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PARSONS ENGINEERING SCIENCE, INC.

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May 8, 1997

Commander
U.S. Army Corps of Engineers
Engineering and Support Center, Huntsville
ATTN: Ms. Richards CEHNC-PM
4820 University Square
Huntsville, AL 35816-1822

SUBJECT: Seneca Army Depot Activity, Open Burning (OB) Grounds Final Feasibility Study (FS) Report

Dear Ms. Richards:

Parsons Engineering Science (Parsons ES) is pleased to submit the response to EPA comments for the Final Feasibility Study (FS) report for the OB Grounds at the Seneca Army Depot Activity located in Romulus, New York. This work was performed in accordance with the Scope of Work (SOW) for Delivery Order 9 to the Parsons ES Contract DACA87-92-D-0022.

To update the Final OB Grounds FS please replace the existing pages in the FS with the pages found in Inserts 1 through 10 (attached). The response to the comment (Insert 10) should be incorporated into the Appendix to update the OB Grounds FS report.

Parsons ES appreciates the opportunity to provide you with this study. Should you have any questions, please do not hesitate to call me at (617) 859-2492 to discuss them.

Sincerely,

PARSONS ENGINEERING SCIENCE, INC.

Elgin Schacht for

Michael Duchesneau, P.E.
Project Manager

MD/cmf/

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cc: Mr. Kamal Gupta, NYSDEC
Ms. Carla Struble, USEPA
Mr. Randall Battaglia, CENAN
Mr. Stephen Absolom, SEDA
Mr. Keith Hoddinott, USACHPPM (Prov.)
Mr. Harry Kleiser, USAEC
Mr. Don Williams, CEMRD

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Off-site sediments samples were collected from areas in Reeder Creek where sediments accumulate. Unlike the on-site sediment samples, the ecological sediment samples collected from the off-site stations in Reeder Creek were abundant with aquatic macroinvertebrates. The fifth sheet of Table 2-1 presents an evaluation of the data collected from these off-site areas of sediment accumulation. The potential constituents of concern analytes for each chemical class are presented in addition to the NYSDEC sediment criteria, the number of samples used to calculate the 95th UCL of the mean and the maximum value detected for a particular analyte. Since this media is sediment, the NY Sediment Criteria values were considered a TBC. The analytes that exceed this TBC are the metals arsenic, copper, lead, manganese, mercury, nickel and zinc. The most significant exceedances are for copper, lead, mercury and zinc. Since there are exceedances for the TBC, this media has also been retained as a media of interest.

2.2.2.3 **Groundwater**

On-site groundwater was not determined to be a media of interest based upon the two rounds of groundwater sampling performed. Both unfiltered and filtered groundwater samples were collected as part of the first round of groundwater sampling. No filtered groundwater samples exceeded the federal action criteria or the NYSDEC GA standard. Several of the unfiltered samples did exceed these criteria due to the presence of turbidity in the samples. A sampling protocol was established prior to the performance of the second round of groundwater sampling that involved low flow sampling. This procedure was developed with the cooperation of representatives of NYSDEC and EPA with the goal of collecting a turbid-free groundwater sample that has an Nephelometric Turbidity Units (NTU) of less than 50. In accordance with these sampling procedures, only unfiltered samples were collected for the second round using low flow sampling procedures. The results of the second round indicated that for lead, only 2 exceedances were detected out of the 33 wells sampled. These exceedances were slight and detected at wells MW-14, that had a lead concentration of 85.5 ug/L, and MW-19, that had a lead concentration of 35.7 ug/L. The exceedences were based on a promulgated NYSDEC GA criteria of 25 ug/L for lead although USEPA recognizes the federal action level of 15 ug/L as the ARAR for lead in groundwater. Due to the high clay content of the on-site soils, even with the low flow sampling techniques, both of these two wells produced samples that had NTU values that were higher than the 50 target value. MW-14 yielded a turbidity of 155 NTU and MW-19 yielded a turbidity of >200 NTU and the exceedances could be an artifact of the elevated turbidity.

