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DECISION DOCUMENT FOR THE REMEDIATION OF

**Operable Unit 2 - Parcels 1C3 & 1C4
Diamond Shamrock Painesville Works**

Lake County, Ohio

prepared by

THE OHIO ENVIRONMENTAL PROTECTION AGENCY

October 7, 2005

**I certify this to be a true and accurate copy of the
official document as filed in the records of the Ohio
Environmental Protection Agency**

By Donna Jackson Date 11-2-05

DECLARATION

SITE NAME AND LOCATION

Operable Unit OU2 - Parcels 1C3 & 1C4 - Diamond Shamrock Painesville Works
Lake County, Ohio

STATEMENT OF BASIS AND PURPOSE

This Decision Document presents the selected remedial action for Operable Unit OU2 (Parcels 1C3 and 1C4) of the Diamond Shamrock Painesville Works in Lake County, Ohio, chosen in accordance with the policies of the Ohio Environmental Protection Agency, statutes and regulations of the State of Ohio, and the National Contingency Plan, 40 CFR Part 300.

ASSESSMENT OF THE SITE

Actual and threatened releases of industrial and/or hazardous wastes and substances from previous industrial activities on the property, including the management of chromium-containing materials, cement production, acid mixing and distribution, and aluminum smelting at the Site, if not addressed by implementing the remedial action selected in the Decision Document, constitute a substantial threat to public health or safety and are causing or contributing to air or water pollution or soil contamination.

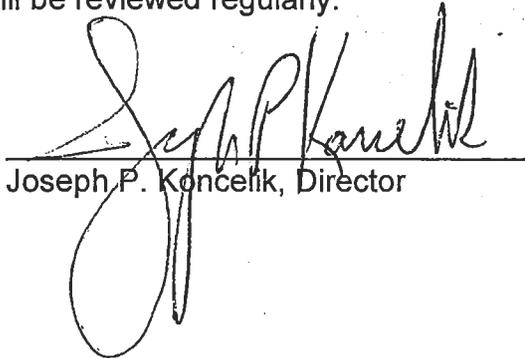
DESCRIPTION OF THE SELECTED REMEDY

- Remediating future residential portions of the property to meet the risk goal through the excavation and appropriate disposal of contaminated soils and/or the placement of a clean soil cover to achieve a four-foot (4') point of compliance in residential areas. Maintenance of the point of compliance will be performed under an operation and maintenance (O&M) agreement.
- Managing soils to create areas for recreational use which meet the risk goal and maintaining a two-foot (2') point of compliance in recreational areas through the excavation and appropriate disposal of contaminated soils and/or the placement of a clean soil cover, as necessary. Maintenance of the point of compliance will be performed under an operation and maintenance (O&M) agreement.
- Implementing an Environmental Covenant (activity and use limitations) prohibiting the use of groundwater on the property for potable and non-potable purposes except for groundwater monitoring and treatment, limiting construction of structures on certain portions of the Site and ensuring that the appropriate point of compliance (POC) will be met.

- Developing a risk management plan (RMP) to address future issues related to the excavation of soils and potential contact with groundwater on the property during redevelopment and maintenance activities.

STATUTORY DETERMINATIONS

The selected remedial action is protective of human health and the environment, complies with legally applicable state and federal requirements, is responsive to public participation and input and is cost-effective. The remedy utilizes permanent solutions and treatment technologies to the maximum extent practicable to reduce toxicity, mobility and volume of hazardous substances at the Site. The effectiveness of the remedy will be reviewed regularly.



Joseph P. Koncelik, Director

Date 11/1/05

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DECISION SUMMARY

for Operable Unit OU2 of the Diamond Shamrock Painesville Works
Lake County, Ohio

1.0 SITE BACKGROUND

1.1 Site History

The Diamond Shamrock Painesville Works is an approximately 1,100 acre former chemical manufacturing facility located in Lake County, Ohio (see Figure 1). The Grand River bisects the Diamond Shamrock Painesville Works and Lake Erie borders it to the north. The Diamond Shamrock Painesville Works facility operated from 1912 through 1977 and manufactured a variety of products including, but not limited to, soda ash, baking soda, chromium compounds, carbon tetrachloride, hydrochloric and sulfuric acids, chlorinated wax, and coke. Diamond Shamrock also generated their own electricity in an on-Site power plant. A number of solution mining wells were located on the property for the purpose of extracting salt from deposits located below the Diamond Shamrock Painesville Works for use in manufacturing processes (see Figure 2). A number of individuals and companies purchased property from Diamond Shamrock and operated industrial facilities within the former facility boundaries, including an aluminum smelting plant, a polyvinyl chloride monomer facility and a coke plant.

In 1995, Director's Final Findings and Orders (DFFOs) for the performance of a remedial investigation and feasibility study at the Diamond Shamrock Painesville Works were signed by Ohio EPA and the following potentially responsible parties (PRPs): Chemical Land Holdings, Inc.; Maxus Energy Corporation; Occidental Chemical Corporation; Painesville Township Board of Trustees; Uniroyal Chemical Company, Inc.; Village of Fairport Harbor; and The Painesville PRP Group. These DFFOs were issued based on historical data collected by Ohio EPA, U.S. EPA and others.

The Diamond Shamrock Painesville Works has been divided into nineteen (19) operable units (see Figure 3). This Decision Document outlines the remediation of one of the nineteen (19) operable units, Operable Unit OU2, which consists of parcels 1C3 and 1C4.

Operable Unit 2 (OU2, the "Site") is approximately thirty-eight (38) acres in size and is located north of Fairport Nursery Road in the central portion of the Diamond Shamrock Painesville Works. A cement plant was originally operated on OU2 by Diamond Shamrock. Industrial activities performed on property adjacent to OU2 included chlorowax manufacturing, carbon tetrachloride production, chromium manufacturing and the production of coke and coal tar products.

Following the closure of the cement operations, the eastern portion of OU2 (Parcel 1C4) was sold to Aluminum Smelting and Refining Co. and then to Cousins, Inc. Both companies ran aluminum smelting operations on this portion of the operable unit. The

western portion of OU2 (Parcel 1C3) was sold to PVS Chemicals, which operated a bulk storage and hydrochloric acid dispensing facility.

Currently, Parcel 1C3 and the western portion of Parcel 1C4 are owned by Tierra Solutions, Inc. (TSI - formerly known as Chemical Land Holdings). The eastern portion of Parcel 1C4 is currently owned by Aluminum Smelting and Refining Co. (ASR).

1.2 Summary of the Remedial Investigation

The RI was conducted by the Painesville PRP Group and other signatories to the 1995 DFFOs, with oversight by Ohio EPA. The RI was performed in two phases and included sampling of surface and subsurface soils, surface water, sediment and groundwater for the purpose of determining the nature and extent of contamination on the Diamond Shamrock Painesville Works. Supplemental sampling of surface and subsurface soils was also conducted by Hull & Associates in 2003 for the Site developer, Lakeview Bluffs LLC. The data obtained from the remedial and supplemental investigations were used to conduct a baseline risk assessment and to determine the need to evaluate remedial alternatives. This Decision Document contains only a brief summary of the findings of the RI and FS. Please refer to the Phase I Remedial Investigation Report (SECOR, 1999) and Phase II Remedial Investigation Report (SECOR, 2003), the Baseline Risk Assessment for the Grand River and Lake Erie (Hull, 2004), included as part of the Phase II Remedial Investigation Report (SECOR, 2003) and the Feasibility Study Report for Operable Unit OU2 (Hull 2004) for additional information on contaminant concentrations.

The nature and extent of contamination within OU2 of the Diamond Shamrock Painesville Works, in each environmental medium, and the contaminants of concern (COCs) attributable to this Site, are described below.

1.2.1 Soil Contamination

Ohio EPA reviewed results from surface and subsurface soil samples collected during Phase I and Phase II RI activities, historical sampling events and supplemental work performed by the Site developer. All analyses, even those not performed under the 1995 DFFOs, met the quality assurance/quality control requirements of the approved RI Work Plan for the Diamond Shamrock Painesville Works.

A total of 27 soil samples (13 surface soil and 14 subsurface soil samples) were collected during the RI. A total of 109 soil samples (57 surface and 52 subsurface soil samples) were collected during supplemental activities, following completion of the RI. Soil samples were analyzed for metals, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, hexavalent chromium, cyanide, asbestos, total organic carbon and polychlorinated biphenyls (PCBs).

The following COCs were found in surface soils within this operable unit: aluminum; cadmium; chromium; lead; manganese; mercury; thorium; PCBs; and polycyclic

aromatic hydrocarbons (PAHs). COCs detected in total soils (surface and subsurface) included all of the COCs listed above, as well as antimony, arsenic, barium, cyanide, and trichloromethane (chloroform). Please refer to the Baseline Human Health Risk Assessment, located in Appendix A of the Feasibility Study for Operable Unit OU 2, for the concentrations of COCs detected in surface soils and total soils on the Site.

1.2.2 Ground Water Contamination

The geology of this portion of the Diamond Shamrock Painesville Works consists of fill material, composed of clay, sand, cinders, fly ash and solvay process residue, underlain by unconsolidated silty clay with thin localized sand and gravel intervals. Bedrock consists of fractured shales, which occur at a depth of twenty (20) to seventy (70) feet below ground surface. Groundwater has been detected at an average depth of approximately four (4) feet below surface.

Groundwater yield is very limited in this area and very few wells exist in the vicinity of the Diamond Shamrock Painesville Works. The closest well is located upgradient, approximately 6,000 feet to the southeast.

A groundwater divide exists across OU2. Groundwater in the northern portion of OU2 flows toward Lake Erie, while groundwater in the southern portion of OU2 flows toward the Grand River. The location of the groundwater divide does not appear to vary significantly on a seasonal basis.

Twenty-two (22) groundwater samples were collected from this operable unit. Samples were analyzed for metals, VOCs, SVOCs, pesticides, cyanide, hexavalent chromium, total dissolved solids (TDS) and PCBs. A number of COCs were detected in the groundwater samples. These included metals, VOCs, SVOCs, pesticides and TDS. Please refer to the Baseline Human Health Risk Assessment, located in Appendix A of the Feasibility Study for Operable Unit OU2, for the concentrations of COCs detected in groundwater on the Site. Groundwater impacts to surface water are discussed in the following section (Section 1.2.3) of this decision document.

1.2.3 Surface Water Contamination

The Lake Erie and Grand River Baseline HRA (Hull, 2003), submitted as part of the Phase II Remedial Investigation Report, Appendix S-I (SECOR, 2003) evaluated both potential releases of COCs from groundwater discharges to the Grand River and Lake Erie using a groundwater fate and transport model (BIOSCREEN) and impacts to surface water, sediment and biota currently posed by the Diamond Shamrock Painesville Works. The evaluation was performed, in part, to determine the potential for Site-related contaminants to impact persons involved in recreational activities in the Grand River and Lake Erie, as well as people eating fish from the Grand River. Fish ingestion was quantitatively evaluated using historical data, with the current Ohio Department of Health fish advisories for the Grand River and Lake Erie taken into account.

All chemicals detected in groundwater at concentrations above their respective Outside the Mixing Zone Average (OMZA) water quality standards were evaluated for their potential to migrate and discharge into Lake Erie and/or the Grand River. The BIOSCREEN model was used to predict concentrations of chemicals of interest in groundwater at the point of discharge to surface water, assuming the maximum detected concentration in each well migrates to the lake and/or river by the shortest groundwater flow path. The predicted surface water concentrations at the point of discharge to surface water were compared to surface water quality standards for the protection of human health (OMZA non-drinking). None of the chemicals detected in groundwater at OU2 exceed the OMZA surface water quality standards at the point of discharge to either Lake Erie or the Grand River.

There is little potential for overland migration of contaminants to Lake Erie and the Grand River from OU2. The majority of the operable unit is paved and flat, is located approximately 800-feet from Lake Erie and 1800-feet from the Grand River, and is separated from both water bodies by other operable units.

1.2.4 Air Releases

Releases of VOCs to outdoor and indoor air were evaluated through modeling for OU2. Indoor air concentrations are exceeded for certain VOCs within the operable unit, when the property is evaluated for a residential end use.

1.2.5 Impacts to Biological Resources

Due to limited habitat, limited ecological receptors and the planned residential end use of OU2, an ecological risk assessment was not required. Should the proposed end use of the property change to one which will support ecological receptors, an ecological risk assessment will be performed at that time.

