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Iron King Mine / Humboldt Smelter Superfund Site

U.S. Environmental Protection Agency • Region 9 • San Francisco, CA • March 2017

Preparation Underway for Soils Cleanup in Certain Residential Yards

This fact sheet provides information about the United States Environmental Protection Agency's (EPA) plans to clean up soil in a limited number of residential yards in Dewey-Humboldt contaminated with material from the Iron King Mine / Humboldt Smelter (IKHS) Superfund site. This fact sheet also provides information about a study of cleanup alternatives that is now ongoing for the non-residential portions of the IKHS site. EPA will hold a public meeting about these topics on April 5, 2017, and we welcome your attendance.

What is the Iron King Mine / Humboldt Smelter Superfund Site?

Superfund is a program that provides authorities and funding for the cleanup of sites with uncontrolled hazardous substances that pose a threat to human health or to the environment. EPA placed the Iron King Mine / Humboldt Smelter site on the Superfund list (the "National Priorities List") in 2008. The Site is shown in ***Figure 1***.

Between the early 1900s and about 1970, the former Iron King Mine in Dewey-Humboldt extracted zinc, silver, lead, and gold, leaving behind a pile of about four million cubic yards of orange mine tailings with high levels of arsenic and lead. The tailings—a powdery waste that remains after the crushing and concentrating of mine ore—washed into the Chaparral Gulch and flowed downstream toward the Agua Fria River. Additionally, tailings have blown from the site to some of the open lands immediately surrounding the mine.

From the late 1800s until about 1937, the Humboldt Smelter and two earlier facilities located at the same site crushed copper and lead ores and melted them in furnaces to make pure metal. During the smelter's operation, lead and other metals rose up the smelter's smoke stacks and were carried away by the wind. Near the former furnaces on the smelter property, there remain large piles of mine waste called dross and slag, and soils contaminated with lead and other metals. Almost all of the smelter's buildings were demolished and removed long ago. In the past, tailings from the smelter and mine intermixed, and these tailings are now held back from entering the Agua Fria River by a dam in the lower Chaparral Gulch.

EPA's last two fact sheets about the IKHS site explained that EPA has completed a comprehensive Remedial Investigation report for the site. This report includes the results of extensive sampling to determine the nature and extent of contamination at all the areas affected by the site. Using information from this remedial investigation, EPA can now begin to develop cleanup options.

Inside This Fact Sheet

» A Review of Basic Information About the Iron King Mine / Humboldt Smelter Superfund Site

» Explanation of EPA Plans to clean up Residential Soil at About 30 Yards

» Progress in the Study of Cleanup Options for the Site's Mine Tailings Pile, Smelter, Contaminated Gulch, and Dam Areas

» Common Questions and Answers About the Residential Soils Cleanup

Public Meeting

April 5, 2017

6:30 – 8:30 p.m.