Further, since the two exceedances of lead in groundwater are approximately 875 feet apart from each other there is no indication of a contiguous groundwater plume. The data would

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comply with the administrative conditions of the requirement.

As mentioned earlier in this section, three categories of ARARs were analyzed. The are as follows: chemical-specific, location-specific, and action-specific. Chemical-specific ARARs address certain contaminants or a class of contaminants and relate to the level of contamination allowed for a specific pollutant in various environmental media (water, soil, air). Location-specific ARARs are based on the specific setting and nature of the site. Action-specific ARARs relate to specific actions proposed for implementation at a site. Both location-specific and action-specific ARARs are independent of the media. In addition to ARARs, advisories, criteria or guidance may be evaluated as "To Be Considered" (TBC) regulatory items. CERCLA indicates that the TBC category could include advisories, criteria or guidance that were developed by EPA, other federal agencies or states that may be useful in developing CERCLA remedies. These advisories, criteria or guidance are not promulgated and, therefore, are not legally enforceable standards such as ARARs. With regard to lead in groundwater this FS uses the promulgated NYSDEC GA criteria of 25 ug/L for lead, although the USEPA recognizes the federal action level of 15 ug/L for lead in groundwater.

Appendix A lists ARARs, TBCs and Standards, Criteria and Guidelines (SCGs) that apply to the OB Grounds during and after remedial action.

An additional CERCLA remedial action objective is that the OB Grounds must comply with ARARs. If a remedial action to be performed is action-based ARARs must be met including remediation worker health protection.

2.2.5 Summary of Remedial Action Objectives and Site Specific Clean-up Goals

Site-specific clean-up goals have been established between NYSDEC, the USEPA (Region II) and the Army for the OB Grounds. For on-site surface and subsurface soils, the goal is to remediate soil with concentrations of lead greater than 500 mg/kg. This concentration is based on the output of the UBK model indicating that 500 mg/kg would be protective of human, residential exposure.

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Table 2-2

SENECA ARMY DEPOT ACTIVITY
OPEN BURNING GROUNDS
FEASIBILITY STUDY

SUMMARY OF REMEDIAL ACTION OBJECTIVES

Environmental Media	Remedial Action Objectives	Clean-up Goals	Basis
On-site Soil & Sediment	1) Prevent leaching to groundwater causing lead in groundwater to exceed 25 ug/L*,	500 mg/kg lead	Protection of groundwater
	2) Prevent ingestion/direct contact with soil having lead in excess of 500 mg/kg,		Allow residential or industrial land use
	3) Prevent soil loading to Reeder Creek,		Protect ecological receptors in Reeder Creek
	4) Meet RCRA requirements for closure.		Compliance with ARARs
Reeder Creek Sediment	Prevent bioaccumulation of copper and lead	16 mg/kg for copper and 31 mg/kg for lead	Protect ecological receptors in Reeder Creek

Note: *This FS uses the promulgated NYSDEC GA criteria of 25 ug/L for lead in groundwater, although the USEPA recognizes the federal action level of 15 ug/L of lead in groundwater.

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- As an initial step in the remediation process, remove all UXOs from the areas of the site whcih will undergo remediation;

- Cover the areas of the OB Grounds with soils containing lead concentrations above 60 ppm with at least 9 inches of clean fill. The cover would prevent direct contact and incidental soil ingestion by terrestrial life.

- Develop vegetative stabilization of the remaining soil at the OB Grounds to minimize erosion and possible recontamination of Reeder Creek; and

- Conduct periodic monitoring of the sediments in Reeder Creek to ensure that it is not being recontaminated by the lead left in the soils at the site.

