PROPOSED PLAN

RESIDENTIAL YARD SOILS
OMAHA LEAD SITE

OMAHA, NEBRASKA

Prepared by:

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INTRODUCTION

This Proposed Plan for the Omaha Lead Site (OLS) is intended to inform and solicit the views of the affected community regarding the Environmental Protection Agency's (EPA) preferred alternative to address lead contamination in residential yards. A Proposed Plan fulfills public participation requirements under Section 117(a) of the Comprehensive Environmental, Response, Compensation, and Liability Act (CERCLA), as amended, and the Section 300.430(f)(2) of the National Contingency Plan (NCP). The purpose of this Proposed Plan is to:

- Provide basic background information about the site
- Identify the Preferred Alternative for remedial action at the site and explain the reasons for the Agency's preference
- Describe the other remedial options considered
- Solicit public review of and comment on all alternatives described and
- Provide information on how the public can be involved in the remedy selection process.

This Proposed Plan highlights key information from the Remedial Investigation, Baseline Human Health Risk Assessment (HHRA), and Feasibility Study previously released for the OLS. These and other documents are available for additional information regarding the proposed remedial action in the Site Administrative Record located at the EPA Regional Office in Kansas City, Kansas, or at any of three document repositories located in the Omaha area:

Omaha Public Library
W. Dale Clark Main Library
215 South 15th Street
Omaha, Nebraska
(402) 444-4800

South Omaha Library
2202 M. Street
Omaha, Nebraska
(402) 444-4850

Washington Branch Library
2816 Ames Avenue
Omaha, Nebraska
(402) 444-4849

EPA Region 7 Records Center
901 N. 5th Street
Kansas City, Kansas

The EPA is interested in receiving public comment on all alternatives evaluated and on the rationale for the preferred alternative. New information that EPA receives during the public comment period could result in the selection of a final remedy that differs from the preferred alternative.

SITE BACKGROUND

The OLS includes contaminated surface soils present at residential properties, child care facilities, schools, and other residential-type properties in the city of Omaha, located in Douglas County, Nebraska, that have been contaminated as a result of air emissions from lead smelting/refining operations. The total area of the OLS is approximately 20 square miles and encompasses the eastern portion of the greater metropolitan area in Omaha, Nebraska. The site is centered around downtown Omaha, Nebraska, which was the former location of two lead processing facilities. ASARCO, Incorporated operated a lead refinery at 500 Douglas Street in Omaha, Nebraska, for over 100 years. In addition, the Gould, Incorporated lead battery recycling plant was located at 555 Farnam Street. Both companies released lead-containing particulates to the atmosphere from their smokestacks.

The EPA began sampling residential properties and properties that were used to provide licensed child care services in March 1999. To date, approximately 16,000 residential properties have been tested for soil-lead contamination. Only those properties located within an area near downtown Omaha have been found to have lead concentrations consistently above the soils screening level of 400 parts per million (ppm). This general area is bounded by 45th Street to the west, the edge of downtown Omaha to the east, Ames Avenue to the north, and L Street to the south. These are approximate boundaries and should not be considered absolute. Approximately 40 percent of the yards that EPA has tested actually exceed 400 ppm. Soils tested in Council Bluffs, Iowa, and Carter Lake, Iowa, generally do not exceed this concentration.

The ASARCO facility conducted lead refining operations from the early 1870s until 1997. The ASARCO facility was located on approximately 23 acres on the west bank of the Missouri River in downtown Omaha. During the operational period, lead and other heavy metals were emitted into the atmosphere through smoke stacks and other processes. The pollutants were transported downwind in various directions and deposited on the ground surface. In addition, Gould operated a secondary lead smelter and lead battery recycling plant which closed in 1982.

The Douglas County Health Department (DCHD) performed monitoring of the ambient air quality around the ASARCO facility from1984 until 1996. This air monitoring routinely measured ambient lead concentrations far above the 1.5 micrograms per cubic meter ($\mu g/m^3$) standard for lead. The highest recorded quarterly average measured in air was 6.57 $\mu g/m^3$

In 1998, the Omaha City Council solicited assistance from EPA to address problems with the high frequency of children found with elevated blood lead levels by the Douglas County Health Department (DCHD). The EPA began investigating the lead contamination in the area under the authority of the CERCLA.

The DCHD has compiled statistics on the results of blood lead screening of children seven years of age and younger for more than 25 years. Blood lead screening of children living in zip codes located east of 45th Street have always exceeded the 10 microgram per deciliter (µg/dl) health-based threshold more frequently than children living anywhere else in the county. There is a decreasing trend in the frequency of elevated screenings with time as well as with distance from the former locations of the lead processing industries. The DCHD partially attributes this to the increased number of blood lead screenings that have been performed in the county. In addition, releases of lead-contaminated particulate matter from the ASARCO refinery did not stop until 1997. Elimination of this source of exposure is likely to have had a dramatic affect on the rate of elevated blood lead levels in children.

There is an ongoing removal action at the site that involves the removal and replacement of lead-contaminated soil. The EPA remains the lead agency for the removal action. Soil is being removed and replaced at child care facilities and residences where blood lead concentrations in children are equal to or greater than 10µg/dl and where soil samples (collected outside the roof drip line to eliminate the influence of lead-based paint) contained lead concentrations equal to or greater than 400 ppm. Properties that have lead-contaminated soil at or exceeding 1,200 ppm also qualify for the removal action. Currently, removals have occurred at approximately 530 properties.

