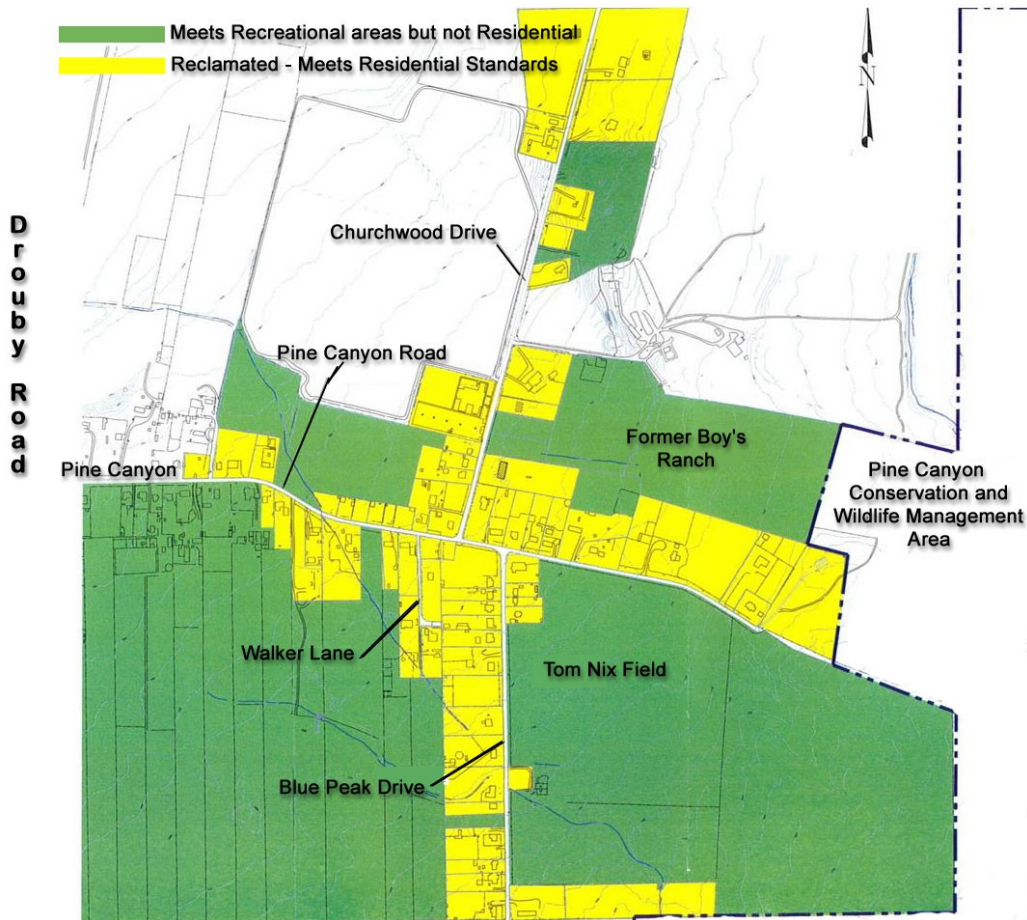


Tooele County Health Department

Pine Canyon Developer Guidelines

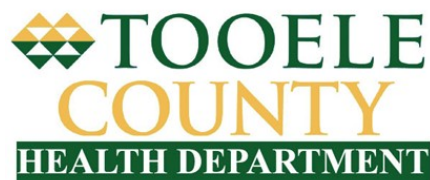


Tooele County Health Department

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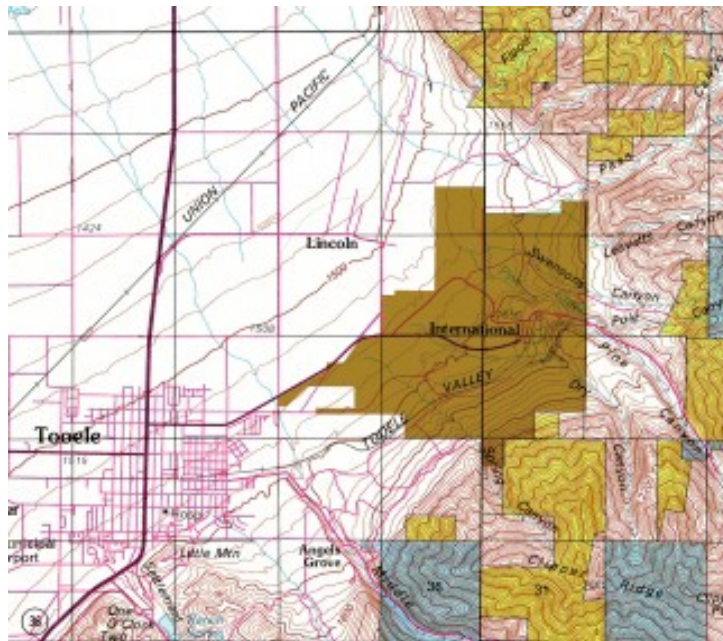
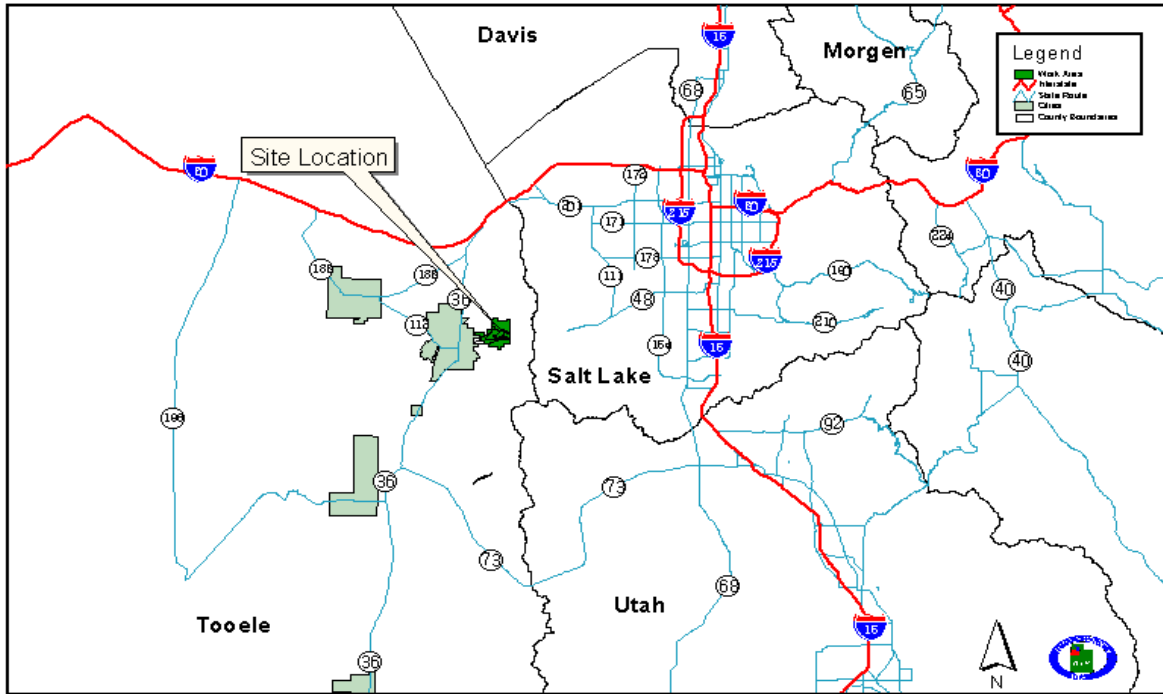
www.tooelehealth.org