Humboldt Elementary School Gymnasium

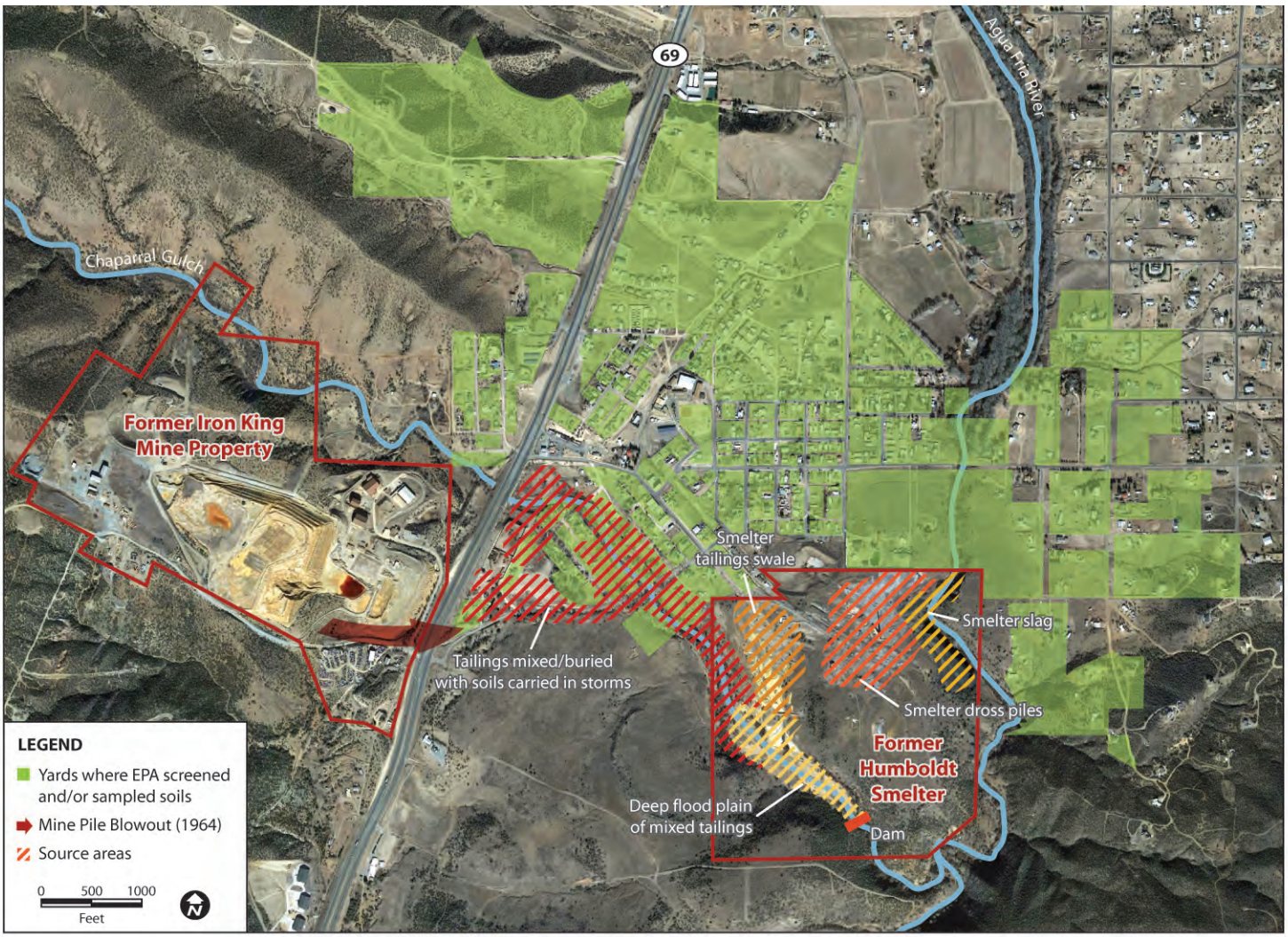

Figure 1: Map of Iron King Mine/Humboldt Smelter Superfund Site

What About Residential Yards?

Over many years, lead emissions from the smelter stack, wind-blown tailings from the mine and the smelter, mine spills from rail loading areas, and use of mine tailings resulted in lead and arsenic contamination in soils in some residential yards in Dewey-Humboldt. During EPA's 2009 and 2015 soil investigations at approximately 600 residential properties in the community, EPA found that soils in the vast majority of the yards sampled do not pose an unacceptable health risk to residents. However, EPA has identified about 30 properties where levels of lead (or arsenic) in yard soil are high enough that exposure to the soil for a long period of time could pose a threat to health. As such, EPA is planning a cleanup of soils for these yards to protect residents' health.

The results of EPA's investigation are detailed in the Remedial Investigation report and Risk Assessment report found on EPA's website (see last page) or at the Dewey-Humboldt Town Library. EPA has also issued fact sheets, sent letters to impacted homeowners, and held several public meetings explaining the residential results. EPA will reach out directly to homeowners whose properties may be impacted by the upcoming cleanup of residential yards.

How Did EPA Decide Which Yards to Clean Up?

EPA will perform cleanups at about 30 yards in Dewey-Humboldt to address long-term health risks posed by lead and/or arsenic in soils resulting from the former mine and smelter operations, and will focus on areas with the highest levels of contamination first. It is important to note that lead and arsenic occur naturally in soil throughout Dewey-Humboldt, and soils in all yards have some level of lead or arsenic independent of that caused by the site. The naturally-occurring concentration of lead or arsenic is called "background" lead and arsenic. For cleanup purposes, EPA is focused on areas where levels of these metals are higher than background levels.