The site was added to the EPA National Priorities List (NPL) in February 2003. To date, potentially responsible parties (PRPs) have not participated in studies with EPA or implementation of response actions at the site.

SITE CHARACTERISTICS

Lead processing at the eastern edge of downtown Omaha was conducted for more than 100 years. Residential properties located along the directions of prevailing winds were tested to determine the extent of migration. Other properties were later tested to fill in gaps in order to identify a geographic pattern.

The use of kriging analysis revealed that the surface lead contamination exists above the 400 ppm screening level over a wide area of eastern Omaha. In general, concentrations of lead in soil are greatest near downtown, which was the former location of the now closed lead processing industries. Concentrations of lead decrease with increasing distance from downtown. The area is approximately 20 square miles in size and it includes some of the oldest neighborhoods in the Omaha area. This area is primarily used for residential purposes and is populated with a variety of ethnic and income groups. This is the same area where the DCHD finds children exceeding the Center for Disease Control (CDC) blood lead standard of 10 µg/dl for children under seven years of age.

SCOPE AND ROLE OF RESPONSE ACTION

This Proposed Plan describes an interim approach EPA prefers for addressing residential properties that have been contaminated with lead by industries located in downtown Omaha, Nebraska. These industries no longer exist, however, they involved processing of lead on a large scale. Releases of large amounts of lead-contaminated particulate matter to the atmosphere and subsequent contamination of surface soil of residential yard soil was an environmental consequence of these activities. Residential properties that are contaminated with lead resulting from historic industrial emissions are the only type of properties that will be addressed by this cleanup. Residential properties are defined as any area with high accessibility to sensitive populations (children under seven years of age and pregnant or nursing women), and includes properties containing single and multi-family dwellings, apartment complexes, vacant lots in residential areas, schools, child care facilities, community centers, parks, green ways, and any other areas where children may be exposed to site-related contaminated media. Residential yards contaminated solely from other sources, such as lead-based paint, cannot be addressed under CERCLA authority and will not be addressed by this cleanup action.

The lead contamination is located only at the surface of residential properties. There is considerable variability in lead concentrations found in surface soils. In fact, less than half of the residences EPA has tested have soil concentrations that exceed the 400 ppm screening level. Modification of residential yards resulting from filling, grading, or other activities can either cover or dilute surface lead contamination. In addition, flooding by the Missouri River could also have covered surface contamination with silt or eroded contaminated material down stream during historic flood events. Due to the high degree of variability in surface lead concentrations, EPA has defined the site to include only those properties that have soil lead concentrations that meet or exceed an established preliminary remediation goal of 400 ppm.

SUMMARY OF SITE RISKS

A HHRA was developed for the OLS using site-specific information. Lead was identified in the HHRA as the primary contaminant of concern. Other metals, such as arsenic, were also identified as contaminants of concern, but were eliminated due to their relatively low risk and lack of connection to the release from the industrial sources being addressed by this Superfund action.

The EPA uses the Integrated Exposure Uptake Biokinetic (IEUBK) model to evaluate the risk that lead contamination of soil poses to children under seven years of age. The IEUBK model uses either site-specific inputs (if available) or default inputs to estimate the probability that a child's blood lead level might exceed a health-based standard of 10 micrograms per deciliter (ug/dl). If only default values are used as inputs to the model, a child would have less than a 5 percent probability of having a blood lead level at or above the 10 µg/dl if the soil in that child's environment had no more than 400 ppm of lead in the soil.

The site-specific IEUBK evaluation included bioavailability measurements from a swine study that were substituted for the default value in the model. In addition, site-specific airborne lead level information was substituted for the default value in the model on the basis of actual air monitoring results collected by the DCHD. By using measured absolute bioavailability values for lead of 37 and 51 percent as measured by the swine study, EPA's IEUBK model predicts that a young child residing in the site will have more than a 5 percent chance of having a blood-lead concentration of 10 ug/dl or greater if the soil lead concentrations are above a range of 238 ppm to 329 ppm, respectively. Additional in-vitro bioavailability samples collected and analyzed from the site indicate that the site-wide average absolute bioavailability is approximately 40 percent. Using 40 percent bioavailability, the IEUBK model predicts that a child would have more than a 5 percent probability of exceeding 10 ug/dl at soil lead concentrations exceeding approximately 300 ppm.

REMEDIAL ACTION OBJECTIVES

One Remedial Action Objective has been developed for residential soils in Omaha:

Reduce the risk of exposure of young children to lead such that an individual child, or group of similarly exposed children, have no greater than a 5 percent chance of having a blood-lead concentration exceeding 10 ug/dl.

DETERMINATION OF PRELIMINARY SOIL CLEAN UP GOALS

Final cleanup levels for lead in residential soil at Superfund sites generally are based on the IEUBK model results and the nine criteria analysis in accordance with the NCP. The EPA generally selects a residential soil lead cleanup level which is within the range of 400 ppm to 1200 ppm. As described above, the IEUBK modeling results for the OLS recommends a soil

lead concentration of about 300 ppm to reach the Remedial Action Objective that a child has a less than a 5 percent probability of having a blood lead level exceeding 10 ug/dl. The IEUBK model input parameter that significantly influenced this recommended cleanup level is the relatively high bioavailability of the lead in the OLS soils. The site-specific bioavailability parameter (approximately 40 percent) is based on both in-vivo and numerous in-vitro measurements and was inserted into the model instead of the default value of 30 percent.