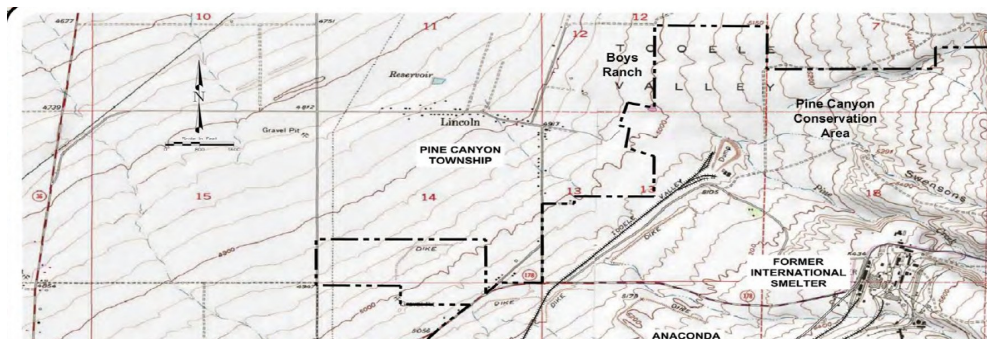
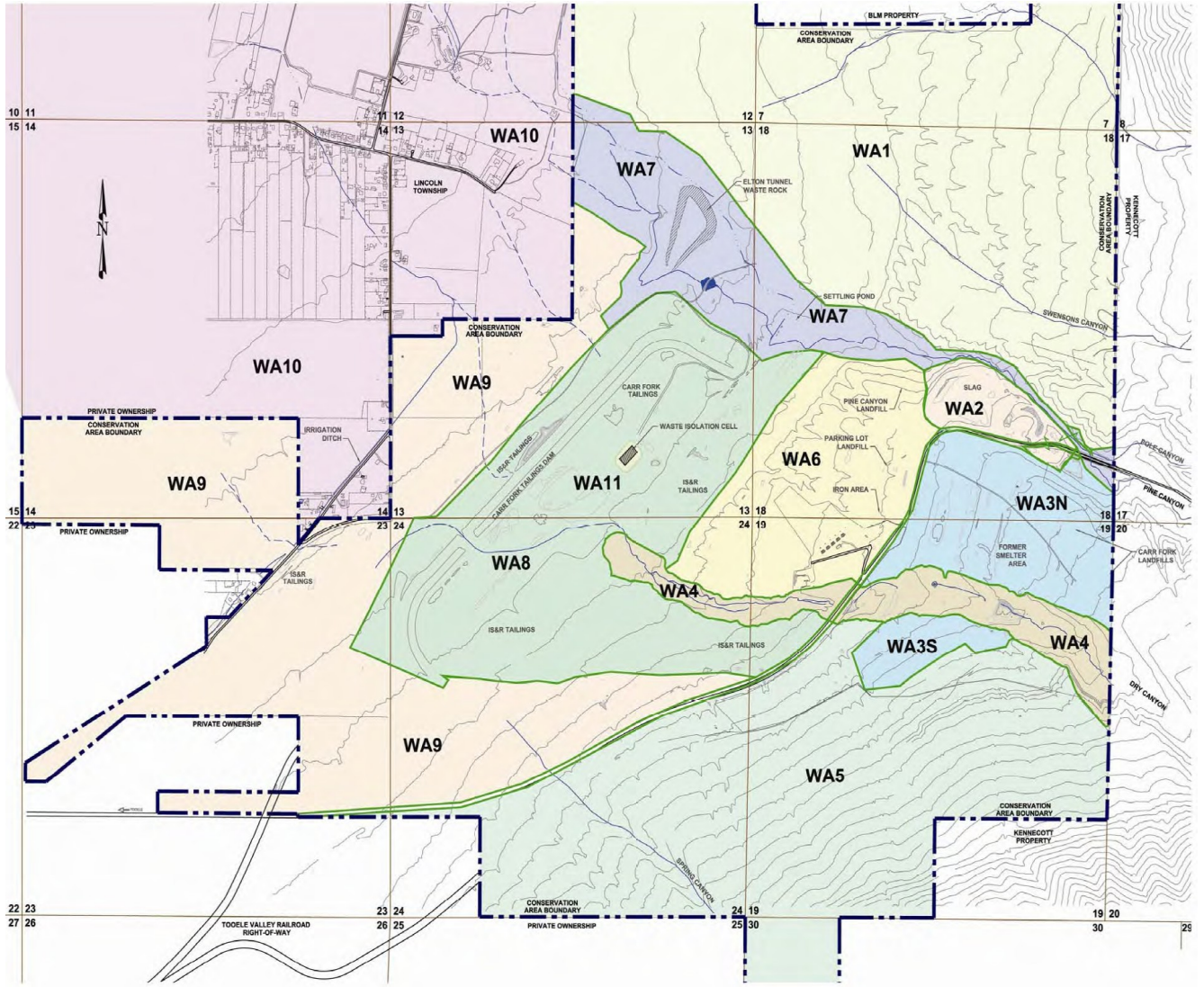
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Map of the Site Location



Map of the Site Location showing work areas



Chronology of Events

Chronology	
1909–1981	The Tooele Valley Railroad (TVRR) was constructed in 1909 to connect the Union Pacific and Western Pacific lines at Warner, Utah
1984	Utah Division of Environmental Health, Bureau of Solid and Hazardous Waste Site Investigation
1985	EPA Site Investigation
1985	Atlantic Richfield Investigation
1986–1989	Atlantic Richfield Surface Water Samples Reclamation begins
1995	Utah Division of Environmental Response and Remediation Surface Water Sampling
1996	Expanded Site Investigation
1999–2000	National Priority List Activities (EPA)
2001-2006	Remedial Investigation including the Tooele Valley Railroad Spur and Pine Canyon Investigation
2007	Declaration of the Record of Decision http://www.epa.gov/region8/superfund/ut/intrmtnismelt/ROD.pdf
2010	EPA announces remediation complete and the site be taken off the National Priorities List later this year

Developer Guidelines

These Developer Guidelines are written for developers and homeowners who plan to develop or otherwise improve property which 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 US Environmental Protection Agency (EPA) monitored actions since 1986. Specifically, Atlantic Richfield Company (Atlantic Richfield), under the direction of the EPA, has completed a series of remedial actions in the Pine Canyon area wherein soil with elevated lead and arsenic concentrations was removed from residential properties and replaced with clean soil. The Environmental studies conducted during 2001-2003 by Atlantic Richfield indicate lead and arsenic concentrations above acceptable residential cleanup levels may still exist in the soil 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

If TCPZ determines the development or other improvements are within the Overlay Zone, TCPZ will refer the applicant to the Tooele County Health Department (TCHD). Environmental Health Scientists will review previous sampling data (See Figure 2) for sampling completed to date in undeveloped areas in Pine Canyon).

