UNION ROAD SITE
Erie County, New York
Site No. 9-15-128

RECORD OF DECISION
March 1992

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PREPARED BY
NEW YORK STATE DEPARTMENT OF
ENVIRONMENTAL CONSERVATION

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Town of Cheektowaga, Erie County, New York
Site No. 9-15-128

STATEMENT OF PURPOSE:

This Record of Decision (ROD) sets forth the selected Remedial Action Plan (RAP) for the Union Road Site. This RAP was developed in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, and the New York State Environmental Conservation Law (ECL). The selected remedial plan complies to the extent practicable with the National Oil and Hazardous Substance Pollution Contingency Plan, 40 CFR Part 300, of 1985 as revised in 1990.

STATEMENT OF BASIS:

This decision is based upon the Record of the New York State Department of Environmental Conservation (NYSDEC) for the Union Road Site and upon public input to the Proposed Remedial Action Plan (PRAP) presented by the NYSDEC. A copy of all the pertinent documents is on file at the Cheektowaga South Branch Library, 2660 Williams Street, Cheektowaga, New York and at the office of the NYSDEC, 270 Michigan Avenue, Buffalo, New York and 50 Wolf Road, Albany, New York. A bibliography of the documents included as a part of the Record is included in the Appendix. The New York State Department of Health (NYSDOH) concurs with the selected remedy.

DESCRIPTION OF SELECTED REMEDY:

The selected RAP will control the off-site migration of contaminants from the site and will provide for the protection of public health and the environment. It is technically feasible and it complies with statutory requirements. Briefly, the selected RAP includes the following:

- Waste consolidation and installation of a soil-bentonite (SB) slurry wall surrounding the disposal area, and keyed into underlying clay layer. The slurry wall will act as a groundwater cutoff wall, preventing leachate escape to the Slate Bottom Creek.

- Installation of a flexible membrane liner (FML) cap over the site.

- Pumping of shallow/perched contaminated groundwater, treatment and discharge.

- Collection of contaminated surface water from the marsh area, treatment and discharge.

- Restoration/relocation of marsh.

- Lining of the Deer Lik and Slate Bottom Creeks.
- Provide clean soil cover over the contaminated surface soil in roundhouse area.
- Limited action alternatives which will include the deed restrictions and monitoring.

DECLARATION:

The selected RAP is protective of human health and the environment. The remedy selected will meet the substantive requirements of the Federal and State laws, regulations and standards that are applicable or relevant and appropriate to the remedial action. The remedy will satisfy the statutory preference for remedies that employ treatment that reduce toxicity, mobility or volume as a principal element. This statutory preference will be met by eliminating the mobility of contaminants with a direct pathway of migration to the Creek; and by treating contaminated groundwater to reduce the toxicity. The long term health risk associated with contact with the surface soils will be eliminated by the installation of the soil cap.

Because the remedy will result in hazardous substances remaining on the site above health based levels, the five year review will apply to this remedial action.

3-9-92
Date

Edward O. Sullivan

Section 1: SITE LOCATION AND DESCRIPTION

The Union Road site is located in the Town of Cheektowaga, Erie County, New York, on property about one mile east of Union Road, between Losson and French Roads (see Figure No. 1-1). Primary site access is from Losson Road. Delineation of the site boundary is illustrated in Figure No. 1-2 which measures approximately 70 acres.

The site was the former location of a large railroad facility which comprised a classification yard, maintenance facilities and waste disposal area. This facility was operated for approximately 40 years from about 1915 to 1955. Located within the site area is an open waste lagoon, an area containing buried waste material and contaminated soil, and a marsh with contaminated sediment.

The area in the vicinity of the Union Road site is characterized by generally flat topography with a gentle slope ranging from 1 to 3 percent.

The area immediately surrounding the disposal area at the Union Road site consists of fields and woods with some low lying marsh areas. Residential areas exist essentially adjacent to the site to the north and west, and within 1/8 mile to the east and south. Commercial buildings are located within one mile of the site on Losson, Union and French Roads. A Town of Cheektowaga Park is situated about 1/2 mile northeast of the site.

Runoff from the site drains generally southeastward through a marsh area to Deer Lik Creek which in turn flows into Slate Bottom Creek which is a tributary of Cayuga Creek located approximately one mile west of the site. The nearest regulated New York State Wetland (LA-6) is located approximately one mile northeast of the site (upstream location). There are no known critical habitats, or endangered or threatened species within one mile of the Union Road site. There are no known uses of groundwater within three miles of the Union Road site and no known surface water intakes within three miles downstream of the site. All residents within a one mile radius of the site are connected to the public water supply.

Section 2: SITE HISTORY

2.1 Site Use:

It is reported that a railroad maintenance facility operated by the New York Central RailRoad (NYCRR) commenced operation in the area adjacent to, and including the Union Road site in early 1900.

Review of historical aerial photographs indicates that by 1928, one roundhouse, several maintenance and storage buildings, tanks and numerous sheds were constructed in the vicinity of the site. The railroad yard operated until the mid-1950's and was dismantled sometime between 1951 and 1958 as indicated by historical photographs.

The tar pit/lagoon is believed to be a man-made depression into which the now defunct NYCRR deposited waste oil, lubricants, tars, sludges and equipment cleaning solutions from rail car and locomotive servicing and repairs. A 1938 photograph shows a railroad spur that extends from the main tracks and terminates at the depression. This spur allowed for the transfer of the waste from the maintenance facility/classification yard to the disposal area and the tar pit.

On January 20, 1960, the Witben Realty Corporation, a Florida based land development corporation and present owner, took title to approximately 71 acres of land which includes the tar pit, disposal area and the roundhouse area of the Union Road Site.

2.2 **Area of Concern**:

The portions of the site which are of concern are:

a. The tar pit/lagoon approximately 1/4 acre in area and potentially four to five feet deep containing tar like waste.

b. Waste disposal area south of the tar pit. The 1938 aerial photograph indicates land disposal activity in the area.

c. Roundhouse area. Remains of the underground structures exist at the site.

d. Slate Bottom Creek, the presence of orange colored drainage ways in the marsh area, oil sheen present in the tar pit discharge, and presence of tar like materials in the banks of Slate Bottom Creek are indications that contamination is moving off-site.

2.3 **Previous Investigations**:

a. During December 1982 the Erie County Department of Environment and Planning (DEP) responded to a complaint and did preliminary investigations of the site. Infrared analysis of the tar like samples indicated characteristics of asphalt and lube oil. In April 1983, DEP resampled the site.

b. During July 1983-May 1984, RECRA Research, Inc. (RECRA) a consultant for Universal Marion/Witben Realty (current owner of the site), performed a technical evaluation of the site.

c. In May 1986, Town of Cheektowaga constructed a snow fence around the site's perimeter and posted signs.

d. In May 1986, a Phase I Investigation was completed by RECRA for the New York State Department of Environmental Conservation (NYSDEC).

e. In December 1986, the site was referred to the United States Environmental Protection Agency (USEPA) for interim removal measures. During 1988 USEPA installed a hi-vis fence around the site, posted hazardous waste signs, and installed a filter fence to prevent/minimize migration of oil/waste to the Slate Bottom Creek.

Section 3: <u>CURRENT STATUS</u>

3.1 Introduction:

The EP toxicity characteristic analysis performed by USEPA on the tar sample indicated a EP Toxicity concentration of 130 mg/l for total lead, thereby classifying the waste as hazardous by definition of the Resource Conservation and Recovery Act (RCRA). Since the site posed a significant threat to the health and the environment and the hazardous waste was confirmed, the proposed Phase II investigation was dropped and the site was referred to conduct the Remedial Investigation/Feasibility Study (RI/FS) under State Superfund Program.

The RI was conducted in two phases by Consulting Engineers, Dvirka and Bartilucci (D & B) for NYSDEC during December 1988 to November 1990. The components of the RI comprised the following:

- Aerial photography and topographic mapping.
- Geophysical survey.
- Waste lagoon/tar pit sampling.
- Drum sampling.
- Test pit and test trench excavation and sampling.
- Surface water and sediment sampling.
- Soil boring and sampling in areas of buried waste.
- Surficial soil sampling.
- Monitoring well soil boring and sampling.
- Monitoring well installation and groundwater sampling.
- Hydraulic conductivity/slug testing.
- Packer testing/sampling of bedrock monitoring wells.
- Construction of security fence.
- Placement of booms and berm in marsh area.
- Placement of warning signs along creek banks.
- Air monitoring.

3.2 Results of the Remedial Investigation:

<u>3.2.1 Geophysical Survey</u>: Geophysical techniques utilized during the investigation included magnetic surveying, resistivity surveying and terrain conductivity profiling. These surveys were used as an aid in the location of areas of buried waste and contaminated groundwater and placement of monitoring wells, waste borings and test pits.

On the basis of the geophysical surveys conducted at the Union Road site, it was concluded that:

a. Buried metal objects, some of which could be drums, are broadly distributed in the fill on the south side of the tar pit.

b. Material inferred to be tar like because of its electrical properties (low resistivity) extends for about 300 feet to the southwest of the present open tar pit, approximately along the alignment of the former railroad spur at the site.

3.2.2 Geology: The geological features of the site are delineated in geologic cross sections AA' and BB' (See Figures 3-13, 3-14 and 3-11 in Appendix). The Onondaga limestone bedrock at the site is extremely competent except for the upper 5 to 10 feet which is weathered and fractured. The bedrock surface elevations at the site varies from 572 feet to 588 feet (MSL). The surface elevation at the site varies from 615 to 625 feet (MSL) except for the lagoon where the surface elevation drops to 604 feet (MSL). The bedrock is found to be generally overlain by a 5 foot to 23 foot layer of till (in the southwestern portion) and 12 feet to 30 feet of clay.

3.2.3 Hydrogeology: The Union Road site can be divided hydrogeologically into three aquifer systems:

- o Bedrock Aquifer
- o Overburden/Bedrock Interface Aquifer
- o Shallow/Perched Fill Aquifer

Analysis of groundwater elevations indicates a general northeasterly flow of groundwater in the bedrock aquifer, southwesterly flow in overburden/bedrock interface aquifer and southeasterly (towards Slate Bottom Creek) in shallow (perched) fill aquifer. The surface drainage from the Union Road site dicharges to Slate Bottom Creek, either directly or through marsh.

3.2.4 Nature and Extent of Contamination: The frequency, range of concentration and location of maximum concentration of each contaminant for the following media; groundwater, surface water and surface water sediment, marsh sediment, surficial soil, subsurface soil, test pit soil and tar pit waste are presented in Tables 4-96 through 4-103 in the Appendix and presented in the RI/FS.

3.2.4.1 Tar Pit: The tar pit is an exposed waste lagoon. Based on the nature of the waste and historical information, the material in the tar pit comprises highly contaminated waste oils and lubrication grease, as well as possibly waste solvents, disposed during operation of the former railroad facility. The analytical results indicates that lagoon waste contains elevated concentrations of volatile organic compounds and very high levels of metals including antimony, arsenic, copper, mercury, silver, zinc and in particular lead, as well as polycyclic aromatic hydrocarbons (PAHs) base neutral compounds and petroleum hydrocarbons (PHCs).

The waste material in the tar pit exceeds EP Toxicity limits for lead. As a result, the material in the tar pit is characterized as a hazardous waste. The frequency and range of concentration of each contaminant detected in the tar pit waste is presented in RI Table 4-103 (Appendix). The tar pit has an exposed surface area of about 9,000 square feet and is four to five feet in depth, constituting approximately 1,700 cubic yards of waste material. The waste material appears to be relatively homogeneous throughout the tar pit.

3.2.4.2 Subsurface Soil/Fill Material/Buried Waste: Significant amounts of waste material and highly contaminated soil are buried about 15 feet below ground surface within the disposal area immediately southwest of the tar pit. The buried waste material is the same as that in the tar pit and resulted from waste disposal activities at the former railroad facility. The volume of this material is estimated to be 25,000 cubic yards.

In addition to the buried waste material underlying the disposal area, the fill material overlying the buried waste, exhibit elevated concentrations of PAHs, petroleum hydrocarbons and lead, as well as chromium, copper and nickel. The depth of the fill overlying the buried waste is approximately 15 feet, which results in a volume of 80,000 cubic yards, including the surficial soils.

Subsurface soil in an area immediately southwest of the former roundhouse was found to be contaminated with fuel oil. Soil samples from this area exhibit levels of semi-volatile organic compounds, petroleum hydrocarbons and lead, as well as arsenic and copper. The aerial extent of the fuel oil contaminated material is about 10,000 to 12,000 square feet and the depth approximately 1 to 5 feet below grade, which results in an estimated volume of 1,800 cubic yards.

Section AA' and EE' (Figure 3-15, 3-19 and 3-11 in Appendix) delineate the waste and fill in the disposal area. Although this buried waste material and fill does not constitute a direct threat to human or ecological health, through direct contact, ingestion or inhalation, it does cause contamination of groundwater and most likely impacts the surface waters and sediments surrounding the site through discharge of contaminated groundwater into surface water body.

3.2.4.3 Surficial Soil: Surficial soil in the disposal area is for the most part stained with oil and generally contains elevated concentrations of PAHs, base neutral compounds, petroleum hydrocarbons and metals, including antimony arsenic, cadmium, copper, zinc and in particular lead, which are well in excess of background concentrations. Asbestos (between 2-10% chrysotile) was found in a few surficial soil samples in the disposal area and roundhouse area in excess of that considered to be a concern by USEPA. EP Toxicity limits were exceeded for lead in two of four samples analyzed. The surface area of contaminated soil in the disposal area is approximately 145,000 square feet. Samples of surficial soil obtained in the roundhouse area and south of the former roundhouse also exhibit contamination; however, except for PAHs, the degree of contamination is substantially less than that found in the disposal area. For the most part, surficial material encountered in the roundhouse area (and to the south) is largely comprised of cinder-like material, whereas the disposal area is overburden. The arsenic exceeded the risk-based cleanup concentration.

3.2.4.4 Groundwater: Groundwater in the bedrock aquifer is contaminated by benzene, ethyl-benzene, toluene and xylene. However, the source of this contamination is either a natural occurence (which is most likely) or off-site.

The till aquifer immediately overlying bedrock and underlying the buried waste and fill material in the disposal area, also exhibits contamination by antimony chromium and lead, in excess of NYS Groundwater Standards.

The perched aquifer in the fill and buried waste in the disposal area, is discolored, and has an oil sheen and fuel odor, and shows high levels of copper, chromium, lead, antimony and arsenic above NYS Groundwater Standards. The semi-volatile organic compounds, including PAHs and petroleum hydrocarbons are also at elevated levels. The perched aquifer in the roundhouse area indicates antimony in excess of NYS Groundwater Guidance Values and base neutral compounds at elevated levels. It is apparent that perched (and till) groundwater contamination is caused by waste disposal operations at the former railroad facility. The volume of contaminated groundwater underlying the disposal area in the perched/fill aquifer is estimated to be approximately 1.8 million gallons. The Figure 2-8 indicates the locations of the monitoring wells.

3.2.4.5 Surface Water: Except for iron, which appears to be indigenous to the area of the Union Road site, analytical results of samples obtained form Slate Bottom and Deer Lik Creeks did not contravene NYS Surface Water Standards and Guidelines for either Class C or D water bodies, and undisturbed samples obtained from the marsh contiguous to the tar pit, also did not exceed Surface Water Standards and Guidelines.

3.2.4.6 Surface Water Sediment: Surficial sediment in Slate Bottom and Deer Lik Creeks, both upstream and contiguous to the site, generally exhibits elevated levels of petroleum hydrocarbons and base neutral compounds however, the highest concentrations of these contaminants, as well as lead, are located downstream of the site.

Sediment in the march adjacent to the tar pit (being closer to the waste source) shows substantially higher contaminant levels as compared to the sediment in the creeks. Concentrations of base neutral compounds, and petroleum hydrocarbons and lead in particular, are very high. Other metals found in the surficial marsh sediment include antimony, arsenic, copper and zinc. Lead and antimony were found in exceed risk-based cleanup concentrations for the site.

The aerial extent of the contaminated portion of the marsh comprises a surface area of approximately 40,000 square feet. Based on an average depth of contaminated sediment of about 5 feet, the estimated volume of contaminated marsh is 8,000 cubic yards.

3.2.5 Contaminant Fate and Transport:

o Tar Pit:

The primary route of contaminant migration from the tar pit appears to be runoff from the surface of waste lagoon resulting from precipitation, which flows into the marsh downgradient of the lagoon and eventually into Deer Lik and Slate Bottom Creeks. Oil was observed on water ponded on the surface of the waste material adjacent to the marsh area. The bulk tar like material itself, because of its highly non-viscous nature does not appear to be migrating horizontally at the present time. Past migration of tar like material to Deer Lik Creek and Slate Bottom Creek is evident.

o Surficial Soil:

Due to the high affinity of both organic compounds and metals to soil, it is unlikely that contaminated surficial soil poses a significant threat to groundwater. These soils, especially in the disposal area, could be transported by surface runoff into the marsh area, Deer Lik Creek and Slate Bottom Creek. However, it appears that the greatest threat is most likely due to direct/dermal contact or ingestion, and inhalation of these contaminants if they become airborne as dust particles. Similar to runoff and resulting environmental risk, surficial soil in the disposal area poses the greatest threat to public health due to elevated levels of PAHs, asbestos, arsenic and lead.

o Buried Waste Material and Overlying Fill:

The primary route of contaminant migration from the buried waste material and overlying fill is the leaching of organic compounds and metals to groundwater. Perched groundwater in the fill and deeper buried waste material is highly contaminated with both organic compounds and inorganic chemicals.

Although groundwater on the Union Road site moves slowly, and is not used as a source of potable water in the vicinity of the site, groundwater can migrate towards the marsh and Deer Lik and Slate Bottom Creeks and cause contamination of these surface waters.

Section 4: ENFORCEMENT STATUS

The following Potentially Responsible Parties (PRPs) for the Union Road site have been identified:

1. Witben Realty (present owner):
   c/o Universal Marion Corporation
   P.O. Box 4369
   Jacksonville, FL 33207
   Note: Universal Marion Corporation is the parent company of Witben Realty.

2. Past owner/generator:

New York Central Railroad (now defunct)

3. (By succession in interest to former owner/generator NYCRR).
Penn Central Corporation
Suite 1200
4 Penn Central Plaza
Philadelphia, PA 19103

In 1987 the Witben Realty and Penn Central Corporation were offered the opportunity to enter into a consent order for the performance of the RI/FS. When they did not step forward to perform the work a state funded RI/FS was undertaken. At this stage in the process the PRPs will be offered the opportunity to perform the remedial design and construction of the chosen alternative.

Section 5: GOALS AND OBJECTIVES FOR THE REMEDIAL ACTIONS

5.1 Summary of the Site Risks:

Part of the RI/FS process included evaluating the risks presented to human health and the environment by the site as it exists now. The evaluation is presented in the final baseline human Health Risk Assessment (HRA) Report, June 1991 and the final Environmental Risk Assessment Report, June 1991 prepared for the Union Road Site. The components of the HRA include:

- Identification of the site related chemicals and media of concern;
- An evaluation of the toxicity of the contaminants of concern;
- Identification of possible exposure routes and pathways;
- Estimating the added risk of experiencing health effects.

Exposure routes are the mechanisms by which contaminants enter the body (e.g. inhalation, dermal contact and ingestion). Exposure pathways are the environmental media through which contaminants are carried (e.g. soil, groundwater and air).

The risk assessment for this site (Chapter 8 of the HRA Report) indicates inhalation of asbestos from the disposal area, ingestion and dermal exposure of carcinogenic PAHs and inhalation of arsenic results in the highest carcinogenic risks. With the exception of asbestos which involves much uncertainties, each of these compounds pose carcinogenic risks within one order of magnitude of the NYSDOH goals of 10^{-6}.

Lead and antimony contributes most significantly to the non-carcinogenic risks The risk associated with exposure to non-carcinogenic contaminants are determined using "hazardous index" (HI) approach. A HI is the ratio of predicted exposure levels to acceptable exposure levels. A HI greater than one indicates that adverse non-carcinogenic effects may occur, while a value below one indicates such effects are unlikely to occur. At this site lead poses HI hazard indices slightly greater than one for ingestion of bank waste; and up to two orders of magnitude greater than 1.0 for dermal exposure. Antimony results in hazard indices up to one order of magnitude greater than 1.0 for dermal exposure to the tar pit and marsh sediments.

Table 8-2 of the HRA Report (see Appendix) lists the summary of elevated risks by matrix, area and contaminants.

5.2 Remedial Objectives:

Remedial action objectives consist of medium-specific goals for protecting human health and the environment. The main purpose of stating remedial action objectives is to establish an acceptable contaminant level or range of levels for each exposure route. The media of concern identified for the Union Road site are the perched aquifer in the fill/waste; surface and subsurface soil/waste, tar pit waste and marsh/creek sediments (see Table 1.1, Attachment 2).

The regulatory requirements identified as being either applicable or relevant and appropriate to the remediation of the site are given in Table 1.2 (Appendix).

Based upon the discussion above, the following remedial action objectives have been established for the Union Road site:

1. Prevent direct exposure with on-site surface soils, tar pit material, contaminated waste in sediments and contaminated ground/surface water so the potential risk to human health through exposure is at an acceptable level.

2. Prevent erosion of contaminated on-site surficial soil and tar pit waste from the site into the Slate Bottom Creek; thereby eliminating contaminant loading to the Slate Bottom Creek through mechanical erosion and eliminating a potential source of contaminants to the sediments.

3. Limit the migration of contaminated groundwater from the site into the creek; thereby limiting contaminant loading to the creek via subsurface groundwater.

4. Limit the migration of contaminants to the groundwater and reduce contaminant levels in the groundwater in order to achieve groundwater standards.

Section 6: DESCRIPTION AND EVALUATION OF REMEDIAL ALTERNATIVES

6.1 Introduction:

Initially, the Phase I/Phase II Feasibility Study (FS) Report of the Union Road site identified eleven different operable units at the site. Remedial action alternatives were developed for each operable unit based on the general response actions under the following categories for each of the potential exposure pathways:

- Institutional response actions.
- Control response actions.
- Treatment and disposal response actions.