The EPA performed a general analysis to compare model blood-lead predictions based on site soil and dust concentrations with the corresponding existing blood-lead data in the community. There are many uncertainties associated with performing such analyses, but the results indicated that the model did not significantly over or under predict the blood-lead levels in the areas sampled.

Based on the uncertainties in some parameters used in the IEUBK modeling effort, described in the HHRA, and a general analysis performed to compare model predictions based on site soil concentrations with the existing blood-lead data in the community, the EPA is recommending a risk management cleanup level for lead in residential soils at the site of 400 ppm. This cleanup level is at the lower end of the 400 ppm to 1200 ppm range generally considered protective for residential cleanups. The cleanup of soils at or above 400 ppm combined with a variety of other risk reduction activities identified in the following sections is anticipated to reduce child blood-lead levels to meet the Remedial Action Objective and provide a protective remedy for the community. These additional activities include health education, additional blood-lead screening, in-home evaluations of potential sources of exposure for blood-lead elevations, cleaning of home interiors, and addressing loose and flaking exterior lead-based paint.

Although the IEUBK model identified a potential risk to young children at a soil lead level in the range of 300 ppm, EPA believes that the combination of site response actions recommended in the alternatives in this document will be protective of human health. However, the EPA will collect additional environmental and health data during implementation of the interim remedy, and this additional data will be used to further refine the HHRA and better assess risks for the OLS at the lower end of the typical cleanup range. Additionally, at the completion of the comprehensive remedial action for the site, the EPA will sponsor a site-wide exposure study to assess whether the Remedial Action Objective has been met. Should the study determine that a child or a group of similarly exposed children within the site boundaries still have a greater than 5 percent probability of exceeding a blood-lead level of 10 ug/dl, EPA will make a determination whether additional actions are required to meet the Remedial Action Objective.

The EPA is aware that lead in the environment at the OLS originates from many sources. In addition to the identified soil exposure pathway, other important sources of lead exposure are interior and exterior lead-based paint, lead-contaminated interior dust, and to a lesser extent, tap water. Generally, sources other than soil, exterior paint, interior dust, and tap water cannot be remediated by the EPA in the course of residential lead cleanups. CERCLA and the NCP limit

Superfund authority to address interior lead-based paint. For example, CERCLA Section 104(a)(3)(B) limits the EPA's liability to respond to releases within residential structures as follows – Section 104(a)(3):

> "Limitations on Response. The President (EPA) shall not provide for removal or remedial action under this section in response to a release or threat of release…from products which are part of the structure of, and result in exposure within, residential buildings or business or community structures…"

The above-cited section of CERCLA generally limits the EPA's authority to respond to lead-based paint inside a structure or house. However, the EPA has authority to conduct response actions addressing soils contaminated by a release of lead-contaminated paint chips from the exterior of homes to prevent recontamination of soils that have been remediated.

The Office of Solid Waste and Emergency Response (OSWER) policy recommends against using money from the Superfund Trust Fund to address interior lead-based paint exposures, and recommends that actions to address or abate interior lead-based paint risks be addressed by others such as U.S. Department of Housing and Urban Development (HUD), local governments, health authorities, PRPs, private organizations, or individual homeowners. OSWER policy also recommends against using Superfund trust money to remove interior dust solely from lead-based paint or to replace lead plumbing within residential dwellings, and recommends that the regions seek partners to address these other lead exposure risks.

The EPA acknowledges the importance of addressing these other exposures in realizing an overall solution to the lead problems at residential Superfund sites. The EPA is prepared to partner with other organizations such as Agency for Toxic Substances and Disease Registry (ATSDR), HUD, state environmental departments, state and local health departments, private organizations, PRPs, and individual residents and to participate in a comprehensive lead risk reduction strategy that addresses lead risks comprehensively. The EPA can provide assessments of these other lead hazards to homeowners as part of our investigation activities and can provide funds to support health education efforts to reduce the risk of lead exposure in general. It should be understood that OSWER policy directs that the EPA should not increase the risk-based soil cleanup levels as a result of the action taken to address these other sources of exposure.

SUMMARY OF ALTERNATIVE CLEAN UP PLANS CONSIDERED

Four alternatives were developed in the feasibility study to meet the identified Remedial Action Objective. The alternatives were developed to specifically address residential soil contamination resulting from lead processing operations and include:

- Alternative 1: No Action
- Alternative 2: Excavation with Health Education and Institutional Controls
- Alternative 3: Excavation and Phosphate Stabilization with Health Education and Institutional Controls

- Alternative 4: Interim Excavation with Treatability Study, Health Education, and Institutional Controls

Alternative 1: No Action

The EPA is required by the NCP, 40 C.F.R. § 300.430(e)(6) to evaluate the No Action Alternative. The No Action Alternative may be appropriate at some sites where a removal action has already occurred that reduce risks to human health and the environment. Although a time-critical removal action is occurring at the OLS, residual risks to human health remain, as documented in the HHRA. Under the No Action Alternative, the time-critical removals would cease. The concentrations of metals in residential yard soils would remain at levels that present an unacceptable risk to human health, particularly for young children residing at the OLS. The No Action Alternative is therefore not protective of human health and will not be considered further.