Future Development within the Lincoln Removal Action Area

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?

Historically area smelters have processed ore from local mines. The smelting 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 which 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 process leaving behind the lower metal content tailings. Since these tailings have no productive use, they were typically deposited into tailing impoundments.

Slag: During smelting, the concentrated ore was conveyed through blast furnaces to “drive off” the sulfur and further separate the target metals leaving a by-product waste known as slag. The slag waste was normally disposed of in piles near the former smelter.

Stack Emissions: Stack emissions consist of finite particles discharged from smelter stacks.

Future Development within the Lincoln Removal Action Area

What are the Health Concerns associated with impacted soils?

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

Scientific studies have concluded 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 the affected material (soil, tailing, 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, experience 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 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.

Detailed information on lead and arsenic may be found in the International Smelter & Refining Information booklet. Visit <http://www.tooelehealth.org> and follow the links.

Future Development within the Lincoln Removal Action Area

How Land Use affects Clean up Levels:

As stated earlier, it is the primary type of use of an area and the frequency with which people are exposed to its soils which determines acceptable lead and arsenic cleanup levels. The EPA, after completing a Health Risk Assessment for the IS&R site established 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 the land use changes due to proposed development and construction, it is important to evaluate the lead and arsenic levels against cleanup levels established for this proposed future use. Thus, when an agricultural or open space area is developed into a residential area, actions to reduce lead and arsenic concentrations on the property may be required.

The Remedial Objective for each development is that the average lead and arsenic concentrations in soil for any given 40,000 sf of planned / existing subdivided lot must meet the cleanup criteria (based on anticipated future use) as set forth in the table below. In addition, any zone where any single sample exceeds the Remedial Action Level must be remediated to meet the Cleanup Level, for the anticipated future use.

Table of Cleanup Levels for Pine Canyon

Land-Use	Average Concentration (mg/kg) ¹⁾	
	Lead	Arsenic
Recreational/Open Space	900	150
Undeveloped Agricultural	2,230	900
Residential / Garden Areas (min 40,000 ft ² surrounding house and garden areas)	580	100
Remedial Action Level—Residential	900	150
Remedial Action Level—Open Space / Recreational	1800	300
Remedial Action Level—Agricultural	14,850	4,545

¹⁾ parts per million (mg/kg)

Future Development within the Lincoln Removal Action Area

Residential cleanup levels apply to the average soil concentrations on the 40,000 sq ft immediately surrounding a house and any vegetable garden areas. The land use type recreational/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 Figures 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 may be more cost effective to place a layer of clean material (cap) over the impacted area to prevent human contact with the soil.
- An environmental professional should be contracted to assist in determining what the best option is for individual properties.
- Steps are listed in the next few pages.

Future Development within the Lincoln Removal Action Area

1. Prepare Concept Plan of the proposed improvement

- Required drawings / documents prepared by the applicant shall be submitted to Tooele County Planning and Zoning (TCPZ) who will distribute to 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 proposed improvements will be (residential, open space, roads, buildings, etc.).
- The TCPZ in conjunction with health department, will review the plan, confirm that it is within the Overlay Zone and 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.

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 their consultant is required.
- Purpose of the SAP is to define a plan of how an environmental assessment will evaluate current environmental condition of the property relative to established clean up levels.
- The health department will then review the plan to evaluate sampling design, sampling methods, sample handling, and data quality objectives.
- The plan should include the intended Scope of Work and details on how the work will be accomplished.
- Sampling may begin once authorization to move forward is obtained from TCHD.
- Soil analysis for lead and arsenic can be performed by X-ray fluorescence spectrometry (XRF) with a minimum 5% Quality Assurance duplicate samples analyzed by inductively coupled plasma (ICP) methods or as otherwise approved by the health department. 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. Composite samples should be collected and analyzed for depths representing 0-6", 6"-12" and 12"-18".

Future Development within the Lincoln Removal Action Area

Remedial Objectives and Acceptance Criteria:

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

- The area average lead/arsenic concentrations in soil for any given residential building pad and the adjacent 40,000 sq ft (residential portion) of a planned or of an existing subdivided lot shall not exceed the cleanup level of 580 ppm lead or 100 ppm arsenic. In addition, any structure must have a minimum 30 ft buffer that meets the residential standard. No area, as determined by sampling 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 average lead/arsenic concentrations in the open space area of each planned or existing subdivided lot shall not exceed the cleanup levels of 900 ppm lead and 150 ppm arsenic. In addition no area, as determined by sampling, shall exceed 2,239 ppm lead or 200 ppm arsenic. Evaluation of the minimum criteria shall be applied at each of the three sampling depths.
- In the event that it is not known where the structures will be built or garden areas planned, then the entire lot shall be cleaned to the residential standard.