1.3 Additional Information, Approved by the Ohio EPA, Subsequent to the Remedial Investigation

As previously discussed, Lakeview Bluffs LLC, the developer for the Diamond Shamrock Painesville Works, performed additional soil characterization activities on OU2 in 2003, following completion of the RI. These additional activities were utilized, in part, to estimate remedial costs for a potential residential end use of the Site. The data was compiled into a report entitled Supplemental Phase II Environmental Site Assessment for OU2 (Hull, 2003) and was submitted to the Ohio Department of Development as part of a Round #2 Clean Ohio Revitalization Fund (CORF) application submitted on July 28, 2003. Ohio EPA reviewed and commented on the CORF application. A copy of the report and Ohio EPA's comments may be found in Appendix C of the Feasibility Study for Operable Unit OU2 (Hull, 2004). Although this project was not awarded funding through the Round #2 CORF, the additional data was utilized, with Ohio EPA's approval, to conduct the human health risk assessment for OU2.

2.0 SUMMARY OF SITE RISKS

A baseline risk assessment was conducted, following U.S. EPA guidance, to evaluate current and potential future risks to human health from contaminants present at the Site. The results demonstrated that the existing concentration of contaminants in environmental media pose risks to human receptors at a level sufficient to trigger the need for remedial actions. A residual risk assessment was also performed, in order to determine that the level of risk that would remain on-Site following implementation of a remedy would be acceptable. As previously mentioned, a quantitative baseline ecological risk assessment was not performed for OU2 due to the limited habitat, limited ecological receptors and planned residential end use of the property.

2.1 Risks to Human Health

2.1.1 Baseline Human Health Risk Assessment

The objectives of the baseline human health risk assessment were as follows:

- To determine the Site-specific chemicals of concern (COCs);
- To evaluate the complete exposure pathways in OU2 with respect to current and future conditions;
- To estimate the potential exposures to potential receptors via the complete exposure pathways; and,
- To estimate potential non-cancer hazards and cancer risks associated with the COCs for each potential receptor.

The chemical constituents addressed by the baseline human health risk assessment were based on data collected during the Phase I and Phase II Remedial Investigations and the Supplemental Phase II Environmental Site Assessment for OU2. Chemical constituents detected in analytical samples from the property were screened against Site-specific background concentrations and health-based screening levels (i.e., U.S. EPA Region IX Preliminary Remediation Goals). Those constituents which exceeded background and health-based screening levels, continued through the risk assessment process.

A site conceptual model was developed in order to visually present a list of the potential receptors (people performing various types of activities) and the types of contaminated media with which they could potentially come into contact (see Figure 5). The types of receptors evaluated for OU2 included the active industrial worker, construction/excavation worker, resident (both adult and child), and recreator (both adult and child).

Risk and hazard values were calculated for each of the different types of receptors identified for this operable unit, using U.S. EPA risk assessment guidance. Exposure to multiple chemicals was taken into account in these calculations. In addition, in order to be protective of potential future residents and recreators within OU2, potential risk posed by exposure to Grand River surface water, sediments and fish were added to the cumulative human health risks calculated for future residents and recreators. Potential risks posed by exposure to Lake Erie surface water, sediments and fish were qualitatively assessed.

Ohio EPA requires that remedial alternatives be proposed for a site if it is determined that unacceptable risk exists. For cancer-causing contaminants, the total excess lifetime carcinogenic risk (with all contaminants evaluated together) is set at $1E-5$. This equates to a 1 in 100,000 chance of developing cancer from site-related contaminants and is in excess of the background cancer risk that people incur through exposure to carcinogens in everyday life (eg.- cigarette smoke, exposure to gasoline fumes, etc.). For non-carcinogenic (non-cancer) compounds, the non-cancer hazard goal is equal to a Hazard Index (HI) of 1. The HI is determined by adding, as appropriate, multiple hazard quotient (HQ) values which are calculated for each individual contaminant and receptor exposure combination as evaluated in the baseline risk assessment.

Cumulative (total) risks were determined for the active industrial worker (exposure to surface soils, soil volatilizing to indoor air, and groundwater volatilizing to indoor air), construction worker (exposure to total soils and groundwater), resident (exposure to surface soils, Grand River surface water, sediments and fish, soil volatilizing to indoor air, and groundwater volatilizing to indoor air), and recreator (exposure to surface soils and Grand River surface water, sediments and fish). A summary of risk posed to the various types of receptors is as follows:

Receptor Type	Non-Carcinogenic Risk (HI)	Carcinogenic Risk
Active Industrial Worker	0.06	2 x 10⁻⁵*
Construction /Excavation Worker	2	2 x 10⁻³
Resident	0.4 (Adult) / 3 (Child)	7 x 10⁻⁴ (Adult) / 8 x 10⁻⁴ (Child)
Recreator	0.1 (Adult) / 0.8 (Child)	6 x 10 ⁻⁶ (Adult) / 1 x 10 ⁻⁵ (Child)

* Values in **bold** represent risk in excess of acceptable levels

2.1.2 Residual Human Health Risk Assessment

Residual risks are those remaining after a remedy is assumed to have been implemented. Residual risks were calculated using the same equations and methodology presented in the baseline human health risk assessment. Only those potential receptors and media that exceeded non-carcinogenic hazard or carcinogenic risk goals in the baseline human health risk assessment were carried through in the residual human health risk assessment. Maximum concentrations were removed from the data set and recalculated until the target risk and/or hazard goals were met for each residual exposure scenario. In effect, risks are re-calculated assuming exposure to COCs in these areas that drive risk levels have been remedied in some manner.

Results of the baseline human health risk assessment indicated that evaluation of remedial alternatives is warranted for the industrial worker (for soil acting as a source to indoor air only), the construction worker, and adult and child residents (for direct-contact pathways and soil acting as a source to indoor air). Figure 4 illustrates the results of the residual human health risk assessment and the approximate areas that exceed risk and hazard goals for OU2, and therefore require remedial action. More detailed information regarding the remediation that will be required to meet acceptable risk is included in the Feasibility Study for Operable Unit OU2 (Hull, 2004).

2.2 Risks to Ecological Receptors

As previously mentioned, limited habitat and ecological receptors exist within the boundaries of OU2. In addition, the residential redevelopment planned for this property will eliminate any habitat which currently exists. While potential ecological impact is qualitatively discussed within the Feasibility Study for Operable Unit OU2 (Hull, 2004) a quantitative ecological risk assessment was not conducted for this portion of the Diamond Shamrock Painesville Works.

3.0 FEASIBILITY STUDY

A FS was conducted by the Painesville PRP Group and other signatories to the 1995 DFFOs for the Diamond Shamrock Painesville Works to define and analyze appropriate remedial alternatives. That study was conducted with oversight by Ohio EPA, and was approved on January 31, 2005. The RI and FS are the basis for the selection of Ohio EPA's preferred remedial alternative.

4.0 REMEDIAL ACTION OBJECTIVES

As part of the RI/FS process, remedial action objectives (RAO's) were developed in accordance with the National Contingency Plan (NCP), 40 CFR Part 300, which was promulgated under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended, and U.S. EPA guidance. The RAOs are goals that a remedy should achieve in order to ensure the protection of human health and the environment. The goals are designed specifically to reduce the potential adverse effects of site contaminants present in environmental media to an acceptable risk level.

The following RAOs have been established for the Diamond Shamrock Painesville Works, including OU2, in order to address risk posed by exposure to all media including the Grand River:

- **A carcinogenic risk goal of 1E-5.** This Site-specific risk goal has been established for the Diamond Shamrock Painesville Works, in compliance with the National Oil and Hazardous Substances Pollution Contingency Plan ("NCP", U.S. EPA, 1994) and Ohio EPA Division of Emergency and Remedial Response guidance. The NCP identifies a human health carcinogenic risk range of 1E-4 (1 in 10,000) to 1E-6 (1 in 1,000,000) be met following Site remediation. As previously discussed, the risk accounted for within the Site-specific goal is that which is in excess of normal everyday risks to which people are exposed.
- **A non-carcinogenic hazard goal of 1.** This hazard goal was established for the Site in compliance with requirements specified under the NCP and DERR guidance.

It should be noted that both the carcinogenic and non-carcinogenic human health risk and hazard goals for this OU include risks posed by contact with Lake Erie and Grand River water and sediment, as well as the ingestion of fish. Although important ecological resources (e.g., endangered species) are not currently an issue within this OU, if they do exist in the future, suitable risk-based standards will be applied to this Site.

5.0 SUMMARY OF REMEDIAL ALTERNATIVES

A total of three (3) remedial alternatives were considered in the FS. A brief description of the major features of each of the remedial alternatives follows. More detailed information about these alternatives can be found in the Feasibility Study for Operable Unit OU2 (Hull, 2004).

5.1 Alternative ALT OU2-A

FS Alternative ALT OU2-A is a “no action” remedial alternative. The NCP requires evaluation of a “no action” alternative in order to establish a baseline for the comparison of other remedial alternatives. Under this alternative, no remedial activities or monitoring are performed.

5.2 Alternative ALT OU2-B

FS Alternative ALT OU2-A is an industrial land use alternative, which combines an Environmental Covenant (activity and land use limitations) to protect the industrial worker, as well as a risk management plan (RMP) to protect workers involved in future construction or excavation activities. The Environmental Covenant will include the following activity and land use limitations: limiting future use of the property to industrial activities; prohibiting groundwater extraction for potable and non-potable use except for groundwater monitoring and treatment (e.g., use as drinking water); and prohibiting new construction of habitable structures in areas where VOC levels exceed indoor air-based remediation goals. The RMP would be designed to prevent unacceptable exposures to soils or groundwater by workers involved in future construction or excavation activities. This alternative does not involve the treatment or removal of contaminated environmental media from the property.

5.3 Alternative ALT OU2-C

FS Alternative ALT OU2-C is a combined residential and recreational land use alternative, which meets risk goals through a combination of excavation and/or placement of clean soil cover, on-Site or off-Site management of excavated soils, establishment of an Environmental Covenant and development of a RMP, to protect workers involved in future construction or excavation activities.

RAOs for direct-contact with soil in residential areas will be achieved by establishing a minimum four-foot (4') point of compliance through excavation of impacted soils and/or placement of clean soil cover/backfill. A four-foot (4') residential point of compliance is proposed to account for limited landscaping activities that may be conducted by future residents. Because subsurface structures (i.e., basements and crawl spaces) will be prohibited through activity and use limitations, a deeper point of compliance is not required.

Excavated soils will be disposed off-Site or if below acceptable recreational risk-based levels, selectively relocated, to designated Soil Management Areas on the property, to be used for non-residential (e.g., recreational or landscaping) purposes. Excavated areas where concentrations of COCs that exceed the risk and hazard goals remain

would be covered with soil so that RAOs are met within the applicable point of compliance. A minimum two-foot (2') point of compliance will be maintained in recreational areas to ensure that risk-based standards are met. An Environmental Covenant will include the following activity and land use limitations: prohibiting groundwater extraction for potable and non-potable use except for groundwater monitoring and treatment; prohibiting construction of subsurface structures in areas where VOC levels exceed indoor air-based PRGs; and prohibiting residential development in on-Site Soil Management Areas, and limiting these areas to recreational use only.

6.0 COMPARISON AND EVALUATION OF ALTERNATIVES

6.1 Evaluation Criteria

In selecting the remedy for this Site, Ohio EPA considered the following eight criteria as outlined in U.S. EPA's National Contingency Plan (NCP) promulgated under CERCLA (40 CFR 300.430):

1. Overall protection of human health and the environment - Remedial alternatives shall be evaluated to determine whether they can adequately protect human health and the environment, in both the short- and long-term, from unacceptable risks posed by hazardous substances, pollutants, or contaminants present at the Site.
2. Compliance with ARARs - Remedial alternatives shall be evaluated to determine whether a remedy will meet all of the applicable or relevant and appropriate requirements under State and Federal and Local environmental laws;
3. Long-term effectiveness and permanence - Remedial alternatives shall be evaluated to determine the ability of a remedy to maintain reliable protection of human health and the environment over time, once pollution has been abated and RAOs have been met. This includes assessment of the residual risks remaining from untreated wastes, and the adequacy and reliability of controls such as containment systems and institutional controls;
4. Reduction of toxicity, mobility, or volume through treatment - Remedial alternatives shall be evaluated to determine the degree to which recycling or treatment are employed to reduce toxicity, mobility, or volume, including how treatment is used to address the principal threats posed by the Site;
5. Short-term effectiveness - Remedial alternatives shall be evaluated to determine the following: (1) Short-term risks that might be posed to the community during implementation of an alternative; (2) Potential impacts on workers during remedial action and the effectiveness and reliability of protective measures; (3)

Potential environmental impacts of the remedial action and the effectiveness and reliability of mitigative measures during implementation; and (4) Time until protection is achieved;

6. Implementability - Remedial alternatives shall be evaluated to determine the ease or difficulty of implementation and shall include the following as appropriate: (1) Technical difficulties and unknowns associated with the construction and operation of a technology, the reliability of the technology, ease of undertaking additional remedial actions, and the ability to monitor the effectiveness of the remedy ; (2) Administrative feasibility, including activities needed to coordinate with other offices and agencies and the ability and time required to obtain any necessary approvals and permits from other agencies (for off-Site actions); and (3) Availability of services and materials, including the availability of adequate off-Site treatment, storage capacity, and disposal capacity and services; the availability of necessary equipment and specialists, and provisions to ensure any necessary additional resources; the availability of services and materials; and the availability of prospective technologies;
7. Cost - Remedial alternatives shall evaluate costs and shall include the following: (1) Capital costs, including both direct and indirect costs; (2) Annual operation and maintenance costs (O&M); and (3) Net present value of capital and O&M costs.; The cost estimates include only the direct costs of implementing an alternative at the Site and do not include other costs, such as damage to human health or the environment associated with an alternative. The cost estimates are based on figures provided by the Feasibility Study.
8. Community acceptance - Remedial alternatives shall be evaluated to determine which of their components interested persons in the community support, have reservations about, or oppose.