2.3 GENERAL RESPONSE ACTIONS

This section presents the general response actions that have been considered applicable at the OB Grounds. This initial effort involves screening the universe of general response actions for application at this facility. The screening process involves relating media specific remedial action objectives to various general response actions. Ultimately, these action will be used to identify specific remedial technologies. The process of selecting general response actions has involved a qualitative engineering evaluation of response actions that have been developed for application to Superfund sites. This evaluation is based upon engineering experience, EPA Superfund Innovative Technology Evaluation (SITE) demonstration evaluation reports, vendor information, EPA technology databases and Department of Defense (DoD) technology evaluation reports.

Based upon the characteristics of the waste and the site conditions, determined during the RI, the appropriateness of an action was based upon effectiveness, implementabilty and cost. General response actions that have the potential to meet the previously described remedial action objectives were considered along with remedial technologies and process options that are associated with these general actions.

Appropriate response actions are those actions that involve control of inorganics in soil and sediment and removal of UXOs from the site. Controlling these materials will assure that exposure to humans and ecological receptors are prevented and will accomplish the remedial action goals for soil and sediments. The initial response action for each alternative, except the no-action, will be the removal of UXOs from the areas of the site to be remediated. Since groundwater, surface water and air are not a media of concern, other than preventing further degradation to the quality of these various media, general response actions for these media have not been considered. Unlike actions for organics compounds, response actions for

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removed below grade will be backfilled with clean soil. A cover of native vegetation will be established as an additional erosion control measure, but once the cover is established, maintenance activities will no longer be required.

Also, a 9-inch cover of clean fill will be placed above soils with lead concentrations above 60 ppm, which will prevent direct contact and incidental ingestion by terrestrial life.

The permanence of the alternative must also be assessed. Once the treated and remaining excavated soils are removed from the site, the remedial action would be considered permanent. There will no longer be soil on the site that poses an unacceptable threat to human health and the environment. There is some question about the permanence of the solidification/stabilization treatment technology. In general, the solidified soil, as with all concrete, is subject to weathering from freeze-thaw and wet-dry cycles. If the material is safely placed in a secure landfill, the material will be protected from weathering, and there would be no degradation of the concrete, which indicates that the treatment will be permanent.

Permanence is further enhanced by the use of stabilizing agents, such as lime. The lime reacts with the heavy metals to form insoluble carbonates and hydroxides. These products are far less soluble than the free metals, and are very resistant to weathering.

5.4.2.3 <u>Conclusion</u>

Alternative 4 would protect human health and the environment. This alternative protects against ingestion of and direct contact with surface soils having concentrations of lead above 500 mg/kg and prevents potential leaching of lead into the groundwater by removing subsurface soils with concentrations of lead above 500 mg/kg. These soils also include the Case 1 soils, which have concentrations of constituents exceeding TCLP criteria. Excluding the hazard contributed by lead which was evaluated separately, the results of the human heath baseline risk assessment determined that the total site non-carcinogenic and carcinogenic risks are within the acceptable range of EPA target values for the future on-site residential exposure scenario. That is, aside from the hazards posed by lead, the conditions at the site would not require a remedial action. However, removal of Case 1 through Case 5 soils would further reduce both risks because the RI analytical data indicate that the soils in these locations also contain high concentrations of other metals and semivolatile organic compounds. The HI would be reduced from 0.33 to 0.11 and the total site carcinogenic risk would be reduced from 1×10^{-5} to 9×10^{-6}.

This alternative also meets the soil clean-up criteria established for lead in on-site soils and the sediment clean-up criteria for copper and lead in Reeder Creek. The entire 17,900 cy

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In addition, since the hazardous material is primarily in the soil, there is little or no risk of a spill or release during the remedial action.

The last item to be considered is the time until treatment is accomplished. Initially, there will be a substantial period of time required to obtain the necessary permits and approvals for construction of the landfill. The actual remedial action (excavation and stabilization) should be completed in a brief period of time. The initial treatability testing and vendor selection should take two to three months. Once the treatability testing is completed and a vendor is selected, the mobilization time should be less than one month, since no specialized equipment is required. All of the equipment used is standard construction equipment. Little permitting will be required, and operations should begin quickly. The remedial action would take one to three months, depending primarily on the time needed for the solidified soil to cure.