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 health department will issue an approval letter to proceed to the applicant.
- The applicant may then proceed by working with planning and zoning commission through the standard approval process.

Future Development within the Lincoln Removal Action Area

If the field sampling indicates soil concentration levels of lead and/or arsenic are above established cleanup levels, the applicant will then prepare a Remedial Work Plan (RWP). The RWP should be prepared in accordance with the Table of Contents shown below and must be submitted to the health department for approval prior to implementation. (Possible remedial action methodologies may include those described below under “Remedial Construction”):

Remedial Work Plan (RWP) Table of Contents:

1. Purpose and Objectives of Remedial Work Plan
11. Discussion of Investigation Findings
 - a. data summary
 - b. areal extent map
111. Roles and Responsibilities
- 1V. 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
- V1. Remedial Construction Schedule
- V11. Post Construction Confirmation of Remedial Objectives

The RWP will be reviewed for completeness and to insure the proposed plan addresses the full extent of the impacted soil and adequately addresses the community health and safety issues. Final approval by the TCHD to proceed forward with the development or property improvement is based on meeting performance criteria, not specific methodologies. Although the health department may approve certain methodologies in the RWP, the applicant is fully responsible for meeting cleanup requirements.

Future Development within the Lincoln Removal Action Area

Remedial Work Plan (RWP)

4. Remedial Construction

- After review / authorization to proceed, cleanup remedial construction actions may begin.
- Described here are two possible cleanup techniques:
 - > The first technique involves complete removal of impacted soil from the property.
 - > The second technique uses a combination of methods to minimize the potential of human exposure.
- All methods require that disturbed areas including the repository be revegetated using a method and seed mix satisfactory to the TCHD.

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 the property is clean, thereby allowing unrestricted use in the future. Removing impacted soil from a property requires the most upfront costs; however, this method does not require long-term operation and maintenance or impose land use restrictions.

Soil is to be removed using environmentally safe methods that will reduce the 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 objectives have been met. Following removal, the area should be planted with native grass or other acceptable vegetative cover which prevents migration of windblown dust.

Future Development within the Lincoln Removal Action Area

Technique 2: Using the impacted Soil as Backfill

When using Technique two, some impacted soils may be used as backfill in utility trenches, or under hardscape features, including asphalt roads. It may be used within open space landscape berms or dikes. It must be covered and approved by TCHD.

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 surface in perpetuity.

A protective surface 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.