Alternative 2: Excavation with Health Education and Institutional Controls

Under this alternative, residential yard soils with at least one non-drip zone sample (avoiding the influence of exterior lead-based paint) greater than 400 ppm lead will be excavated and disposed. Excavation would continue until lead concentration at the exposed surface of the excavation is less than 400 in the initial one foot below the surface, or less than 1,200 ppm at depths greater than one foot. Yards where only the drip zone soil exceeds 400 ppm lead would not be addressed under this action. A public health education program would be implemented to deal with the residual risk associated with soil contamination below 400 ppm and other non-soil sources of lead. An extensive sampling program would be required to identify residential yards that required excavation. The EPA estimates that approximately 16,000 contain soils that exceed 400 ppm lead. Excavated soil would be disposed either in a soils repository constructed offsite, used as beneficial fill in an industrial land use project, if appropriate, or transported to a sanitary landfill and used as daily cover. Institutional Controls (ICs) would be developed for the offsite soil repository, and for non-residential lead-contaminated areas where land use could change to residential.

Alternative 3: Phosphate Stabilization and Excavation with Health Education and Institutional Controls

This alternative involves a combination of excavation and stabilization of residential yard soils and high child impact areas found to contain lead concentrations above 400 ppm. Phosphate stabilization would be conducted on soils with lead concentrations above 400 ppm, but less than the level determined by treatability studies to be effectively stabilized. Residential yards above the effective stabilization level for lead would be excavated as described in Alternative 2. Preliminary results have shown phosphate treatment to reduce the bioavailability of lead by as much as 50 percent. For alternative development and costing purposes, the OLS Feasibility Study assumed that phosphate treatment could be applied to soils contaminated at levels less than 800 ppm lead. The 800 ppm action level would be subject to change, based on the final results of a phosphate treatability study. In addition, this alternative includes all other activities described in Alternative 2, including health education, ICs, exterior lead-based paint

remediation, and interior cleaning. This alternative would require a phosphate stabilization treatability study to determine the treatment effectiveness and upper concentration levels before phosphate stabilization could be implemented. Additionally, extensive sampling to identify the residential properties exceeding action levels would be required.

Alternative 4: Interim Excavation with Treatability Study, Health Education, and Institutional Controls

Alternative 4 involves excavation and replacement of soils from residential properties exceeding 800 ppm. As part of this interim action, the EPA will continue to excavate soils exceeding 400 ppm lead at high child impact areas and homes where a child resides with an elevated blood-lead concentration. This alternative also includes the health education elements included with Alternatives 2 and 3. This alternative leaves open the decision to use phosphate treatment for lower levels of contamination until the treatability study has been completed. This interim approach would require EPA to propose a final remedy and seek public comment after completion of the treatability study. This alternative also includes the additional elements of Alternatives 2 and 3 including ICs, exterior lead-based paint remediation, and interior cleaning.

EVALUATION OF ALTERNATIVES

A comparative analysis of alternatives using the nine NCP evaluation criteria is presented in this section. The purpose of this analysis is to identify the advantages and disadvantages of each alternative relative to the other alternatives. A separate comparison of the alternatives is presented under the heading of each criterion.

Protection of Human Health and the Environment

This criterion is used to determine if each alternative is protective of human health and the environment and is assessed based on a composite of factors, especially long-term effectiveness and permanence, short-term effectiveness, and compliance with applicable or relevant and appropriate requirements (ARARs). Protection of human health and the environment is addressed to varying degrees by the three action alternatives, Alternatives 2, 3, and 4. The No Action Alternative would have no effect on the OLS. Therefore, it does not address any of the identified risks for human health.

Alternative 2 and Alternative 3 both provide protection of human health through reduced exposure to lead in contaminated soils. Alternative 3 provides protection through *in situ* treatment for soil levels between 400 ppm and 800 ppm by immobilizing lead and effectively reducing the bioavailability. However, this determination will have to be supported by laboratory bench scale data and a treatability study to determine if the treatment is effective at the site. Alternative 4 is protective for the residences where soil excavation and replacement is conducted, but must be followed by a final action to be fully protective. ICs would not be necessary except for future residential development in non-remediated areas.

Alternatives 2, 3, and 4 provide protection by removing the contaminated soils from the exposure pathway and replacement with clean soil. The excavation activities address risk of exposure through direct contact with lead-contaminated soil. Exposure to lead in house dust would be reduced through interior cleaning. Future risk from residential development in non-remediated areas is addressed through the implementation of ICs. Health education programs would provide further, ongoing risk reduction for Alternatives 2, 3, and 4.

In general, permanence of the different alternatives is similar. Alternative 2 provides permanence through complete removal and containment of contaminated soils at or above 400 ppm lead concentrations. Alternative 3 provides permanence through immobilization of phosphate-treated contaminated soils and through removal and replacement of excavated soils. Alternative 4 provides permanence for residential yards over 800 ppm lead through excavation and replacement of contaminated soils.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

This criterion is used to determine how each alternative meets applicable or relevant and appropriate federal and state requirements, as defined in CERCLA, Section 121. A detailed evaluation of ARARs is presented in the feasibility study. Alternatives 2, 3, and 4 meet the federal and Nebraska ARARs. The No Action Alternative has no ARARs with which to comply.