There will also be time required to properly close the landfill, probably two to three months. By this time, the waste will have been treated and will no longer be hazardous, so the threats to human health and the environment will be negligible.

5.5.2.2 Long-term Protectiveness

The assessment of the long-term protectiveness of Alternative 5 can be divided into two major categories, an assessment of the magnitude of the residual risk, and an evaluation of the adequacy and reliability of the controls used for the waste residuals and untreated soil.

The magnitude of the residual risk is easy to quantify. The removal plan for the soils will be designed such that the remaining soils demonstrate a lead concentration less than 500 mg/kg. There will be no treatment residuals left at the site, so the treatment residuals will not be included in the risk evaluation.

The controls to be used for long-term management are more involved. The material disposed in the landfill will not be hazardous, and there will be no long term threat to human health and the environment. However, there will be a landfill on site which will require maintenance.

Also, a 9-inch cover of clean fill will be placed above soils with lead concentrations above 60 ppm, which will prevent direct contact and incidental ingestion by terrestrial life.

The permanence of the alternative must also be assessed. Once the soil is encased in the Subtitle D landfill, the remedial action would be considered permanent. There will no longer be soil on the site that poses an unacceptable threat to human health and the environment. There is some question about the permanence of the solidification/stabilization treatment

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will have been tested to ensure that there are no unacceptable levels of lead remaining. Initially, some maintenance will be required to reestablish a vegetative cover at the site. Once the cover is established, there will be no need for long-term maintenance.

Also, a 9-inch cover of clean fill will be placed above soils with lead concentrations above 60 ppm, which will prevent direct contact and incidental ingestion by terrestrial life.

The permanence of the alternative must also be assessed. Once the soil fines are removed from the site, the remedial action would be considered permanent. There will no longer be soil on the site that poses an unacceptable threat to human health and the environment.

5.6.2.3 Conclusion

This alternative would protect human health and the environment. This alternative protects against ingestion of and direct contact with surface soils having concentrations of lead above 500 mg/kg and prevents potential leaching of lead into the groundwater by removing subsurface soils with concentrations of lead above 500 mg/kg. These soils also include the Case 1 soils, which have concentrations of constituents exceeding TCLP criteria. Excluding the hazard contributed by lead which was evaluated separately, the results of the human heath baseline risk assessment determined that the total site non-carcinogenic and carcinogenic risks are within the acceptable range of EPA target values for the future on-site residential exposure scenario. That is, aside from the hazards posed by lead, the conditions at the site would not require a remedial action. However, removal of Case 1 through 5 soils would further reduce both risks because the RI analytical data indicate that the soils in these locations also contain high concentrations of other metals and semivolatile organic compounds. The HI would be reduced from 0.33 to 0.11 and the total site carcinogenic risk would be reduced from 1×10^{-5} to 9×10^{-6}.

This alternative meets the soil clean-up criteria established for lead in on-site soils and the sediment clean-up criteria for copper and lead in Reeder Creek. The entire 17,900 cy of soil and sediment would be excavated and portions would either be treated off-site at a TSDF (i.e., the fine fraction from the soil washing process) or backfilled to the site as clean fill. As shown in Table 2-4, removal of Case 1 through Case 5 soils will result in a maximum concentration of lead of 463 mg/kg. For off-site sediment, removal of Reeder Creek sediments reduces the maximum concentration of copper and lead to 9.5 mg/kg and 10.5 mg/kg, respectively for the reach influenced by the OB Grounds.

This alternative also provides long-term protection of the environment. The sediments in Reeder Creek with concentrations of lead and copper above the established criteria will be removed. As a result, the aquatic community in Reeder Creek would be protected.

