - quantities
 - proposed surface grading and restoration
 - deposition of impacted soil
 - quality assurance
- V. Site Specific Health and Safety Plan
- VI. Remedial Construction Schedule
- VII. Post Construction Confirmation of Remedial Objectives

The RWP will be reviewed for completeness and to insure that the proposed plan addresses the full extent of the impacted soil and adequately addresses community health and safety issues. Final approval by TCHD is based on meeting performance criteria, not specific methodologies. Allow TCHD may approve certain methodologies in the RWP, the Applicant is fully responsible for meeting cleanup requirements.

Step 3: Remedial Construction

After review and authorization to proceed, the cleanup remedial construction actions may begin. Described below are three possible cleanup techniques. The first technique involves complete removal of impacted soil from the property. The remaining two techniques use a combination of methods to minimize the potential of human exposure.

Technique 1: Removing the Impacted Soil

Using this technique, all impacted soil is excavated from the property and transported to a landfill, or other approved area for permanent disposal. Atlantic Richfield has set aside a portion of its property for disposal of smelter impacted soil that exceeds cleanup levels. Removing all impacted soil is the surest way for the TCHD to determine your property is clean, thereby allowing unrestricted use in the future. Removing impacted soil from a property requires the most upfront costs; however, it will not require long-term operation and maintenance or impose land use restrictions.

Soil is to be removed using environmental safe methods that reduce dust and protect community residents from physical and environmental hazards. No specific depth is required during removal; however, confirmation sampling needs to confirm that remedial objects have been met. Following removal, plant area with native grass or other acceptable vegetative cover that prevents migration of windblown dust.

Technique 2: Partial Removal

Using the partial removal technique, impacted soils are removed from various portions of a large property (i.e. residential portion) and either transported to the Atlantic Richfield repository or spread onto open space areas within the property that have higher acceptable cleanup levels. Current and subsequent property owners are responsible for maintaining the open space in perpetuity or cleanup the property to a higher land use standard as needed to prevent human exposure.

Using these same concepts, greenbelts can be created by moving residential soils to open space areas on a subdivision wide basis providing a variety of amenities, such as attractive views, open space preservation, and convenient recreation opportunities.

Because the EPA allows open space areas to contain higher levels of lead and arsenic, impacted soil can be permanently left as long as there is a minimum cover of grass or other coverage as approved by TCHD.

Technique 3: Using the Impacted Soil as Backfill

When using this technique, some impacted soils may be used as backfill in utility trenches, or under hardscape features such as asphalt roads.

When this technique is used, the impacted soil must be covered with a minimum of 18" of clean soil, concrete, asphalt or other surfacing to minimize the risk of human exposure. Current and subsequent property owners are responsible for maintaining the protective surfacing in perpetuity.