In an effort to simplify both the detailed analysis of alternatives and the implementation of the selected alternative, the operable units at the site were reduced by combining like units to the following three units:

- The tar pit (tar-like waste in tar pit).
- Contaminated soil, sediment and buried waste (waste material in disposal area, marsh, creeks and roundhouse area).
- Shallow groundwater (including surface water from marsh area).

Remedial alternatives for the contaminated banks and bed of Slate Bottom and Deer Lik Creeks and for contaminated surficial soil in roundhouse area were also developed and evaluated. The following alternatives which passed the initial screening with respect to effectiveness, implementability and cost were analyzed in detail.

Remedial alternatives for the tar pit:

Alternative A1 - No action.
Alternative A2 - Isolation with subsurface barrier and cap (tar pit, buried waste disposal area, marsh area).
Alternative A3 - Isolation by capping (buried waste, tar pit and marsh area).
Alternative A4 - Excavation and transportation to an offsite RCRA landfill.
Alternative A5 - Excavation, on-site stabilization/solidification, and on-site disposal.
Alternative A6 - Excavation and on-site incineration with on-site or offsite ash disposal.
Alternative A7 - Excavation and transportation to an offsite incinerator.

Remedial alternatives for the contaminated soil, sediment and buried waste:

Alternative B1 - No action.
Alternative B2 - Isolation with subsurface barrier and cap (see Alternative A1 above).
Alternative B3 - Isolation by capping (buried waste disposal area, tar pit, and marsh area).
Alternative B4 - Excavation and transportation to an offsite RCRA landfill.
Alternative B5 - Excavation, on-site stabilization/solidification and on-site disposal.
Alternative B6 - Excavation and on-site incineration with on-site or offsite ash disposal.
Alternative B7 - Excavation and transportation to an offsite incinerator.
Alternative B8 - Excavation and bioremediation.
Alternative B9 - Soil washing/soil flushing.
Alternative B10 - On-site vitrification.

Remedial alternatives for remediation of the shallow groundwater:

Alternative C1 - Pump and treat using carbon adsorption (organics removal).

Alternative C2 - Pump and treat using ultraviolet-light-enhanced oxidation (organics removal).
Alternative C3 - Pump and treat using oil/water separation (petroleum hydrocarbon removal).
Alternative C4 - Pump and treat using pH adjustment and precipitation (heavy metals removal).
Alternative C5 - Pump and treat using electrochemical precipitation (heavy metals removal).
Alternative C6 - Pump and treat using liquid ion exchange process (heavy metals removal).

Remedial alternatives for remediation of banks and bed of Slate Bottom and Deer Lik Creeks:

Alternative D1 - Periodic inspection and removal of exposed oily wastes from Slate Bottom and Deer Lik Creeks (as an interim removal action, exposed oily wastes and contaminated soil and sediment were removed from the creeks in August and September 1990).
Alternative D2 - Containment/stabilization of the banks and bed of Slate Bottom Creek (placement of concrete lining of rip rap in creeks).

Remedial alternatives for remediation of surficial soil in roundhouse area:

Alternative E1 - Soil Cover

A brief description and evaluation of the alternatives follows:

6.2 <u>Remedial Alternatives</u> - Tar Pit:

6.2.1 <u>Alternative A1</u>: No Action

In this alternative, the surface soil, fill and buried waste in the waste disposal area, tar pit waste, roundhouse subsurface soil, marsh sediment and subsurface sediment and waste contaminated sediment in the bed and banks of Slate Bottom and Deer Lik Creeks would remain in their current conditions. No waste would be removed for treatment and/or disposal. The existing fence surrounding the waste disposal area, tar pit and marsh would remain and be maintained. The site would be continually monitored to detect migration and release of contaminants.

Cost: The present worth of the capital cost and O & M cost is approximately $1.0 million.

6.2.2 <u>Alternative A2</u>: Isolation of Waste with a Subsurface Barrier and Cap (combined tar pit and disposal area)

This alternative will involve construction of a soil bentonite slurry wall around the present location of the tar pit (including or excluding the marsh area) and buried waste disposal area. The slurry wall would be keyed into the low permeability clay layer below the site. The cap would be placed over the total area. Marsh sediment and other contaminated soil/waste from creek/round house area will be placed over the disposal area before capping.

Cost: The present worth of the capital cost and Operation and Maintenance (O&M) cost is $8.2 million for subsurface barrier and cap of the combined tar-pit and disposal area.

<u>6.2.3 Alternative A3</u>: Isolation by Capping (combined tar pit and disposal area)

In this alternative, the waste disposal area, tar pit and marsh or the waste disposal area and tar pit would be isolated with a cap. The cap would minimize infiltration of rainwater into the sediment and soil and eventually into the groundwater. This alternative is similar to the subsurface barrier and cap alternative discussed in Section 6.2.2 except that, with this alternative, a subsurface barrier would not be installed to obstruct migration of groundwater beneath the capped area. It is assumed that the natural clays surrounding the capped area would be sufficient to mitigate migration of groundwater into the capped area; however, additional information (e.g., borings and permeability tests in the clay area) would need to be conducted to verify this assumption.

Cost: The present worth of the capial and O & M cost is approximately $6.9 million.

<u>6.2.4 Alternative A4</u>: Excavation and Transportation of Tar Pit Material to an Offsite RCRA Landfill

In this alternative, the 1,700 cubic yards of waste material in the tar pit and one foot underlying clay (400 cubic yards) would be excavated and transported to an offsite RCRA landfill. Waste will require stabilization before landfilling. Due to high organic contents in the tar pit waste, local facilities may not accept the waste. Long distance hauling of the waste to Emelle, Alabama or Pinewood, South Carolina may be required.

Cost: The present worth of the capital cost and operation and maintenance (O & M) cost for this alternative is $1.5 million.

<u>6.2.5 Alternative A5</u>: Excavation, On-site Stabilization/ Solidification and On-site Disposal

In this alternative, tar pit waste would be excavated and stabilized/solidified on-site. Potential solidification technologies utilize Portland cement, a lime/fly ash pozzolanic system, or other fixating agents capable of immobilizing both organic and heavy metal contaminants in a stable, non-leaching solid. Several such systems were investigated and are applicable to the site. The stabilized solid would be disposed in an on-site landfill.

Cost: The present worth of the capital and O & M cost is approximately $3.5 million.

6.2.6 Alternative A6: Excavation and On-Site Incineration with On-Site or Offsite Ash Disposal

In this alternative, the tar pit waste would be excavated and incinerated on-site. Ash from the incinerator would be disposal of on-site or offsite. Because incineration does not destroy heavy metals, the ash containing high levels of lead would, most likely, require stabilization. There are mainly potential incinerator technologies which may be applicable to the tar pit waste.

Cost: The present worth of capital cost and O & M cost is $3.5 million with on-site ash disposal and $1.3 million with offsite ash disposal.

6.2.7 Alternative A7: Excavation and Transportation to an Offsite Incinerator

In this alternative, the 2,100 cubic yards of waste material and underlying clay in the tar pit would be excavated and transported to an offsite incinerator. At the offsite incinerator, the waste would be burned with the resultant ash being stabilized before placement in a landfill.

Cost: The present worth of the capital and O & M cost is estimated to be $4.4 million.

These alternatives were evaluated and scored in accordance with the Department's Technical and Administrative Guidance Memorandum (TAGM) No. HWR-90-4030, titled selection of remedial actions at inactive hazardous waste sites prepared by NYSDEC. Table 2.3 (Appendix) presents a summary of the key evaluation factors for the tar pit waste.

6.3 Remedial Alternatives - Contaminated Soil, Sediment & Buried Waste:

6.3.1 Alternative B1: No action.

This alternative is discussed in detail in Section 6.2.1, Alternative A1, under tar pit.

6.3.2 Alternative B2: Isolation of Waste with a Subsurface Barrier and a Cap (combined tar pit and disposal area)

This alternative is discussed in detail in Section 6.2.2, Alternative A2.

6.3.3 Alternative B3: Isolation of Waste with a Cap (combined tar pit and disposal area)

This alternative is discussed in detail in Section 6.2.3, Alternative A3.

6.3.4 Alternative B4: Excavation and Transportation to an Offsite RCRA Landfill

In this alternative, the sediment and soil in the waste disposal area, roundhouse subsurface soil, marsh surficial and subsurface sediment and bed and banks of Deer Lik and Slate Bottom Creeks would be excavated and transported to an offsite RCRA landfill. Again, the offsite facility would be required to stabilize/solidify the EP Toxic materials prior to disposal, as required by the RCRA land ban regulations. The FS Report indicates that the waste would have to be hauled long distance to either The Emelle facility in Emelle, Alabama or Laidlaw facility in Pinewood, South Carolina due to space availability.

Cost: The present worth of the capital and O & M cost of this alternative is estimated to be $72.4 million.

6.3.5 Alternative B5: Excavation, On-site Stabilization/Solidification and On-site Disposal

In this alternative, surface soil, fill and buried waste material in the waste disposal area, roundhouse subsurface soil, marsh surficial and subsurface sediment and the bed and banks of Slate Bottom and Deer Lik Creeks would be excavated and stabilized/solidified on-site. Stabilization/solidification would be accomplished with Portland cement, a lime/fly ash pozzolanic system, or other fixating agrents capable of immobilizing both organic and heavy metal contaminants in a stable, non-leachable solid. The solid would be placed in an on-site landfill. Long term effectiveness for organic contaminants is questionable, a treatability study will be required.

Cost: The present worth of the capital cost and O & M cost for this alternative varies from $19 million to $30 million depending upon the type of process.

6.3.6 Alternative B6: Excavation, On-site Incineration, On-site or Offsite Soil and Ash Disposal

In this alternative, the surface soil, fill and buried waste, the roundhouse subsurface soil, the marsh sediment and subsurface sediment (after dewatering) and the bed and banks of Slate Bottom and Deer Lik Creeks would be excavated and incinerated on-site. Treated soil and ash from the incinerator would be disposed of in an on-site or offsite landfill. If the treated soil and/or ash fails the Toxicity Characteristic Leaching Procedure (TCLP) for lead as expected, it would require stabilization prior to disposal. This alternative is similar to Alternative A6 discussed above, except that a much larger quantity is involved in this alternative.

Cost: The present worth of the capital cost and O & M cost for this alternative is as follows: $34.9 million, if on-site ash disposal is selected and $78.8 million if offsite ash disposal is selected.

6.3.7 Alternative B7: Excavation and Transportation to an Offsite Incinerator

In this alternative, the surface soil, fill and waste in the waste disposal area, the roundhouse subsurface soil, the marsh surficial and subsurface sediment (after dewatering) and the bed and banks of Slate Bottom and Deer Lik Creeks would be excavated and transported to an offsite incinerator. The approximately 128,000 cubic yards of soil, sediment and waste would be burned at an offsite incinerator. Resultant soil and ash, if it fails the TCLP, would be stabilized prior to land disposal in accordance with the RCRA land ban restrictions. This alternative is similar to the Alternative A7 (tar pit operable unit) discussed above in Section 6.2.7 except that a much larger quantity is involved in this operable unit.

Cost: The present worth of the total capital and O & M lost for this alternative is $274.9 million.

6.3.8 Alternative B8: Excavation and Bioremediation

In this alternative, surface soil, fill and waste in the waste disposal area, marsh surficial and subsurface sediment, roundhouse subsurface soil and the bed and banks of Slate Bottom and Deer Lik Creeks would be excavated and treated in an on-site biological remediation system. The system could be either landfarming or bioslurry. It would produce a liquid effluent and a sludge containing heavy metals. The sludge, after treatment for organics, would be stabilized with portland cement or a pozzolanic material (if it fails the TCLP) before land disposal in accordance with the RCRA land ban restrictions. The liquid effluent would be treated and discharged to Deer Lik or Slate Bottom Creeks.

Cost: The present worth of the capital and O & M cost is estimated to be $70.5 million for offsite sludge disposal and $29 million for on-site sludge disposal.

6.3.9 Alternative B9: Soil Washing

In this alternative, surface soil, fill and buried waste in the waste disposal area, marsh surficial and subsurface sediment, roundhouse subsurface soil and the waste and contaminated soil and sediment in the bed and banks of Slate Bottom and Deer Lik Creeks would be excavated and washed with a solvent(s) to extract the organic and/or metal contaminants. The organics-laden solvent would be decanted from the liquid-solid mixture. After separation from the solvent, the organics would be incinerated offsite. The solvent would be recycled. Washed solids would be stabilized, if necessary, and be placed in a RCRA landfill or processed to recover and recyle the metals.

Cost: The present worth of the total capital and O & M cost is estimated to be $26 million or $44 million depending on the type of process.

6.3.10 Alternative B10: On-site Vitrification

The vitrification process creates a nonleachable glass-like melt. The electricity heats the area to between 1600 ^{o}F and 2000 ^{o}F and pyrolyzes the organics present in the soil. The heat melts the soil and contaminants, incorporating any inorganics (i.e. heavy metals) into the structure of the melt. Off-gases are collected in a fume hood, and quenched and scrubbed before discharge to the atmosphere.

Because of technical problems, vitrification technology has been withdrawn indefinitely from the commercial arena recently by the developers. Therefore, this alternative is not considered further.

Cost: The present worth of the capital and O & M cost of vitrification is estimated to be $61.5 million.

Table 3.4 (Appendix) presents a summary of the key evaluation factors for the contaminated soil and sediment. For most of the remedial alternatives, it will be necessary to perform treatability studies to determine if the technologies can effectively treat the contaminated soil and sediment. The costs for treatability studies varies depending on the technology.

6.4 Remedial Alternatives - Groundwater:

Treatment of the shallow groundwater will require a combination of treatment units because of the presence of elevated levels of organics and inorganic contaminants. Pretreatment will be performed using oil/water separation. Primary metals removal options include standard pH adjustments and precipitation technology, and the more recently developed iron coprecipitation systems. Because it is doubtful that either of the primary metals removal technologies will meet SCGs for discharge to groundwater or surface water, secondary metals removal will likely be required. Promising technologies include ion exchange and sorption filtration. Lastly, feasible technologies for the removal of organics include UV/oxidation and carbon adsorption.

Any sludges generated by the treatment of the shallow groundwater will be treated/disposed in the same manner as the contaminated soils and sediments removed from the site.

Alternatives for disposal of the removed groundwater are as follows: discharge to surface water (treatment required), discharge to groundwater via recharge wells or infiltration galleries (treatment required) and discharge to sanitary sewer.

Compliance with NYSSCGs: The treated groundwater will comply with the substantiate requirements of the New York State Pollutant Discharge Elimination System (SPDES) program if discharged to surface water or to Buffalo Sewer Authority effluent limits if discharge to BSA system.

Protection of Human Health and Environment: Treatment would reduce the concentration below acceptable limits.

Short Term Effectiveness: Groundwater treatment using a closed system will not present any short term risks to the community.

Long Term Effectiveness and Permanence: The treatment will permanently destroy organics and remove heavy metals present in groundwater. The treatment will result in the reduction of toxicity, and will be easy to implement.

Costs: The cost of the treatment of the shallow groundwater and surface water from the marsh area is estimated to be as follows:

a)	Groundwater Extraction	$233,000
b)	Oil/Water Separation	41,000
c)	Iron Based Co-Precipitation	286,000
d)	Sorption Filteration	187,000
e)	Ultra-Violet Oxidation	298,000
f)	Discharge to Creek	7,000
	TOTAL	$1,052,000

The estimated cost of $1.1 million is based on treatment of groundwater and disposal to Creek. The analytical results of the shallow groundwater well sample are within the Buffalo Sewer Authority (BSA) effluent limits. Therefore, the groundwater could be disposed off to BSA without pretreatment at a savings of approximately $750,000 if permitted.

Alternatives for the treatment of the shallow groundwater are discussed in detail in the FS Report. Table 4.13 (Appendix) presents a summary of the score sheets for each of the alternatives for treatment of the shallow groundwater scored in accordance with TAGM HWR-90-4030. Table 4.14 (Appendix) presents the summary of the key evaluation factors for groundwater alternatives.

6.5 Remedial Alternatives - Slate Bottom Creek & Deer Lik Creeks:

6.5.1 Alternative D1: Periodic Inspection, Removal and Treatment/Disposal of Exposed Oily Wastes in the Creeks

In this alternative, the contaminated banks and bed of Slate Bottom and Deer Lik Creeks would be inspected periodically with exposed oily waste and contaminated sediment being removed and treated. The waste would be treated offsite using stabilization/solidification or offsite incineration as discussed above. The present worth of the capital and O&M cost of the alternative is estimated to be $2.6 million.

6.5.2 Alternative D2: Placement of Concrete Culvert in Slate Bottom Creek and Deer Lik Creek

This alternative consists of the construction of a concrete culvert in Slate Bottom Creek from its confluence with Deer Lik Creek to the 16 foot diameter closed culvert south of the site. The culvert would be approximately 1,850 feet in length. It would prevent migration of contaminants from the bed and banks of the creek downstream. Three culvert options are considered:

- o 16 foot diameter closed culvert.
- o Open culvert (channel) extending up the entire height of the banks.
- o Open culvert (channel) extending 15 feet up the banks.

Construction of a concrete channel along the portions of Slate Bottom and Deer Lik Creeks is expected to have a negative impact on plant and animal life along these stretches by reducing wildlife habitat. However, the channel will eliminate the potential for direct contact with waste materials which remain in the Creek banks. It will also eliminate migration or leaching of such wastes into surface waters. Lastly, the channel will negate the need to provide continued, long-term maintenance of the Creek banks and to remove waste material and sediments which would result from bank erosion.

Lining of the Creeks by rip rap or concrete revetment will be less costly and readily acceptable for wildlife habitat. Therefore, although not evaluated in the FS Report, the use of rip rap/concrete revetment for lining the Creeks will be considered during the design phase. If it can be shown that rip rap can provide long term effectiveness and permanence and can protect the human health and environment, then rip rap would be considered.

Cost: The present worth of the total capital cost and O & M cost are $3.5 million for 15 feet open culvert, $4.7 million for full height open culvert and $8.7 million for 16 foot diameter closed culvert.

6.6 Remedial Alternatives - Surficial Soil in Roundhouse Area:

6.6.1 Alternative E1: Soil Cover for Surficial Soil in Roundhouse Area

Although not evaluated in detail in the FS, remedial action for surface soil in the vicinity of the former roundhouse is considered part of the preferred alternative for the Union Road Site. The risk assessment determined that elevated levels of arsenic found in the surface soils in this area could result in potentially unacceptable health risks ($2.9x10^{-6}$) due to inhalation exposure for children playing in or near this area. The potential for risk due to inhalation will be minimized with the placement of clean cover soil over the arsenic contaminated areas where cover and vegetation do not currently exist. Vegetation will be placed over the cover to minimize erosion and long-term O&M requirements. This area will be protected by land use restrictions in the deed, and access restrictions will be considered during the design phase. By covering the exposed area, the pathway of concern will be eliminated. Approximately 7.5 acres of land will be covered at the estimated cost of $300,000.

6.7 Evaluation of Alternatives:

The preferred alternative for this site is Alternative A2, Isolation of Waste with subsurface barrier (slurry wall) and cap. In addition, contaminated groundwater from the disposal area, and surface water from the marsh area will be removed, treated and disposed of. The waste from the Creek banks and bed will be removed and consolidated with the tar pit waste before capping. The banks and bed of the Creeks will be lined with concrete or rip rap. Clean soil cover will be provided in the roundhouse area.

Based on available information, this alternative appears to provide the best balance of trade-offs among the alternatives with respect to the evaluation criteria described below. This section evaluates the expected performance of the preferred alternative against the criteria and compares it to the other available options when there are significant differences.

The criteria used to compare the potential remedial alternatives are defined in the National Contingency Plan (40 CRF 300.430). For each of the criteria, a brief description is given followed by an evaluation of the preferred and optional alternatives against that criterion.

Threshold Criteria - The first two criteria must be satisfied in order for an alternative to be eligible for selection.

1. **Protection of Human Health and the Environment** - This criterion is an overall and final evaluation of the health and environmental impacts to assess whether each alternative is protective. This evaluation is based upon a composite of factors assessed under other criteria, especially short/long-term impacts and effectiveness and compliance with ARARs (see below).

   The proposed remedy will control risks to human health and the environment by reducing the release of contaminants to the groundwater, surface water, and air pathways. The combination of an impermeable cover along with the slurry wall will reduce the amount of water infiltrating the site which subsequently produces contaminated groundwater. No unacceptable short-term risks or cross-media impacts will be caused by implementation of the remedy. This remedial action will prevent human and ecological contact with hazardous materials. The dermal contact pathway will be eliminated.

2. **Compliance with New York State Standard, Criteria and Guidelines (SCGs)** - Compliance with SCGs addresses whether or not a remedy will meet all of Federal and State environmental laws and regulations and if not, provides grounds for invoking a waiver

Although the chemical specific SCGs would not be met by slurry wall and cap containment system, within the containment structure, the chemical concentration outside the containment should be within NYS SCGs. The collection and pretreatment of groundwater will attain the NYS discharge limitations. The NYSDEC Guidelines for eroding soils are accommodated through shoreline stabilization.

Primary Balancing Criteria - The next "primary balancing criteria" are used to weigh major trade-offs among the different hazardous waste management strategies.

3. **Short-term Impacts and Effectiveness** - The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment is evaluated. The length of time needed to achieve the remedial objectives is estimated and compared with other alternatives.

Because it is less intrusive, results in adequate protection, and can be implemented in a short amount of time, the preferred alternative is preferable to the excavation/treatment alternatives in regard to this criterion. Although less intrusive, the containment alternatives do involve a limited amount of waste excavation. This is necessary to remove wastes deposited in the Creek, and to consolidate the wastes. Engineering controls will be applied to minimize the release of particulates into the air.

4. **Long-term Effectiveness and Permanence** - If wastes or residuals will remain at the site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude and nature of the risk presented by the remaining wastes; 2) the adequacy of the controls intended to limit the risk to protective levels; and 3) the reliability of these controls.

The preferred alternative would provide an adequate degree of long-term effectiveness and permanence. The magnitude and nature of the risks presented by the remaining wastes would be acceptable given the adequacy and reliability of the controls used to limit these risks. If the type of volume of contaminants released by the site were to significantly change over time, mitigative measures could be taken to address any new threats.