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The remedial action goal for sediments in Reeder Creek was established as the concentrations of copper and lead presented in the NYSDEC "Technical Guidance for Screening of Contaminated Sediments". This guidance sets the clean-up goal for lead at 31 mg/kg and for copper the goal was established as 16 mg/kg. These values were established as maximum values that would be protective of the aquatic community in Reeder Creek. Additionally, to prevent further run-off from the OB Grounds into Reeder Creek, a drainage swale was also established as a requirement of the proposed remedial action.

Soil and sediment remedial action objectives for the OB Grounds are summarized in Table 2-2.

Human Health Risk Concerns

In their letter of November 7, 1995, NYSDEC confirmed that the proposed cleanup levels for soils at the OB Grounds would "satisfy human health concerns and allow unrestricted future use of the site from the viewpoint of remaining lead concentrations".

In their letter of December 29, 1995, the EPA, Region II, confirmed that the cleanup levels would be acceptable for surface soils, subsurface soils, and sediments on the OB Grounds. According to their letter, "the 500 mg/kg lead soil cleanup level would satisfy human health risk concerns for lead in soils only". Regarding the groundwater, EPA will require appropriate post remediation groundwater monitoring to assure that the quality of the groundwater remains protective of human health.

Both letters are included in Appendix F of this report.

Ecological Risk Concerns

The EPA confirmed that the 500 mg/kg soil cleanup level would be acceptable for the protection of ecological receptors if future land use at the site were limited to industrial, commercial, or residential use. The EPA also agreed that the clean-up goal for sediment in Reeder Creek would be protective of ecological receptors within the creek. However, the potential for soil with 500 mg/kg lead to enter Reeder Creek through surface water runoff must be prevented.

Table 5-1
SENECA ARMY DEPOT ACTIVITY
OPEN BURNING GROUNDS
FEASIBILITY STUDY

ASSEMBLED REMEDIAL ALTERNATIVES

ALTERNATIVE	TECHNOLOGIES AND PROCESSES
1	No Action
4	Excavation/Solidification/Stabilization of soils failing TCLP/Off-site landfill - Excavation and treatment of soils above TCLP criteria - Excavation of sediments in Reeder Creek which exceed NYSDEC sediment criteria for lead and copper; - Excavation of remaining soils with lead concentrations above 500 mg/kg; - Place all excavated soils in off-site Subtitle D landfill - Long-term groundwater monitoring - Runoff prevention - Site Covering and Revegetation - Sediment sampling in Reeder Creek
5	Excavation/Solidification/stabilization of soils failing TCLP/On-site landfill - Excavation and treatment of soils exceeding TCLP criteria; - Excavation of sediments in Reeder Creek which exceed NYSDEC sediment criteria for lead and copper; place in on-site Subtitle D landfill - Excavation of remaining soils with lead concentrations above 500 mg/kg; - Place all excavated and treated soils in on-site Subtitle D landfill - Long-term groundwater monitoring - Runoff prevention - Site Covering and Revegetation - Sediment sampling in Reeder Creek
6	Excavation/Soil Washing - Excavation of all soils with lead concentrations above 500 mg/kg including soils above TCLP criteria - Excavation of sediments in Reeder Creek which exceed NYSDEC sediment criteria for lead and copper - Soil washing with coarse soil fraction backfilled and fine fraction to off-site treatment and landfill - Long-term groundwater monitoring - Runoff prevention - Site Covering and Revegetation - Sediment sampling in Reeder Creek

- A soil cover consisting of 9 inches of clean fill will be placed over areas of the OB Grounds with soils containing lead concentrations above 60 ppm. The area to be covered is estimated to encompass most of the OB Grounds. Slope stabilization will also be provided near Reeder Creek as necessary to present surface water runoff from migrating to the creek.

- A cover of native vegetation will be established as an erosion control measure. Once the cover is established, there will be no continued maintenance requirements. This will help to control dust and minimize infiltration of contaminants to groundwater.

- A riprapped drainage swale will be constructed to intercept any surface water runoff from the site thereby preventing recontamination of Reeder Creek with sediments from the OB grounds.