5: Submit Final Report

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

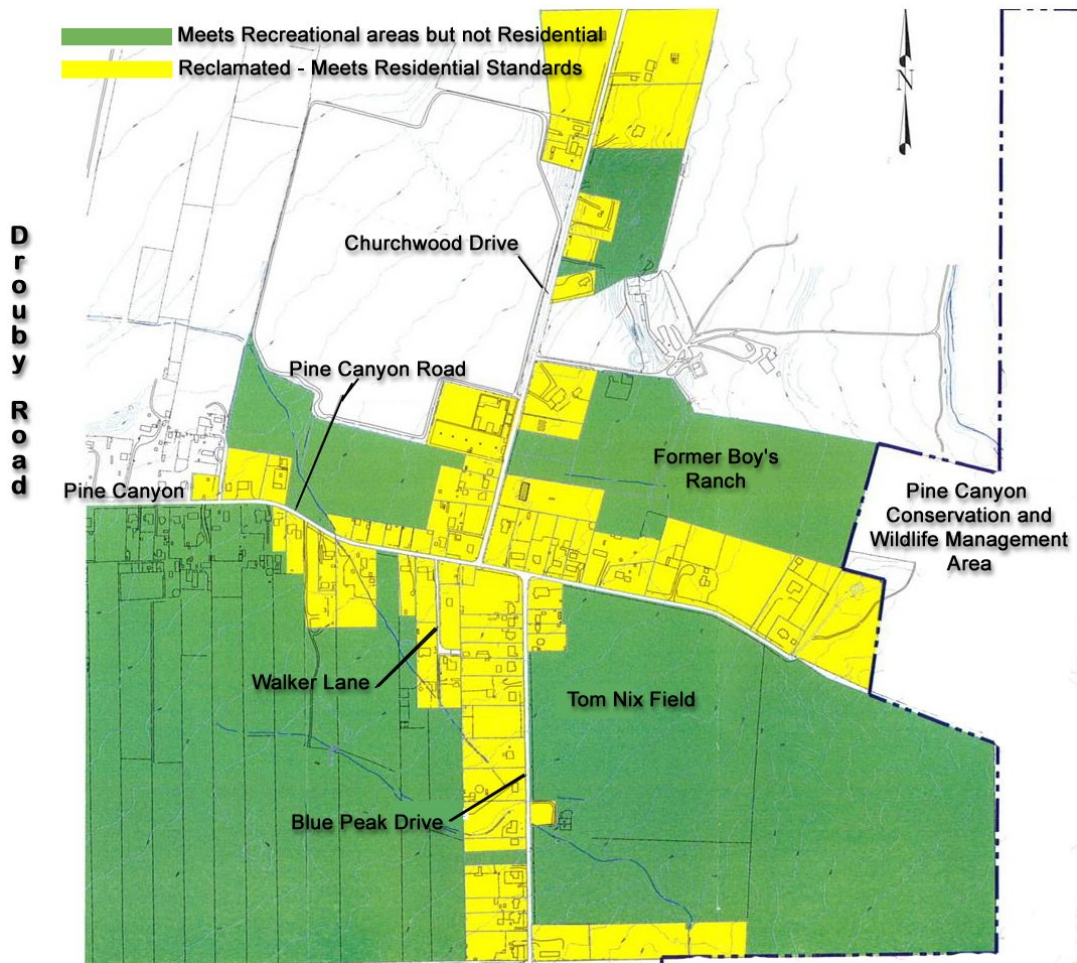
6: Proceed with Development Approval

- Once TCHD approves the final report, they will provide a letter to planning and zoning 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 planning and zoning after all other requirements are met.

Future Development within the Lincoln Removal Action Area