Although the excavation/treatment alternatives would provide a greater degree of permanence they would not provide the highest degree of permanence because significant quantities of residual wastes would remain. Wherever finally disposed, this residual waste would have the potential of eventually leaching out heavy metals and producing contaminated groundwater.

5. **Reduction of Toxicity, Mobility, or Volume** - Preference is given to alternatives that permanently, and by treatment, significantly reduce

the toxicity, mobility, or volume of the wastes at the site. This includes assessing the fate of the residues generated from treating the wastes at the site.

The preferred alternative would reduce the mobility of the wastes by minimizing the production and migration of leachate. There will be a slight reduction in toxicity by collecting and treating groundwater. Excavation/treatment would produce air emissions, treated ash, and groundwater treatment residues. The containment alternatives would generate water treatment residues (e.g. spent activated carbon, metal sludges, depending on the actual method employed).

The excavation/treatment alternatives would signicantly reduce the toxicity, mobility and volume of the wastes whereas the containment alternatives would only reduce the mobility of the wastes. The excavation/treatment alternative would reduce the toxicity of organic contaminants by thermal destruction. Mobility would be reduced by chemically treating the resulting ash to prevent the release of heavy metals. Volume would be reduced by segregating out non-hazardous wastes and incinerating the rest.

6. **Implementability** - The technical and administrative feasibility of implementing the alternative is evaluated. Technically, this includes the difficulties associated with the construction and operation of the alternative, the reliability of the technology and the ability to effectively monitor the effectiveness of the remedy. Administratively, the availability of the necessary personnel and material is evaluated along with potential difficulties in obtaining special permits, rights-of-way for construction, etc.

Even though all of the potential alternatives are technically implementable, there are significant differences in the level of difficulty to construct and operate the remedies. The capping and slurry wall activities anticipated for the containment alternatives are well established. Minimizing the release of contaminants during these activities would require special attention. The installation of a geomembrane as the impermeable component of the final cover is well established but requires special techniques and experienced personnel. The materials and personnel needed would be readily available.

The greatest challenges to implementing the excavation/treatment alternatives would be materials handling, availability of RCRA landfill capacity (local landfill will not accept material containing more than 2% organics), availability of incinerator capacity. High metal contents would pose problems for incineration. The very large quantities of waste to treat would monopolize scarce incinerator resources. If additional capacity was needed, a significant delay would be realized while the siting, design, construction and permitting process was completed. The use of on-site incinerators could face administrative feasibility problems if projected air emissions were thought to be unacceptable or there was significant local resistance to the installation and operation of multiple incinerators in the community. The residual ash will contain high percentages of lead and heavy metals and would pose problems for disposal.

7. **Cost** - Capital and operation and maintenance costs are estimated for the alternatives and compared on a present worth basis. Although cost is the last criterion evaluated, where two or more alternatives have met the requirements of the remaining criteria, cost effectiveness can be used as the basis for final selection.

   The estimated cost of the individual operable units and the total project cost for various alternatives is tabulated on the next page in tabular form for easy comparison.

6.8 Interim Remedial Measures:

As a result of the findings of the RI/FS, the following interim remedial measures were undertaken at the site by the NYSDEC:

1. Construction of 3,000 foot chain link fence around the waste lagoon, contaminated marsh and waste disposal area; including posting of warning signs.

2. Placement of "hazardous waste area" warning signs along the banks of both Slate Bottom and Deer Lik Creeks.

3. The excavation and removal of 1,700 c.y. of contaminated soil/ waste from the banks of Slate Bottom Creek.

The IRM is discussed in detail in the IRM Report, waste and contaminated soil removal from the banks of Slate Bottom Creek, Union Road, June 1991.

TABLE-COST SUMMARY (Cost in Millions of Dollars)
Operable Unit Cost/Total Project Cost for Different Remedial Alternatives

Remedial Action Alternative	Tar-Pit Only	Disposal Area Only	Tar-Pit and Disposal Area Combined	Ground-water Treatment	Concrete Culvert in Creek	Soil Cover for Round-house Area	Sub-Total	10% Contin-gency	Total Project Cost
No Action	NA	NA	1.0 M	-	-	-	1.0 M	0.1 M	1.1 M
Isolation-Cap & Slurry Wall	NA	NA	8.2 M	1.1 M	3.5 M	0.3 M	13.1 M	1.3 M	14.4 M
Isolation-Cap Only	NA	NA	6.9 M	1.1 M	3.5 M	0.3 M	11.8 M	1.2 M	13.0 M
Offsite RCRA Landfill	1.5 M	72.4 M	-	1.1 M	3.5 M	0.3 M	78.8 M	7.9 M	86.7 M
Onsite RCRA Landfill	3.5 M	30 M	-	1.1 M	3.5 M	0.3 M	38.4 M	3.8 M	42.2 M
Onsite Incineration									
a. Onsite Ash Disposal	3.5 M	34.9 M	-	1.1 M	3.5 M	0.3 M	43.3 M	4.3 M	47.6 M
b. Offsite Ash Disposal	1.3 M	78.8 M	-	1.1 M	3.5 M	0.3 M	85.0 M	8.5 M	93.5 M
Offsite Incineration	4.4 M	274.9 M	-	1.1 M	3.5 M	0.3 M	284.2 M	28.4 M	312.6 M
Bio-Remediation-									
a. Onsite Sludge Disposal	3.5 M*	29.0 M	-	1.1 M	3.5 M	0.3 M	37.4 M	3.7 M	41.1 M
b. Offsite Sludge Disposal	1.5 M*	70.5 M	-	1.1 M	3.5 M	0.3 M	76.9 M	7.7 M	84.6 M
Soil Washing-									
a. Meetaleep	3.5 M*	26.0 M	-	1.1 M	3.5 M	0.3 M	34.4 M	3.4 M	37.8 M
b. Best Process	3.5 M*	44.0 M	-	1.1 M	3.5 M	0.3 M	52.4 M	5.2 M	57.6 M

* Bio-Remediation and soil washing are not applicable to tar-pit waste. The cost of excavation, stabilization and offsite/onsite (1.5M/3.5M) disposal assumed for tar-pit material.

The cost may very depending upon the type of process used, highest cost used for comparison for the different alternatives.

Section 7: SUMMARY OF GOVERNMENT'S DECISION

7.1 Introduction:

Based on the evaluation of alternatives this remedial action provides the best balance of trade-offs among the alternatives. Although some treatment techologies is technically possible, it would require multiple technologies and involves much uncertainty. The high cost of most of these remedies is not justified. The long remediation period required for some of the treatment technologies makes them unacceptable for this site. Technologies such as on-site incineration may not be acceptable to the local public.

The recommended remedial action for the Union Road site is the containment option which includes:

a. Isolation of waste with a subsurface barrier and cap as described briefly in Section 6.2.2 and 6.3.2 above;

b. Lining of the contaminated Creek banks and bed, as described in Section 6.5.2 above with concrete or rip rap;

c. Extraction, treatment and disposal of contaminated shallow groundwater as described in Section 6.4 above; and

d. Covering of the select areas of the roundhouse with clean soil fill and vegetation as described in Section 6.6.1 above.

7.2 Description of the Preferred Alternative:

The preferred alternative basically comprises the excavation of select areas of the site containing contaminated soil and sediment; placement, consolidation and containment of this excavated material on-site; removal of contaminated groundwater and on-site treatment and disposal; installation of a subsurface barrier/slurry wall around the waste disposal area; placement of clean soil cover and vegetation over areas with contaminated surficial soil; and lining of contaminated creek banks and bed. This remedial action plan is designed to prevent human and ecological contact with hazardous materials and contaminant releases from the site, as well as to minimize adverse impacts to the environment as a result of remediation of the site by the restoration/relocation of a marsh which is currently contaminated and will be removed as part of the preferred remedial alternative.

The preferred alternative will prevent erosion of the contaminated on-site soil/waste by surface run-off and limit migration of contaminants to the groundwater by minimizing the infiltration.

The recommended groundwater and marsh water treatment system consists of an oil/water separator for nonaqueous liquids/oil removal, an iron-based coprecipitation system for primary metals removal, a sorption filtration system for secondary metals removal (if required) and a carbon adsorption system for organics removal. A process schematic for the recommended treatment system is shown in Figure 1 (Appendix). The contaminated water could be disposed off to BSA without pre-treatment, if permitted.

The major components of the preferred alternative for the Union Road site are as follows:

- o Dewatering and on-site treatment of the existing marsh area water prior to disposal to the creek.
- o Excavation of contaminated sediment from the marsh and creek banks and contaminated subsurface soil in the area of the former roundhouse, and placement and consolidation of the material within the buried waste disposal area.
- o Backfill of the tar pit, marsh area, roundhouse area and waste disposal area with fill from the on-site borrow area.
- o Installation of a subsurface barrier/slurry wall around the waste disposal area.
- o Capping of the area within the limits of the slurry wall.
- o Installation of access road, fence and screening vegetation around the capped area.
- o Restoration/relocation of the marsh.
- o Installation of monitoring wells around the slurry wall.
- o Installation of a concrete or rip rap liner in the creek channels.
- o Covering of select areas of contaminated surface soils in the roundhouse area with clean soil and vegetation.
- o Extraction of shallow/perched contaminated groundwater within the slurry wall.
- o On-site treatment of the contaminated groundwater and disposal to the creek.

The conceptual design of the preferred alternative is shown in Drawings 1 and 2, and Figures 3 through 5 (Appendix). Treatability study of compactibility testing if required, will be done during the design phase.

7.3 <u>Permanent vs. Non-Permanent Options</u>:

The two major components of the preferred alternative are isolation of the waste and treatment of the contaminated groundwater. The treatment of the contaminated groundwater is considered as a permanent remedy. However, isolating the waste by containment system is not considered as a permanent remedy. The reasons for not selecting a permanent remedy for waste are described briefly in Section 7.1 above, which includes uncertainty in technologies, high costs, long remediation period and public acceptability.

7.4 <u>Monitoring</u>:

As a part of the long term monitoring program at this site, water level measurements as well as analyses of groundwater samples will be used to determine if the the remedial action is achieving its intended goals. The monitoring program will be designed during the remedial design phase. The remedial design will include provisions for the regular O & M of the components of the remedial action once it is in place. This will include regular inspections (and repair when necessary) of the soil cap to monitor for erosion and/or settling. These inspections may be incorporated into the regular maintenance of the site. In addition, the remedial design will include provisions for the O & M of the groundwater pumping and pretreatment system. Periodic inspection and maintenance of the concrete lining in the Creeks will be required.

Since the waste material will be left in place, the design will incorporate a five year review program in the O & M schedule to evaluate the effectiveness of the system.

7.5 Cost Estimate of the Preferred Alternative:

The total present worth of the capital cost and O & M cost for all the components of the preferred alternative is $14.6 million. This includes cost of slurry wall, cap, lining of Creek, groundwater pump and treat, soil cover for the roundhouse area and cost of the monitoring program. The breakdown of the estimated capital cost, present worth of O & M cost, annual O & M cost and total cost for the various components is shown in Table C1.

7.6 Documentation of Significant Changes:

The Proposed Plan for the Union Road site was released for public comment on January 16, 1992. The Proposed Plan identified isolation with subsurface barrier and cap, ground and surface water treatment and discharge, lining of the Creeks, and provision of clean soil cover in roundhouse area as the preferred response action. All written and verbal comments submitted during the public comment period were reviewed by the NYSDEC. Upon review of these comments, it was determined that no significant changes to the remedy, as it was originally identified in the Proposed Plan, were necessary.

UNION ROAD SITE
ERIE COUNTY, NEW YORK
SITE No. 9-15-128

APPENDIX
RECORD OF DECISION
MARCH 1992

PREPARED BY
NEW YORK STATE DEPARTMENT OF
ENVIRONMENTAL CONSERVATION

Appendix

UNION ROAD SITE
Proposed Remedial Action Plan

FIGURES

Index of Figures

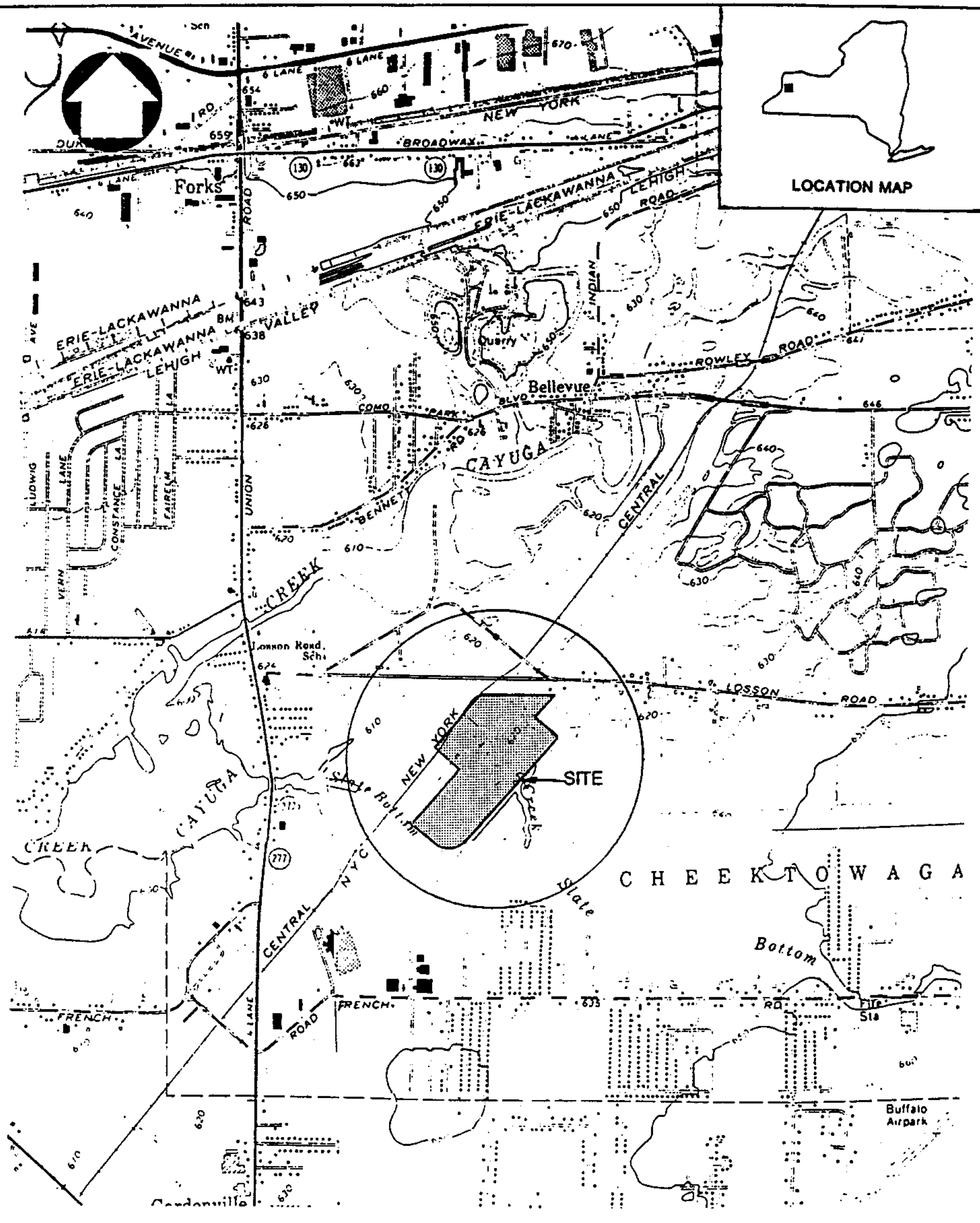
TABLES

Index of Tables

RI: Remedial Investigation Report, Union Road Site
FS: Feasibility Study Report, Union Road Site
HRA: Health Risk Assessment, Union Road Site
CDR: Conceptual Design Report, Union Road Site, September 1991

ADMINISTRATIVE RECORD
RESPONSIVENESS SUMMARY

FIGURES



UNION ROAD SITE

LOCATION MAP

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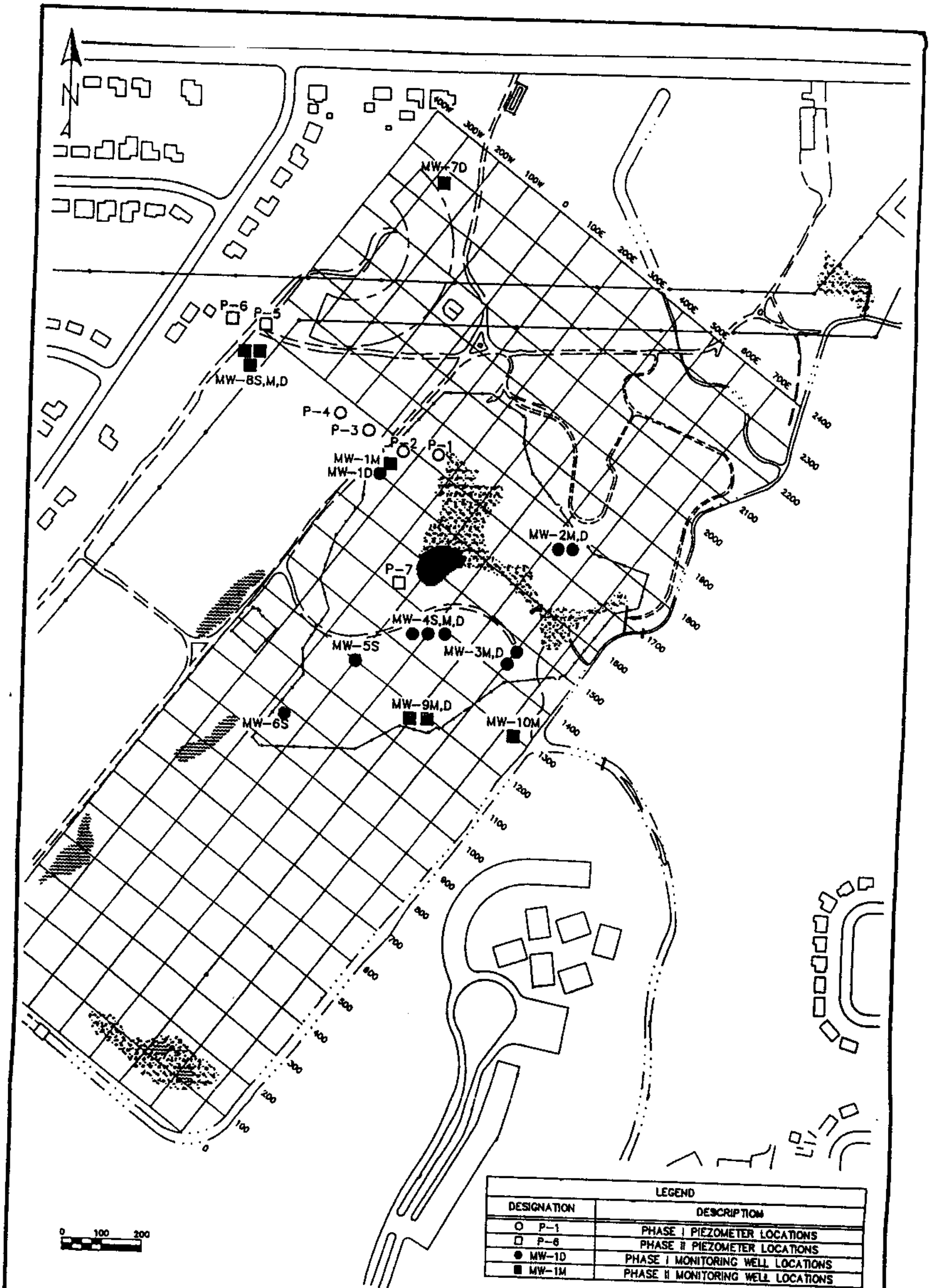
FIGURE 1-1



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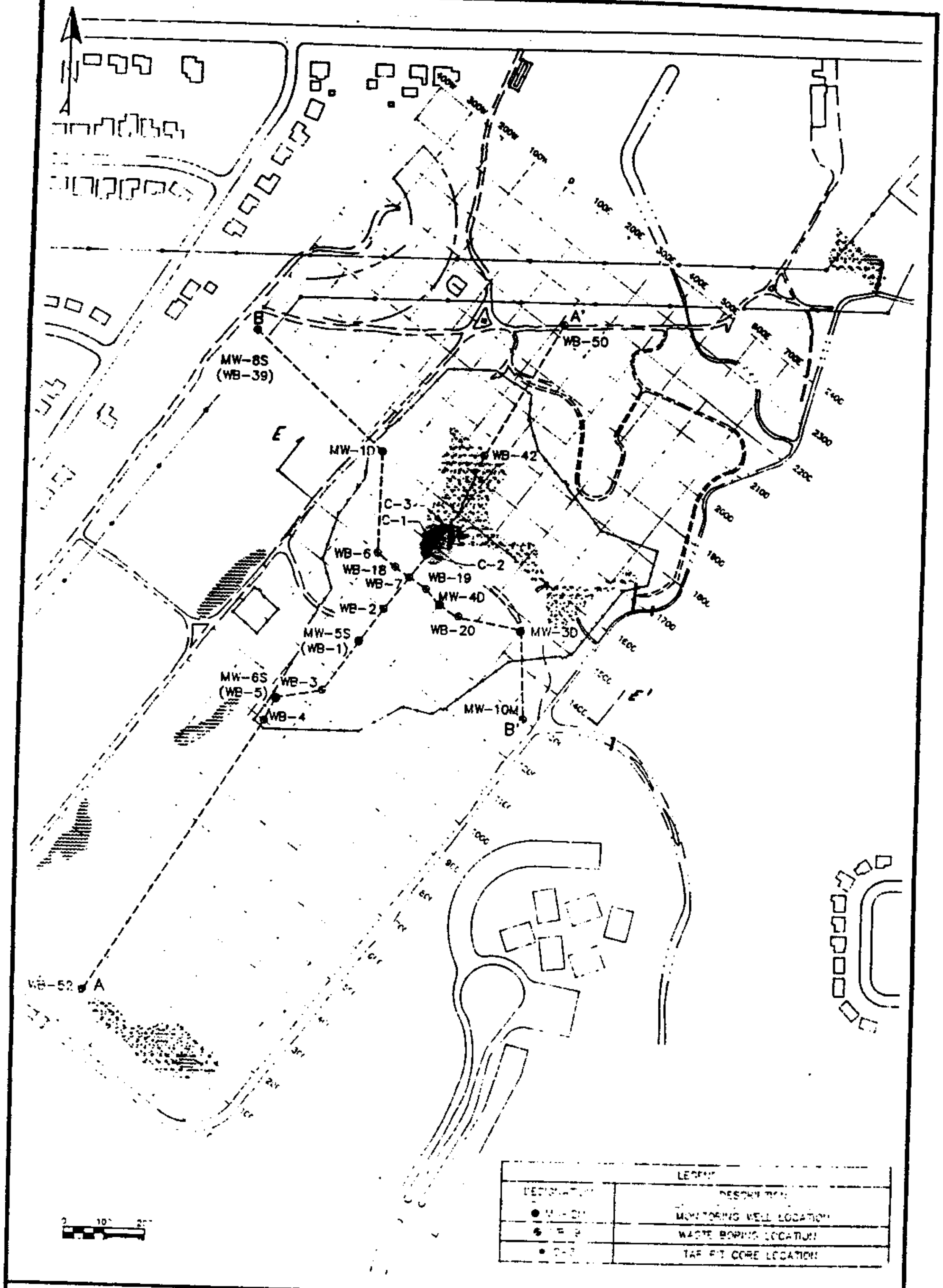
UNION ROAD SITE