- Sediment sampling in Reeder Creek will be conducted on an annual basis at four location within the reach affected by the OB grounds. The purpose of the sampling is to ensure that Reeder Creek is not being recontaminated by lead left in the soil at the site.

- The following is a generic description of one type of UXO clearance which may potentially be used by the Army to clear areas of the OB Grounds undergoing remediation. The process is a sifting operation which would be conducted prior to any treatment process and would involve the following steps:

    1. Soils are excavated.
    2. Soils are brought to the sifter area.
    3. Soils are loaded into a sifter. Those items which do not fit through the sifter screen will fall into a conveyor and be sorted by UXO personnel.
    4. Potential live items and inert scrap are segrated and dealt with as required.
    5. The sifted soil is stockpiled and/or taken for treatment in the standard haztox sense.

The "Proposed Ordnance and Explosive Clearance Procedures" are included in Appendix G.

of soil and sediment would be removed, treated (Case 1 soils), and disposed of in a Subtitle D landfill (Cases 1 through 5 soils). As shown in Table 2-4, removal of Case 1 through Case 5 soils will result in a maximum concentration of level of 463 mg/kg. For off-site sediments, removal of Reeder Creek sediments reduces the maximum concentration of copper and lead to 9.5 mg/kg and 10.5 mg/kg, respectively, for the reach influenced by the OB grounds.

This alternative also provides long-term protection of the environment. The sediments in Reeder Creek with concentrations of lead and copper above the established criteria will be removed. As a result, the aquatic community in Reeder Creek would be protected. Furthermore, covering and revegetation of the site and construction of a drainage swale to intercept surface water runoff will prevent recontamination of Reeder Creek by runoff from the OB grounds as well as protect terrestrial wildlife.

5.4.3 Reduction in Toxicity, Mobility, and Volume

Overall, Alternative 4 would be effective in reducing the toxicity and mobility of the hazardous constituents present in the soil at the site. Assessing the volume reduction is somewhat more difficult. The treated soil will have a larger volume than the untreated soil, but the treated soil will no longer be a hazardous waste. In general, a volume increase of 50% for the treated soil can be expected. Furthermore, excavation of the remaining soils and sediments would increase the volume by approximately 20% from 14,200 cy to 17,000 cy.

The decrease in toxicity and mobility can be assessed on both a small scale and site-wide basis. On the small scale, both the toxicity and mobility of the hazardous constituents in the soil are assessed with the TCLP test. The larger the leaching fraction, the greater the mobility and the greater the toxicity. Since the primary treatment criteria for solidification/stabilization is that the waste no longer be TC hazardous, the treated waste will exhibit lower toxicity and mobility than the untreated waste. The mass of the potentially hazardous constituents in the soil will remain unchanged.

There are also major decreases on a site-wide basis. By treating the soil which contains the highest concentrations of hazardous constituents, the overall site risk (toxicity) will be reduced to acceptable levels. By solidifying the soil, and then transferring all the soils and sediments to a landfill, the mobility of the hazardous constituents will be effectively reduced. A properly managed Subtitle D landfill does not allow for uncontrolled releases from the landfill. The treated soil will be the only treatment residual.

Furthermore, covering and revegetation of the site and construction of a drainage swale to intercept surface water runoff will prevent recontamination of Reeder Creek by runoff from the OB grounds and protect terrestrial wildlife.

5.5.3 Reduction of Toxicity, Mobility, and Volume

Overall, Alternative 5 would be effective in reducing the toxicity and mobility of the hazardous constituents present in the soil at the site. The treated soil will have a larger volume but will no longer be considered a hazardous waste or capable of leaching metals. In general, a volume increase of 50% for the treated soil can be expected. In addition, excavation of the remaining soils would increase the volume by approximately 20%.