Long-Term Effectiveness

Long-term effectiveness looks at the results of a clean up action in terms of the risk remaining at the OLS after the goals of the clean up have been met. The primary focus of this evaluation is to determine the extent and effectiveness of the controls that may be required to manage the risk posed by treatment residuals and/or untreated wastes.

Alternative 3 effectively reduces risks through a combination of treatment and excavation, while Alternatives 2 and 4 achieves risk reduction through excavation only. The residual risk is greater with Alternative 3 because the phosphate treatment component of this remedy leaves lead contamination in some yards that have moderate levels of lead contamination. Alternatives 2 and 3 reduce risks for homes using effective engineering controls with soil concentrations of lead at or above 400 ppm. Alternative 4 only addresses residential yards with soil-lead levels over 800 ppm, and must be followed with a final action to address long-term risks. Alternatives 2 and 3 also rely on the use of ICs and public education for controlling residual risks. The No Action alternative provides no effectiveness for the protection of public health and the environment over the long term.

While all action alternatives involve the excavation and transport of contamination, Alternative 2 provides greater risks to residents and remediation workers due to the increased volume of material being transported during the remediation period only. Alternatives 2 and 3 rely on ICs to reduce risks from a soil repository and to control the risk associated with potential

future development in residential areas. Alternative 4 relies upon ICs only to control risks associated with a soil repository.

Short-Term Effectiveness

This criterion addresses the effects of the alternatives during the construction until the clean up is completed and the selected level of protection has been achieved. Alternatives 2, 3, and 4 are similarly effective in the short term for protection of the public and remedial action workers. Alternatives 2, 3, and 4 would require a similar length of time to implement at each residence. However, Alternative 2 would require more transportation of the contaminated soils, which would increase the risks to remedial action workers due to transportation incidents. Alternative 3 would present a greater risk to workers handling phosphoric acid during soil treatment activities. Alternative 4 would take the least amount of time to implement overall, but would be considered an interim action, and would require a follow-up final action to accomplish the required risk reduction. The No Action Alternative imposes no risk on remedial action workers, but the public and environment would continue to be exposed to current lead levels.

Reduction of Toxicity, Mobility or Volume

This criterion addresses the statutory preference for selecting remedial actions that employ treatment technologies that permanently and significantly reduce toxicity, mobility, or volume of the contaminants. The No Action Alternative would not reduce toxicity, mobility, or volume of site contaminants. Alternative 2 would significantly reduce mobility for residences with soils at concentrations of 400 ppm lead or above through soil excavation and replacement. Alternative 3 would reduce mobility of contaminants through treatment of soils with lead concentrations between 400 ppm and 800 ppm lead, and through the removal and replacement of soils at concentrations of 800 ppm and above. The phosphate stabilization of Alternative 3 uses treatment as a principle element of the cleanup, which is preferable under the Superfund law and the NCP. Alternative 4 would significantly reduce mobility of contaminants in soils for those lead-contaminated properties at concentrations of 800 ppm and above through the removal and replacement of soils. Mobility of excavated materials placed in a soil repository is greatly reduced due to the engineering features designed to contain the contaminated soils.

Implementability

Implementability addresses the technical and administrative feasibility of implementing a clean up and the availability of various services and materials required during its implementation. All alternatives are readily implementable. Excavation is a proven and easily implemented technology. The treatment portion of Alternative 3 requires additional studies to evaluate the effectiveness of phosphate stabilization. All three action alternatives are technically feasible from an engineering perspective.

Cost

This criterion addresses the direct and indirect capital cost of the alternatives. Operation and maintenance costs incurred over the life of the project, as well as present worth costs, are also evaluated. The present worth costs for Alternative 2 is estimated at $214 million. Alternative 3 is estimated at $122 million. Alternative 4 is estimated to cost $77 million. No costs are associated with the No Action Alternative.

Alternative 2 is more costly that the other alternatives because it applies excavation technology to all soil containing 400 ppm or more. Alternative 3 is much less costly than Alternative 2 because it utilizes a less costly treatment technology (phosphate stabilization) for soil with lower levels of contamination. The cost estimate for Alternative 4 only includes addressing those properties with lead-soil concentrations above 800 ppm and would need to be followed by a final response action.

State Acceptance

This criterion addresses the Nebraska Department of Environmental Quality's (NDEQ) preferences or concerns about the OLS remedial action alternatives. The EPA is the lead agency and has coordinated all OLS activities with NDEQ throughout this project. The NDEQ, as the EPA's support agency, generally concurs with the proposed remedy. The NDEQ will provide comments during the comment period.

Community Acceptance

The EPA, by providing this Proposed Plan and supporting documents included in the Administrative Record file, encourages public review and comment on the preferred clean up. In order to provide the community with an opportunity to submit written or oral comments, EPA has established a public comment period beginning Friday July 16, and concluding August 16, 2004. A public meeting will also be held on August 10, 2004, in Omaha, Nebraska, to present the Proposed Plan, accept written and oral comments, and to answer questions concerning the Preferred Alternative.