LOCATIONS OF MONITORING WELLS AND PIEZOMETERS

FIGURE NO. 2-8



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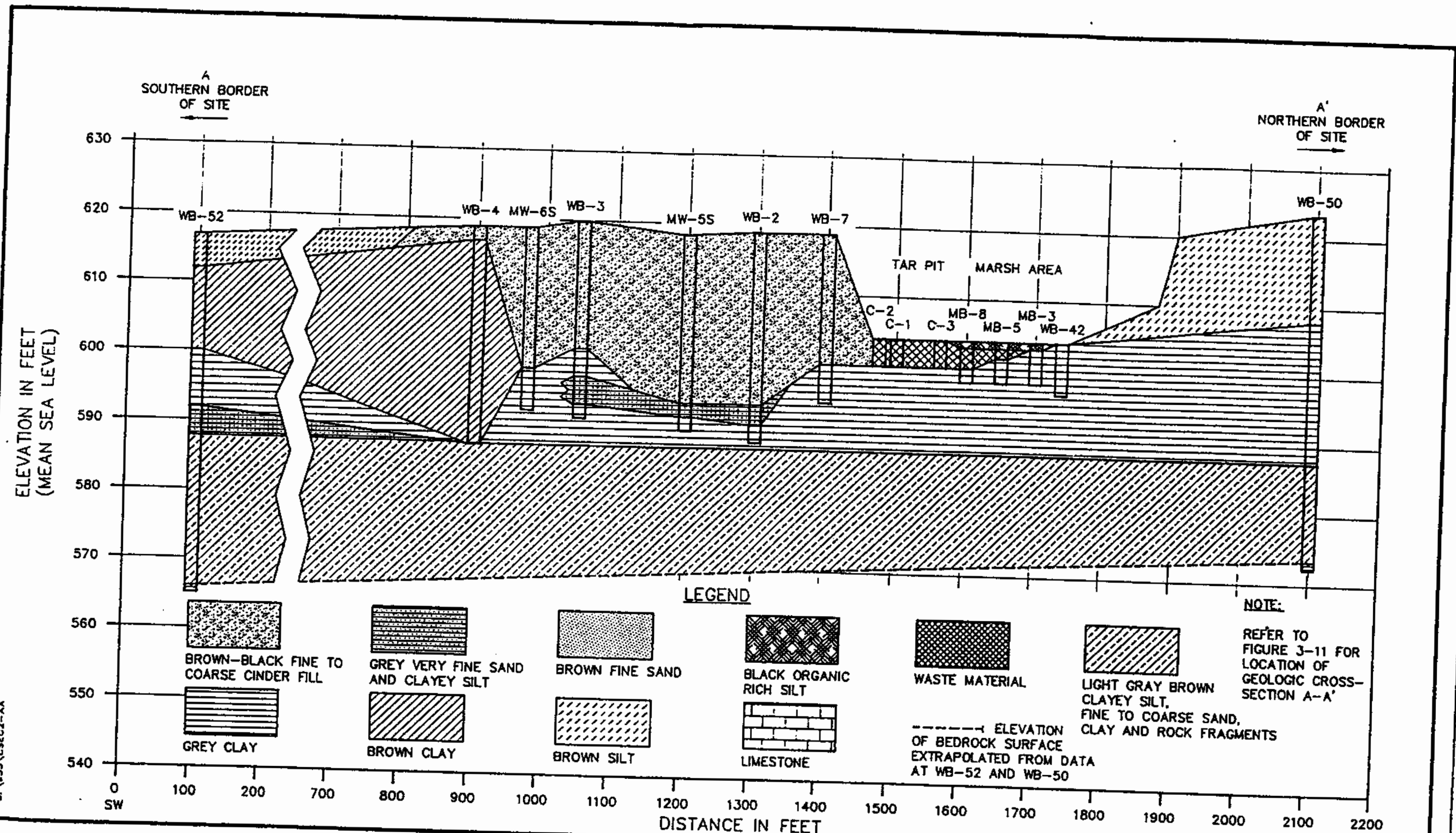
UNION ROAD SITE

LOCATIONS OF GEOLOGIC & WASTE CROSS SECTIONS

FIGURE NO. 3-11



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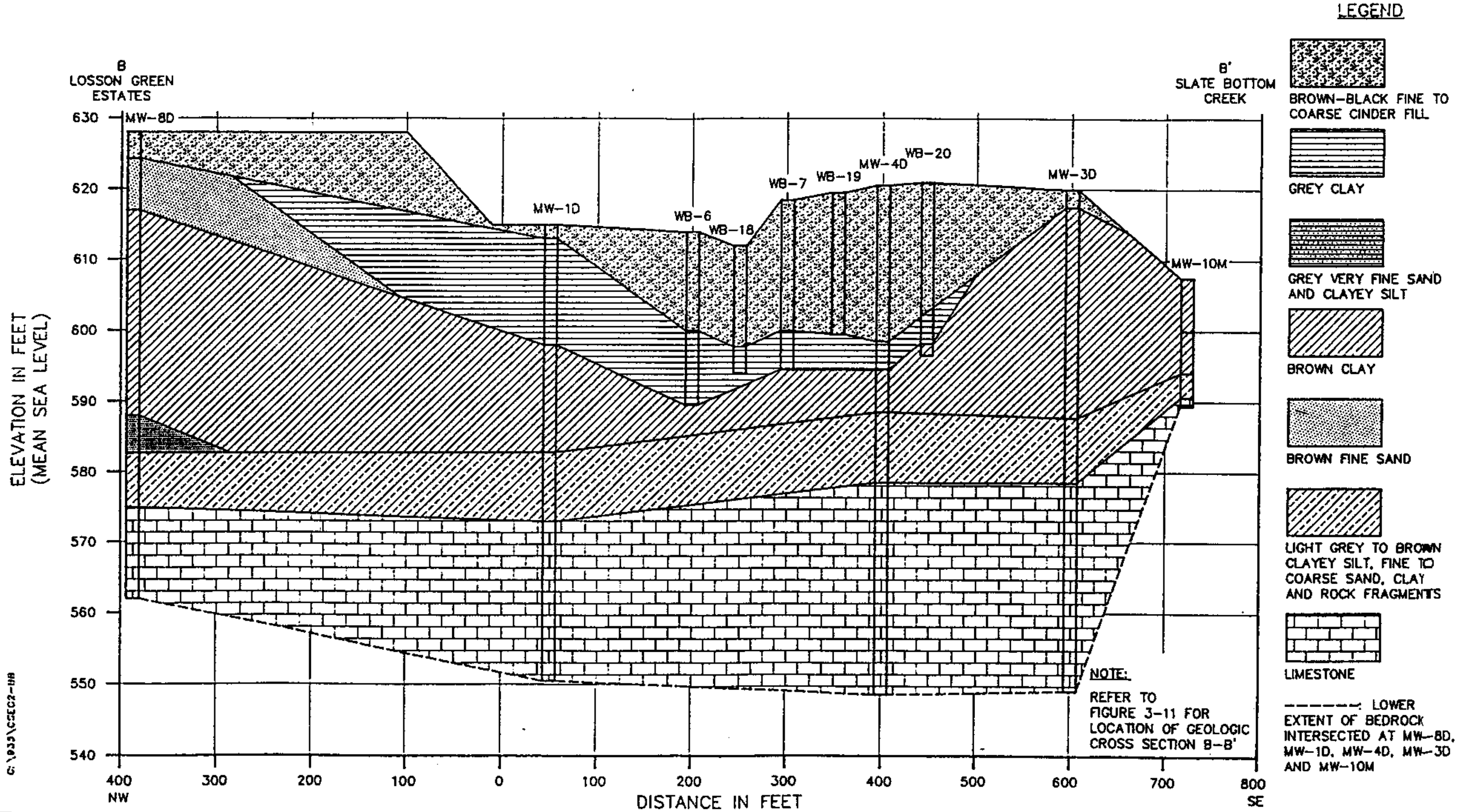
UNION ROAD SITE

GEOLOGIC CROSS-SECTION A-A'

FIGURE NO. 3-13



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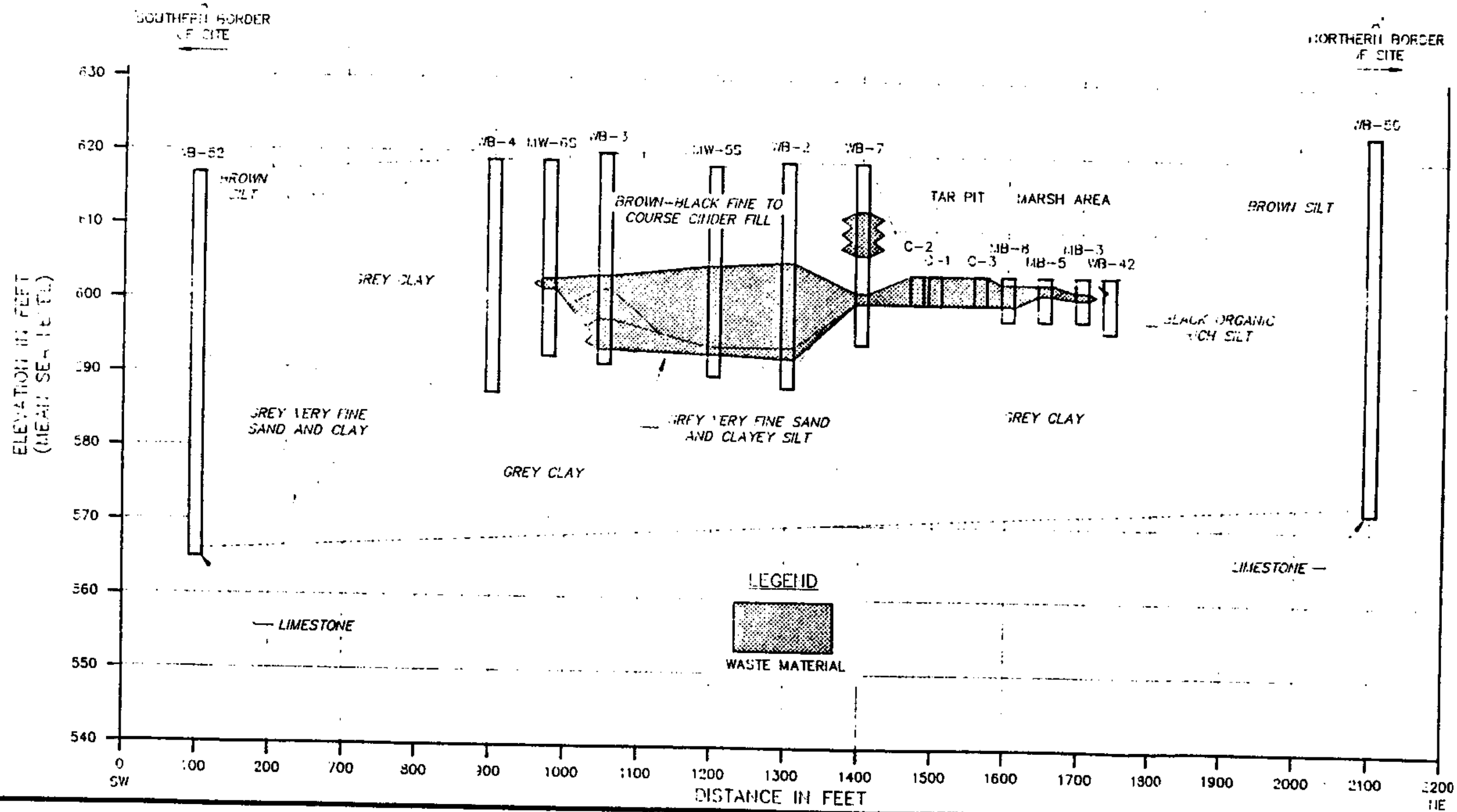
UNION ROAD SITE

GEOLOGIC CROSS-SECTION B-B'

FIGURE NO. 3-14



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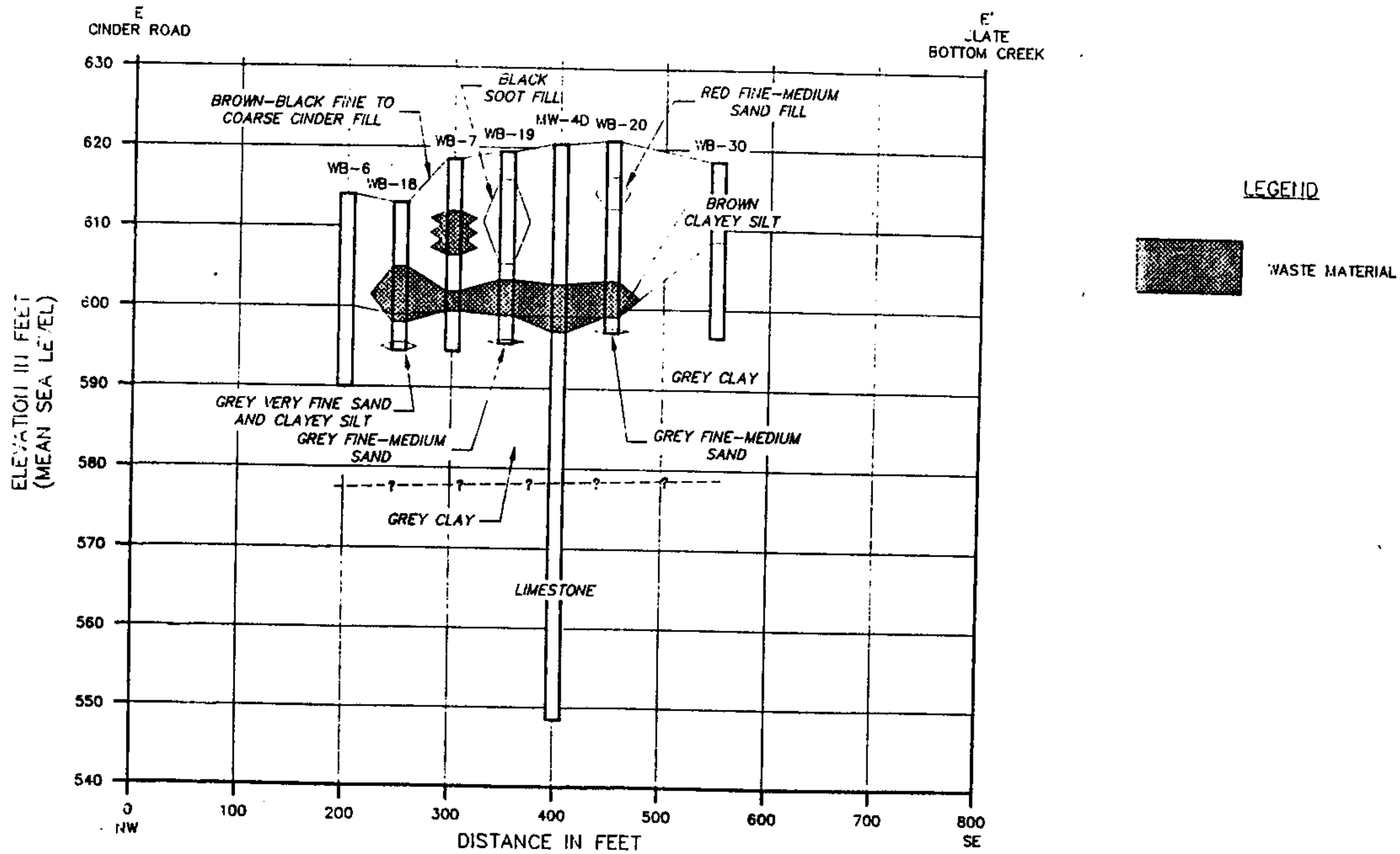
UNION ROAD SITE

BURIED WASTE CROSS SECTION A–A'

FIGURE NO. 3–15



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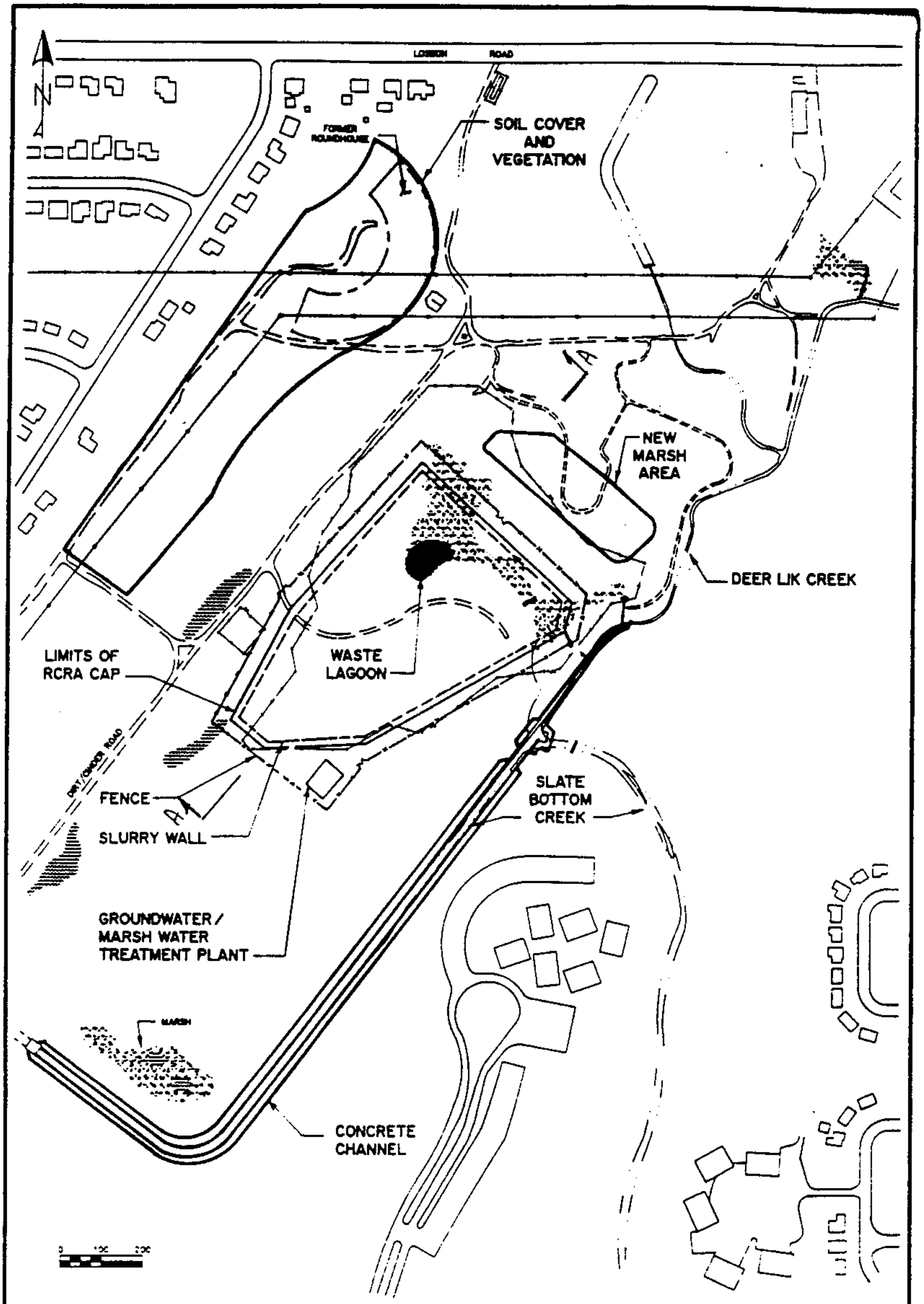
UNION ROAD SITE

BURIED WASTE CROSS SECTION E-E'