EPA has selected the yards to clean up based on detailed information from our studies on the health effects of lead and arsenic, along with results from the many samples taken from each yard.

The Superfund Process

As shown in ***Figure 2***, the Superfund process includes investigating a contamination problem, evaluating and comparing cleanup options, selecting a cleanup option after public input, and designing and executing the cleanup. This is called the remedial process. In cases where a cleanup is urgent and is simpler and less costly than those cleanups generally addressed under the remedial process, EPA can use a similar but shorter cleanup process called a removal action. For the IKHS Site, EPA is using the simpler removal process for cleanup of soils in residential yards, and the remedial process for the more complicated problems posed by the non-residential areas – the mine tailings, the mine, the smelter property, and the dam in the lower Chaparral Gulch.

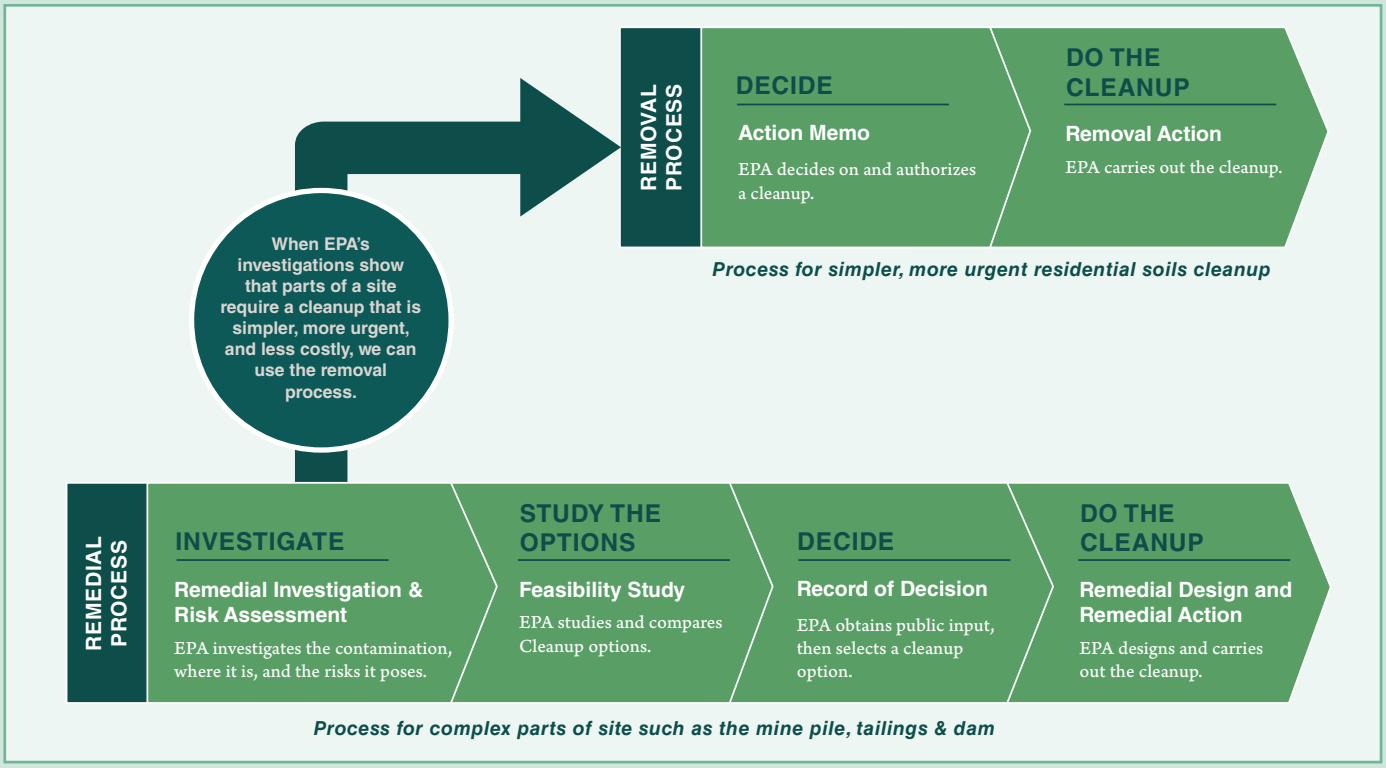

Figure 2: EPA uses the remedial and removal processes to clean up contamination at Superfund sites.