Evaluation Criteria 1 and 2 are threshold criteria required for acceptance of an alternative that has accomplished the goal of protecting human health and the environment and complied with the law. Any acceptable remedy must comply with both of these criteria. Evaluation Criteria 3 through 7 are the balancing criteria for picking the best remedial alternatives. Evaluation Criteria 8, community acceptance, was determined, in part, by written responses received during the public comment period and statements offered at the public meeting.

6.2 Analyses of Evaluation Criteria

This section examines how each of the evaluation criteria is applied to each of the remedial alternatives identified in Section 5.0 and compares how the alternatives achieve the criteria. In addition to the discussion provided below, Table 1 of this Decision Document provides a more detailed analysis of each alternative evaluated. For each of the eight criteria, alternatives are discussed in the order of preference by Ohio EPA.

6.2.1 Overall Protection of Human Health and the Environment

The assessment of cancer risks and non-cancer hazards to human receptors requires that exposure pathways be identified and the risks and hazards of each pathway be numerically estimated. Three (3) chemical exposure routes have been identified: direct contact to soils, direct contact to groundwater, and exposure to volatile contaminants from soils and groundwater. A variety of human receptors, including industrial and construction workers, recreators and residents were evaluated for exposure to COCs through these routes of exposure. A discussion of the results of risks posed to human health is presented in Section 2.0 of this Decision Document.

Since ecological risk was not qualitatively evaluated for OU2, as discussed in Section 2.0 of this Decision Document, it did not factor into the comparison of alternatives for overall protection of human health and the environment.

Alternative ALT OU2-C provides the most overall protection of human health and the environment, through limiting contact with contaminated soils and exposure of receptors to volatile contaminants from soils and groundwater through an Environmental Covenant, a RMP and the excavation and management of contaminated soils and placement of clean soils. This alternative will allow for a residential end use of the property.

While Alternative ALT OU2-B limits contact through an Environmental Covenant, access limitations and a RMP, it does not provide the level of protection needed for residential use. The property would be limited to an active industrial or recreational end use under this alternative.

Finally, Alternative ALT OU2-A does not meet the protectiveness criteria, since no action would occur.

6.2.2 Compliance with ARARs

Alternative ALT OU2-C meets the requirement of compliance with ARARs for a residential end use. Risk-based standards will be met under this alternative. Any applicable Agency permitting requirements can also be readily met.

Alternative ALT OU2-B meets the requirement of compliance with ARARS, but only if the property is limited to an industrial or recreational end use. The Site-specific risk-based carcinogenic level of 1E-5 cannot be achieved for residential use under this alternative.

Alternative ALT OU2-A does not meet ARARs since there is no action under this scenario.

6.2.3 Long-Term Effectiveness and Permanence

Alternative ALT OU2-C meets the requirement for long-term effectiveness and permanence. Removing contaminated soils and/or placing clean soil in areas of contamination eliminates the risk posed to human health through direct contact and a soil cover is reliable and easily maintained.

Alternative ALT OU2-B does not meet this requirement as effectively as ALT OU2-C. Under this alternative, contaminated soils would not be removed from the property and direct contact would only be limited due to the establishment of an Environmental Covenant. A RMP would address potential risk to construction workers.

Alternative ALT OU2-A does not meet this requirement because the contamination is not removed or remediated. Because there are no controls over the contaminated materials within the operable unit, no reliability exists with this remedy.

6.2.4 Reduction of Toxicity, Mobility or Volume through Treatment

All of the proposed remedial alternatives are equal in not achieving this criterion, since none of them involve either recycling or treatment.

6.2.5 Short-Term Effectiveness

Alternative ALT OU2-B involves minimal Site work and does not involve the excavation or grading of contaminated soils. Therefore, risk to the community, Site workers and the environment due to increased exposures during remedy implementation are not significant under this scenario. The remedy would be immediately effective.

Alternative ALT OU2-C is the least effective in the short term, due to the management of contaminated soils during remedial activities. Protection for workers would be required to reduce exposure to contaminated soils through the direct contact and inhalation pathways. A temporary increase in dust due to remedial activities could also affect the community. Stormwater would have to be managed to limit the impact to the environment. This alternative would be effective within three (3) to six (6) months following the start of remedial activities.

As with Alternative ALT OU2-B, Alternative ALT OU2-A does not pose a significant risk to the community, Site workers or the environment during remedy implementation. However, the no-action remedy would not be utilized, because it does not meet the RAOs for OU2.

6.2.6 Implementability

Alternatives ALT OU2-A and ALT OU2-B are both readily implemented. ALT OU2-A, the no action alternative, does not involve any permits, construction or maintenance.

ALT OU2-B involves the placement of an Environmental Covenant on the property and limiting access to areas which exceed acceptable risk to Site workers and potential recreators, both of which are easily performed.

Alternative ALT OU2-C is the most difficult of the alternatives to implement, since it involves excavation, filling and grading activities. Authorizations that would need to be obtained include stormwater permits and approval for potential management of contaminated soils on-Site. Construction and maintenance required under this alternative are easily implemented and materials are easily obtained.

6.2.7 Cost

The present worth cost (2005 value) for each remedial alternative, including operation and maintenance, is as follows:

Alternative ALT OU2-A	No Action Alternative	\$ 0.00
Alternative ALT OU2-B	Industrial/Recreational Alternative	\$ 81,000.00
Alternative ALT OU2-C	Residential/Recreational Alternative	\$ 1,353,100.00 –
		\$ 3,961,000.00 *

* A range is provided for Alternative ALT OU2-C, since the final cost is dependent on the amount of soils excavated, clean soil cover placed on-Site and whether contaminated soils are managed on- or off-Site.

6.2.8 Community Acceptance

The Ohio EPA received comments on the preferred plan from interested parties during the public comment period and at the public meeting held at the Painesville Township Hall on July 7, 2005. Those comments and Ohio EPA's responses are included in the Responsiveness Summary, found at the end of this Decision Document.

7.0 SELECTED REMEDIAL ALTERNATIVE

Ohio EPA's selected remedial alternative for this Site is Alternative ALT OU2-C. Alternative ALT OU2-C supports the future redevelopment of OU2 into a mix of residential and recreational uses. This preferred alternative consists of the following components:

- In residential areas where direct-contact risk and/or hazards exist, a four-foot (4') point of compliance will be achieved by one or more of the following actions:
 - Removal of soils that exceed risk and/or hazard goals for residential use to depths of up to four feet (4'), with placement of clean fill soil as necessary to meet residential RAOs in the top four feet (4') of soil; and/or

- Placement of four feet (4') of clean soil cover over areas where soils exceed risk and/or hazard goals for residential use.
- In recreational areas where direct-contact risk and/or hazards exist , a two-foot (2') point of compliance will be achieved by one or more of the following actions:
 - Removal of soils that exceed risk and/or hazard goals for recreational use to depths of up to two feet (2'), with placement of clean fill soil as necessary to meet recreational RAOs in the top two feet (2') of soil; and/or
 - Placement of two feet (2') of clean soil cover over areas where soils exceed risk and/or hazard goals for recreational use.
- Conducting confirmatory sampling and a risk assessment to ensure that the appropriate risk and/or hazard goals have been met for the OU. Risk and/or hazards presented by exposure of residents and recreators to Grand River and Lake Erie surface water, sediments and fish will be included in this cumulative risk assessment (see Appendix A, Table 8 for the summary of risks and/or hazards which must be added to the risks and/or hazards calculated for OU2 media).

In lieu of conducting a post-remedy risk assessment, the PRPs may choose to calculate OU-specific remedial cleanup standards, utilizing Agency-approved methodologies. Confirmation sampling for this OU would be performed in areas undergoing remediation, in order to demonstrate that the remedial cleanup standards were met. Since the contamination is located in isolated areas and remedial activities will focus on those areas only, OU-wide grid sampling is not required.

- Establishing an enforceable Environmental Covenant which allows for combined residential and recreation use of the property, limits the construction of habitable buildings within OU2 to specified areas, limits the construction of buildings to slab-on-grade (no basements or crawl-spaces permitted), and prohibits residential development in designated on-Site Soil Management Areas, limiting these areas to recreational use only. In addition, the use of groundwater beneath OU2 will be prohibited and the limitation will specify the duty to inform persons, as necessary, of the environmental conditions of the property and the elements of the RMP. The RMP will outline specific safety components for construction workers and those maintenance workers, if any, that perform infrequent excavation activities in the future on the property.
- Establishment of an O&M Agreement between Ohio EPA and the PRPs to demonstrate that the activity and use limitations specified in the Environmental Covenant remain in effect and are not being violated.
- Establishment and Ohio EPA approval of an RMP for the areas of OU2 that do not meet direct contact risk and hazard goals for the construction worker

receptor in order to protect them from exposure to contaminated soils and groundwater during post-remedial construction and development activities.

7.1 Soil Excavation and Placement of Clean Soils

In general, ALT OU2-C consists of achieving a four-foot (4') point of compliance for residential areas and a two-foot (2') point of compliance for recreational areas through a combination of soil removal and placement of clean soil cover to eliminate direct contact exposure to contaminated soils. The depth of soil removal may range from zero to four feet or greater, with placement of clean soil fill where confirmation sampling data indicate that residual risks and/or hazards remain above the remedial goals. Relocation of soils onto other portions of the OU must be performed in compliance with Federal, State and local laws, rules and regulations. Soils from off-Site sources may be utilized as fill on the property and must be sampled prior to placement on the Site. It is the PRP's responsibility to ensure that soils brought onto the property do not lead to an exceedence of risk and/or hazard goals established for OU2. This will be documented through confirmatory sampling following completion of the remedy. Where confirmation sampling data demonstrate that soil removal alone is sufficient in achieving risk goals for residential use, no clean soil cover will be necessary. Confirmation sampling will be performed across remediated portions of OU2 and will extend to the appropriate depth of either 2' or 4', in order to demonstrate that risk and hazard goals, as well as applicable points of compliance, have been achieved. A plan for representative confirmatory sampling will be approved by Ohio EPA as part of the remedial design phase of the RD/RA project. Samples will be analyzed for TAL metals, TCL volatiles, TCL semivolatiles, TCL pesticides and PCBs, hexavalent chromium and cyanide.

A 4-foot point of compliance (POC) is proposed to account for limited landscaping activities that may be conducted by future residents in residential areas. Because subsurface structures (i.e., basements and crawl spaces) will be prohibited through an Environmental Covenant, a deeper point of compliance is not required. Buildings located over these areas will be restricted to slab-on-grade (i.e., no basements or crawl-spaces). The performance standards for the Environmental Covenant are discussed in Section 7.2, below.

This alternative includes three (3) components to address soils that exceed risk goals for residential and recreational use and achieve residential and recreational points of compliance:

Component C-1 - Placement of a minimum of four feet (4') of clean soil cover over residential areas that exceed direct-contact risk goals and placement of a minimum of two feet (2') of soil cover over recreational areas that exceed direct-contact risk and/or hazard goals.

Component C-2 - Excavation of zero (0) to four (4) or more feet of impacted soils, confirmation soil sampling, placement of up to two (2) to four (4) feet of clean soil backfill as needed to meet the RAOs for recreational and residential areas, and on-Site management of the impacted soils in designated Soil Management Areas restricted to recreational use.

Component C-3 – Excavation of zero (0) to four (4) feet of impacted soils, confirmation soil sampling, placement of up to two (2) to four (4) feet of clean soil backfill as needed to meet the RAOs for recreational and residential areas, and off-Site disposal of the impacted soils.