FIGURE NO. 3-19

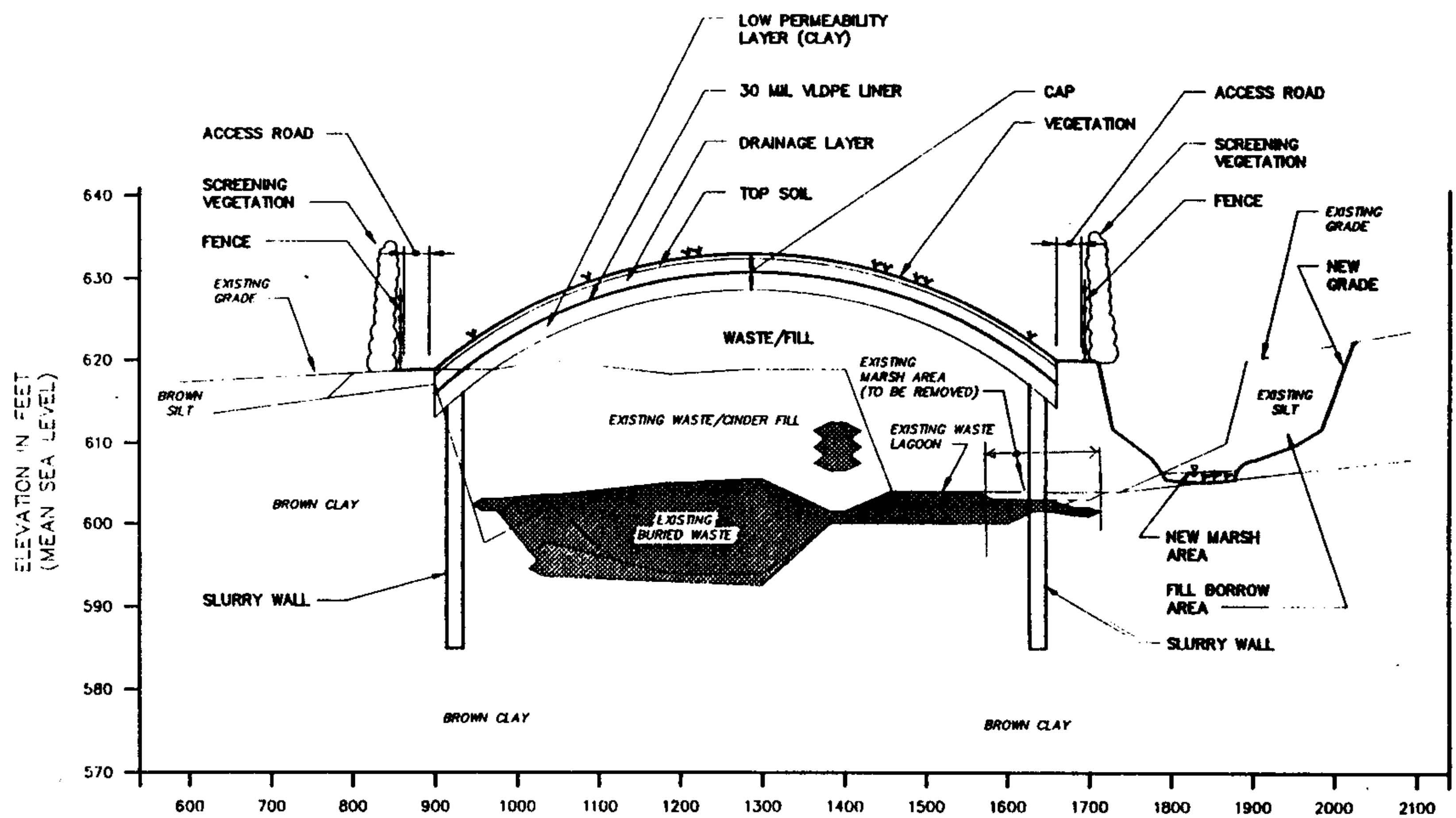


Dvirka and Bartilucci

UNION ROAD SITE

PREFERRED REMEDIAL ALTERNATIVE

DRAWING - 1



NOTE: THICKNESS OF SLURRY WALL IS NOT TO SCALE

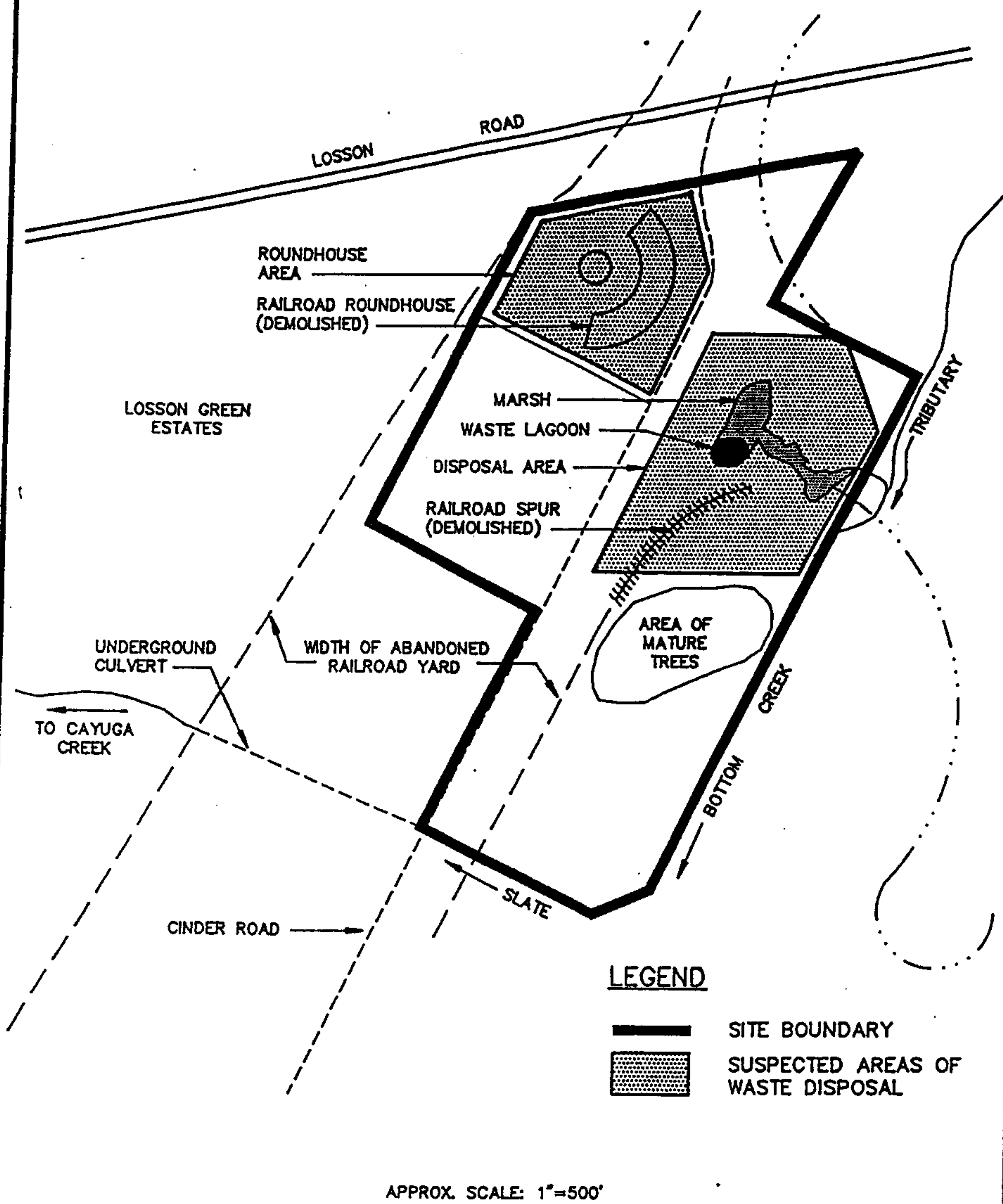
Dvirka and Bartilucci

UNION ROAD SITE

PREFERRED REMEDIAL ALTERNATIVE

CROSS SECTION A–A

DRAWING 2



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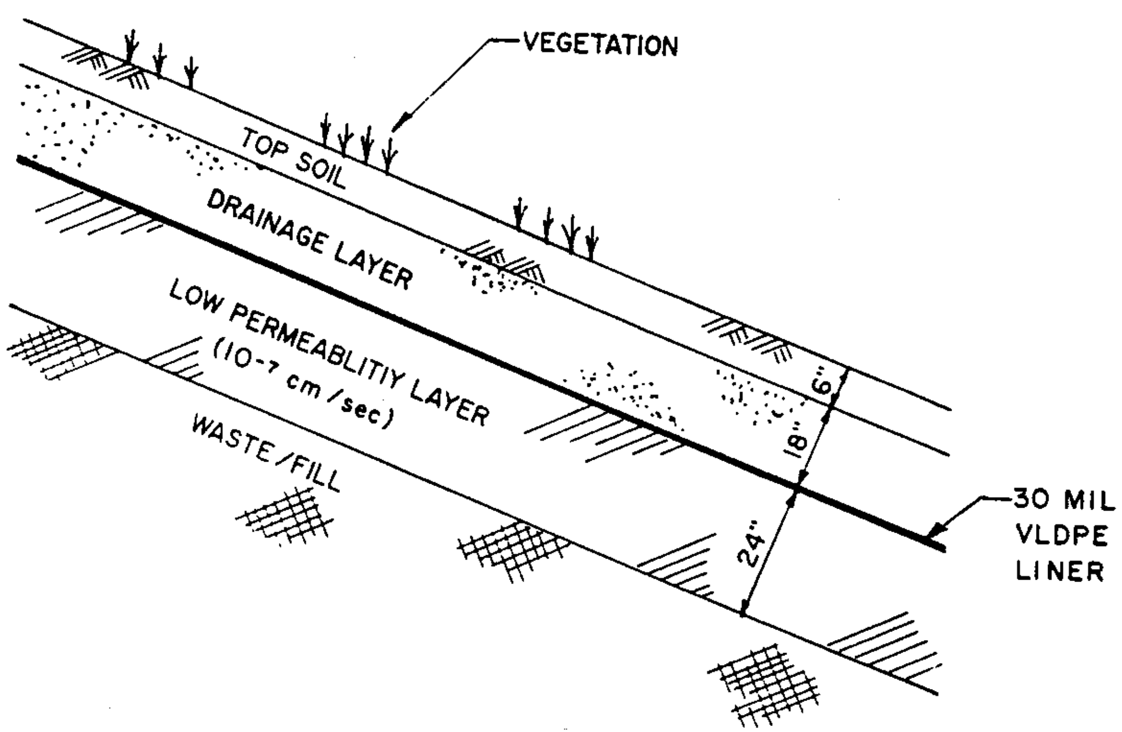
UNION ROAD SITE

DEFINITION OF SITE / STUDY AREA BOUNDARY

FIGURE 1-2



UNION ROAD SITE

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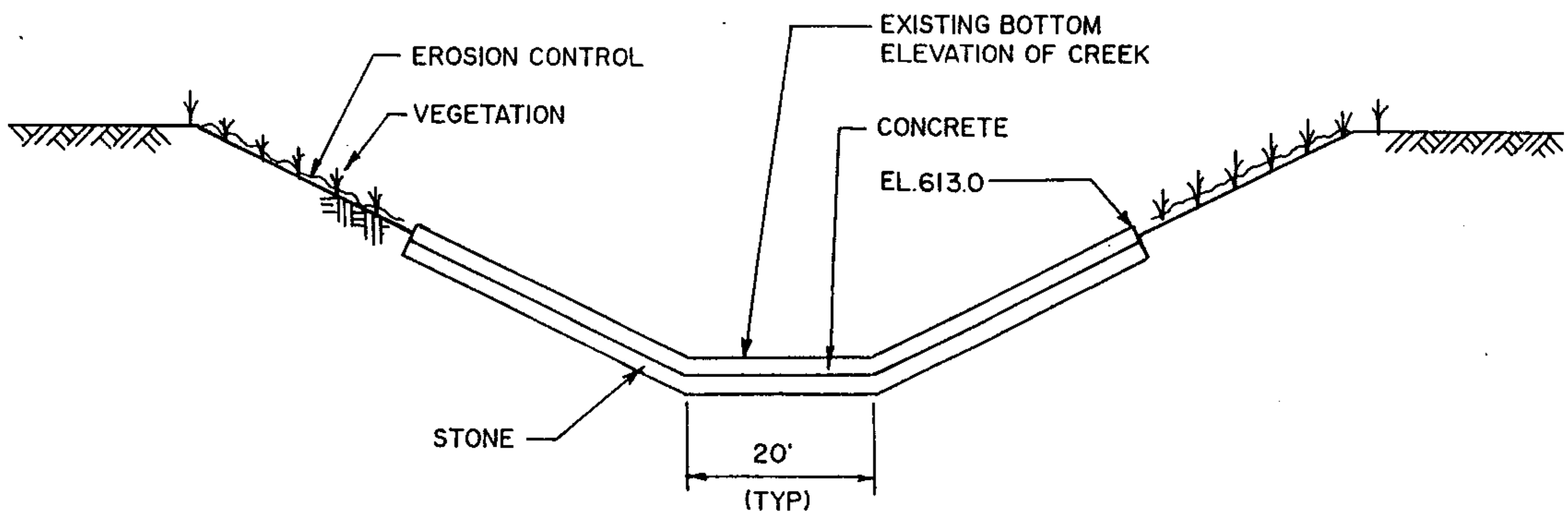
TYPICAL CAP SECTION

FIGURE 3



UNION ROAD SITE

TYPICAL SECTION OF SLATE BOTTOM CREEK

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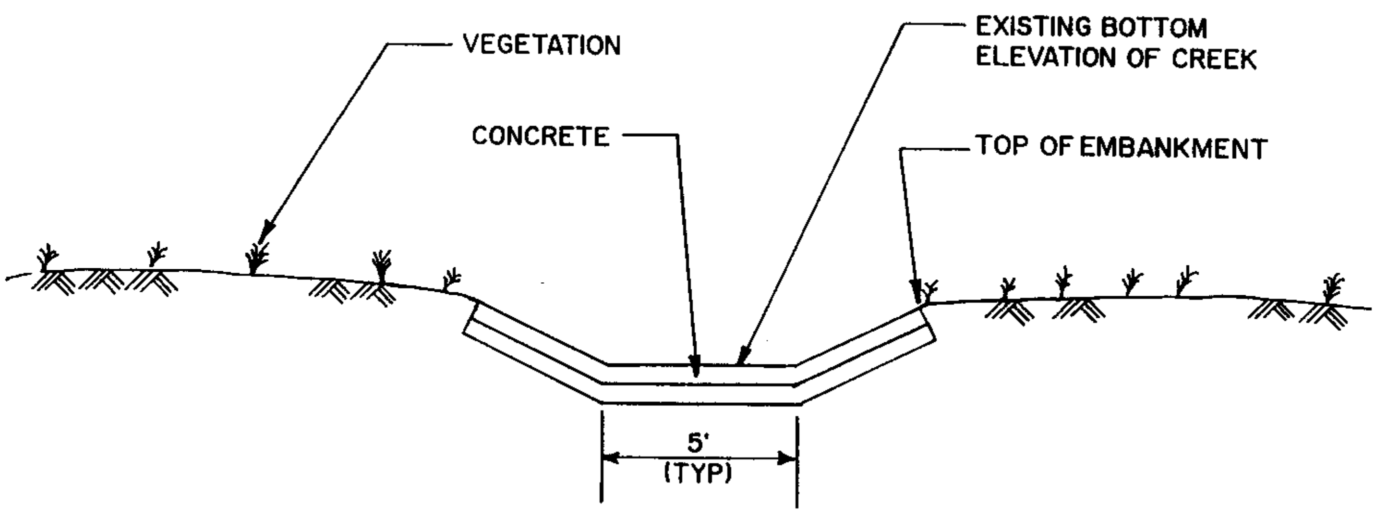
FIGURE 4



UNION ROAD SITE

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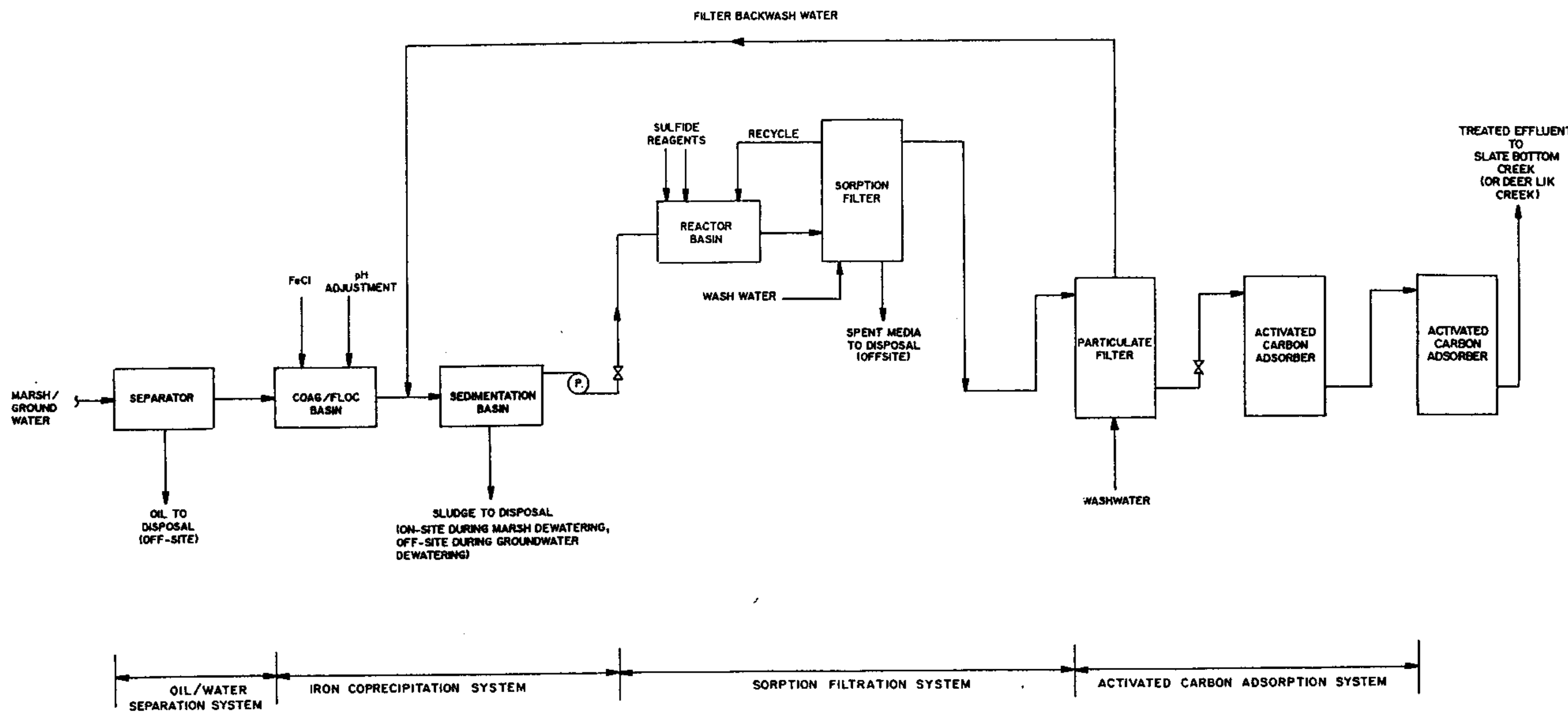
TYPICAL SECTION OF DEER LIK CREEK

FIGURE 5



UNION ROAD SITE

PROPOSED ON SITE TREATMENT SYSTEM

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FIGURE 1

TABLES

TABLE 4-96

UNION ROAD SITE/TOWN OF CHEEKTOWAGA, NEW YORK
PHASE I/II REMEDIAL INVESTIGATION
CONTAMINANT DETECTION FREQUENCY FOR GROUNDWATER

CONTAMINANT	Number of detections/ number of samples collected	Concentration Min - Max	Location of Maximum (Sample ID)
VOLATILE ORGANICS (ug/l)			
Acetone	4/27	11 - 41	MW-1D
Benzene	11/27	7 - 350	MW-1D (53-63)
Ethylbenzene	3/27	10 - 39	MW-1D (53-63)
Toluene	2/27	15 - 42	MW-4D
Xylenes	5/27	5 - 54	MW-1D (53-63)
SEMIVOLATILE ORGANICS (ug/l)			
Benzo(a)anthracene	2/27	10 - 19	MW-6S
Benzo(b)fluoranthene	1/27	16 - 16	MW-6S
Benzo(ghi)perylene	1/27	12 - 12	MW-6S
Benzo(a)pyrene	1/27	16 - 16	MW-6S
Chrysene	2/27	10 - 19	MW-6S
Di-n-butylphthalate	1/27	29 - 29	MW-1D (53-63)
Bis(2-ethylhexyl)phthalate	12/27	10 - 60	MW-5S
Fluoranthene	2/27	21 - 45	MW-6S
Indeno(1,2,3-cd)pyrene	1/27	12 - 12	MW-6S
Di-n-octyl phthalate	1/27	59 - 59	MW-5S
Phenanthrene	2/27	15 - 44	MW-6S
Pyrene	2/27	20 - 48	MW-6S
PESTICIDE/PCBs (ug/l)	0/27		
METALS (ug/l)			
Aluminum	22/27	206 - 35600	MW-3M
Antimony	14/27	13.6 - 408	MW-4S
Arsenic	3/27	27.1 - 35.5	MW-4S
Barium	10/27	201 - 704	MW-4S
Beryllium	1/27	0.48 - 0.48	MW-4S
Cadmium	1/27	8.4 - 8.4	MW-6S
Calcium	27/27	22800 - 1030000	MW-3M
Chromium	12/27	10.2 - 350	MW-4S
Copper	6/27	62.2 - 898	MW-6S
Iron	26/27	173 - 140000	MW-6S
Lead	13/27	7.2 - 10100	MW-4S
Magnesium	26/27	17900 - 287000	MW-3M
Manganese	20/27	19.2 - 4660	MW-3M
Mercury	2/27	0.22 - 0.72	MW-6S
Nickel	5/27	51.3 - 91.8	MW-3D (46.5-59)
Potassium	13/27	5070 - 35800	MW-3D (46.5-59)
Sodium	27/27	5310 - 3470000	MW-3D (46.5-59)
Vanadium	1/27	95.6 - 95.6	MW-3M
Zinc	13/27	22.3 - 1270	MW-1D (45.5-53)

TABLE 4-97

UNION ROAD SITE/TOWN OF CHEEKTOWAGA, NEW YORK
PHASE I/II REMEDIAL INVESTIGATION
CONTAMINANT DETECTION FREQUENCY FOR SURFACE WATER