The decrease in toxicity and mobility can be assessed on both a small scale and site-wide basis. On the small scale, both the toxicity and mobility of the hazardous constituents in the soil are assessed with the TCLP test. The larger the leaching fraction, the greater the mobility and the greater the toxicity. Since the primary treatment criteria for solidification/stabilization is that the waste no longer be TC hazardous, the treated waste will exhibit lower toxicity and mobility than the untreated waste. The mass of the potentially hazardous constituents in the soil will remain unchanged.

There are also major decreases on a site-wide basis. By treating the soil at the site which contains the highest concentrations of hazardous constituents, the overall site risk (toxicity) will be reduced. By transferring the treated soil and remaining excavated soils and sediments to a properly constructed Subtitle D landfill, the mobility of the hazardous constituents will be effectively reduced.

5.5.4 Compliance with ARARs

Alternative 5 will comply with all ARARs and TBCs. A list of the ARARs for this alternative is in Appendix C.

5.5.5 Implementability

A discussion of implementability can be divided into three sections, technical feasibility, administrative feasibility, and availability of services and materials. Technical feasibility describes items such as construction and operation, technology reliability, and monitoring considerations. Administrative feasibility addresses issues such as permitting, interaction with

Furthermore, covering and revegetation of the site and construction of drainage swale to intercept surface water runoff will prevent recontamination of Reeder Creek by runoff from the OB grounds, and protect terrestrial wildlife.

5.6.3 Reduction in Toxicity, Mobility, and Volume

Alternative 6 would be very effective in reducing the toxicity, mobility, and volume of the hazardous constituents present at the site. The primary goal of soil washing is volume reduction, and the process is expected to reduce the volume of contaminated soil to approximately 30 percent of the original volume. The toxicity and mobility reductions are accomplished in the solidification process. The potentially hazardous constituents are stabilized in the process, which reduces the toxicity. The solidification and subsequent landfilling of the soil fines reduces the mobility. The final mobility of the hazardous constituents is negligible.

5.6.4 Compliance with ARARs

Alternative 6 will comply with all ARARs and TBCs. A list of the ARARs for this site is in Appendix C.

5.6.5 Implementability

A discussion of implementability can be divided into three sections, technical feasibility, administrative feasibility, and availability of services and materials. Technical feasibility describes items such as construction and operation, technology reliability, and monitoring considerations. Administrative feasibility addresses issues such as permitting, interaction with NYSDEC and EPA, and community relations. Availability of services and materials describes the ease of obtaining vendors and equipment, and the availability of offsite disposal capacity.

5.6.5.1 Technical Feasibility

The technical feasibility of Alternative 6 is fairly good. Soil washing has been used for a number of years, and has been demonstrated to be effective at sites with similar contamination, but treatability studies will be necessary to confirm that the technology will be effective at the OB Grounds. The solidification/stabilization process is known to be effective for treating the soil washing residuals. The technical advantages of soil washing is to decrease the quantity of material that will require solidification. The solidification process

This comparison will provide the information necessary to decide the appropriate alternative for this site.

The discussion is divided into two groups. The first group, the threshold criteria, include the overall protection of human health and the environment, and compliance with ARARs. The next group includes the remainder of the evaluation criteria: long term effectiveness and permanence, reduction of toxicity, mobility, and volume through treatment, short-term effectiveness, implementability, and cost.

5.7.2 Threshold Criteria

Each alternative must be assessed against the threshold criteria, which are overall protection of human health and the environment and compliance with ARARs, because both criteria must be met by any alternative in order to be eligible for selection.

All of the alternatives, except Alternative 1 (no-action), provide protection of human health and the environment. For Alternatives 4, 5,and 6, soils with concentrations of lead exceeding 500 mg/kg will be removed. Although the results of the human health baseline risk assessment determined that the total site non-carcinogenic and carcinogenic risks are within the acceptable range of EPA target values for the on-site residential future use exposure scenario, removal of these soils (Case 1 through Case 5 soils) further reduces both risks. The indicator for noncarcinogenic risk, HI, for the future on-site residential exposure scenario is reduced from 0.33 to 0.11, which are both below the EPA target value of 1.0. The total site carcinogenic risk for the same exposure scenario is reduced from 1×10^{-5} to 9×10^{-6}.