Although these components could be considered remedial alternatives in themselves, a combination of these components will effectively address the requirements for Site redevelopment. Redevelopment will include a grading plan that may substantially alter the contours of OU2. Component C-1 of ALT OU2-C is effective for those areas that need to be brought up to grade as part of the redevelopment plan. Components C-2 or C-3, which both include excavation, are more effective for those areas where either filling is not necessary or a net cut is proposed as part of redevelopment. Excavated soils which meet residential risk goals for direct-contact may be beneficially reused to fill portions of the Property designated for recreational use (i.e., the Soil Management Areas of Component C-2). In the event that the volume of excavated material exceeds fill requirements, these soils would be disposed off-Site (Component C-3) in compliance with applicable rules and regulations.

The various components of ALT OU2-C include a significant amount of earthwork, including on-Site and off-Site transportation. Assuming a uniform cut of four feet, a maximum estimate of 41,100 cubic yards (cy) of soils would be removed and transported off-Site for disposal, or managed on-Site. Excavated soils would be temporarily staged on-Site prior to off-Site transportation and disposal or placement in an on-Site Soil Management Area. Approximately 43,000 cy of clean soil fill would be transported to the Site to fill excavated areas, achieve a four-foot (4') point of compliance, and taper these areas to match existing grade.

A survey will be performed following the completion of excavation, filling and grading activities at OU2. This survey will consist of: (1) verification that appropriate surface elevations have been met through an elevation survey; and (2) verification that soil depths are compliant with POC requirements through the collection of soil borings.

As part of the redevelopment, the clean soil cover will either be seeded with grass and other vegetation or covered with pavement and structures (where appropriate). Establishment of a vegetative layer and implementation of stormwater and erosion control measures during redevelopment construction are considered components of the cover installation. The approximate limits of remedial excavation and cover activities are shown on Figure 4.

An O&M Agreement between Ohio EPA and the PRPs will be established to maintain the required POCs on the property. Long-term landscaping and general property maintenance activities (e.g., mowing, mulching) will assist in addressing long-term maintenance needs that may arise. Periodic reviews will be conducted to ensure that the POC is met in both residential and recreational areas.

Performance standards

Construction Worker

The performance standard is met by the establishment of and adherence to a RMP for the areas of OU2, designated on Figure 4 as CDC-1, CDC-2/RIA-2, CDC-3/RIA-3 and CDC/RIA-1, that do not meet direct contact risk and hazard goals for the construction worker receptor. A notice of the RMP will be recorded on the property deed at the Lake County Recorder's Office, and will include requirements necessary to protect construction workers (e.g., safety planning, air monitoring, soil handling procedures) from exposure to contaminated soils and groundwater in excess of risk and hazard goals during post-remedial construction and development activities. The RMP will require that Ohio EPA be notified 15 days prior to the planned initiation of construction activities involving excavation.

Residential Areas

The performance standard is met if all portions of OU2, and more specifically the areas identified on Figure 4 as RDC-1 through RDC-8, to be utilized for residential purposes, based on current Site redevelopment plans, meet a four-foot (4') minimum point of compliance (POC), as demonstrated through the following:

- Upon completion of excavation, filling and grading activities, confirmation sampling will be performed across those portions of OU2 which did not originally meet residential risk and/or hazard goals and required remediation (i.e., excavation, filling and/or grading activities to meet the required POC). This confirmation sampling will extend to a depth of 4'. Analytical results will be combined with results from Phase I and Phase II RI sampling for non-remediated areas and will be used to perform an OU-wide risk assessment utilizing the methodologies and assumptions provided in Appendix A of this Decision Document. Results of the risk assessment must demonstrate that the cumulative risk goal of $1E-5$ and cumulative hazard goal of 1 have been met for all chemicals and media of concern impacting receptors in OU2. This includes additive risks and/or hazards posed by exposure to the Grand River, as required in the baseline risk assessment for this OU. The post-remedy risk assessment shall be submitted to Ohio EPA within sixty (60) days following the completion of excavation, filling and grading activities.

If the Painesville PRP Group chooses, they may submit OU-specific remedial standards to Ohio EPA for review and approval as part of the design documentation under a future RD/RA Order. OU-specific remedial standards must be calculated following Ohio EPA-approved methodologies.

Confirmation sampling would be required for those areas undergoing remediation, as specified above, to document that OU2 meets the cumulative risk goal of $1E-5$ and a cumulative hazard index of 1, however a post-remedial risk assessment would not be necessary.

- Upon completion of excavation, filling and grading activities, a survey will be performed on OU2 in order to demonstrate that the applicable 4' minimum POC has been achieved in all residential areas. Results of the survey, demonstrating compliance with the applicable minimum POC, will be

submitted to Ohio EPA within sixty (60) days following the completion of excavation, filling and grading activities.

Recreational Areas

The performance standard is met if all portions of OU2 to be utilized solely for recreational purposes, based on current Site redevelopment plans, meet a two-foot (2') minimum POC, as demonstrated through the following:

- Upon completion of excavation, filling and grading activities, confirmation sampling will be performed across those portions of OU2 which did not originally meet recreational risk and/or hazard goals and required remediation (i.e., excavation, filling and/or grading activities to meet the required POC). This confirmation sampling will extend to a depth of 2'. Analytical results will be combined with results from Phase I and Phase II RI sampling for non-remediated areas and will be used to perform an OU-wide risk assessment utilizing the methodologies and assumptions provided in Appendix A of this Decision Document. Results of the risk assessment must demonstrate that the cumulative risk goal of 1E-5 and cumulative hazard goal of 1 have been met for all chemicals and media of concern impacting receptors in OU2. This includes additive risks and/or hazards posed by exposure to the Grand River, as required in the baseline risk assessment for this OU. The post-remedy risk assessment shall be submitted to Ohio EPA within sixty (60) days following the completion of excavation, filling and grading activities.

If the Painesville PRP Group chooses, they may submit OU-specific remedial standards to Ohio EPA for review and approval as part of the design documentation under a future RD/RA Order. OU-specific remedial standards must be calculated following Ohio EPA-approved methodologies. Confirmation sampling would be required for those areas undergoing remediation, as specified above, to document that OU2 meets the cumulative risk goal of 1E-5 and a cumulative hazard index of 1, however a post-remedial risk assessment would not be necessary.

- Upon completion of excavation, filling and grading activities, a survey will be performed on OU2 to demonstrate that the applicable 2' POC has been achieved in all recreational areas. Results of the survey, demonstrating compliance with the applicable minimum POC, will be submitted to Ohio EPA within sixty (60) days following the completion of excavation, filling and grading activities.

7.2 Environmental Covenant and O&M Agreement

An Environmental Covenant specifying activity and use limitations will be employed to preclude the construction of habitable subsurface structures (i.e. basements and crawl-spaces) on the entirety of OU2. Additionally, the areas designated on Figure 4 as RAI-1, RAI-2 and RAI-3, where VOCs in soils exceed calculated indoor air risk and/or hazard goals, will be subject to activity and use limitations precluding the construction of all habitable structures to eliminate the potential for exposure to indoor air impacted by VOCs in soil. The Environmental Covenant will also prohibit groundwater use for

potable and non-purposes except for groundwater monitoring and treatment. The applicable minimum POCs will be maintained through an O&M Agreement. Specifically, a 4' minimum POC will be established for soils in residential areas and a 2' minimum POC will be established for soils in recreational areas.

Performance Standards

- The performance standard is met if an Environmental Covenant, which includes activity and use limitations that: a) prohibit the construction of habitable subsurface structures (e.g., basements, crawl-spaces) at OU2; b) prohibit the construction of all habitable structures and fence off the areas designated on Figure 4 as RAI-1 through RAI-3 at OU2; c) prohibit potable and non-potable groundwater usage on the entirety of OU2 except for groundwater monitoring and treatment; and d) require all post-remedial construction activities be completed under an RMP, is executed between Ohio EPA and the PRPs.
- The performance standard is met if within thirty (30) days of the execution of the Environmental Covenant, documentation is provided to Ohio EPA that the executed Environmental Covenant for OU2 has been recorded at the Lake County Recorder's Office.
- The performance standard is met if periodic monitoring, per an O&M Agreement between Ohio EPA and the PRPs, demonstrates that the activity and use limitations specified in the Environmental Covenant remain in effect and are not being violated.

8.0 BIBLIOGRAPHY

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Hull & Associates, *Supplemental Phase II Environmental Property Assessment for Parcels 1C3 and the Western Portion of 1C4*, December 2003.

Hull & Associates, Inc., *Feasibility Study Report for Operable Unit OU2 of the Diamond Shamrock Painesville Works Site*, December 2004.

SECOR International Incorporated., *Phase I Remedial Investigation Report for the Diamond Shamrock Painesville Works Site*, 1999.

SECOR International Incorporated., *Phase II Remedial Investigation Report for the Diamond Shamrock Painesville Works Site*, June 2003.

9.0 GLOSSARY

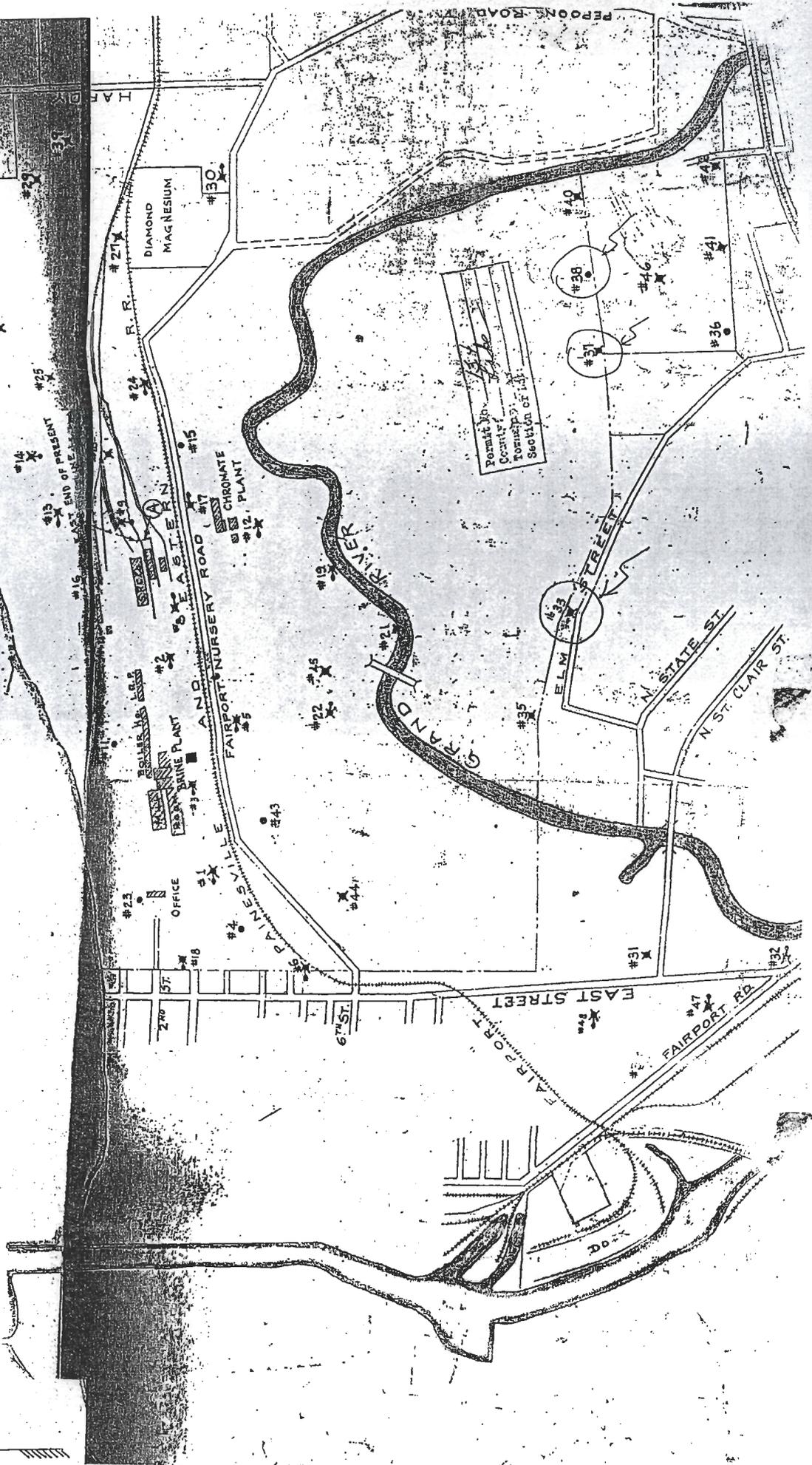
ARARs -	Applicable or relevant and appropriate requirements. Those rules which strictly apply to remedial activities at the Site, or those rules whose requirements would help achieve the remedial goals for the Site.
Baseline Risk Assessment -	An evaluation of the risks to humans and the environment posed by a site.
Carcinogen -	A chemical that causes cancer.
CERCLA -	Comprehensive Environmental Response, Compensation and Liability Act. A federal law that regulates cleanup of hazardous substances sites under the U.S. EPA Superfund Program.
Decision Document -	A statement issued by the Ohio Environmental Protection Agency giving the Director's selected remedy for a site and the reasons for its selection.
Ecological Receptor -	Animals or plant life exposed to chemicals released from a site.
Environmental Covenant -	A servitude arising under an environmental response project that imposes activity and use limitations and that meets the requirements established in section 5301.82 of the Revised Code.
Exposure Pathway -	Route by which a chemical is transported from the Site to a human or ecological receptor.
Feasibility Study -	A study conducted to ensure that appropriate remedial alternatives are developed and evaluated such that relevant information concerning the remedial action options can be presented to a decision-maker and an appropriate remedy selected.
Hazardous Substance -	A chemical that may cause harm to humans or the environment.
Human Receptor -	A person exposed to chemicals released from a site.
NCP -	National Contingency Plan. A framework for remediation of hazardous substances as specified in CERCLA.
O&M -	Operations and Maintenance. Long-term measures taken at a site, after the initial remedial actions, to assure that a

remedy remains protective of human health and the environment.