CONTAMINANT	Number of detections/ number of samples collected	Concentration Min - Max	Location of Maximum (Sample ID)
VOLATILE ORGANICS (ug/l)	0/10		
SEMIVOLATILE ORGANICS (ug/l)			
Bis(2-ethylhexyl)phthalate	1/11	35 - 35	MA-SW-2C
PESTICIDE/PCBs (ug/l)	0/10		
METALS (ug/l)			
Aluminum	9/10	127 - 2550	MA-SW-2D
Antimony	1/10	68.5 - 68.5	MA-SW-2D
Calcium	10/10	58000 - 191000	MA-SW-2D
Chromium	3/10	11.1 - 16.6	MA-SW-2C
Copper	1/10	61.9 - 61.9	MA-SW-2D
Iron	10/10	253 - 15600	MA-SW-2D
Lead	3/10	12.3 - 76.4	MA-SW-3
Magnesium	10/10	11500 - 25500	MA-SW-3
Manganese	10/10	47.3 - 149	MA-SW-2C
Potassium	1/10	6380 - 6380	MA-SW-3
Selenium	1/10	1.2 - 1.2	MA-SW-1
Sodium	10/10	10400 - 83500	SBC-SW-1
Zinc	2/10	28.1 - 240	MA-SW-2D

TABLE 4-98

UNION ROAD SITE/TOWN OF CHEEKTOWAGA, NEW YORK
PHASE I/II REMEDIAL INVESTIGATION
CONTAMINANT DETECTION FREQUENCY FOR SURFACE WATER SEDIMENT

CONTAMINANT	Number of detections/ number of samples collected	Concentration Min - Max	Location of Maximum (Sample ID)
VOLATILE ORGANICS (ug/kg)			
Acetone	7/8	18 - 56	MA-SD-1
Methylene Chloride	3/8	10 - 22	MA-SD-2
SEMIVOLATILE ORGANICS (ug/kg)			
Benzo(a)anthracene	1/12	8900 - 8900	DLC-SD4
Benzo(b)fluoranthene	1/12	8500 - 8500	DLC-SD4
Benzo(k)fluoranthene	1/12	6400 - 6400	DLC-SD4
Benzoic Acid	1/12	13000 - 13000	MA-SD-3
Chrysene	3/12	3100 - 19000	DLC-SD4
Bis(2-ethylhexyl)phthalate	1/12	1900 - 1900	DLC-SD1
Fluoranthene	2/12	1400 - 7700	DLC-SD4
Fluorene	1/12	6400 - 6400	DLC-SD4
Di-n-octyl phthalate	1/12	5700 - 5700	DLC-SD4
Phenanthrene	2/12	4400 - 34000	DLC-SD4
Pyrene	2/12	1300 - 9600	DLC-SD4
PESTICIDE/PCBs (ug/kg)	0/10		
METALS (mg/kg)			
Aluminum	10/10	2430 - 18700	MA-SD-2
Antimony	5/10	15.7 - 6560	DLC-SD4
Arsenic	9/10	3 - 48	SBC-BW2
Barium	6/10	55 - 135	SBC-BW2
Calcium	10/10	4420 - 108000	MA-SD-3
Chromium	10/10	6.2 - 53	DLC-SD4
Copper	10/10	8 - 12900	DLC-SD4
Cyanide	3/10	0.65 - 2.5	SBC-SD-5
Iron	10/10	10200 - 67100	DLC-SD4
Lead	13/13	9.4 - 143000	DLC-SD4
Magnesium	10/10	1960 - 15300	SBC-SD-1
Manganese	10/10	183 - 753	MA-SD-1
Mercury	2/10	0.6 - 0.64	SBC-BW2
Nickel	9/10	9.1 - 43.7	MA-SD-2
Potassium	5/10	1140 - 3040	MA-SD-2
Silver	2/10	13.3 - 15.8	DLC-SD4
Thallium	1/10	0.29 - 0.29	SBC-SD-5
Vanadium	5/10	13.8 - 37.9	MA-SD-2
Zinc	10/10	34.1 - 614	MA-SD-3
RCRA PARAMETERS	0/1		
TCLP PARAMETERS (ug/l)			
Barium	1/1	267 - 267	MA-SD-2

TABLE 4-99

UNION ROAD SITE/TOWN OF CHEEKTOWAGA, NEW YORK
PHASE I/II REMEDIAL INVESTIGATION
CONTAMINANT DETECTION FREQUENCY FOR MARSH SEDIMENT

CONTAMINANT	Number of detections/ number of samples collected	Concentration Min - Max	Location of Maximum (Sample ID)
VOLATILE ORGANICS (ug/kg)			
Acetone	5/5	61 - 190	MB-15 (2-4)
2-Butanone	3/5	29 - 43	MB-15 (2-4)
Chlorobenzene	1/5	7 - 7	MB-14 (2-4)
SEMIVOLATILE ORGANICS (ug/kg)			
Chrysene	1/5	7800 - 7800	MB-12 (3-4)RE
Bis(2-ethylhexyl)phthalate	1/5	1300 - 1300	MB-15 (2-4)RE
Phenanthrene	1/5	1500 - 1500	MB-15 (2-4)RE
PESTICIDE/PCBs (ug/kg)	0/5		
METALS (mg/kg)			
Aluminum	5/5	7090 - 20800	MB-7 (4-8)
Antimony	4/5	102 - 1420	MB-15 (2-4)
Arsenic	5/5	2.9 - 31.1	MB-12 (3-4)
Barium	5/5	92.1 - 180	MB-12 (3-4)
Calcium	5/5	2040 - 89300	MB-12 (3-4)
Chromium	5/5	20 - 63.8	MB-12 (3-4)
Cobalt	1/5	12 - 12	MB-7 (4-8)
Copper	5/5	17.9 - 2320	MB-15 (2-4)
Iron	5/5	24800 - 44300	MB-12 (3-4)
Lead	5/5	13 - 28300	MB-15 (2-4)
Magnesium	5/5	4180 - 6450	MB-9 (2-4)
Manganese	5/5	257 - 491	MB-12 (3-4)
Mercury	3/5	0.26 - 1.3	MB-12 (3-4)
Nickel	5/5	23.6 - 120	MB-12 (3-4)
Potassium	2/5	1610 - 2330	MB-7 (4-8)
Silver	1/5	3.1 - 3.1	MB-15 (2-4)
Vanadium	4/5	21.1 - 34.5	MB-7 (4-8)
Zinc	5/5	96.7 - 280	MB-12 (3-4)
EPTOX METALS (mg/l)			
Lead	3/5	0.0649 - 0.981	MB-12 (3-4)

TABLE 4-100

UNION ROAD SITE/TOWN OF CHEEKTOWAGA, NEW YORK
PHASE I/II REMEDIAL INVESTIGATION
CONTAMINANT DETECTION FREQUENCY FOR SURFICIAL SOIL

CONTAMINANT	Number of detections/ number of samples collected	Concentration Min - Max	Location of Maximum (Sample ID)
VOLATILE ORGANICS (ug/kg)			
Acetone	8/14	15 - 60	SUSL-3
2-Butanone	1/14	49 - 49	SUSL-1
Methylene Chloride	4/14	8 - 16	SUSL-1
SEMIVOLATILE ORGANICS (ug/kg)			
Acenaphthene	2/14	1000 - 6000	SUSL-17
Acenaphthylene	2/14	1400 - 8900	SUSL-17
Anthracene	3/14	1000 - 21000	SUSL-17
Benzo(a)anthracene	6/14	1400 - 110000	SUSL-17 DUP
Benzo(b)fluoranthene	6/14	1100 - 110000	SUSL-17 DUP
Benzo(k)fluoranthene	4/14	1100 - 66000	SUSL-17 DUP
Benzo(ghi)perylene	4/14	890 - 110000	SUSL-17 DUP
Benzo(a)pyrene	6/14	1200 - 98000	SUSL-17 DUP
Chrysene	7/14	1000 - 120000	SUSL-17 DUP
Dibenzo(a,h)anthracene	1/14	42000 - 42000	SUSL-17 DUP
Dibenzofuran	2/14	980 - 7200	SUSL-17 DUP
Bis(2-ethylhexyl)phthalate	2/14	1700 - 1800	SUSL-17
Fluoranthene	6/14	1800 - 250000	SUSL-24
Fluorene	2/14	990 - 6600	SUSL-17 DUP
Indeno(1,2,3-cd)pyrene	2/14	1500 - 12000	SUSL-17
2-Methylnaphthalene	4/14	1000 - 1800	SUSL-17 DUP
Naphthalene	3/14	1200 - 3300	SUSL-17
Phenanthrene	9/14	840 - 120000	SUSL-17
Pyrene	8/14	1100 - 240000	SUSL-17 DUP
PESTICIDE/PCBs (ug/kg)			
alpha-BHC	1/14	89 - 89	SUSL-14
alpha-Chlordane	1/14	470 - 470	SUSL-14
gamma-Chlordane	1/14	440 - 440	SUSL-14
4-4' DDE	1/14	470 - 470	SUSL-14
4-4' DDT	1/14	180 - 180	SUSL-14
Dieldrin	2/14	140 - 180	SUSL-17
Endosulfan sulfate	1/14	110 - 110	SUSL-14
Endrin-ketone	2/14	48 - 60	SUSL-6
Heptachlor epoxide	1/14	160 - 160	SUSL-14
METALS (mg/kg)			
Aluminum	14/14	3090 - 16200	SUSL-17
Antimony	5/14	12.7 - 228	SUSL-1
Arsenic	13/14	4.6 - 33	SUSL-10
Barium	11/14	45.9 - 1960	SUSL-17
Cadmium	6/14	1.1 - 15.5	SUSL-12
Calcium	13/14	2980 - 184000	SUSL-11
Chromium	14/14	7.5 - 153	SUSL-17
Cobalt	3/14	13 - 18.3	SUSL-17
Copper	14/14	14.7 - 1190	SUSL-17
Cyanide	3/14	0.93 - 2.6	SUSL-1
Iron	14/14	12600 - 104000	SUSL-1
Lead	14/14	14.7 - 5400	SUSL-17
Magnesium	10/14	1420 - 9560	SUSL-9
Manganese	14/14	83.3 - 7670	SUSL-2
Mercury	7/14	0.11 - 1.4	SUSL-17
Nickel	14/14	10 - 121	SUSL-17
Potassium	4/14	1180 - 2030	SUSL-9
Selenium	6/14	1.7 - 3.7	SUSL-2
Vanadium	13/14	13.4 - 49.2	SUSL-17
Zinc	14/14	59.6 - 4940	SUSL-2

TABLE 4-101

UNION ROAD SITE/TOWN OF CHEEKTOWAGA, NEW YORK
PHASE I/II REMEDIAL INVESTIGATION
CONTAMINANT DETECTION FREQUENCY FOR SUBSURFACE SOIL

CONTAMINANT	Number of detections/ number of samples collected	Concentration Min - Max	Location of Maximum (Sample ID)
VOLATILE ORGANICS (ug/kg)			
Acetone	14/16	14 - 630	SLBH-1 (20-22)
2-Butanone	2/16	33 - 35	SLBH-WB45 (0-2)
Carbon disulfide	1/16	9 - 9	SLBH-WB52 (20-22
Ethylbenzene	1/16	22 - 22	SLBH-WB45 (0-2)
Methylene Chloride	2/16	21 - 54	SLBH-1 (20-22)
Xylene	1/16	67 - 67	SLBH-WB45 (0-2)
SEMIVOLATILE ORGANICS (ug/kg)			
Benzo(a)anthracene	4/16	1100 - 11000	SLBH-WB24 (6-8)
Benzo(b)fluoranthene	1/16	13000 - 13000	SLBH-WB24 (6-8)
Benzo(k)fluoranthene	3/16	1300 - 5100	SLBH-WB24 (6-8)
Benzoic acid	1/16	8400 - 8400	SLBH-2 (22-24)
Benzo(ghi)perylene	1/16	2100 - 2100	SLBH-WB24 (6-8)
Benzo(a)pyrene	2/16	1700 - 5800	SLBH-WB24 (6-8)
Chrysene	4/16	1300 - 9500	SLBH-WB24 (6-8)
Dibenzofuran	1/16	1200 - 1200	SLBH-4 (14-22)
Bis(2-ethylhexyl)phthalate	3/16	920 - 1100	SLBH-7 (26-28)
Fluoranthene	4/16	2700 - 9400	SLBH-WB24 (6-8)
Fluorene	1/16	2900 - 2900	SLBH-4 (14-22)
Indeno(1,2,3-cd)pyrene	1/16	3100 - 3100	SLBH-WB24 (6-8)
2-Methylnaphthalene	2/16	1400 - 5200	SLBH-WB45 (0-2)
Naphthalene	1/16	1700 - 1700	SLBH-4 (14-22)
Phenanthrene	6/16	1100 - 19000	SLBH-4 (14-22)
Pyrene	5/16	960 - 6200	SLBH-4 (14-22)
PESTICIDE/PCBs (ug/kg)	0/16		
METALS (mg/kg)			
Aluminum	17/17	1860 - 20600	SLBH-1 (20-22)
Antimony	6/17	13.6 - 945	SLBH-WB45 (0-2)
Arsenic	10/17	3.6 - 47.1	SLBH-WB40 (14-16)
Barium	16/17	53.2 - 549	SLBH-WB16 (10-12)
Beryllium	2/17	1.1 - 1.6	SLBH-WB24 (6-8)
Cadmium	2/17	1.3 - 3.4	SLBH-WB16 (10-12)
Calcium	17/17	2060 - 132000	SLBH-2 (22-24)
Chromium	17/17	6 - 2220	SLBH-WB16 (10-12)
Cobalt	5/17	11.7 - 27.5	SLBH-WB24 (6-8)
Copper	17/17	11.2 - 5490	SLBH-WB40 (14-16)
Cyanide	3/17	1.7 - 5.8	SLBH-WB16 (10-12)
Iron	17/17	6260 - 118000	SLBH-WB24 (24-26)
Lead	17/17	3.8 - 23000	SLBH-WB16 (10-12)
Magnesium	15/17	1490 - 31300	SLBH-MW7D (38-40)
Manganese	17/17	104 - 6970	SLBH-WB24 (6-8)
Mercury	5/17	0.13 - 0.74	SLBH-WB45 (0-2)
Nickel	15/17	13.4 - 203	SLBH-WB24 (24-26)
Potassium	9/17	1030 - 4890	SLBH-WB51 (25-27)
Selenium	1/17	1.7 - 1.7	SLBH-WB45 (0-2)
Silver	1/17	3.1 - 3.1	WB-7-B7 (16-18)
Vanadium	13/17	17.2 - 42.2	SLBH-WB51 (25-27)
Zinc	17/17	29 - 967	SLBH-WB16 (10-12)
RCRA PARAMETERS	0/2		
EPTOX METALS (mg/l)			
Arsenic	1/2	0.10 - 0.10	SLBH-4 (14-22)
Barium	1/2	0.469 - 0.469	SLBH-6 (18-22)
Lead	5/7	0.0876 - 62.5	SLBH-4 (14-22)
TCLP PARAMETERS (ug/l)			
2-Butanone	1/2	15 - 15	SLBH-4 (14-22)
Methylene Chloride	2/2	8 - 17	SLBH-6 (18-22)
Arsenic	2/2	83.6 - 173	SLBH-6 (18-22)
Barium	2/2	887 - 913	SLBH-4 (14-22)
Chromium	2/2	21.4 - 30	SLBH-6 (18-22)
Lead	2/2	727 - 16900	SLBH-4 (14-22)

TABLE 4-102

UNION ROAD SITE/TOWN OF CHEEKTOWAGA, NEW YORK
PHASE I/II REMEDIAL INVESTIGATION
CONTAMINANT DETECTION FREQUENCY FOR TEST PIT SOIL

CONTAMINANT	Number of detections/ number of samples collected	Concentration Min - Max	Location of Maximum (Sample ID)
VOLATILE ORGANICS (ug/kg)			
Acetone	7/7	14 - 390	SLTP-10 (0-1)
2-Butanone	2/7	41 - 58	SLTP-10 (0-1)
Methylene Chloride	3/7	6 - 14	SLTP-17 (5-6)
4-methyl-2-pentanone	1/7	27 - 27	SLTP-10 (0-1)
Toluene	1/7	31 - 31	SLTP-10 (0-1)
SEMIVOLATILE ORGANICS (ug/kg)			
Anthracene	1/7	950 - 950	SLTP-13 (5-6)
Benzo(a)anthracene	3/7	1100 - 7100	SLTP-13 (5-6)
Benzo(b)fluoranthene	3/7	1500 - 11000	SLTP-13 (5-6)
Benzo(k)fluoranthene	1/7	1100 - 1100	SLTP-21 (1-2)
Benzo(ghi)perylene	1/7	2100 - 2100	SLTP-13 (5-6)
Benzo(a)pyrene	3/7	1200 - 5500	SLTP-13 (5-6)
Chrysene	4/7	1000 - 7300	SLTP-13 (5-6)
Dibenzo(a,h)anthracene	2/7	820 - 1200	SLTP-13 (5-6)
Diethylphthalate	1/7	1100 - 1100	SLTP-3 (1-3)
Fluoranthene	4/7	1100 - 9300	SLTP-13 (5-6)
Indeno(1,2,3-cd)pyrene	2/7	1700 - 3600	SLTP-13 (5-6)
Phenanthrene	4/7	2000 - 9300	SLTP-10 (0-1)
Pyrene	4/7	840 - 11000	SLTP-13 (5-6)
PESTICIDE/PCBs (ug/kg)	0/7		
METALS (mg/kg)			
Aluminum	7/7	382 - 9490	SLTP-3 (1-3)
Antimony	2/7	3930 - 3990	SLTP-10 (0-1)
Arsenic	5/7	2.4 - 35.7	SLTP-11 (1-3)
Barium	5/7	55.3 - 562	SLTP-13 (5-6)
Cadmium	5/7	0.44 - 7.8	SLTP-17 (5-6)
Calcium	7/7	2330 - 134000	SLTP-2 (1)
Chromium	6/7	14.9 - 313	SLTP-13 (5-6)
Copper	6/7	17.3 - 23500	SLTP-11 (1-3)
Cyanide	6/7	0.71 - 3.3	SLTP-17 (5-6)
Iron	7/7	420 - 138000	SLTP-11 (1-3)
Lead	7/7	5.5 - 128000	SLTP-10 (0-1)
Magnesium	3/7	1470 - 139000	SLTP-2 (1)
Manganese	7/7	40.2 - 762	SLTP-11 (1-3)
Mercury	5/7	0.12 - 10.6	SLTP-11 (1-3)
Nickel	6/7	9.5 - 104	SLTP-11 (1-3)
Potassium	1/7	1200 - 1200	SLTP-21 (1-2)
Selenium	1/7	4.8 - 4.8	SLTP-17 (5-6)
Silver	2/7	13.4 - 15.4	SLTP-11 (1-3)
Sodium	2/7	526 - 6120	SLTP-10 (0-1)
Thallium	2/7	0.13 - 0.35	SLTP-17 (5-6)
Vanadium	3/7	14 - 29.4	SLTP-17 (5-6)
Zinc	7/7	15.2 - 701	SLTP-11 (1-3)

TABLE 4-103

UNION ROAD SITE/TOWN OF CHEEKTOWAGA, NEW YORK
PHASE I/II REMEDIAL INVESTIGATION
CONTAMINANT DETECTION FREQUENCY FOR TAR PIT SAMPLES

CONTAMINANT	Number of detections/ number of samples collected	Concentration Min - Max	Location of Maximum (Sample ID)
VOLATILE ORGANICS (ug/kg)			
Acetone	5/5	16 - 490	TP-TA-C2 (1-3)
2-Butanone	4/5	52 - 230	TP-TA-C1 (3-4.5)
2-Hexanone	3/5	47 - 130	TP-TA-C1 (3-4.5)
Methylene Chloride	1/5	6 - 6	TP-TA-C3 (1-3)
4-methyl-2-pentanone	4/5	52 - 230	TP-TA-C1 (3-4.5)
Toluene	3/5	16 - 100	TP-TA-C2 (1-3)
Xylenes	4/5	8 - 61	TP-TA-C1 (3-4.5)
SEMIVOLATILE ORGANICS (ug/kg)			
Chrysene	1/5	24000 - 24000	Tar Pit Phase II
Dibenzofuran	1/5	3000 - 3000	TP-TA-C2 (1-3)
Bis(2-ethylhexyl)phthalate	2/5	1000 - 1100	TP-TA-C1 (1-3)
2-Methylnaphthalene	3/5	1100 - 2800	TP-TA-C2 (1-3)
Naphthalene	2/5	2200 - 210000	Tar Pit Phase II
Phenanthrene	3/5	5200 - 53000	Tar Pit Phase II
PESTICIDE/PCBs (ug/kg)	0/4		
METALS (mg/kg)			
Aluminum	4/4	2510 - 19700	TP-TA-C1 (5-6)
Antimony	3/4	949 - 1080	TP-TA-C3 (1-3)
Arsenic	4/4	6.6 - 29.2	TP-TA-C1 (1-3)
Barium	4/4	95 - 232	TP-TA-C3 (1-3)
Cadmium	2/4	1.4 - 1.5	TP-TA-C3 (1-3)
Calcium	4/4	2210 - 34500	TP-TA-C1 (1-3)
Chromium	4/4	22 - 36.3	TP-TA-C3 (1-3)
Copper	4/4	34.1 - 7140	TP-TA-C3 (1-3)
Cyanide	3/4	0.74 - 1.6	TP-TA-C3 (1-3)
Iron	4/4	25200 - 42000	TP-TA-C3 (1-3)
Lead	4/4	167 - 96600	TP-TA-C3 (1-3)
Magnesium	4/4	1490 - 4950	TP-TA-C1 (5-6)
Manganese	4/4	251 - 336	TP-TA-C1 (5-6)
Mercury	3/4	1.7 - 4	TP-TA-C2 (1-3)
Nickel	4/4	23 - 35.7	TP-TA-C3 (1-3)
Potassium	2/4	465 - 2290	TP-TA-C1 (5-6)
Silver	3/4	2.1 - 13	TP-TA-C3 (1-3)
Sodium	3/4	3040 - 3980	TP-TA-C3 (1-3)
Vanadium	2/4	14.7 - 32.9	TP-TA-C1 (5-6)
Zinc	4/4	105 - 393	TP-TA-C3 (1-3)
EPTOX METALS (mg/l)			
Lead	3/3	18.8 - 187	C3 Eptox (1-3)
TCLP PARAMETERS (ug/l)			
2-Butanone	2/3	12 - 13	TP-TA-C3 (1-3)
Chloroform	2/3	5 - 8	TP-TA-C1 (1-3)
Arsenic	3/3	0.0399 - 0.0883	TP-TA-C2 (1-3)
Barium	3/3	0.179 - 0.547	TP-TA-C1 (1-3)
Cadmium	1/3	0.0030 - 0.0030	TP-TA-C3 (1-3)
Chromium	2/3	0.0023 - 0.0093	TP-TA-C2 (1-3)
Lead	3/3	4.12 - 101	TP-TA-C1 (1-3)

Table 5-1

SUMMARY OF INDICATOR CHEMICALS

Carcinogenic Effects	Noncarcinogenic Effects
Arsenic	Lead
Total PAHs	Manganese
Nickel	Barium
Cadmium	Antimony
Beryllium	Copper
Dieldrin	Arsenic
Alpha-chlordane	Zinc
Beta-BHC	Cadmium
Gamma-chlordane	Vanadium
4,4'-DDT	Thallium
Asbestos	Nickel
Trans-1,3-dichloropropene	Mercury
Heptachlor	Selenium
Benzene	Silver
Total PCBs	Dieldrin
Tetrachloroethene	Alpha-chlordane
	Gamma-chlordane
	Cyanide
	Chromium (as (CrIII))
	Beryllium
	Naphthalene
	4,4'-DDT
	Endrin-ketone
	Phenol
	2-Butanone
	Ethylbenzene
	Xylene
	Toluene
	Trans-1,3-dichloropropene
	2-Methyl-4-pentanone
	Di-n-octylphthalate
	Di-n-butylphthalate
	Butylbenzylphthalate
	Diethylphthalate
	Pentachlorophenol
	Chlorobenzene
	Benzyl alcohol

Source: Final Baseline Human Health Risk Assessment, Union Road Site, June 1991.