Alternatives 4, 5, and 6 are also protective of the environment because sediments with lead and copper concentrations above the established NYSDEC criteria will be removed from Reeder Creek. Furthermore, covering and revegetation of the site and the drainage swale to intercept surface water runoff, which are required as part of the remedial action, will prevent recontamination of the creek as well as prevent direct contact and incidental ingestion by terrestrial wildlife of on-site soils with lead concentrations above 60 ppm. Furthermore, the removal of these sediments reduces the maximum concentrations of copper and lead for the reach of Reeder Creek affected by the OB grounds to 9.5 mg/kg and 10.5 mg/kg, respectively. These concentrations are considered to be protective of the aquatic life with the creek.

Alternatives 4, 5, and 6 prevent dermal contact with and ingestion of contaminated soils by removing surface soils with lead concentrations above the established clean-up goal of 500 mg/kg. These alternatives also prevent potential leaching of lead to the groundwater by removing the subsurface soils with lead concentrations above 500 mg/kg. This volume also

Alternatives 4, 5, and 6 were determined to meet these site specific remedial action objectives for soil and sediments. That is, they are protective against ingestion of and dermal contact with soils having concentrations of lead above 500 mg/kg; prevent leaching of lead from the soil into the groundwater above the federal action level; and protect terrestrial wildlife and the ecological receptors within Reeder Creek.

Alternative 6 ranks highest for long-term protectiveness of human health and the environment, permanence, and reductions in toxicity, mobility, and volume of hazardous constituents. Alternative 4, which involves off-site disposal of the materials, ranks highest for implementability and cost. Furthermore, Alternative 4 is far less costly than Alternative 6. However, Alternative 4 ranks lowest for short-term protectiveness because all of the soils are transported off-site for disposal while Alternative 5 ranks highest for short-term protectiveness because no hazardous materials are transported from the site.

INSERT 10

Response to Comments
by
USEPA
for Draft Final Feasibility Study at the OB Grounds
Seneca Army Depot Activity
Romulus, New York
Comment Date: April 8, 1997

Comment 1. Parsons ES still contends that the NYSDEC GA criteria of 25 μg/L will be used in the FS and not the federal action level of 15 μg/L, since the federal action level is not promulgated. As we discussed during the March 1997 BCT meetings, the OB Grounds documents can state that Army opinion on what the ARAR should be, but should also include that EPA recognizes the federal action level of 15 ug/L as the ARAR for lead in groundwater.

Response 1. Agreed. The text of the OB Grounds FS has been revised to include the recommended notation. The text changes were made to pages 2-13, 2-18, and Table 2-2.

Comment 2. As we discussed previously, an addendum to the OB Grounds FS will be necessary in order to address changes in the level of cleanup for the OB Grounds soils. Parsons ES December 12, 1996 responses to comments only discussed EPA's July 30, 1996 comment letter. As you know, the OB Grounds FS report must be finalized for the administrative record before the public comment period can begin for the OB Grounds Proposed Plan.

Response 2. Agreed. The text has been revised to reflect the changes in the clean up for the OB Grounds. The text has been revised to indicate that a 9-inch clean fill cover will be added to areas at the OB Grounds where soils contain lead concentrations above 60 ppm. The text revisions were made to pages 2-22, 5-7, 5-16, 5-29, and 5-43.

Furthermore, a riprapped drainage swale will replace the sedimentation pond to control surface water runoff into Reeder Creek. The basis for this change is that with the addition of the vegetated 9-inch clean fill cover over most areas of the OB Grounds, any sediment runoff would be clean fill material and not contaminated soil. The text revisions were made to pages 2-19, 5-7, 5-17, 5-31, 5-44, 5-47, 5-52, and Table 5-1.