OU -	Operable Unit. A subdivision of a site. In the case of Diamond Shamrock, nineteen (19) operable units have been identified based on historical activities, current environmental contamination, and current property ownership. This was done in order to facilitate the feasibility study portion of the RI/FS process.
Preferred Plan -	The plan that evaluates the remedial alternatives presented in the Feasibility Study and identifies the preferred remedial alternative selected Ohio EPA to remediate the Site in a manner that best satisfies the evaluation criteria.
Remedial Action Objectives (RAO) -	Specific goals of the remedy for reducing risks posed by the Site.
Remedial Investigation -	A study conducted to collect information necessary to adequately characterize the Site for the purpose of developing and evaluating effective remedial alternatives.
Responsiveness Summary-	A summary of all comments received concerning the Preferred Plan and Ohio EPA's response to all issues raised in those comments.
RMP-	Risk Management Plan. A plan developed to address risk to workers on a Site during post-remedial activities.
PAHs	Polynuclear aromatic hydrocarbons. Class of semi-volatile chemicals including multiple six-carbon rings. Often found as residue from coal-based chemical processes.
PCBs	Polychlorinated biphenyls. An oily chemical typically used in electrical equipment.

FIGURES

Figure 2 - Map of Present and Propose Brine Wells.
 Diamond Alkali Company
 (submitted to Ohio EPA by the Lake County
 General Health District - 7/14/05)





FEASIBILITY STUDY OPERABLE UNITS
(PARCEL GROUPINGS)

- OU1N- SEE FIGURE 2
- OU1S- SEE FIGURE 2
- OU2- 1C3/1C4
- OU3- 3A1/3B1 (MINUS ONE-ACRE SITE)
- OU4- 7C1/7C2
- OU5- 7C3
- OU6- 2C1
- OU7- 4A1/4A3/4B1/4B2/4C1/1A7
- OU8- 4B3
- OU9- 4A2
- OU10- ONE-ACRE SITE
- OU11- NA (FORMERLY THE EASTERN HALF OF PARCEL 1C4) INCORPORATED INTO OU2, DECEMBER 2003.
- OU12- 1A1/1A2/1A3/1A4/1A5/1A6/1A8/1A9/1A10/1C1/1C2/ (WEST STUDY AREA 1)
- OU13- 7B1
- OU14- 7B2
- OU15- 1B1/1B2/5B1
- OU16- 6B1 (UPLAND)
- OU17- 1C5
- OU18- 1B3
- OU19- 7C4
- OU20- 6B1 (SLOPE/LOWLANDS)



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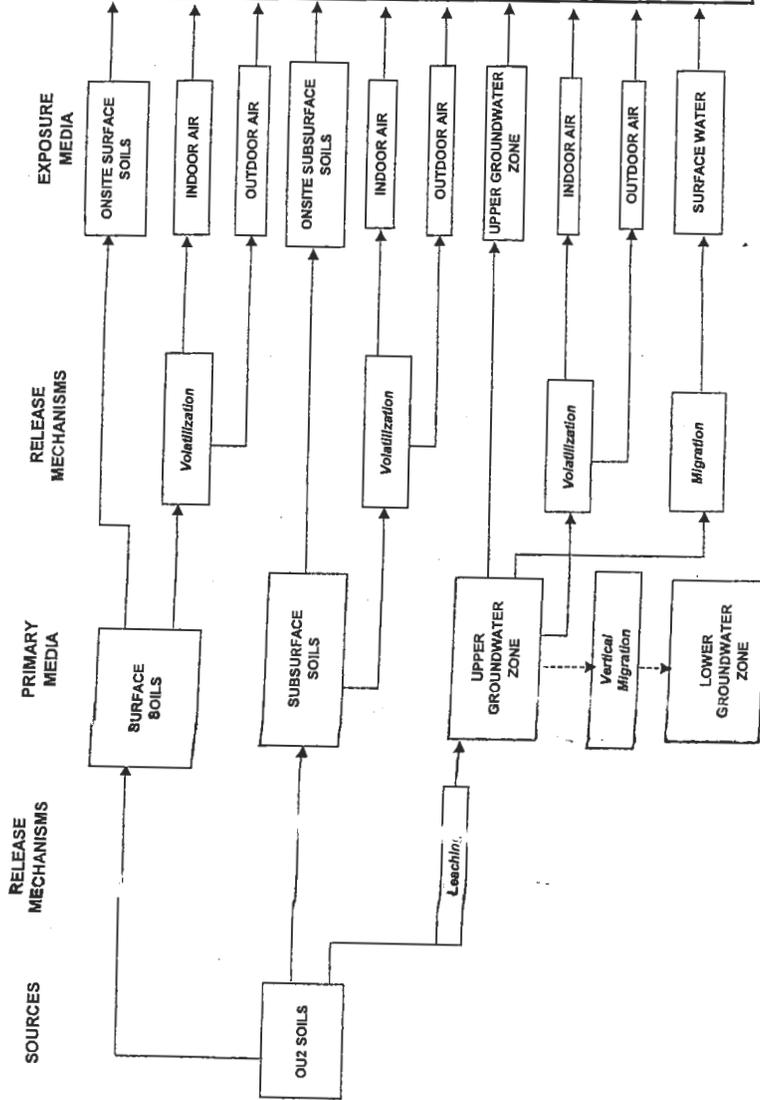
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Figure 2 - Map of the Diamond Shamrock Peainessville Works Site Indicating Individual Operable Units (Hull & Associates, 2005).

PROJECT	10001
SUBMITTAL BASE	APRIL 2005
PLOT DATE	4/16/05

RECEIVED
 JAN 13 2005
 OHIO EPA A-EDC

Current and Future Exposure Scenarios				
Industrial Worker	Resident	Construction Worker	Recreator	Ecological
X	X	X	X	
X	X	X	X	
X	X	X	X	
X	X	X	X	
O*	O*	X	O*	
X	X	X	X	
O**	O**	O**	O**	
X-	X-		X-	O



X = Complete and potentially significant pathway
 O = Complete but insignificant pathway
 No Entry = Incomplete pathway
 - - - = Incomplete pathway

*Volatile emissions from soil to outdoor air were evaluated on the basis of an infinite source model for surface soils. Thus, as VOCs in surface soils are depleted, the model accounts for contributions to surface soil gas from any volatile emissions from subsurface soils.
 **Volatile emissions from soil air, groundwater to outdoor air were evaluated on the basis of an infinite source model for surface soils to outdoor air. Thus, as VOCs in surface soil are depleted, the model accounts for contributions to surface soil gas from any volatile emissions from groundwater.
 ***Volatile emissions within anticipated depth of excavation evaluated for volatile emissions from soil to outdoor air.
 - Risks from a Grand River recreator scenario calculated in the Baseline Human Health Risk Assessment for Site-Wide Issues were added to the OU2 resident and recreator risks to account for this exposure pathway.

FIGURE 3
 HULL & ASSOCIATES, INC.
 SOLON, OHIO

Figure 4 - Conceptual Site Model for Operable Unit OU2
 (Hull & Associates, 2002)

OPERABLE UNIT 2
 DECEMBER 2001
 T1E001

TABLES

Table 1 - Analysis of remedial alternatives (from: Feasibility Study for Operable Unit OU2 (Hull & Associates, 2005)).

FEASIBILITY STUDY
 FORMER DIAMOND SHAMROCK PAINESVILLE WORKS SITE
 OPERABLE UNIT 2 - PARCELS 1C3 AND 1C4

TABLE 1

INDIVIDUAL EVALUATION OF FINAL ALTERNATIVES

(revised from FS Report for Operable Unit OU2 - Table 3)

CRITERIA	ALTERNATIVE OU2-A			ALTERNATIVE OU2-C		ALTERNATIVE OU2-B		ALTERNATIVE OU2-D	
	No Action		Land Use Restriction, Access Restriction, Risk Mitigation Plan	Component C-1 Land Use Restriction, Risk Mitigation Plan, Excavate & Manage On-Site, 0-4 Clean Soil Cover	Component C-2 Land Use Restriction, Risk Mitigation Plan, Excavate & Manage On-Site, 0-4 Clean Soil Backfill	Component C-3 Land Use Restriction, Risk Mitigation Plan, Excavate & Off-Site Disposal, 0-4 Clean Soil Backfill			
Environmental Impacts	Impact equivalent to existing conditions.	Impact equivalent to existing conditions.	Impact equivalent to existing conditions.	Potential stormwater impact during excavation, management and cover placement activities. These impacts can be mitigated. Temporary on-site staging may be required.	Potential stormwater impact during excavation and, to a lesser extent, cover placement activities. These impacts can be mitigated.	Potential stormwater impact during excavation and, to a lesser extent, cover placement activities. These impacts can be mitigated.			
Action is Complete	Not applicable.	Not applicable.	Not applicable.	Clean soil cover placement within 3 months.	Excavation, on-site management and clean soil cover placement within 6 months.	Excavation and clean soil cover placement within 6 months.			
IMPLEMENTABILITY									
Ability to Construct and Operate	No construction or operation.	No construction or operation.	No construction or operation.	Simple to perform and construct. Would require materials handling of 49,100 cy of imported fill.	Simple to perform and construct. Would require materials handling of 20,600 cy of impacted soil cy and 62,800 cy of imported fill.	Simple to perform and construct. Would require materials handling of approximately 20,600 cy of impacted soil and 43,100 cy of imported fill.			
Ease of Doing More Action if Needed	If monitoring indicates action is necessary, may need to go through FS process again.	If monitoring indicates action is necessary, may need to go through FS process again.	If monitoring indicates action is necessary, may need to go through FS process again.	Simple to repair or extend cover soil system.	Simple to visually monitor cover system. No groundwater monitoring proposed.	May require specific agency approval to manage excavated material on-site.			
Ability to Monitor Effectiveness	No monitoring.	No monitoring.	No monitoring.	See Alternative OU2-A.	Contractors and borrow sources readily available.	Contractors and borrow sources readily available.			
Ability to Obtain Approvals and Coordinate with Other Agencies	No approval necessary.	No approval necessary.	No approval necessary.	Equipment and borrow sources readily available. No specialist requirements.	See Component C-1.	See Component C-1.			
Availability of Services and Capacities	Not applicable.	Not applicable.	Not applicable.	See Component C-1.	See Component C-1.	See Alternative OU2-A.			
Availability of Equipment, Specialists and Materials	Not applicable.	Not applicable.	Not applicable.	See Component C-1.	See Component C-1.	See Component C-1.			