PINE CANYON AREA ENVIRONMENTAL OVERLAY ZONE

Figure 1



Future Development within the Lincoln Removal Action Area

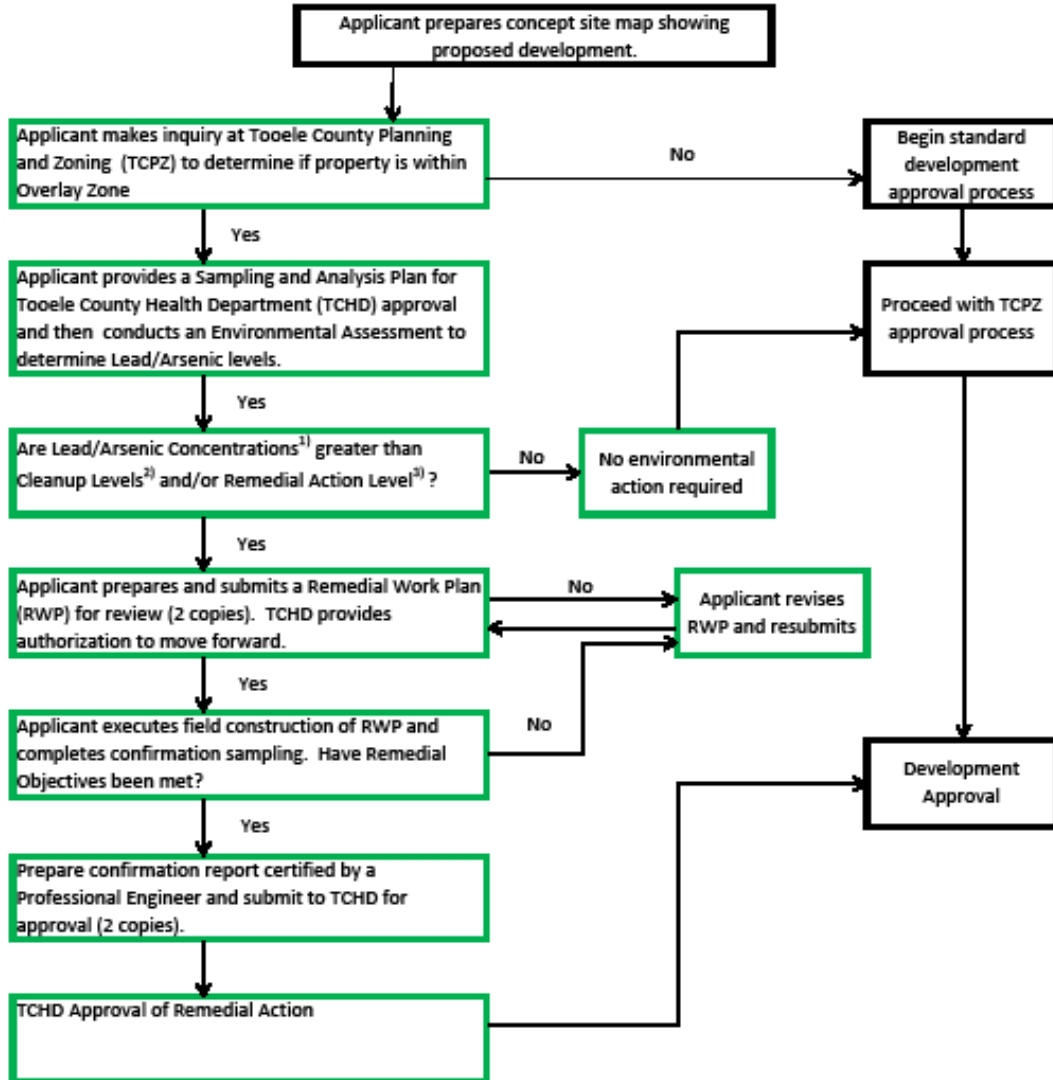
PINE CANYON UNDEVELOPED PROPERTY SAMPLING RESULTS

Figure 2



Future Development within the Lincoln Removal Action Area

Development Approval Process for Property within the Pine Canyon Environmental Overlay Zone Pine Canyon, Utah Figure 4