PREFERRED ALTERNATIVE

Alternative 4 was developed as an interim action to continue addressing the site risks while the phosphate treatability study is conducted. The EPA's preferred alternative is nearly identical to Alternative 4 with the difference that EPA's preferred alternative specifies the number of residential properties that are estimated to exceed the projected treatment range for phosphate stabilization. Data from the Remedial Investigation indicate that approximately 5,600 residential properties exceed 800 ppm which is the anticipated treatment limit for phosphate stabilization. The EPA projects that the treatability study may take as long as three years or more to complete. During this interim period the preferred alternative involves excavation and soil replacement at 5,600 high priority properties. This slight adjustment to Alternative 4 is being proposed primarily to allow for increased construction efficiencies. Nearby homes that are above or near the anticipated treatment level of 800 ppm could be excavated at the same time to

avoid duplicate mobilization/demobilization, and doubling of other fixed costs associated with moving equipment from location to location.

As in Alternative 3, the 800 ppm level was established because phosphate treatment has been shown to reduce bioavailability by as much as 50 percent. Since 400 ppm has been established as a preliminary remediation goal, 800 ppm is believed to be the upper bound that soil could be effectively stabilized using phosphate treatment and left in place. The 800 ppm interim action level is subject to change based on the final results of the phosphate treatability study and a final action level will be selected in a future Record of Decision. As part of this interim action, the EPA will continue to excavate soils exceeding 400 ppm lead at high child impact areas and homes where a child with an elevated blood-lead concentration resides.

Since human health risks are associated with soil-lead concentrations between 400 and 800 ppm, this alternative cannot be selected as the final action for the site. This interim approach serves to initiate risk reduction actions at the higher contaminated properties until the phosphate treatability study can be completed to assess the effectiveness of that technology for the lesser contaminated soils. This interim alternative would allow time to establish programs and partnerships with other agencies and organizations to assist in addressing the site risk from lead sources that EPA has limited authority to address.

Under EPA's Preferred Alternative, the IC program described under Alternatives 2 and 3 would be initiated. The preferred alternative includes elements of the health education program described above which are allowable under CERCLA. The EPA will partner with other public and private parties to evaluate and promote implementation of elements that cannot be funded under CERCLA and to address sources of lead contamination in the community that cannot be addressed using CERCLA authority. Participation in this type of comprehensive effort to address all potential sources of lead contamination is further described below. A subsequent Proposed Plan and final Record of Decision would be issued at a later date that would determine any long-term controls or restrictions that are necessary to assure that the remedy provides long-term protection.

The EPA will use the environmental and health data collected during the interim remedial action to further refine the HHRA. The data will be used to further assess actual risks at the lower end of the typical residential cleanup level (near 400 ppm). In particular, the bioavailability factor and other inputs into the IEUBK model will be reassessed to strengthen the modeling results.

Soil sampling performed to guide response decisions will be done in accordance with procedures described in the "Superfund Lead-Contaminated Residential Sites Handbook". Residential yards will be divided into a number of sections and one multi-aliquot composite sample[1] will be collected from each section. The number of sections in each yard will depend

[1]To collect a "composite" sample, a number of individual portions or "aliquots" are collected from a sampling section and combined to result in a single composite sample.

upon the size of the yard. For properties less than 5,000 square feet, separate sections will generally be designated for the front yard, back yard, and side yard (if substantial). For properties greater than 5,000 square feet, the lot will generally be divided into four sections of roughly equal surface area. Properties over one acre in size will be divided into approximate1/4 acre sections. A five-aliquot composite sample will typically be collected from each section. In addition, a four-aliquot composite sample will typically be collected from the drip zone of the house within 6 to 30 inches from the exterior walls. A separate composite sample is collected from distinct play areas and gardens, if present.

Soil samples will generally be analyzed for lead content using X-Ray Fluorescence Spectrography (XRF). Sampling results are compared to appropriate soil action levels. If one or more non-drip zone sections exceed the appropriate action level, the property becomes eligible for Superfund response. In addition to removal of contaminated soils in sections that exceed the action level, the preferred remedy includes addressing interior dust levels that exceed EPA and HUD criteria and removes and restores loose and flaking exterior lead-based paint in cases where more than ten percent of the surface area is affected.

Participation in Comprehensive Approach

The EPA recognizes that many potential sources potentially contribute to lead exposure at the OLS. In addition to soil, other potential sources include interior and exterior lead-based paint, lead-contaminated interior dust, drinking water, occupant hobbies or activities, and occupational exposure resulting in subsequent contamination of homes. The EPA will seek to partner with other public and private entities to characterize and address all identified sources of lead exposure to the OLS community.

Consistent with agency policy, the EPA will assess the contribution of all identified sources of lead to the overall lead exposure. The EPA will participate in the development of risk reduction strategies that address all sources that contribute significantly to exposure. There are limitations on the agency's statutory authority under CERCLA to abate some of these sources such as interior lead-based paint[2] and plumbing because CERCLA responses may be taken only to releases or threatened releases into the environment. In these cases where CERCLA authority is limited, EPA will identify and coordinate to the greatest extent possible with other interested parties, authorities and funding sources in the design of comprehensive, cost-effective response strategy that addresses as many sources of lead as practicable.