**FEASIBILITY STUDY
FORMER DIAMOND SHAMROCK PAINESVILLE WORKS SITE
OPERABLE UNIT 2 - PARCELS 1C3 AND 1C4**

TABLE 1

INDIVIDUAL EVALUATION OF FINAL ALTERNATIVES

(revised from FS Report for Operable Unit OU2 - Table 3)

CRITERIA	ALTERNATIVE OU2-A	ALTERNATIVE OU2-B	COMPONENT C-1 Land Use Restriction, Risk Mitigation Plan, 0-4' Clean Soil Cover ^a	ALTERNATIVE OU2-C COMPONENT C-2 Land Use Restriction, Risk Mitigation Plan, Excavate & Manage On-Site, 0-4' Clean Soil Backfill ^b	COMPONENT C-3 Land Use Restriction, Risk Mitigation Plan, Excavate & Off-Site Disposal, 0-4' Clean Soil Backfill ^c
	No Action	Land Use Restriction, Access Restriction, Risk Mitigation Plan	Land Use Restriction, Risk Mitigation Plan, 0-4' Clean Soil Cover ^a	Land Use Restriction, Risk Mitigation Plan, Excavate & Manage On-Site, 0-4' Clean Soil Backfill ^b	Land Use Restriction, Risk Mitigation Plan, Excavate & Off-Site Disposal, 0-4' Clean Soil Backfill ^c
Estimates ^d					
Land Use	\$0	\$81,000	Not Applicable	Not Applicable	Not Applicable
Additional Land Use	\$0	\$81,000	Not Applicable	Not Applicable	Not Applicable
Initial Land Use	\$0	Not Applicable	\$1,353,100	\$2,129,000	\$3,961,000
Year Annual O&M Cost	\$0	\$0	\$0	\$0	\$0
Present Worth Cost	\$0	\$81,000	\$1,353,100	\$2,129,000	\$3,961,000

a. --- The thickness of clean soil cover is based on direct-contact risk and future land use. For industrial and recreational use scenarios, the RAGS-based risk assessment using the 95% UCL indicates no direct-contact hazard exists. Up to four feet of clean soil cover is proposed to address direct-contact risks in areas proposed for residential use using the maximum concentrations detected in the data set and RAGS protocol. Refer to Tables E-1 through E-4 in Appendix E for a more detailed breakdown of cost, including a -30/+50% range per CERCLA cost estimating guidance.

b. The cost for Components C-1 through C-3 of ALT OU2-C assume that the entirety of OU2 is addressed by that component. In actuality, the cost for ALT OU2-C, which includes all three components, will fall within the cost range of these components.

c. No long-term operation and maintenance are anticipated for any of the remedial alternatives. Annual preparation/Risk Mitigation Plan report is included in the capital cost estimates.

d. No long-term operation and maintenance are anticipated for any of the remedial alternatives.

APPENDICES

Appendix A

**Input parameters and assumptions for post-remedy (confirmatory)
risk assessment for Operable Unit OU2.**

**[copied and/or modified from FS Report for Operable Unit OU2
(Hull, 2004).]**

POST-REMEDY RISK ASSESSMENT INPUTS / ASSUMPTIONS

TABLE 1

BASELINE INDUSTRIAL WORKER SCENARIO: EXPOSURE FACTOR VALUES FOR HUMAN HEALTH RISK ASSESSMENT FOR SOIL DATA

(from FS Report for Operable Unit OU2 - Appendix A - Table 3-3 (Hull, 2004))

Exposure Factor	Industrial Worker
BW - Body Weight (kg)	70 a
ATc - Averaging Time Carcinogenic (days)	25,550 a
ATn - Averaging Time Non-Carcinogenic (days)	9,125 a
ED - Exposure Duration (years)	25 a
EF - Exposure Frequency (days/year)	250 a
IR - Ingestion Rate Soil (mg/day)	100 b
InhR - Inhalation Rate (m ³ /hour)	1.6 c
AF - Soil to Skin Adherence Factor (mg/cm ²)	0.2 d
SA - Surface Area of Exposed Skin (cm ²)	3,300 d
ET - Exposure Time (hr/day)	8 e
PEF-Particulate Emission Factor (m ³ /kg)	6.26E+08 f

- a Risk Assessment Guidance for Superfund, Part B - Development of Risk-Based Preliminary Remediation Goals U.S. EPA, 1991.
- b Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, USEPA, 2002.
- c Exposure Factors Handbook value for adults involved in moderate activities, U.S. EPA, 1997.
- d Risk Assessment Guidance for Superfund, Part E Supplemental Guidance for Dermal Risk Assessment, U.S. EPA, 2004.
- e Professional judgement based on an average work day.
- f Site-specific based on USEPA's Soil Screening Guidance Calculation for a 30-acre Site in Cleveland

POST-REMEDY RISK ASSESSMENT INPUTS / ASSUMPTIONS

TABLE 2

BASELINE CONSTRUCTION WORKER SCENARIO: EXPOSURE FACTOR VALUES FOR HUMAN HEALTH RISK ASSESSMENT FOR SOIL DATA

(from FS Report for Operable Unit OU2 - Appendix A - Table 3-10 (Hull, 2004))

Exposure Factor	Construction/Excavation Worker	
BW - Body Weight (kg)	70	a
ATc - Averaging Time Carcinogenic (days)	25,550	a
ATn - Averaging Time Non-Carcinogenic (days)	365	a
ED - Exposure Duration (years)	1	a
EF- Exposure Frequency (days/year)	250	a
IR - Ingestion Rate Soil (mg/day)	330	a
InhR - Inhalation Rate (m ³ /hour)	2.5	a
AF - Soil to Skin Adherence Factor (mg/cm ²)	0.7	b
SA - Surface Area of Exposed Skin (cm ²)	3,300	b
ET - Exposure Time (hr/day)	8	c
PEF-Particulate Emission Factor (m ³ /kg)	6.26E+08	d

- a Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, USEPA 2002.
- b Risk Assessment Guidance for Superfund, Part E Supplemental Guidance for Dermal Risk Assessment, U.S. EPA, 2004.
- c Professional judgement based on an average workday.
- d Site-specific based on USEPA's Soil Screening Guidance Calculation for a 30-acre site in Cleveland.

TABLE 3

BASELINE CONSTRUCTION WORKER SCENARIO: EXPOSURE FACTOR VALUES FOR GROUNDWATER
 (from FS Report for Operable Unit OU2 - Appendix A - Table 3-16 (Hull, 2004))

Exposure Factor	Construction Worker
BW - Body Weight (kg)	70 a
ATc - Averaging Time Carcinogenic (days)	25,550 a
ATn - Averaging Time Non-Carcinogenic (days)	365 a
ED - Exposure Duration (years)	1 a
EF - Exposure Frequency (days/yr)	250 a
IRgw - Ingestion Rate Groundwater (L/event)	0.01 c
AF - Soil to Skin Adherence Factor (mg/cm ²)	0.7 b
SA - Surface Area of Exposed Skin (cm ² /day)	3,300 b
ET - Exposure Time to Groundwater (hr/day)	2 c

References:

- a Draft Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, USEPA 2001.
- b Risk Assessment Guidance for Superfund, Part E Supplemental Guidance for Dermal Risk Assessment, Interim, U.S. EPA, 2001.
- c Site-specific estimated extrapolated from Residential Scenario for Risk Assessment Guidance for Superfund, U.S. EPA, 1989.

POST-REMEDY RISK ASSESSMENT INPUTS / ASSUMPTIONS

TABLE 4

BASELINE ADULT RESIDENTIAL SCENARIO: EXPOSURE FACTOR VALUES FOR HUMAN HEALTH RISK ASSESSMENT FOR SOIL DATA

(from FS Report for Operable Unit OU2 - Appendix A - Table 3-20 (Hull, 2004))

Exposure Factor	Adult Resident	
BW - Body Weight (kg)	70	a
ATc - Averaging Time Carcinogenic (days)	25,550	a
ATn - Averaging Time Non-Carcinogenic (days)	8,760	a
ED - Exposure Duration (years)	24	a
EF - Exposure Frequency (days/year)	350	a
IR - Ingestion Rate Soil (mg/day)	100	a
InhR - Inhalation Rate (m ³ /hour)	1	b
AF - Soil to Skin Adherence Factor (mg/cm ²)	0.07	c
SA - Surface Area of Exposed Skin (cm ²)	5,700	c
ET - Exposure Time (hr/day)	24	d
PEF-Particulate Emission Factor (m ³ /kg)	1.21E+09	e

- a Risk Assessment Guidance for Superfund, Part B - Development of Risk-Based Preliminary Remediation Goals U.S. EPA, 1991.
- b USEPA Exposure Factor's Handbook, 1997.
- c Risk Assessment Guidance for Superfund, Part E Supplemental Guidance for Dermal Risk Assessment, U.S. EPA, 2004.
- d Resident assumed to spend all 24 hours per day at home.
- e Site-specific based on USEPA's Soil Screening Guidance Calculation for a 0.5-acre site in Cleveland

POST-REMEDY RISK ASSESSMENT INPUTS / ASSUMPTIONS

TABLE 5

BASELINE CHILD RESIDENTIAL SCENARIO: EXPOSURE FACTOR VALUES FOR HUMAN HEALTH RISK ASSESSMENT FOR SOIL DATA

(from FS Report for Operable Unit OU2 - Appendix A - Table 3-26 (Hull, 2004))

Exposure Factor	Child Resident	
BW - Body Weight (kg)	15	a
ATc - Averaging Time Carcinogenic (days)	25,550	a
ATn - Averaging Time Non-Carcinogenic (days)	2,190	a
ED - Exposure Duration (years)	6	a
EF- Exposure Frequency (days/year)	350	a
IR - Ingestion Rate Soil (mg/day)	200	a
InhR - Inhalation Rate (m ³ /hour)	1	b
AF - Soil to Skin Adherence Factor (mg/cm ²)	0.2	c
SA - Surface Area of Exposed Skin (cm ²)	2,800	c
ET - Exposure Time (hr/day)	24	d
PEF-Particulate Emission Factor (m ³ /kg)	1.21E+09	e

- a Risk Assessment Guidance for Superfund, Part B - Development of Risk-Based Preliminary Remediation Goals U.S. EPA, 1991.
- b USEPA Exposure Factor's Handbook, 1997.
- c Risk Assessment Guidance for Superfund, Part E Supplemental Guidance for Dermal Risk Assessment, U.S. EPA, 2004.
- d Resident assumed to spend all 24 hours per day at home.
- e Site-specific based on USEPA's Soil Screening Guidance Calculation for a 0.5-acre site in Cleveland

POST-REMEDY RISK ASSESSMENT INPUTS / ASSUMPTIONS

TABLE 6

BASELINE ADULT RECREATOR SCENARIO: EXPOSURE FACTOR VALUES FOR HUMAN HEALTH RISK ASSESSMENT FOR SOIL DATA

(from FS Report for Operable Unit OU2 - Appendix A - Table 3-33 (Hull, 2004))

Exposure Factor	Adult Recreator	
BW - Body Weight (kg)	70	a
ATc - Averaging Time Carcinogenic (days)	25,550	a
ATn - Averaging Time Non-Carcinogenic (days)	8,760	a
ED - Exposure Duration (years)	24	b
EF- Exposure Frequency (days/year)	175	c
IR - Ingestion Rate Soil (mg/day)	100	d
InhR - Inhalation Rate (m ³ /hour)	1	b
AF - Soil to Skin Adherence Factor (mg/cm ²)	0.07	c
SA - Surface Area of Exposed Skin (cm ²)	5,700	d
ET - Exposure Time (hr/day)	4	c
PEF-Particulate Emission Factor (m ³ /kg)	6.26E+08	e

- a Risk Assessment Guidance for Superfund, U.S. EPA, 1989.
- b USEPA Exposure Factors Handbook, 1997a.
- c Site-specific based on activity and climate patterns of Ohio.
- d Risk Assessment Guidance for Superfund, Part E, Supplemental Guidance for Dermal Risk Assessment, USEPA 2004.
- e Site-specific based on USEPA's Soil Screening Guidance Calculation for a 30-acre site in Cleveland

POST-REMEDY RISK ASSESSMENT INPUTS / ASSUMPTIONS

TABLE 7

BASELINE CHILD RECREATOR SCENARIO: EXPOSURE FACTOR VALUES FOR HUMAN HEALTH RISK ASSESSMENT FOR SOIL DATA

(from FS Report for Operable Unit OU2 - Appendix A - Table 3-39 (Hull, 2004))

Exposure Factor	Child Recreator	
BW - Body Weight (kg)	15	a
ATc - Averaging Time Carcinogenic (days)	25,550	a
ATn - Averaging Time Non-Carcinogenic (days)	2,190	a
ED - Exposure Duration (years)	6	b
EF - Exposure Frequency (days/year)	175	c
IR - Ingestion Rate Soil (mg/day)	200	d
InhR - Inhalation Rate (m ³ /hour)	0.66	b
AF - Soil to Skin Adherence Factor (mg/cm ²)	0.2	c
SA - Surface Area of Exposed Skin (cm ²)	2,800	d
ET - Exposure Time (hr/day)	4	c
PEF-Particulate Emission Factor (m ³ /kg)	6.26E+08	e

- a Risk Assessment Guidance for Superfund, U.S. EPA, 1989.
- b USEPA Exposure Factors Handbook, 1997a.
- c Site-specific based on activity and climate patterns of Ohio.
- d Risk Assessment Guidance for Superfund, Part E Supplemental Guidance for Dermal Risk Assessment, U.S. EPA, 2004.
- e Site-specific based on USEPA's Soil Screening Guidance Calculation for a 30-acre site in Cleveland

POST-REMEDY RISK ASSESSMENT INPUTS/ASSUMPTIONS

TABLE 8

SUMMATION OF LAKE ERIE^a AND GRAND RIVER RESIDENT OR RECREATOR RISKS
 (modified from FS Report for Operable Unit OU2 - Appendix A - Table 5-14 (Hull, 2004))

Receptor ^b	Non-Cancer Hazard	Cancer Risk
Adult Grand River Recreator / Resident	0.1	4.3×10^{-6}
Child Grand River Recreator / Resident	0.5	7.5×10^{-6}

- a. Risks from Lake Erie media were qualitatively assessed as part of the Lake Erie and Grand River Baseline Human Health Risk Assessment (Hull 2003)
- b. Adult fisher and child recreator risks calculated in the Phase II RI Appendix S-1 - Lake Erie and Grand River Baseline Human Health Risk Assessment (Hull, 2003).