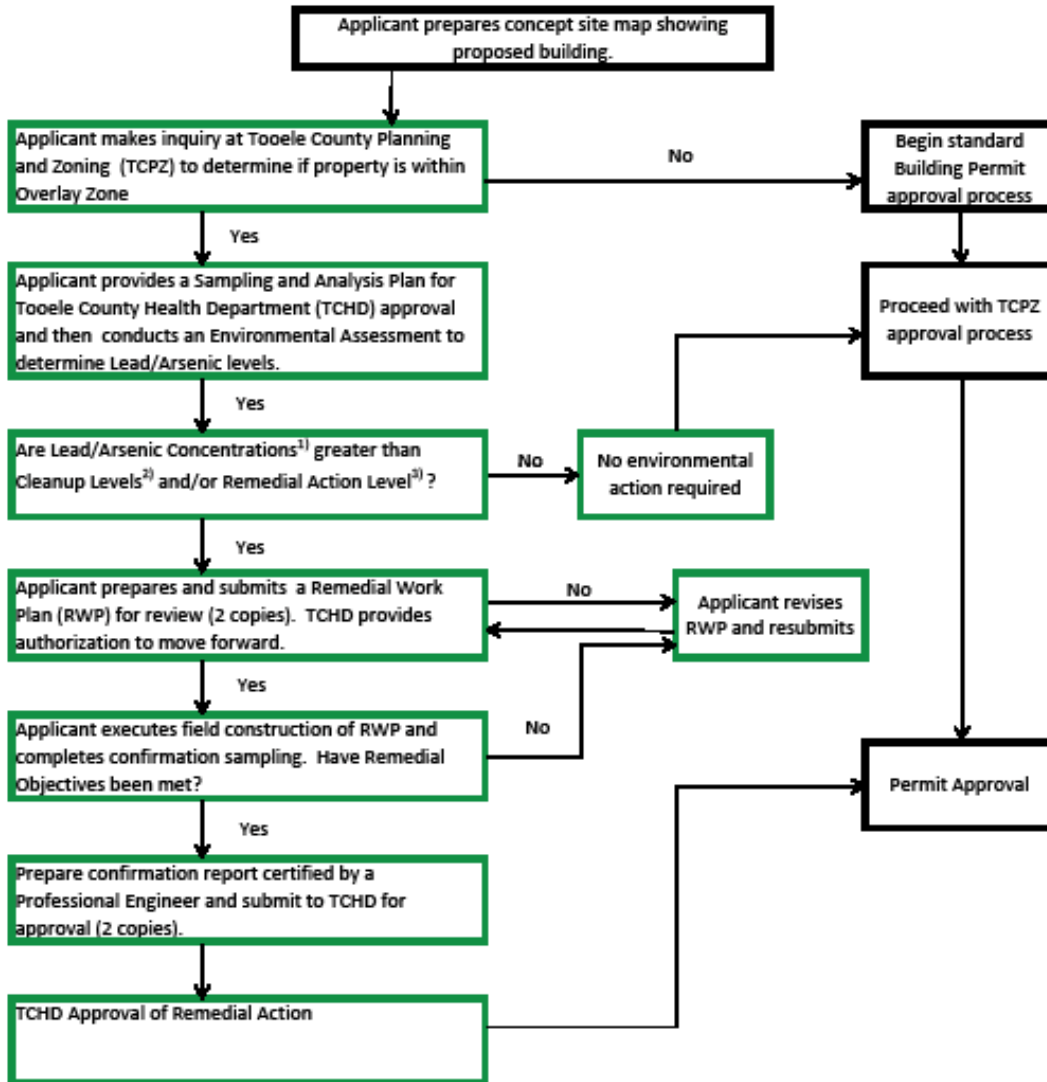
1) The average for any given 40,000 sf of planned/existing subdivided lot, as determined by composite samples, shall not exceed the Cleanup Levels.