We used this information to calculate an estimate of the risk (or chance) of health effects to someone if they are exposed to soils over several decades.

EPA completed risk calculations for each yard using assumptions that are health protective. When performing our risk calculations, we took a special average of the levels of lead or arsenic found in samples of the soils that is higher than a usual average to account for the places in the yard where we may not have sampled. This is called an exposure point concentration, or EPC number, for a yard. In June 2015, EPA provided property owners with the EPC numbers for lead and arsenic in their yards, along with a scale to understand whether their yard's EPC numbers were low, marginal, or elevated.

On the following page, you'll find the criteria that EPA is using to select the yards for cleanup. EPA has two priority groups for the cleanup. Please remember that an EPC number for a yard is based on the sampling results from all the samples we took in that yard.

What Will the Cleanup Entail?

Depending on the extent of contamination in a given yard, EPA will:

1. Remove some or all surface soils in the yard to a depth of about one foot.
2. Replace the area with clean soil and restore the yard to a condition similar to what existed prior to the cleanup. (Note: clean soil will be sampled to ensure it is safe before being placed in a yard.)
3. Transport excavated soils to the top and rear of the current tailings pile on site and place them in a small area where the tailings pile requires temporary cover to prevent tailings from blowing away.

See the Question and Answers section of this fact sheet for more information about the cleanup.

Highest Priority	The EPC number we calculated for lead in the yard is above 800 milli-grams per kilogram (mg/kg) OR	The EPC is below 800 mg/kg but at least one single sample has lead at a level above 1000 mg/kg, OR	The EPC we calculated for arsenic is above about 288 mg/kg.
Moderate Priority	The EPC we calculated for lead is above 400 mg/kg but less than 800, OR	The EPC is below 400 mg/kg but at least one single sample has lead at a level above 1000 mg/kg, OR	The EPC we calculated for arsenic is above about 144 mg/kg.

We may add portions of other properties adjacent to properties meeting these above criteria based on additional sampling that will be completed while conducting the removal. Please note that these numbers are specific to the IKHS site. They take into account factors for Dewey-Humboldt that may be different in other places. As such, the cleanup values you see above may differ from those used at other Superfund sites.

Where are the Yards Subject to Cleanup?

The great majority of yards that EPA sampled (95%) do not require cleanup. The yards meeting the cleanup criteria do not fit one clear pattern and are spread out somewhat sporadically throughout the community. As an example, there are many yards that, though they are very close to the smelter, have very low levels of lead or arsenic and do not need cleanup. We believe that the yards needing cleanup fall into a patchwork pattern in part because over time some yards have been altered by activities like grading, landscaping, and building, while others have not. Additionally, in the past contamination in some areas was placed in a location that later became a residential yard. For example, there are many yards with elevated lead levels clustered along an old railway alignment parallel to Main Street that lead directly into the smelter.

Most of the yards where we are proposing cleanup lie within about one half-mile north of the former smelter. None of the yards lie east of the Agua Fria River, and a few yards lie north of the tailings pile at the mine.

What is EPA Doing About the Non-Residential Contamination at the Site?

EPA is making the cleanup of residential yards our highest priority at the site because there may be direct human exposure to soils, and because homeowners need to resolve contamination issues with their properties promptly. However, the main Iron King Mine tailings pile, the tailings in the Chaparral Gulch and great flood plain, the dam holding back tailings, and the mine tailings and other wastes at the former smelter property also pose many potential risks to the environment. Evaluating cleanup options for these areas is much more complex than for residential properties. EPA has now initiated a Feasibility Study to evaluate options for cleaning up these non-residential areas. Issues that will be evaluated in the feasibility study include, for example:

- How to remove or make the main Iron King Mine tailings pile permanently stable so that tailings in the pile do not move into the air or wash into drainages;
- How to keep people, animals, and wildlife from being exposed to tailings on the main tailings pile, in the Chaparral Gulch, and on the smelter property;
- How to keep the Aqua Fria River from becoming contaminated by mine waste;
- How to ensure that heavy rain water coming out of the mountains can flow over the dam without eroding and picking up mine tailings;
- How to ensure that the tailings behind the dam do not break loose and flow into the Lower Gulch; and
- How to make the former smelter property safe, including its large piles of dust-like dross material, slag, and contaminated soils.