TABLE 1.1
SUMMARY OF CONTAMINANTS PRESENT IN SOLID AND SEMI-SOLID MEDIA OPERABLE UNITS
UNION ROAD SITE
TOWN OF CHEEKTOWAGA, ERIE COUNTY, NEW YORK

Operable Unit	Media	Estimated Volume	Elevated Metals?	PAHs?	Petro. Hydro-carbons?	BNAs?	EP Toxic?	TCLP?	Asbestos?	Recommended for Inclusion in Remedial Action Plan?
Tar Pit	Waste Oils & Lubricants	1,700 cy	Sb As Cu Hg Ag Zn Pb Pb>NYSDEC USEPA	Yes >NYSDEC	Yes	Yes	Yes, Pb	Yes, Pb	ND	Yes
	55-gallon drums									Yes
	1' Underlying Soil	400 cy	None	ND	Yes	Yes	NA	NA	NA	Yes
Surficial Soils										
1. Disposal Area	Soil	5,000 to 10,000 cy	Sb As Cd Cu Zn Pb	Yes >NYSDEC	Yes	Yes	Yes, Pb	NA	Yes	Yes
2. Roundhouse Area	Soil	Area: 7.5 acres	As Cu Pb	Yes >NYSDEC	Yes	Yes	No	NA	Yes	Yes
Subsurface Soil/Buried Waste										
1. Disposal Area	Fill mat'l over buried waste	80,000 cy*	Pb Cr Cu Ni Sb As Zn Cd	Yes >NYSDEC	Yes	Yes	Likely,Pb	NA	Yes	Yes
	Soil/Buried Waste	25,000 cy	Sb As Cr Cu Zn Pb	Yes >NYSDEC	Yes	Yes	Yes, Pb	NA	Yes	Yes

TABLE 1.1 (continued)

Operable Unit	Media	Estimated Volume	Elevated Metals?	PAHs	Petro. Hydro-Carbons?	BNAs?	EP Toxic?	TCLP?	Asbestos?	Recommended for Inclusion in Remedial Action Plan?
	1' Underlying Soil	6,000 cy	Cr Cu Ni Pb Zn	Yes	Yes	Yes	No	NA	Yes	Yes
2. SW of Roundhouse	Subsurface Soil	1,800 cy	Pb As Cu	Yes >NYSDEC	Yes	Yes	No	NA	Yes	Yes
	1' Underlying Soil	500 cy	NA	NA	NA	NA	NA	NA	NA	Yes
Slate Bottom and Deer Lik Creeks	Sediment in bed & stream banks	5,000 cy**	Ag As Cu Sb Pb Zn	Yes >NYSDEC	Yes	BNs	Yes, Pb	NA	NA	Yes
Marsh	Surficial Sediment	1,500 cy	Pb Sb As Cu Zn	Yes >NYSDEC	Yes	BNs	No	No	NA	Yes
Marsh	Subsurface Sediment	8,000 cy***	Pb As Cu Hg Ni	Yes >NYSDEC	Yes	BNs	Yes	NA	NA	Yes
Marsh	1' Underlying Soil	1,500 cy	No	ND	Yes	Yes	No	NA	NA	Yes

TOTAL VOLUME OF MATERIAL IN THE TAR PIT = 2100 CY
TOTAL VOLUME OF THE BURIED WASTE, AND
CONTAMINATED SOIL AND SEDIMENT (INCLUDING UNDERLYING SOIL) = 127,800 CY

NA - Not Analyzed
ND - Not Detected
* - Includes surficial soil in the waste disposal area
** - Includes one foot of underlying soil
*** - Includes surficial sediment in the marsh

TABLE 1.2
APPLICABLE OR RELEVANT AND APPROPRIATE NEW YORK
STATE STANDARDS, CRITERIA, AND GUIDELINES (SCGs)
FOR THE UNION ROAD SITE

SCG	APPLICATION
NYSDEC Soil Cleanup Criteria Guidelines	Cleanup of tar pit and contaminated soil and sediment
NYSDEC Standards and Guidelines for Class GA Groundwater	Cleanup of perched groundwater
NJDEP Ground Water Cleanup Level Guidelines	Cleanup of perched groundwater
NYSDEC Standards and Guidelines for Class C Surface Waters	Cleanup of the marsh water
New York State Guidelines for the Control of Toxic Ambient Air Contaminants	Air emissions from on-site incineration or on-site vitrification
Air Cleanup Criteria of NYSDEC Division of Air Resources	Air emissions from on-site incineration or on-site vitrification, remedial operations
AIR/SUPERFUND NATIONAL TECHNICAL GUIDANCE STUDY SERIES	Air emissions from on-site incineration or on-site vitrification, remedial operations
ACGIH Threshold Limiting Values	Air emissions from remedial operations, including excavation
National Ambient Air Quality Standards (NAAQS)	Air emissions from on-site incineration or on-site vitrification
Target Concentrations for the High-risk Chemicals identified in the Health Risk Assessment	Cleanup of the tar pit, contaminated soil and sediment, perched groundwater, and marsh water

Table 1.2 (continued)

SCG	APPLICATION
RCRA Hazardous Waste Transportation Regulations	Transportation of the tar pit waste, and contaminated soil and sediment to an off-site landfill or incinerator
U.S. Department of Transportation Hazardous Materials Transportation Regulations	Transportation of the tar pit waste, and contaminated soil and sediment to an off-site landfill or incinerator
40 CFR 264 Part O Standards for incinerators	On-site and off-site incineration of the tar pit waste, and contaminated soil and sediment
40 CFR 264 Part N Standards for landfills	On-site containment/capping and disposal of the tar pit waste, and contaminated soil and sediment after stabilization
RCRA Land Ban Restrictions for characteristic hazardous wastes	On-site or off-site land disposal of the tar pit waste, and contaminated soil and sediment
Buffalo Sewer Authority and Erie County Department of Environment and Planning Sewer Use Ordinances	Industrial discharge permit required for discharge of marsh water or perched groundwater to the Buffalo sewer system
Clean Water Act and New York State Water Pollution Control Regulations	New York State Pollutant Discharge Elimination System (NYSPDES) Permit required for discharge of marsh water or perched groundwater to Slate Bottom or Deer Lik Creek, or to groundwater
Section 404 of the Clean Water Act	Section 404 Permit required from the U.S. Army Corps of Engineers for diversion of the creek prior to excavation of the banks

Table 1.2 (continued)

SCG	APPLICATION
Fish and Wildlife Coordination Act	Consultation with the Fish and Wildlife Service required prior to diversion of the creek to determine measures for mitigating adverse impacts on the aquatic life
Occupational Safety and Health Administration (OSHA) Regulations of 40 CFR 1910	Worker training, work practices, and worker protection for remedial operations
NYS Uniform Procedures Act	Permit for discharge of marsh water or perched groundwater to Slate Bottom Creek or Deer Lik Creek

TABLE 2.3
SUMMARY OF KEY EVALUATON FACTORS
FOR THE TAR PIT

Remedial Action Alternative	Onsite or Offsite?	Attains SCGs?	Remediation Implementation Period	Remediation Capital Cost ($)	Post-Remediation O&M Period (years)	Annual Post-Remediation O&M Cost ($)	Total Present Worth @ 5% int. (1990 $)	NYSDEC Hierarchy Rating	Treatability Study Required?	Total Score
Isolation of Waste with Subsurface Barrier and Cap	Onsite	No	8 months	5,358,000 5,666,000	> 30 > 30	160,000 160,000	7,818,000** 8,126,000***	4	no	54+
Excavation and Transportation to an Off-site RCRA Landfill	Offsite	Yes	4 months	1,513,000	0	0	1,513,000	5	yes	81
Excavation and On-site Incineration with On-site or Off-site Ash Disposal	Onsite	Yes	3 years* 6 months	2,228,000 1,266,000	30 (onsite disposal) 0 (offsite disposal)	160,000 0	3,458,000 1,266,000	1 1	yes yes	72 87
Excavation and Transportation to an Off-site Incinerator	Offsite	Yes	4 months	3,497,000	0	0	3,497,000	1	yes	75
Excavation, On-site Stabilization/ Solidification, and On-site Disposal	Onsite	Yes	3 years*	2,100,000	30	160,000	3,330,000	3	yes	71
No Action	Onsite	No	------	0	Indefinite	60,000	957,000	-------	-------	42

1 - destruction
2 - separation/treatment
3 - solidification/chemical fixation
4 - control and isolation technologies
5 - off-site land disposal
* - On-site options include construction of on-site RCRA landfill
** - System around waste disposal area, tar pit, and marsh.
*** - System around waste disposal area and tar pit.
+ - total does not include cost.

TABLE 3.4
SUMMARY OF KEY EVALUATION FACTORS
FOR THE CONTAMINATED SOIL AND SEDIMENT

Remedial Action Alternative	Onsite or Offsite?	Attains SCGs?	Remediation Implementation Period	Remediation Capital Cost ($)	Post-Remediation O&M Period (years)	Post-Remediation O&M Cost ($)	Total Present Worth @ 5% int. (1990 $)	NYSDEC Hierarchy Rating	Treatability Study Required?	Total Score
Isolation of Waste with a Subsurface Barrier and Cap	Onsite	No	8 months	5,358,000 5,666,000	> 30 > 30	160,000 160,000	7,818,000** 8,126,000***	4	no	69
Excavation and Transportation to an Off-site RCRA Landfill	Offsite	Yes	1.8 years	71,603,000	0	0	72,441,000	5	yes	69
Excavation, On-site Incineration, and On-site or Off-site Soil Disposal	Onsite	Yes	6.7 yr* (24 hr/day) 5.0 yr (24 hr/day)	32,727,000 77,819,000	30 (onsite disposal) 0 (offsite disposal)	160,000 0	33,957,000 77,819,000	1 1	yes yes	79 72
Ecavation and Transportation to an Off-site Incinerator	Offsite	Yes	5.0 years	217,871,000	0	0	217,996,000	1	yes	71
On-site Vitrification	Onsite	Yes	4.8 yr (24 hr/day)	60,886,000	30	36,000	61,422,000	1	yes	75
Excavation and Bioremediation	Onsite	Maybe	13.2 years*	26,774,000 70,588,000	30 (onsite disposal) 0 (off-site disposal)	160,000 0	29,228,000 70,732,000	1	yes	60
Excavation, On-site Stabilization/ Solidification, and On-site Disposal	Onsite	Yes	3.4 yr* (24 hr/day)	22,637,000	30	160,000	23,867,000	3	yes	80
Soil Washing (METALEEP)	Onsite	Yes	2.5 yr (8 hr/day)	25,673,000	0	0	25,673,000	2	yes	82
Soil Washing (BEST Process)	Onsite	Yes	7.4 yr* (24 hr/day)	41,545,000	30 (onsite disposal)	160,000	44,005,000	2	yes	76
Periodic Inspection, Removal, and Treatment/Disposal of Exposed Oily Waste in the Creeks	Offsite	No	30 years	2,091,000 738,000	30 30	36,000 36,000	2,644,000 1,291,000	1 (incin.) 5 (landfill)	yes yes	58
Complete Removal of the Creek Bed and Banks	Offsite	Yes	2 months	11,410,000 2,646,000	0 0	0 0	11,747,000 3,283,000	1 (incin.) 5 (landfill)	yes yes	-- --
Stabilization of Creek Bed and Banks	Offsite	No	3 months	133,000	0	0	434,000	4	no	--
Concrete Culvert in Slate Bottom Creek and Deer Lik Creek	Onsite	No	10 months 20 months 7 months	8,728,000 (closed) 4,656,000 (up entire banks) 3,469,000 (15' up banks)		0	8,728,000 4,656,000 3,469,000	4	no	-- -- --
Isolation by Capping	Onsite	No	5 months	3,916,000 4,451,000	> 30 > 30	160,000 160,000	6,376,000** 6,911,000***	4	no	57
No Action	Onsite	No	----------------	0	Indefinite	60,000	957,000	--------	--------	41

1 - destruction , 2 - separation/treatment , 3 - solidification/chemical fixa , 4 - control and isolation technologies, 5 - off-site land disposal
* - On-site disposal options include construction of on-site RCRA landfill
** - System around waste disposal area, tar pit, and marsh.
*** - System around waste disposal area and tar pit.

ser/DVIR01/NYD6

Table 8-2

Summary of Elevated Risks By Matrix, Area and Contaminant

Risk	Matrix	Area	Receptor	Total Risk	Contaminant/Risk
INGESTION (EPA Intake Rate)					
Carcinogenic	Surficial Soil	Disposal Area	Children	1.43E-06	CaPAH's / 1.42E-06
Carcinogenic	Tar Pit	N/A	Children	2.91E-06	CaPAH's / 2.90E-06
Non-Carcinogenic	Bank Waste	N/A	Children	2.10E+00	Lead / 1.69E+00
INHALATION (Wind Erosion)					
Carcinogenic	Surficial Soil	Disposal Area	Children	6.41E-04	Asbestos / 6.39E-04
Carcinogenic	Surficial Soil	Disposal Area	Children	6.41E-04	Arsenic / 1.29E-06
Carcinogenic	Surficial Soil	Disposal Area	Idylwoods Apts.	1.70E-06	Asbestos / 1.52E-06
Carcinogenic	Surficial Soil	Disposal Area	No. of Losson Road	1.72E-06	Asbestos / 1.54E-06
Carcinogenic	Surficial Soil	Roundhouse Area	Children	2.29E-06	Arsenic / 2.10E-06
DERMAL					
Carcinogenic	Surficial Soil	Disposal Area	Children	1.60E-06	CaPAH's / 1.50E-06
Non-Carcinogenic	Surficial Soil	Disposal Area	Children	5.33E+00	Lead / 4.08E+00
Carcinogenic	Tar Pit	N/A	Children	3.06E-06	CaPAH's / 3.06E-06
Non-Carcinogenic	Tar Pit	N/A	Children	4.39E+01	Lead / 3.93E+01
Non-Carcinogenic	Tar Pit	N/A	Children	4.39E+01	Antimony / 4.43E+00
Non-Carcinogenic	Bank Waste	N/A	Children	1.54E+02	Lead / 1.11E+02
Non-Carcinogenic	Bank Waste	N/A	Children	1.54E+02	Antimony / 4.23E+01
Non-Carcinogenic	Sediment	Marsh	Children	1.16E+01	Lead / 8.54E+00
Non-Carcinogenic	Sediment	Marsh	Children	1.16E+01	Antimony / 2.84E+00

TABLE 4.13. SUMMARY OF GROUNDWATER REMEDIATION ALTERNATIVES SCORESHEETS

Alternative	Compliance with SCGs	Protection of Human Health and the Environment	Short-Term Effectiveness	Long-Term Effectiveness & Permanence	Reduction of Toxicity, Mobility, or Volume	Implementability	TOTAL
Primary Heavy Metals Removal Options							
pH Adjustment and Precipitation--	10	20	10	15	15	15	85
Iron-Based Coprecipitation--	10	20	10	15	15	15	85
Secondary Heavy Metals Removal Options							
Ion Exchange--	10	20	10	15	15	15	85
Sorption Filtration--	10	20	10	15	15	14	84
Organics Removal Options							
Carbon Adsorption--	10	20	10	15	15	15	85
UV Light-Enhanced Oxidation--	10	20	10	15	15	15	85

TABLE 4.14
SUMMARY OF THE KEY EVALUATION FACTORS
FOR THE SHALLOW GROUNDWATER

Remedial Action Alternative	Onsite or Offsite?	Attains SCGs?	Remediation Implementation Period	Remediation Capital Cost ($)	Remediation O&M Period (months)	Remediation O&M Cost ($)	Total Present Worth @ 5% int. (1990 $)	NYSDEC Hierarchy Rating	Treatability Study Required?	Total Score
Groundwater Extraction --										
20 Extraction Wells	Onsite	Yes	3 months	225,000	3	8,000	233,000		Pump tests	
Pretreatment --										
Oil/Water Separation	Onsite	Yes	3 months	40,000	3	1,000	41,000			
Primary Metals Removal Options --										
pH Adjustment and Precipitation	Onsite	Yes	3 months	295,000	3	44,000	339,000	2	Yes	85
Iron-based Coprecipitation	Onsite	Yes	3 months	241,000	3	45,000	286,000	2	Yes	85
Secondary Metals Removal Options --										
Ion Exchange	Onsite	Yes	3 months	119,000	3	5,000	124,000	2	Yes	85
Sorption Filtration	Onsite	Yes	3 months	163,000	3	24,000	187,000	2	Yes	84
Organics Removal Options --										
Carbon Adsorption	Onsite	Yes	3 months	50,000	3	Unknown	50,000+*	2	Yes	85
UV Light-Enhanced Oxidation	Onsite	Yes	3 months	294,000	3	4,000	298,000	1	Yes	85
Treated Water Disposal --										
Infiltration Galleries	Onsite	Yes	3 months	29,000	3	1,000	30,000		Pump tests	
20 Recharge Wells	Onsite	Yes	3 months	168,000	3	3,000	171,000		Pump tests	
Discharge to Sanitary Sewer	Onsite	Yes	3 months	13,000	3	0	13,000			
Discharge to Creeks	Offsite	Yes	3 months	7,000	3	0	7,000			

1 - Destruction
2 - Separation/Treatment
* - Does not include O & M Costs

TABLE C1

THE UNION ROAD SITE (ID 9-15-128)

COST ESTIMATES FOR THE PREFERRED REMEDIAL ALTERNATIVE

No.	Operable Unit	Selected Alternative	Total Estimated Cost (Present Worth)	Estimated Capital Costs	O&M Costs as Present Worth	Estimated Annual O&M Costs
1	Tar Pit, Disposal Area	Containment System (Slurry Wall/RCRA Cap)	$ 5,840,000	$ 5,840,000	*	*
2	Deer Lik & Slate Bottom Creek	Concrete Lining of Bed and Banks	2,884,000	2,884,000	*	*
3	Marsh Water and Shallow Groundwater	Extraction and Treatment	864,000	829,000	35,000**	45,000
4	Roundhouse Area	Excavation and Soil Cover	585,000	585,000	*	*
5	Monitoring Program	30 Year Post Closure Maintenance and Monitoring	3,075,000		3,075,000	200,000
		Subtotal	$13,248,000***			
		Contingencies (10%)	1,325,000			
		Total	$14,573,000			

*Cost included in Item 5 Monitoring Program.
**Cost estimated based on 9 month operation period.
***Cost as presented in the Conceptual Design Report. Where Phase III Feasibility Study presents an estimated cost of $12,699,000, the major difference is related to different assumptions for Items 2 and 5. For Item 2, the Phase III Feasibility Study assumed covering the banks of the creeks above the concrete channel with riprap. The Conceptual Design Report assumed the use of concrete lining to elevation 613 to protect the channel against a 100-year flood. The remaining of the banks will be covered with PVC three dimensional erosion control matting and vegetation. The west bank of Deer Lik Creek and the confluence of the two creeks will be protected against a 100 year flood with riprap. For Item 5, in addition to monitoring the wells outside of the containment system, the Conceptual Design Report also considers monitoring the extraction wells inside the containment.

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ADMINISTRATIVE RECORD

Administrative Record

Engineering Investigation at Inactive Hazardous Waste Sites Phase I Report - Union Road Site, May 1986	Prepared by Recra Environmental for NYSDEC.
Final Work Plan, Jan. 1989 (3 Volumes)	Prepared by Dvirka and Bartilucci (D&B) for NYSDEC.
Phase I RI Field Record Book, May 1989 (1 Volume)	Prepared by D&B for NYSDEC.
Phase I RI Data Validation Report, July 1989 (2 Volumes)	Prepared by D&B thru Johnson and Malhotra for NYSDEC.
Work Plan Addendum 1 for Phase II RI Work, Sept. 1989 (1 Volume)	Prepared by D&B for NYSDEC.
Final Satellite Site Report, October 1989 (1 Volume)	Prepared by D&B for NYSDEC.
Phase II RI Field Record Report, Jan. 1990 (1 Volume)	Prepared by D&B for NYSDEC.
Final Phase I/Phase II FS Report, May 1990 (1 Volume)	Prepared by D&B thru SCS Engineers for NYSDEC.
Phase II RI Data Validation Report, May 1990 (2 Volumes)	Prepared by D&B thru Johnson and Malhotra for NYSDEC.
Biological Sampling Work Plan August 10, 1990 (1 Volume)	Prepared by D&B for NYSDEC.
Biological Study Program Report, June 1991 (1 Volume)	Prepared by D&B for NYSDEC.
Final IRM Waste/Soil Removal from the Banks of Slate Bottom Creek, June 1991	Prepared by D&B for NYSDEC.
Final Environmental Assessment Report Including Biological Study Program, June 1991	Prepared by D&B thru Sadat Associates for NYSDEC.
Final Phase I/Phase II RI Report (3 Volumes) June 1991	Prepared by D&B for NYSDEC.