2) Cleanup Levels:	Residential	580 Pb, 100 As
	Open Space, Agricultural	2230 Pb, 900 As

3) Remedial Action Level	Residential	870 Pb, 150 As
	Open Space, Agricultural	14,850 Pb, 4,545 As

Future Development within the Lincoln Removal Action Area

Building Permit Approval Process for Property within the Pine Canyon Environmental Overlay Zone Pine Canyon, Utah Figure 5



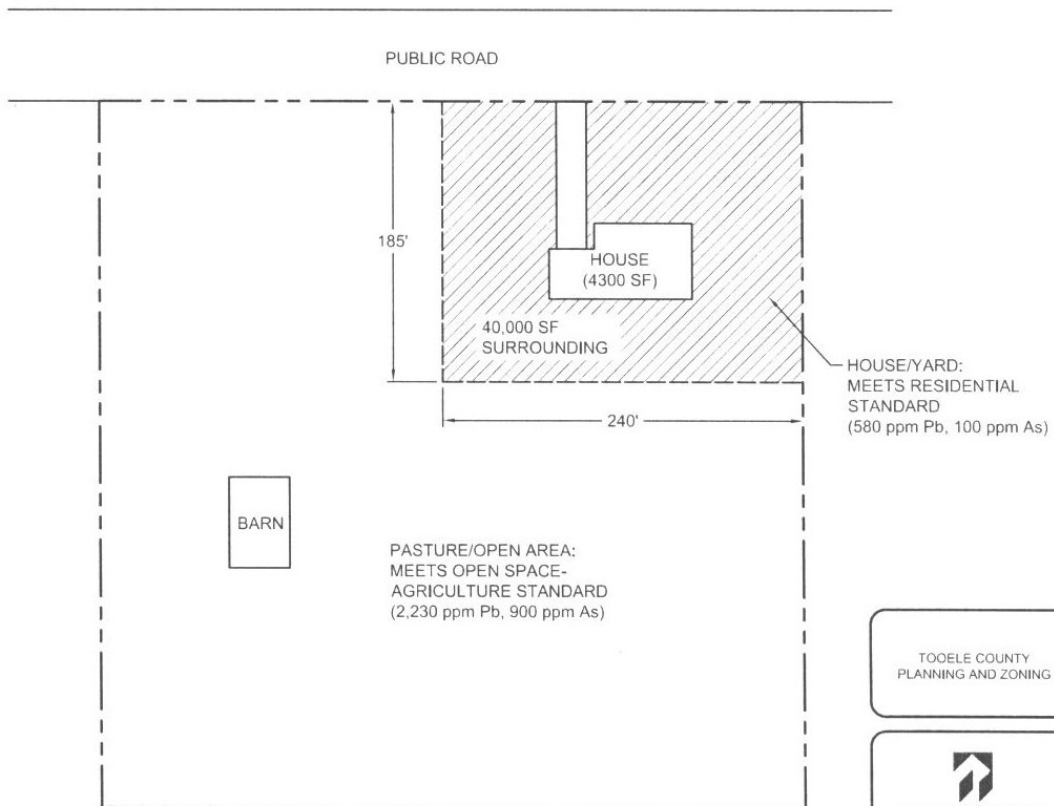
1) The average for any given 40,000 sf of planned/existing subdivided lot, as determined by composite samples, shall not exceed the Cleanup Levels.

2) Cleanup Levels:	Residential	580 Pb, 100 As
	Open Space, Agricultural	2290 Pb, 900 As

3) Remedial Action Level	Residential	870 Pb, 150 As
	Open Space, Agricultural	14,850 Pb, 4,545 As

Possible 5—Acre Lot Configuration

Figure 3



Possible Configuration
Typical 5-Acre Lot

TOOELE COUNTY
PLANNING AND ZONING



DRAWN BY: SB
ENGINEER: SDA
APPROVED: SDA
FILE: 5_ACRE_LOT.dwg

**POSSIBLE
5-ACRE LOT
CONFIGURATION**
PINE CANYON, UTAH

Sheet 97-009	Drawn 3
Date 15-APR-2009	
Scale	

Thinking About FUTURE CHANGE OR IMPROVEMENTS To Your Property?

"Development action" means any man-made change to real estate; including, but not limited to, the construction of buildings or other structures requiring a permit, land uses requiring land use authority approval, subdividing, mining, dredging, filling, grading, paving, excavation or drilling.

If your property is within the Pine Canyon Environmental Overlay Zone Map, it has the potential to have soils with elevated concentrations of lead and arsenic.

As such, a review of environmental conditions and possible remedial action is required for any development action. (See Tag - Right Corner)

For more information contact the Tooele County Health Department prior to conducting any development action.



151 North Main Street

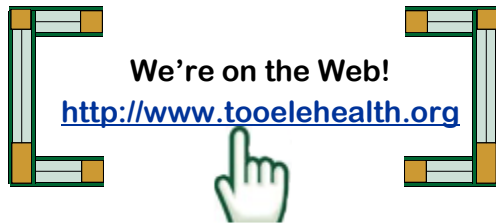
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"Protecting Your Future"



The Tooele County Health Department is located approximately 25 miles from Salt Lake City at the base of the Great Salt Lake.

Follow I—80 west and take exit 99 onto SR36. Follow this road for 12 miles into Tooele Valley.