The *Feasibility Study* will advance in steps during which we will develop a strategy, identify general cleanup options, develop and screen more detailed alternatives, and then compare those alternatives. EPA is currently in the strategy stage and will share the cleanup options with the community as we proceed. It will likely take about a year to complete the Feasibility Study.

Questions and Answers

» **How many yards will be cleaned up, and why?** EPA plans to clean up soils in approximately 30 yards in Dewey-Humboldt. We will generally target the yards with highest levels of contamination first, especially where such yards have residents present. EPA tested or evaluated almost 600 yards in its earlier sampling investigations and the vast majority of yards do not require cleanup. For a limited number of yards, levels of lead (or arsenic) are elevated because of the former mine or smelter, and exposure to yard soils over the long term could pose a threat to health. We are taking this cleanup action to protect the long-term health of those residents. EPA will reach out directly to homeowners whose yards will be impacted.

» **What does the cleanup action involve?** Depending on the extent of contamination in a given yard, EPA will remove some or all surface soils in the yard to a depth of about one foot. This will be followed by replacement and compaction of clean soil and the restoration of the features of the yard to a condition similar to what existed prior to cleanup.

» **If EPA recommends a cleanup of soils in my yard, do I have to allow it?** No. The cleanup is voluntary, and EPA will seek and obtain permission to access the property before doing the work. However, if property access for the cleanup is refused, elevated levels of lead and/or arsenic will remain in soils on the property.

» **Will I have to pay for EPA to conduct the cleanup?** No. As long as you did not create the contamination on the property, or make it worse, you as an owner will not have to pay for the cleanup of your yard.

» **Will EPA coordinate with me in advance about what will be done in my yard?** Yes. If EPA is proposing cleanup in your yard, we will reach out to you directly (via a phone call and in-person) to thoroughly discuss the cleanup, answer questions, devise a restoration plan for your property, and involve tenants where appropriate. Owners will not be asked to sign access agreements until this coordination has occurred.

» **Will I – or my tenant – have to move out during the cleanup of my yard?** EPA does not anticipate needing to temporarily relocate residents in order to conduct the cleanup.

» **About how long will the cleanup take in my yard?** This will vary from yard to yard, depending on how much soil must be removed and replaced and how many yards are being cleaned up nearby. Once soil removal work begins, excavation and backfilling can usually be completed in less than two weeks. Full restoration of yard features can take longer, however. This will also vary by yard.

» **About how long in total will cleanup take for all the yards?** Once planning is complete and soil removal starts, six months or more may be required to complete the cleanup at all properties. Please keep in mind EPA will be able to perform work at yards only to the extent that funding permits. Yards with the highest levels of contamination will be given priority. If field work has to stop due to lack of funding, the time to complete the cleanup action will be extended.

» **Will there be impacts, such as dust, noise and disruptions, during the cleanup action?** EPA will perform rigorous dust suppression during the cleanup. We will also do what is reasonably possible to plan for and limit the impacts of traffic, noise, and street closures. However, some impacts may occur. We will meet with the Town Council and hold public meetings to hear concerns and ideas about these factors before we start soil-moving work. Residents will be notified of any disruptions in advance via flyers, announcements in the town newsletter, and/or direct phone calls.

» **How will this cleanup affect property values?** Property values depend on a large number of market factors, including buyer perception. EPA does not control property values in any way, and does not have the authority or ability to compensate for property value. However, it is usually true that effects on property values related to soil contamination are lessened or eliminated once a cleanup has been completed. Other unrelated real estate market trends do, of course continue to have their usual effect, both now and after the cleanup.

» **Will EPA give me certification that my property is clean?** EPA will provide letters to homeowners with yard-specific information about the soils before the action, the cleanup EPA performed, and the clean soil placed at the conclusion of the cleanup. EPA cannot declare a property "clean" in every way because we did not sample for every possible contaminant in the yard. We can, however, state that we have removed health risks that may have existed due to the Superfund site. Additionally, EPA will issue a final report that will summarize the entire cleanup action in Dewey-Humboldt.

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For More Information

If you have any questions or concerns, or to be added to the site mailing list, please contact:

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For more information, please visit EPA's website for the IKHS site at: **https://go.usa.gov/xX495**