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[2]Generally, CERCLA response actions are undertaken to address a release or threat of a release of a hazardous substance, such as lead, into the environment. There are potential limitations to CERCLA authority. For example, CERCLA Section 104(a)(3) states that "the President (EPA) shall not provide for removal or remedial action under this section in response to a release or threat of release...from products which are part of the structure of, and result in exposure within, residential buildings...." This section generally limits EPA's authority to respond to interior lead-based paint inside a house.

Many agencies and groups currently operate lead risk reduction programs in the OLS community. These include, but are not limited to, the following:

- Agency for Toxic Substances and Disease Registry
- Charles Drew Health Center
- City of Omaha Lead Hazard Control Program
- Douglas County Health Department
- Douglas/Sarpy County Extension
- Fred Leroy Health and Wellness Center
- Hope Medial Outreach
- Lead Safe Omaha Coalition
- Metro Omaha Medical Society
- Nebraska Health and Human Services System
- Nebraska Urban Indian Health Coalition
- North and South Omaha Community Care Councils
- One World
- University of Nebraska Medical Center
- U.S. Department of Housing and Urban Development
- U.S. Environmental Protection Agency

The EPA will seek to coordinate and partner with these and other interested parties and groups having an interest in lead exposure affecting the OLS community A work group formed under the OLS Community Advisory Group has developed a preliminary work plan that would address these multiple sources of lead. The EPA will work with this group and other interested parties in the development and implementation of a comprehensive program that addresses all identified potential lead exposure sources.

Excavation

The preferred alternative involves the excavation and removal of soil, backfilling the excavation with clean soil, and restoring the grass lawn. Excavation would be performed at 5,600 properties where exposure potential is of greatest concern. Generally, the properties that will be designated for response include: 1) residences exceeding 400 ppm lead where children with elevated blood lead levels reside; 2) child care facilities exceeding 400 ppm lead; 3) high child impact areas such as a park or school exceeding 400 ppm; or 4) any residential property where at least one non-foundation sample exceeds 800 ppm lead.

Soil would be excavated using lightweight excavation equipment and hand tools in the portions of the yard where the surface soil exceeds 400 ppm lead. For child care facilities, residences that house children with EBLs, and high child impact areas, soil cleanup would be initiated if at least one non-drip zone sample exceeds 400 ppm lead. Excavation would continue until the lead concentration measured at the exposed surface of the excavation is less than 400 ppm in the initial foot, or less than 1,200 ppm at depths greater than one foot. The ATSDR has provided the EPA with a health consultation, which states that soil lead levels less than 1,200 ppm will not cause significant human health risk if covered with a minimum of 12 inches of

clean soil. The excavation will cease at less than 12 inches if soil lead concentrations below 400 ppm are encountered within the initial foot of excavation. This Proposed Plan assumes that approximately 5,600 homes have contamination over 800 ppm lead in soils and that each will require removal of approximately 60 cubic yards. Under these assumptions, a total of 336,000 cubic yards of soil would require excavation, replacement, and disposal.

Clean fill and topsoil would be used to replace the soil removed after excavation, returning the yard to its original elevation and grade. The EPA will avoid using soil from the loess hills as fill for the OLS. After the topsoil has been replaced, a grass lawn will be re-established through either hydro-seeding or sodding. The EPA anticipates that most, if not all, residential yards will be restored through placement of sod. Sodding provides a more immediate cover and requires less maintenance to establish. Hydro-seeding offers potential cost savings relative to sodding, but can present more difficulty in establishing a high quality lawn. Hydro-seeding may be considered for very large properties, or for unoccupied properties, in lieu of sodding. Hydro-seeding would only be applied, however, with the agreement of the homeowner and when circumstances assure that a quality grass cover can be effectively established from seed. Sod must be used in sloped areas of properties that would be subject to erosion before the hydro-seed could become established.

Soil capping may be considered as an acceptable alternative to, or in combination with, excavation to reduce cost in special cases such as large parks or school yards where placement of a cap would not create drainage problems. Capping in areas where surface soil-lead concentrations are greater than 400 ppm, but less than 1,200 ppm, would require a minimum of 12 inches of clean soil for the cap. Capping would not occur in areas where surface soils exceed 1,200 ppm lead.

Disposal

Three options are available to accommodate disposal of the excavated yard soils. The first option would be to simply haul the contaminated soil to an offsite sanitary landfill for use as daily cover and disposal. This option is currently being used for an ongoing time-critical removal action at the site.

The second option would be to use the soil excavated from the residential yards as beneficial fill in the construction of an industrial facility. Lead-contaminated soils at the site are considered a risk to human health only in residential settings. In certain instances, removed soils could be safely used in an industrial setting without creating a risk to human health. Constructed engineering features may also be necessary to protect human health and the environment.

Option three would consist of constructing an offsite repository on privately owned land. This alternative may be the most costly because significant design and site preparation would be required for construction of the facility. This option would also be limited by the availability of land and willingness of landowners to maintain such a facility. A constructed offsite repository could be the preferred option should land belonging to a Responsible Party for the site be identified and the repository constructed and maintained by that Responsible Party.