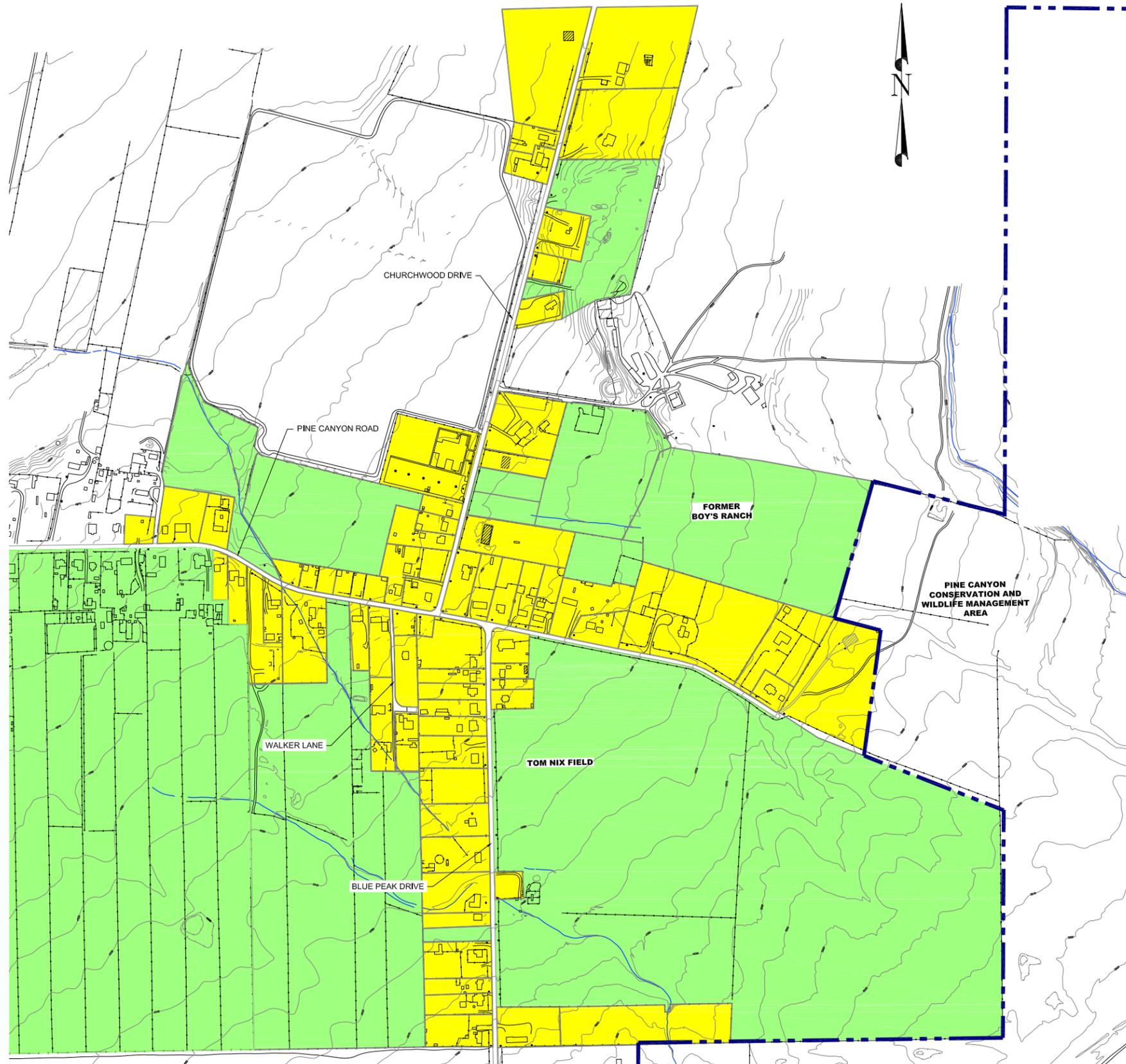
When covered with a protective surfacing, this method provides effective protection from lead and arsenic exposure, while minimizing cleanup costs. Using the impacted soil as backfill material eliminates hauling and disposal costs, as well as costs to purchase and haul clean backfill. Use of this method requires the approval of the design and institutional controls directed by the TCHD.

Step 4: Submit Final Report

Upon completion of the remedial work, submit for approval a final report prepared by and certified by a professional engineer for approval. Include in the report a summary of remedial construction and all confirmation sampling. Confirmation sampling must certify that remedial construction was completed according to the RWP and that remedial objectives have been met. Figures showing sample locations and areas addressed by remedial actions; tables with analytical results; construction quantities and a narrative of actions taken should all be included in the report.

Step 5: Proceed with Development Approval

Once the TCHD approves the final report, TCHD will provide a letter to TCPZ stating that remedial objectives have been met and no future environmental action is necessary for the intended use. Final approval for the project will be given by TCPZ after all other requirements are met.



General Notes

- AREAS WHERE ENVIRONMENTAL ASSESSMENT REQUIRED
- AREAS ALREADY REMEDIATED. NO ENVIRONMENTAL ASSESSMENT REQUIRED
- CONSERVATION AREA BOUNDARY

No.	Revision/Issue	Date

TOOELE COUNTY
PLANNING AND ZONING



DRAWN BY: RDE

ENGINEER:

APPROVED:

**PINE CANYON AREA
ENVIRONMENTAL
OVERLAY ZONE**

DEVELOPMENT GUIDE

TOOELE, UTAH

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Scale NO SCALE	