Appendix B
Responsiveness Summary

RESPONSIVENESS SUMMARY

for OU2 and OU6 of the Diamond Shamrock Painesville Works
Lake County, Ohio

Please note that this responsiveness summary contains comments pertaining to both OU2 and OU6 of the Diamond Shamrock Painesville Works. The public hearings for the preferred plans for both OUs were held simultaneously on July 7, 2005 and many of the letters received during the public comment period referred to both OU2 and OU6. Therefore, Ohio EPA has selected to present the Agency's responses to the preferred plans for OU2 and OU6 in a single responsiveness summary.

Comments from Lake County General Health District

- (1) *In the above referenced documents (Feasibility Studies for OU2 and OU6, Ohio EPA comments on the Feasibility Studies for OU2 and OU6, and the Preferred Plans for OU2 and OU6) under either end use, there are references to the construction of buildings to be slab on grade. Generally, construction of a house or commercial building constructed on a slab requires the construction of footings below frost to provide the stability of the slab and keep it from moving with freeze and thaw. Installation of the footings could be well below the 2 or 4 foot point of compliance considering the compliance will be achieved by the placement of clean soil on top of the contaminated soil. Installation of the underground utilities such as water and sewer lines will also be below the 2 or 4 foot point of compliance. Both the piping and bedding materials typical for the installation of utilities can act as a conduit creating a pathway for the migration of contamination to other areas of the site or potentially off site. With this in mind, please consider the following questions/concerns:*
- (a) *Will the risk management plan address the risk to the construction workers working below the points of compliance?*
 - (b) *Will Ohio EPA monitor the construction activities (buildings, utilities) to ensure that the risk management plan is followed?*
 - (c) *Does a risk management plan require notification of all construction workers and builders regarding risks and precautions?*
 - (d) *What plan will address the potential for the migration of contaminants on and off the site? Does Ohio EPA review and approved the plan? If so, does Ohio EPA require monitoring of the activities and sampling during construction and in the future?*
 - (e) *If the contamination were to migrate on or off site, (such as the chromium has in the sewer trench along Fairport Nursery Rd.) who will be responsible to correct the problem? Does Ohio EPA have the enforcement authority to ensure that a responsible entity corrects the problem?*

Ohio EPA Response:

- (a) The risk management plan (RMP) that will be established for the OU will require that precautions be taken by workers to minimize potential exposure to contaminants which remain below the required 2 or 4 foot point of compliance (POC). In addition, the RMP will specify how potentially contaminated material must be handled and appropriately disposed during construction activities, in order to protect current and future occupants of the OU.
- (b) It is the responsibility of the current property owner and developer to ensure that the RMP is followed by workers. To the extent that these activities occur while other remedial activities are being performed on the Diamond Shamrock Painesville Works, Ohio EPA may be checking on the progress of development activities. If concerns regarding failure to follow the RMP are brought to the Agency's attention by citizens, political entities or others, Ohio EPA will immediately respond to make sure that current property owner and developer are meeting the requirements of the RMP. The RMP requires that Ohio EPA be notified 15 days in advance of any work which will involve excavation activities within either OU.
- (c) Yes, the RMP requires that all construction worker and builders be notified of the potential risks posed and appropriate methods that must be in place to manage potential exposure to both site workers, recreators and residents.
- (d) The property owner and developer are responsible for insuring that migration of contaminants does not occur due to redevelopment activities on the OU. If plans are part of required remedial activities at the OU, they will be reviewed and approved by Ohio EPA. If the activities are performed outside the scope of remedial activities, those activities must be performed in compliance with applicable statutes and regulations. Should the Agency be made aware of any potential violations of the RMP or any violation of Ohio's environmental statutes or regulations, the Agency will immediately respond.
- (e) See response (d), above.

Yes, Ohio EPA has the authority to enforce Ohio's environmental statutes and regulations, including those regarding contaminant migration.

- (2) *The documents referenced above restrict the use of ground water for potable uses clearly indicating that it is contaminated. Are there other uses that should be restricted such as for irrigation, process water, etc.?*

Ohio EPA Response: In order to eliminate the potential for recontamination of clean soils within the OU, the use of groundwater from the Site for potable and non-potable use, except for ground water monitoring and treatment, will be restricted. This requirement will be addressed in the decision documents.

- (3) *On Page 30 of the Feasibility Study for OU6, there is a statement referring to the maintenance of the Lake Erie shoreline that reads “periodic repair to the shoreline protection system is also anticipated.” What does this mean? Obviously there will be a need to maintain the shoreline protection. Who will be responsible/required to ensure that it is maintained?*

Ohio EPA Response: Ohio EPA will require that the shoreline protection system design be in compliance with applicable statutes and regulations and that all applicable permits, licenses and authorizations be obtained. Ohio EPA will not approve moving forward with construction until all the aforementioned requirements have been satisfied. U.S. Army Corps of Engineers and ODNR maintenance requirements will also be included within the Operation and Maintenance Plan (O&M Plan) established for the shoreline protection system. The property owner and developer are responsible for these activities.

- (4) *In Ohio EPA comments on the Feasibility Study for OU2 there is a comment regarding Appendix A, Executive Summary, page xii regarding an elevated lead sample found. The document states that the lead exposure point concentrations in surface soil at OU2 do not pose an unacceptable health hazard with one exception and that frequent exposures at that one localized area may pose an unacceptable health hazard to a child or adult resident. What actions will be implemented to **prevent** this unacceptable exposure/risk?*

Ohio EPA Response: The area within OU2 that exceeds the direct contact hazard for lead will be covered with a minimum of 4 feet of clean soils and this applicable point of compliance (POC) will be maintained through an O&M Plan.

- (5) *Both Feasibility Study documents state that there are no environmental operation and maintenance costs associated with maintaining a point of compliance under either scenario because the clean back fill will be applied to areas of relatively flat land surface and are not subject to erosion. Placing four feet of soil on a flat area changes the topography and therefore the piles can erode, especially over time during droughty conditions where grass cover dies and heavy rain events follow. To state that no costs are associated indicates that no maintenance is planned or needed of these critical soil piles. The clean soil piles are all that will separate people from the risks associated with the contaminated soils below. This is not acceptable and Ohio EPA should require maintenance of the soils barriers creating the critical point of compliance.*

Ohio EPA Response: Through the Environmental Covenant and the O&M Agreement, the responsible party will be required to maintain a 2 foot POC in recreational areas and a 4 foot POC in residential areas. Ohio EPA will insure that the applicable POCs are maintained during reviews, as required under the O&M Agreement.

- (6) *The Feasibility Study for OU2 indicates that carcinogenic chemicals were*

eliminated by the Detection Frequency Screen and by the U.S. EPA Region 9 PRG Screen. In these discussions the following statements are made in both sections: "Uncertainty associated with the elimination of known, probable and possible human carcinogens by the detection frequency screen may result in an underestimation of potential health risks." "Uncertainty associated with the elimination of known, probably and possible human carcinogens by the U.S. EPA Region 9 PRG Screen may result in an underestimation of potential health risks." Please explain how this issue is being addressed. Will these statements appear in the environmental covenants or deed restrictions so that prospective industries or residents will be advised of these potential risks?

Ohio EPA Response: The language referred to in this comment is commonly included in risk assessments approved by Ohio EPA. It brings awareness to the fact that risk assessment is not an exact science and that data that is utilized in performance of a risk assessment may, at times, be derived from a very limited amount of research. Ohio EPA has made every effort to insure that the remedial standards set for the chemicals of concern at the Diamond Shamrock Painesville Works, including OU2 and OU6, are protective of human health and the environment. This does not guarantee, however, that future research will not determine that the risk levels currently in place at the Site are either over-protective or under-protective. An Environmental Covenant will be put into place for each of the OUs which will contain information regarding Site contamination and will also refer the reader back to the remedial investigations and feasibility studies that have been conducted on the Diamond Shamrock Painesville Works. It will be the responsibility of the prospective industries or residents to review the Environmental Covenant and supporting documentation thoroughly.

- (7) *Enclosed please find a copy of a map "Diamond Alkali Company – Map of Present & Proposed Brine Wells." The map is originally dated 1944 and the most recent entry is dated 1967. The map denotes brine solution mining wells that were active, abandoned and abandoned & plugged at that point in time. The Lake County General Health District has acquired other maps as well that denote brine solution wells and gas wells on the other portions of the Diamond Property located in Painesville City on Jackson St. as well. We acquired these maps from Ohio Department of Natural Resources, Division of Mineral Resource Management and Tierra Solutions. These maps were obtained with concerns of a housing development planned for the Jackson St. property. It is our understanding from the information obtained for ODNR, that many of the older brine solution mining wells on the Fairport Nursery property were abandoned and plugged under the rules and technologies available at the time and that those wells could pose leakage issues in the future. That has already been evidenced by previously plugged wells on the south side of Fairport Nursery Road that had to be resealed a few years back. The issue of subsidence of brine solution mining caverns has also been raised by ODNR through our discussions with Tom Tomastik. Based on the locations of the wells the question of responsibility for repairing old sealed wells should they become a problem must be addressed for these*

operable units at well as all the others. ODNR has advised that buildings/homes should not be constructed over abandoned, plugged brine solution wells or gas/oil wells. Please do the necessary research and address these concerns.

Ohio EPA Response: Ohio EPA is aware of the presence of old brine solution mining and gas production wells across the Diamond Shamrock Painesville Works. A copy of the map which was attached to the Lake County General Health District comments will be included as an attachment to the Decision Document, so that the information is readily available to anyone wishing to develop the Site. Please be aware that the ultimate responsibility for siting a new home or business will be with the zoning department for the local community (City of Painesville, Painesville Township or the Village of Fairport). These entities will be made aware of this map as well.

Comments from Engineering Management Inc. (on behalf of Scepter Management Corporation)

(these comments specifically refer to OU6)

- (1) *Shoreline protection acts to prevent or minimize shore line erosion resulting from wave/current action. Shoreline protection has been constructed elsewhere along the Lake Erie shoreline and is typically designated to protect real estate value. While we acknowledge that in this instance there is an environmental benefit to shoreline protection, the FS and Decision Document should acknowledge the significant real estate protection value (i.e. non-environmental) of the shoreline protection component of the remedies.*

Ohio EPA Response: Ohio EPA included shoreline protection within the preferred plan in order to protect Lake Erie from contamination due to erosion of impacted soils from OU6. Consideration of property values was not part of that decision process.

- (2) *Shoreline protection accounts for approximately 74% (\$4.6 million including contingency) of the \$6.1 million estimated cost for the Active Industrial remedy and approximately 48% of the \$9.5 million estimated cost for the Residential/Recreational remedy. While shoreline protection is the single largest component of the remedies, the FS and Preferred Plan have surprisingly little detail on where the shoreline protection would be constructed, what it will be comprised of and how it will be incorporated into the existing shoreline protection features. Without sufficient detail it is impossible to comment of the efficacy of the proposed approach or the accuracy of the estimated cost.*

Ohio EPA Response: See response to (1), above. As previously stated, Ohio EPA will require that the shoreline protection system design will comply with applicable statutes and regulations and that all applicable permits, licenses and authorizations will be obtained. Ohio EPA will not approve moving forward with construction until

all the aforementioned requirements have been satisfied. U.S. Army Corps of Engineers and ODNR maintenance requirements will also be included within the Operation and Maintenance Plan established for the shoreline protection system.