Exterior Lead-Based Paint

In order to prevent the re-contamination of the clean soil placed in yards after excavation, loose and flaking exterior lead based paint may be removed from homes prior to the soil excavation in the yards. Not all homes will require paint removal. Only those homes where lead-based paint is visibly flaking and deteriorating from 10 percent or more of the surface will be addressed. Paint would be removed primarily through power washing, although some minor wet scraping may occur in areas where damage from power washing would be expected. Paint removal activities will only occur at homes where soil cleanup actions are taken. Removal would follow the substantive EPA and HUD guidelines and regulations.

The removal of exterior lead-based paint will be conducted on a voluntary basis prior to soil removal and replacement. Homes where the EPA removes deteriorating lead-based paint will require repainting to avoid violation of city codes. The EPA will work with HUD, the city of Omaha, and other interested parties to try and develop a program to conduct the repainting or otherwise arrange for the restoration and/or repainting actions.

Interior Lead Dust

At homes where soil cleanup actions are conducted, interior dust will be sampled to assess indoor lead exposure. Homes that exceed the EPA and HUD standards will undergo a one-time cleaning. Interior cleaning would consist of extensive professional cleaning following the substantive EPA and HUD guidelines. The interior cleaning will be conducted on a voluntary basis for willing homeowners, after the soil cleanup is completed in the yard.

Phosphate Stabilization Treatability Study

The EPA is interested in the possible application of phosphate stabilization in yards that are contaminated at relatively low levels (less than approximately 800 ppm). The EPA's experience with phosphate treatment studies at other sites indicates that the effect of phosphate addition to soil should be assessed for a up to three years or more. Specific testing procedures and work plans to conduct the study are currently being developed by the EPA. A treatability study is proposed to determine the effectiveness of this technology to stabilize lead in soil at these levels. The EPA is currently working to locate property meeting the required criteria for conducting the treatability study. Once suitable property has been identified and access issues are resolved, the study will be initiated.

Phosphate treatment involves stabilizing metals in the soil by adding phosphate into the soil to a depth of 6 to 10 inches. It is anticipated the phosphate, in the form of phosphoric acid, would be roto-tilled into the soil, and allowed to stabilize for a few days. Then lime would be added to the yard soil to raise the pH, and the lawn would be re-established.

The treatability study would consist of an initial bench scale test to determine the effect that phosphate addition has on bioavailability of lead in site soils under laboratory conditions. If initial findings are positive, the second phase of the study would involve actual field testing and

additional bioavailability studies. Although site-specific treatability studies are necessary to determine the effect phosphate stabilization has on lowering the bioavailability of lead in onsite residential soils, studies conducted by the EPA at other residential lead sites indicate that phosphate stabilization is effective at lowering the toxicity of lead to young children. The final decision to proceed with phosphate stabilization of yards can only be made by the EPA after providing an opportunity for public comment and peer review of the treatability study.

A long-term monitoring program would be instituted to assess the effectiveness of phosphate stabilization. The program would include soil chemistry monitoring to assess the effects of natural weathering and the long-term stability of the lead-phosphate minerals formed during phosphate treatment.

The EPA has sampled only 16,000 of the approximate 40,000 residential properties in the area of interest. However, the EPA estimates that approximately 16,000 residential yards contain soils that exceed 400 ppm lead, and that approximately 5,600 of these homes have concentrations exceeding 800 ppm. Additional sampling is required to complete the characterization of residential properties at the OLS.

The 400-800 ppm range for phosphate treatment was used to estimate the number of residential properties that should be addressed by the interim remedy while the treatability study is underway. The actual treatment limit will be further assessed during the treatability studies.

Health Education

Due to the environmental problems of lead at the OLS Superfund Site, health education for the community and medical professionals in the area is needed to help reduce immediate exposures that could potentially lead to adverse health effects. An active educational program would be conducted in cooperation with the ATSDR, NHHS, DCHD, and local non-governmental organizations throughout the duration of the EPA remedial action. The following, although not an exhaustive list, indicate the types of education activities that may be conducted at the site. The education activities will be funded until the completion of the soil remediation activities.

- Physicians' education for diagnosis, treatment, and surveillance of lead exposure
- Prevention programs for Lamaze and pre-natal groups associated with local hospitals
- Extensive community-wide blood-lead monitoring
- In-home assessments for children identified with elevated blood-lead concentrations
- Distribution of prevention information and literature
- Development and implementation of prevention curriculum in schools
- Education of community groups such as Girl and Boy Scouts
- Provision of a HEPAVAC for interior cleaning
- Maintenance of a public database for homes where protective barriers are placed at depth as warning to underlying contamination

Equipment will be purchased for the enhancement of the environmental assessment capabilities and to assist in the removal of indoor contaminated dust. In order to perform adequate environmental assessments in the home, XRF equipment may be supplied if needed. Environmental specialists could use this equipment to identify possible sources of lead exposure in the home. Furthermore, HEPAVACs would be provided to allow properly-trained individuals to reduce the levels of lead dust in residences.

Additional Information

The Proposed Plan and the Administrative Record are available for review during normal business hours at the EPA Region 7 Docket Room and at the W. Dale Clark, Washington and South Omaha Libraries. The Administrative Record contains all documents and records on which the decisions about clean up at the OLS was based.

The public can submit written comments (post-marked no later than August 16, 2004) through the 30-day comment period to:

Ms. Debbie Kring
U. S. Environmental Protection Agency
Office of Public Affairs
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Kansas City, Kansas 66101

If you have any questions or need additional information about the OLS, please contact:

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