- (3) *The FS cost estimate for shoreline protection is not supported or justified by the FS or Preferred Plan. Appendix E of the FS identifies a “JJR Opinion of Estimated Costs, February 11, 2005” as the source of support for the shoreline protection cost estimate. However, this document is not included in the FS. We have requested this document from Ohio EPA and were told that Ohio EPA does not have the document. Relying on an “Opinion of Estimated Cost” document that is not included in the administrative record to support such a significant component of the FS cost estimate does not, in our experience, meet the cost documentation standard of practice for FS Reports. Without reasonably detailed support it is impossible to comment on the accuracy of the cost estimate. Given the lack of technical detail for the shoreline protection component of the remedy it is quite possible that the cost estimate reflects a high degree of uncertainty and is inflated. However, without sufficient detail and support we cannot evaluate this possibility...We request that the missing cost documentation identified in this letter be secured and provided for public comment.*

Ohio EPA Response: See response to Comment (2), above.

- (4) *The cost estimates for each of the remedial alternatives shown in Appendix E, Tables E-1 through E-3 include costs for demolition and asbestos abatement. The line items in the tables refer to a “Sevenson Environmental Bid” as the basis of the estimate. However this document is not included in the FS. We requested this document from Ohio EPA and were told that Ohio EPA does not have the document. Without reasonably detailed support it is impossible to comment on the accuracy of the cost estimate...We request that the missing cost documentation identified in this letter be secured and provided for public comment.*

Ohio EPA Response: Similarly to the response provided to Comment (2), above, asbestos removal must be performed in compliance with applicable statutes and regulations.

Comments from Frank Lichtkoppler, Ohio Sea Grant College Program, Ohio State University Extension

- (1) *At the public hearing of July 7, 2005, I mentioned the concern with potential subsidence issues from some of the salt solution wells that may be located on the Diamond Shamrock property.*

Enclosed with this note is a copy of the Geotechnical Red Flag Summary Report regarding the subsurface investigations of the salt solution wells in Painesville, Mentor, Fairport and Painesville Township prepared for the anticipated reconstruction of State Route 2.

Information on the location of the 37 Main Plant wells will be important in the preferred plans for development of OU2 and OU6 as it is recommended that buildings not be constructed over an abandoned wellhead. Subsidence over the abandoned solution wells is a primary geotechnical concern that must be addressed to avoid future problems.

Ohio EPA Response: Ohio EPA will provide a copy of the information provided by Mr. Lichtkoppler to both the Painesville PRP Group and the Site developer so that the information can be included in redevelopment plans for the Site. Local authorities will be made aware of the information, as well.

- (2) *Citizens, I think are looking forward to seeing something besides a wasteland up there. I think it has lots of possibilities for potential good for the community and the citizens out there. We just need to be sure that the environmental regulations are fulfilled and that we have quality assurance and quality control on any of these projects that are going on and we hope that you have the resources to do that and the budget cuts in the state and stuff won't impact you folks.*

We encourage – not knowing as much as we ought to know about this property – a bond or revenue stream for the operation or maintenance is encouraged, to continue this monitoring over a long number of years.

In general, I think it is a good idea personally, as a citizen, that we try and redevelop some of these brownfields for additional uses.

The coastal property, there is no more being made, is all that we have, and if we can put it to better use than an empty field with a fence around it, we encourage – I personally encourage that to be done, as long as it is safe and reliable and that the folks who ultimately live there, work there, play there, fully recognize any of the risks that might be involved and what has gone on there, so that they make a fully-informed decision in purchasing, recreating, using those kinds of properties.

Ohio EPA Response: Ohio EPA will be requesting financial assurance under a future remedial design/remedial action order, to insure that the remedy and long-term monitoring are completed to the Agency's satisfaction.

An Environmental Covenant will be placed on each of the OUs which will, in part, notify anyone purchasing the property of environmental issues associated with the Site. The O&M Plan and RMP will require notification to prospective property owners and Site workers of requirements that must be followed due to restrictions put in place for the Site.

Comments from Art Wolfe, Citizen

I am concerned about possible contamination of the coke oven site by Uranium-238 and similar radioactive elements. The reason is that coal normally contains traces of these radioactive contaminants, and these contaminants may have been concentrated on this site during normal coking operations...Apparently a "fly-over" did not detect an above-average

amount of radioactivity, however it would not be sufficiently sensitive to detect possibly harmful amount of radioactive contaminants in ground water or soil. It seems that a “fly-over” would be detecting mainly gamma radiation because of its long path length and high energy. However some contaminants could be primarily alpha and beta emitters that would not be detected by a fly-over. It might be desirable to analyze samples of ground water and of soil, specifically for the presence of such alpha and beta radioactivity...

Ohio EPA’s Response: The “fly over” which was performed under the U.S. Department of Energy in 1988 was designed to detect low-level gamma radiation and would have been sufficiently sensitive to located gamma radiation in soils across the Diamond Shamrock Painesville Works , as well as in surrounding areas, that could pose a potential risk to human health.

A literature search of scientific journals and other reference material, performed by Ohio EPA, indicates that the amount of radiation released from coal combustion operations is similar to background and does not pose a significant environmental/human health threat. This information when combined with the results of the 1988 “fly over” and the remedial activities selected for OU6, leave Ohio EPA with confidence that radiation sampling is not warranted due to coal combustion activities (coking operations) at this site.

Comments from Russell M. Bimber, Citizen

- (1) *As you know, the 2/25/95 Draft of the Director’s Final Findings and Orders mentioned the presence of buried tankcars and hundreds of 55 gallon drums in the “One Acre Landfill”...Now I contend that the current plan for remediation of OU6 is based on a DFFO which greatly underestimates the hazards of the materials buried in the adjacent landfill. I say those materials may still include over 100,000 gallons of chlorinated solvents in large tanks, and their hazards should preclude allowing any buildings for human occupancy in at least the eastern 500 feet of OU6. The contents of the landfill should become part of the discussion of OU6.*

Ohio EPA’s Response: Remediation of the One Acre Landfill (OU10) and related groundwater (OU 1N-Lake) will be addressed under a separate preferred plan, which will be issued by Ohio EPA. A remedy will be proposed which will include monitoring to insure that contaminants do not migrate from the One Acre Landfill property onto OU6.

- (2) *The Painesville PRP Group presented “An Executive Summary of Key Issues Relating to the Painesville Works Site” (I assume) to EPA in April 1995, but it lacks any useful documentation...If the PRP Group gave Ohio EPA any documents to support this “Executive Summary,” I’d like an appointment to examine them in the Northeast District Office. Are there any such document?*

Ohio EPA’s Response: The Agency does not recall any documents being specifically submitted to the Agency in support of the “Executive Summary” prepared by the Painesville PRP Group. However, if the documentation does exist, it would be part of the Diamond Shamrock Painesville Works public files, which are

located in Ohio EPA's Northeast District Office. You may schedule a file review by contacting Ms. Lily Aaron, at (330) 963-1168.

- (3) *Any fenced "exclusion zones" such as the fenced four acres around the One Acre Landfill, and possibly one around the carcinogenic coal tar residues from the former Coke Plant, should have their property lines extended, along groundwater flow lines, down to the waterline of Lake Erie, to allow for repeated improvements to their erosion barriers.*

Ohio EPA Response: As previously stated, issues concerning the One Acre Landfill will be addressed under the preferred plan for OU10. The design and location of the shoreline protection barriers for OU6 will be approved and permitted by the U.S. Army Corps of Engineers and Ohio Department of Natural Resources. The approved design specifications will be incorporated into the requirements under the RD/RA Order. Operation and Maintenance Agreements for both OU6 and OU10 will include the maintenance requirements of both the U.S. Army Corps of Engineers and Ohio Department of Natural Resources.

Comments from Roger H. Stanley, Citizen

I do have some concern about the EPA plan for the Diamond Shamrock Property, unit 6 (OU6). In discussing clean-up plans with Russ Bimber, a former chemist at Diamond Alkali, I can't help but share his concerns...Though I do not know the details myself, I trust his expertise and good intention...Please give due consideration to any information that he has given you in the past, or may have submitted for the public meeting scheduled for 7/7/05 in Painesville Township.

Ohio EPA Response: All of the comments which are provided to Ohio EPA, both during the public comment period for the preferred plans for OU2 and OU6, as well as at any other time during the remedial investigation process, have been taken into consideration by the Agency. Comments raised by Mr. Bimber, during the public comment period for OU2 and OU6 have been addressed above.

Comments from Anders "Dan" Fjeldstad, Citizen

First off, anytime the EPA cleans up an old industrial site laden with a number of different toxic chemicals is something we can all applaud, as long as it is done properly and the toxic waste is disposed of appropriately. Though, as a taxpayer, I would feel better if those who made the mess paid for its cleanup. But, it is still good that it is finally going to be cleaned up.

Secondly, I'm no expert on how to clean up a site like this will all the various toxics scattered here and there OR whether 2 or 4 feet of clean dirt on top is enough OR whether someone's periodic monitoring of the earth, air, and water can be done "forever."

But I do think that the idea that a piece of ground that was once considered for Superfund status (and dropped more for political and financial reasons than for safety reasons) should

ever be used as a residential area is “crazy!” This, to me, sounds more like a long term “experiment” with the health of the people who would live there. The notion that you could keep small kids and their pets from playing in the yard “forever” is ludicrous. The notion that you could keep any leftover toxics below four feet disregards the constant turnover of the topsoil by rodents, insects, earthworms and even plants. Sometime in the future and somewhere on this property something toxic will arrive at the surface. That’s just the way nature works. The notion that your constant and vigilant monitoring will find IT before some small dog or child will seems to me to be unreasonable. So please reconsider any use of an old industrial site like these as a “residential area!”

As for your plans for either OU2 or OU6 as a new industrial or even commercial site, I would much prefer the former but could live with the latter.

Ohio EPA’s Response: The environmental covenants, risk management plans (RMP) and the O&M Plans that will be developed for OU2 and OU6 provide a means for monitoring activities on the properties in order to limit the possibility of exposure to both human and ecological receptors to contaminants which remain below the required point of compliance. The remedies which have been proposed in the preferred plans for OU2 and OU6 were formulated utilizing standard risk assessment methodologies with conservative assumptions. Ohio EPA believes that the remedies which will be implemented for these properties will provide protection to both human health and the environment.

Comments from Ruth DeGraff, Citizen

Our already contaminated area of Lake County has done enough damage to human health. My blood tests already show high amount of many of the contaminants listed in the News Herald article written about the project in the 7/5/05 edition. I suffer from a dreaded disease possibly enhanced by a very polluted environment. (Chemical plants, Perry Nuclear Plant, local industry, and winds blowing east from the Cleveland area.)

We cannot afford to possibly contaminate Lake Erie because of accidental or improper dumping. The prevailing winds also play a huge role as soil is being dumped or moved. Life and health are more precious than monetary benefits.

We cannot afford to take a chance.

Ohio EPA’s Response: Based on the information available, the remedy which has been selected within this Decision Document is protective of both human health and the environment.

Comments from Ken, Citizen

in regards to OU2 and OU6, diamond shamrock developed the atom bombs that were dropped on japan to end the war at this site, true nothing was mass produced here but plenty of things (uranium ect were brought in here for the research and developement,

phillips metals aka aluminum smelting aka cousins wasn't allowed to sell because of the chromium contamination. I was in a hole we dug that was 4 to 5 feet deep and about 8x8 ft square just on the north side of what was dartron, the walls of the hole were leaching something a color of dark green it was oozing out of the ground it burned our lungs to breath, the smell was something like a strong varnish type of thing tho it wasn't varnish but something kinda pungent, vaporise most definatley a chemical of some sort. we had to take turns in making our repairs because we could not be in that hole for too long at a time. i'm sure you do understand that when ground is dug to make a ditch after its backfilled its loose and crublely almost forever after, and that ground watter and other things can move along that path with less resistance. these sites are a chemical landfill is all, by your own admission no basements or crawls, protective wear for construction people to put living quarters here is rediculous. my best thought for this area would be dirt bike and atv trails in the summer snowmobiles in the winter a golf course for sure. I wouldn't want to livethere knowing what I know and seeing it as it really appears. to bad this is between a river and our lake. and just for the record I don't like the green people not the epa, i'm not an enviromentalist, or a tree hugger, i'm against the peta people too. I don't buy into the global warming thing either, not worried about the ozone layer for sure. i'm sure glad I leave all these important decisions up to smart people tho. hope you all enjoy the view of our wonderful lake p.s. how bout some street names like cancer drive or poison parkway or chemical lane lol seriously tho thanks for the opportunity to comment

Ohio EPA's Response: The area located on the north side of the former Dartron facility is not within the boundaries of either OU2 or OU6, however that portion of the Diamond Shamrock Painesville Works (OU3 and OU18) was thoroughly investigated during Phase II RI activities. No evidence of disposal was found. Based on the information available, the remedies which have been selected OU2 and OU6 are protective of both human health and the environment.