Final Baseline Human HRA Report, August 1991	Prepared by D&B thru Sadat Associates for NYSDEC.
Draft Final Phase III FS Report, September 1991	Prepared by D&B thru SCS Engineers for NYSDEC.
Union Road Site	RI/FS Correspondence Files.
On-Scene Coordinator's Report Union Road Removal Action, Cheektowaga, New York, April 1990	Prepared by Roy F. Weston, Inc. for USEPA, Emergency and Remedial Response Division.
Citizen Participation Plan - Union Road Site	Prepared by NYSDEC, October 1988.
Project Information Sheets	Prepared by NYSDEC, January 1989, November 1989, December 1990.
Responsiveness Summary Documenting Public Meeting of December 6, 1989	Prepared by NYSDEC, January 4, 1990.
Conceptual Design Report Union Road Site, September 1991	Prepared by D&B for NYSDEC.
Review and Response to Substantive Comments on the PRAP, March 1992	Prepared by the NYSDEC Included as a Part of ROD.

NYS Department of Environmental Conservation

RESPONSIVENESS SUMMARY
Union Road Site
Site No. 9-15-128
Town of Cheektowaga, New York

INTRODUCTION:

This Responsiveness Summary provides a summary of the public's comments and concerns regarding the Proposed Remedial Action Plan (PRAP) for the Union Road Site and the New York State Department of Environmental Conservation's (NYSDEC) responses to those comments. At the time of the public comment period, NYSDEC had selected a preferred alternative for controlling soil and groundwater contamination at the site.

The NYSDEC held a public comment period from January 16, 1992 through February 18, 1992 to provide interested parties the opportunity to comment on the PRAP for the Union Road Site.

The NYSDEC held a public meeting to present the preferred remedial alternative for controlling soil and groundwater contamination at the site. The meeting was held at the Cheektowaga Town Hall, Council Chambers, Broadway and Union Roads, Town of Cheektowaga, New York on January 23, 1992 at 7:00 p.m.

The NYSDEC's presentation of the PRAP was well received by both the residents and the members of the Town Council who attended the meeting. No objection to the PRAP or preferred alternatives were raised at the public meeting. Written comments from the PRP(s) included objection to the lining of the Creek and the remediation of this roundhouse area, on ground of justification.

This Responsiveness Summary is divided into the following sections:

I. RESPONSIVENESS SUMMARY OVERVIEW: This section briefly describes the site background and preferred remedial alternative for controlling soil and groundwater contamination.

II. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS: This section provides the history of community concerns and interests regarding the Union Road Site.

III. COMPREHENSIVE SUMMARY OF MAJOR QUESTIONS, COMMENTS, CONCERNS AND RESPONSES: This section summarizes the oral comments received by NYSDEC at the public meeting, and NYSDEC's responses as well as responses to written comments received during the public comment period.

I. OVERVIEW:

The Union Road Site is located in the Town of Cheektowaga, Erie County, New York, on property about one mile east of Union Road, between Losson and French Roads. The area of the site is approximately 70 acres.

The site was the former location of a large railroad facility which comprised a classification yard, maintenance facilities and waste disposal area. This facility was operated for approximately 40 years from about 1915 to 1955. Located within the site area is an open waste lagoon, an area containing buried waste material and contaminated soil, and a marsh with contaminated sediment.

The now defunct New York Conrail Rail Road (NYCRR) deposited waste oil, lubricants, tars, sludges and equipment cleaning solutions from rail car and locomotive servicing and repairs at the site.

Residential areas, commercial areas and a park exists within 1/8 to one mile of the site.

Contamination was found in several areas of the site. Polycyclic Aromatic Hydrocarbon (PAHs), heavy metals and Petroleum Hydrocarbon (PHCs) were detected at high concentrations in waste material, soil, sediments and groundwater. EP toxicity of lead exceeded 5 mg/l classifying the waste as hazardous waste.

A Remedial Investigation (RI) was conducted during December 1988 to November 1990. Based on the findings of the RI, 1,700 C.Y. of waste material was removed from the banks of the Slate Bottom Creek and 3,000 feet of chain link fence was erected around the site as an Interim Remedial Measure (IRM).

The Department's preferred alternative (Isolation with surface barrier and cap) involves waste consolidation; waste containment by slurry wall and cap; extraction and treatment of groundwater and surface water (marsh area); lining of the Creek banks and bed; and clean soil cover and vegetation over contaminated surficial soil in the roundhouse area.

II. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS:

The Department developed a site specific citizen's participation plan for the Union Road Site during October 1988. Citizen participation activities were conducted in accordance with this plan. These activities included holding public meetings on February 15, 1989, December 6, 1989 and January 23, 1992. As a part of the community relations, information sheets were issued during January 1989, November 1989, December 1990 and January 1992. A Responsiveness Summary was issued on January 4, 1990.

Community concerns have centered around property values, children playing in the area, potential contamination of the Creek, contamination of Creek banks, and legal action against PRPs. Some of the concerns were addressed through the IRM performed at the site.

Additional community concerns regarding site clean-up activities were raised during the January 23, 1992 meeting and are summarized in Section III below.

III. COMPREHENSIVE SUMMARY OF MAJOR QUESTIONS, COMMENTS, CONCERNS AND RESPONSES:

This section summarizes comments received from the public during the public comment period and NYSDEC's responses. Subsection A summarizes comments received during the January 23, 1992 meeting and is subdivided into three categories; comments received from elected public officials, comments received from groups and comments received from inidividuals. Subsection B summarizes written comments received during the comment period.

Subsection A: Comments Received During January 23, 1992 Meeting

Comments from Elected Public Officials

Comment: There should not be any release of contaminated or potentially contaminated or pretreated water into the Creek.

Response: The selected alternative will involve the collection, treatment and disposal of surficial water from the marsh and contaminated groundwater from the disposal area. There are two alternatives available to us. The first alternative involves the collection and discharge to the Buffalo Sewer Authority (BSA) for treatment. Currently we are pursuing this option with the BSA and Erie County Department of Environment Planning (ECDEP) to convey the contaminated water to the Public Owned Treatment Works (POTW) through the sewer system. Our preliminary analysis indicates that the water is contaminated at a fairly low concentration and will easily meet the BSA effluent criteria without pretreatment. Therefore, pretreatment (except for oil/water separator) may not be necessary before discharge to BSA. This option is economical and is clearly the Department's first preference. Sewer capacities, compliance with Federal, State and local regulations, wet weather overflows, are some of the concerns which needs to be resolved.

The second alternative is to collect, treat and discharge the treated water to the Creek. Under this alternative the contaminated water will be treated on-site to the effluent limitations set by the Division of Water. The effluent limitations are based on technology assessment (generally lower than applicable standards) and are set to protect the quality of the receiving water. This option will require the State to construct, operate and maintain a treatment plant at the site. This is clearly not our preference.

Comment: The contaminated material from the bed and embankments of the Creeks should be removed to the maximum extent prior to any reshaping, rip-rapping or concrete work.

Response: We have already removed approximately 1,700 c.y. of contaminated material from the banks of the Slate Bottom Creek, as an IRM. We have identified another area of highly concentrated waste material at the intersection of Deer Lik and Slate Bottom Creeks which we intend to remove. In addition, during remediation of the Creek, if we see other pockets of the waste material, we will be picking those up and moving them back to the site.

Comment: Concrete or rip-rap will be used for the protection of embankment of the Creek. The area was worked on because there is flood concerns. It is preferred to take out the material (before providing rip-rip/concrete) to provide a more open and continuous flow channel.

If concrete is used, it must be an open channel and not a closed piping. A pipe is liable to clog and will require the Town contractor to keep it open on an emergency basis. When will you be making a choice between rip-rap and concrete?

Response: An attempt was made to remove all visually contaminated soil from the banks of the Creek during August 1990 to November 1990. It was economically not feasible to remove every bit of contaminated soil and it is expected that some contaminated soil may be exposed due to erosion in the future. Therefore, the Department's preferred alternative calls for lining the channel with rip-rap or concrete. The purpose of lining the Creek is twofold. First is to prevent physical contact with any material which may have been left along the Creek. Second is to prevent erosion and stabilize the banks. Erosion may result in exposing the contaminated material to the environment again.

Lining the Creek with rip-rap (or concrete revetment) will be economical, allow percolation, is readily acceptable to the habitat and is easy to design and construct but the maintenance will be more frequent. Lining the channel with concrete will improve the hydraulic profile of the channel thereby alleviating flood problems. Maintenance will be less frequent. However, concrete lining will be more costly to install, maintain and replace. It will not be acceptable for the habitat, and is liable to crack. It will be decided during the design phase whether to use concrete (which will be an open channel) or rip-rap. The Department's consultant will work closely with the Town engineers during the design phase to make sure the lining will not add to the flooding problems in the area.

Comment: The Town is happy to hear that the marsh area lost in remediation will be replaced by a replacement wetland. There is a stand of extremely old and mature trees very near the site. The Town will like that these mature trees should be part of the preservation. They should not be knocked down or removed for any contouring of the site. They should be preserved.

Response: The "replacement wetland" is a part of the preferred alternative which was required by the Division of Fish and Wildlife (DF&W). It is to be pointed out that on-site clean fill will be excavated and used for capping material. This will result in the creation of the required wetland at an overall savings to the project. This will also result in less disturbance to the community by way of reduced traffic, since the clean fill will not be transported from outside.

The preferred alternative will involve the installation of a vertical slurry wall all around the containment. To prevent any damage to the slurry wall by tree roots, all trees within 25 to 30 feet from the slurry wall will be removed. The stand of old and mature trees in question is outside this limit and is not likely to be affected by the remediation. Every precaution will be taken during design and construction to save and protect these mature trees. One segment of the design will be to define and maintain a buffer zone around the entire site. It is anticipated that the stand of mature trees will fall within this buffer zone, and can be preserved.

Comment: There should be a protocol that details the response mechanism. If Town or any other person must enter the remediated area, any limitation for excavation or other activities should be detailed in the protocol.

Response: A protocol will be developed by the Department's consultant during the design phase which will detail the response mechanism for emergencies like fire fighting, flooding, land slides, falling trees, keeping the Creek open, etc. The Town personnel's roll in these events will be defined. The protocol will also address the restrictions to effectively maintain the integrity of the remedial work.

Comment: The Town of Cheektowaga should be confronted with the option of having to acquire any portion of the property in order to preserve it. It is now listed as a critical environmental impact zone in the Town's land use plan and the Town's master plan; and, therefore, already it is an automatic Type 1 action. Can the State acquire the property?

Resposne: The State, as it stands now, does not acquire these properties. For those sites which have been remediated and require monitoring, a long term permanent easement on the property will be obtained. This easement will restrict the usage and will control what can be done on the property. The State does not have the legal authority to acquire the land for an easement, beyond what is absolutely necessary to protect the public health and the environment. The NYSDOH has asked the NYSDEC to identify a buffer zone around the remediated area to assure the integrity and effectiveness of the remedial work. The buffer zone and the limits of the easement will be identified in the remedial design phase. If the Town, the County or anybody else is interested in acquiring the property, it is something which can be negotiated among the parties involved.

Comment: On the issue of pretreatment, it seems to me it would be prudent to go ahead and do pretreatment before it went out to the BSA. The cost of pretreatment facility versus what it is going to cost the BSA to accept this; is this a consideration at this point? What about long term release of material? Who will be involved in the review, Sewer District No. 1 or Sewer District No. 4? The Town should have some input, because it is going into a public sewer that serves the Town.

Response: It is estimated that approximately one million gallons of contaminant water from the marsh area and two to five million gallons of contaminated groundwater will need remediation. The contamination is at a fairly low concentration. The pretreatment will be required if it is discharged to the Creek. However, there is some question as to whether it would need to be pretreated and to what levels if discharged to the sewer system or sent to the POTW. We are dealing with metals and organics. Organics are easy to pretreat with carbon filters, whereas, metals will have to be precipitated out using more expensive and complicated processes. Pretreatment will involve a larger capital cost for what would be a very short duration of treatment. Once the remedial work is completed, we do not anticipate any seepage from the containment facility. In most cases the slurry wall containment has been found to be very effective. Water levels and water quality will be monitored periodically. If there is any evidence of seepage, we may pump out some water from the containment from time to time. We will need the permission from Sewer District No. 4 for discharge to the sewer system.

Comment: Arsenic has been identified as one of the contaminants at the site. Arsenic finds its way into human tissues through inhalation (and ingestion). If that is the case, during heavy excavation activities millions of these particles will be airborn. Would that in anyway increase any kind of exposure risk to the community or the surrounding residents?

Response: Yes, we would be concerned not only with arsenic but also with PAHs and lead. These are the contaminants that can attach to soil particles and could become airborn and subject to inhalation during construction activities. For all remedial work we develop a site specific Health and Safety (H&S) Plan. This Plan dictates the requirements that not only will protect the on-site worker but also the surrounding community. This Plan imposes air monitoring requirements and acceptable levels. Air is constantly monitored for fugitive dust at the work area and at the site boundry. Work is stopped and dust suppression measure are taken if unacceptable levels are triggered by the monitoring instruments. Since fugitive dust is constantly monitored and control measures are taken, the risk to the community will be insignificant.

<u>**Comments Received from Citizen Groups**</u>

Comment: As a member of the advisory council and vice-president of the Friends of the Woods, I would like to ask you about the cap you anticipate putting on this site. Is it possible that by leaving the top cap off, you might allow rainwater and natural runoff to percolate through, and pump the slurry out and clean it or refine it or whatever is necessary, rather than just let it sit there and it will stay there forever if nobody does anything with it? Is there really any hope of actual cleaning that up at the present time?

Response: The contaminants present at the site, specifically the tar-like material will not readily dissolve in water. Therefore, pumping the leachate out over time will not be effective in cleaning the site. Leaving the top open will result in increased infiltration, that in turn will result in increased capital cost and long term O & M cost. Allowing the water inside the containment for leachate generation may result in potential off-side migration due to increased hydraulic head inside.

Soil washing alternative was evaluated in detail in the FS. Under this alternative chemicals and solvents are added to the waste and the contaminated soil. Leachate is pumped out, treated and reused. It was determined that soil washing will not be very effective for this site, because of tar-like material. Therefore soil washing was not considered in the final selection of the preferred alternative. If the preferred alternative is selected, the waste will remain at the site indefinitely within the containment system. Since the waste material will be left in place, a five-year review will be performed to evaluate the effectiveness of the remedial action and provide a recommendation for any additional future action if necessary based on need, or future technology development.

Comment: If you allow the waste within the containment to dry, all the volatiles are going to be released as vapor into the air. Can you depend on the top cap to hold everything in? Is there no diesel oil at the site?

Response: The contaminants at this site are mostly metals and semi-volatiles. We tested the waste materials for volatiles, and they were essentially insigificant. The waste/tar material have been there for so long, that most of the volatile material if there, has escaped. Although volatiles do not appear to be a problem at this site, during the design phase, we will consider the provision of vents and filters in the top cap to ensure the integrity of the cap.

Comments Received from Individuals

Comment: We own our dream home just down the road and I am very concerned about living next to a toxic waste dump. If you just build a wall around the toxic waste dump and then just cover it, the name will always be there. Can't we excavate the waste and haul it elsewhere where there are no residents or homes? Can't we do something other than just leave it and cover it, and it would be just like a memorial to the Penn Central Railroad saying this is what they did to us? Can't we make a mini park or a golf course out of it? We are concerned about our property, about future sales. Can't we go after Penn Central Railroad and have them pay a part of the millions of dollars of expense?

Response: The Department feels very strongly about selecting an alternative which will give the best usage of the property and will result in permanent and significant reduction of toxicity, volume and mobility. Alternatives involving excavation and offsite disposal to a RCRA landfill were considered and evaluated in detail. These alternatives although not permanent offered unrestrictive usage of the land. The Department's preferred alternative is isolation and on-site containment. Both of these alternatives meet the threshold criteria of protection of human health and the environment and compliance with the standards. Both of the alternatives are effective and implementable. However, offsite disposal will cost more ($87 million); will result in increased truck traffic (20,000 truck loads) during construction and take scare secure landfill capacity. Therefore, on-site containment which will cost only $16 million was preferred over offsite disposal.

There are certain recreational uses that would be compactible with this area. Recreational uses can include; nature trails, cross-country ski trails, mini parks etc. Operation and Maintenance (O&M) and monitoring requirements may impose certain restrictions on where and what type of recreational uses can be allowed. During the design phase, the Department will be willing to work with the Town officials to make provisions in the design for the Town to develop any recreational uses. Vegetation, trees, wetland, etc. will be incorporated in the design to make the site asthetically appealing.

All the PRPs including Penn Central will be offered the opportunity to come forward and do the remedial work. If the PRPs decline the offer, State Superfund money will be used to do the remedial work. The cost recovery proceeding will be initiated against the PRPs after the completion of the project.

Comment: There are a lot of rail lines and spurs back there. Underneath those rail lines there could be channels. Have you checked to make sure that it is solid underneath? You might want to look into that, because water may flow right through the bedding underneath the railing.

Response: At the present time all the rail lines have been removed from the area. During the RI we conducted what is known as a geophysical survey. The general purpose of the geophysical survey was to provide information about the subsurface conditions of the site, identify plumes, locate metal objects, locate pipe conduits. In addition, we excavated test pits and borings. Based on these investigations we did not find any major cavity or channel. In the roundhouse area, the sub-structures are still buried and it is very likely that these structures still have some hollow pockets which have not been filled up by fill material. Under the preferred alternative the waste material will be sealed within the containment and any offsite migration will be insignificant. Therefore, even if any manmade or natural channel exists underground, it should not be a source of offsite migration.

Comment: Have your hydrologists looked into any Dense Non-Aqueous Phase

Liquid (DNAPL) that are heavier than water when you extrapolated into your wells? Is there any DNAPL zone in this site? Is it possible some of them could be undetected?

Response: The DNAPL or DNAPL-zone was not detected during well purging, well development or sampling operation. It is very unlikely that DNAPL detection could have gone undetected.

Comment: This site is classified as an inactive hazardous waste site which is a significant risk to human health and the environment. Doesn't the Commissioner have the power to implement your Record of Decision (ROD) and start remediation immediately, instead of waiting six months to go after the PRPs?

Response: No. For an immediate action, the Commissioner in conjunction with the Commissioner of Health would have to make a declaration under the conservation law that essentially says that this is an imminent threat to the public health and the environment; not a potential or significant threat. The site was fenced under an IRM and at this time, we do not consider it to be an imminent threat. We will contact the PRPs to undertake the remediation in accordance with the ROD, soon after the ROD is signed. On an average it takes about six months to complete this process. Sometimes if a PRP steps forward and starts negotiations, it may even take more time.

Comment: According to your files, Penn Central was a successor to this property along with Witben Realty or Marion Corporation. I think you could have some of the removal costs be taken care of by Penn Central and these other people, rather than spending the State tax money. I am not comfortable with the fact that this property will still be in the possession of this private holder (after the remediation) even though there will be restrictions on it.

It is hard to believe that the State is going to spend all these millions of dollars and yet the true owner of the property is still going to be this Witben Realty. The State could take possession of that parcel. Why leave it in private hands? Pursue all legal remedies with past and present owners.

Response: In 1987, the Witben Realty and Penn Central Corporation were offered the opportunity to enter into a Consent Order for the performance of the RI/FS. When they did not step forward to perform the work a State funded RI/FS was undertaken. After the ROD is signed, all the PRPs will be given the opportunity to remediate the site. If none of the PRPs come forward to do the remediation, a State funded remediation will be initiated. After completion of the project, the matter will be referred to the Division of Environmental Enforcement for cost recovery and associated legal actions.

The State does not have the authority to acquire the property. However, as discussed above the State will obtain a long term permanent easement on the property and use restrictions will be imposed through the deed. Unless the use restrictions are removed, the owners cannot gainfully utilize the property for any other purpose.

Subsection B: Written Comments Received During Comment Period

The attached letter provides the written comments received and the Department's response.

SM

INTEGRATED ENVIRONMENTAL SERVICES

A DIVISION OF NES
44 SHELTER ROCK ROAD
DANBURY, CT 06810
(203) 796-5279

FEB 24 1992

Refer to ESH-1277
February 20, 1992

Mr. Christopher Allen, P.E.
Section Chief, Remedial Section B
Bureau of Western Remedial Action
Division of Hazardous Waste Remediation
New York State Department of Environmental Conservation
50 Wolf Road
Albany, New York 12233

Re: Union Road Site, Erie County
Site No. 9-15-128

Dear Mr. Allen:

Integrated Environmental Services (IES) has prepared the attached comments on the Proposed Remedial Action Plan for the above-referenced site on behalf of The Penn Central Corporation (PCC), which has been named by the NYSDEC as a Potentially Responsible Party for the site. IES was assisted in the preparation of these comments by Mr. James Periconi, Esq. of Donovan Leisure Newton and Irvine, with whom you have had previous communication concerning this matter.

IES, PCC and Mr. Periconi appreciate the your prompt response to our request for copies of relevant documents concerning this site. Your agreement to accept comments through today rather than by the end of the comment period on February 18 is also appreciated in order to allow us additional time to review these documents.

The comments presented in Attachment A are based upon a review of the following documents:

Phase I/Phase II Feasibility Study Report, May, 1990
Phase I/Phase II Remedial Investigation Report, June, 1991
Final Baseline Human Health Risk Assessment, June, 1991
Phase III Feasibility Study Report, August, 1991
Conceptual Design Report, September, 1991
Proposed Remedial Action Plan, January, 1992

Should you have any questions or comments concerning this submittal, please do not hesitate to contact Mr. Periconi at (212) 632-3161 or myself.

Very truly yours,

Robert Weireter

Robert Weireter
Department Manager
Geosciences and Environmental Engineering

cc: James Periconi, Esq.
Michael Cioffi, Esq.
Pat Nelson (w/o attachment)
Edward Sullivan (w/o attachment)

ies

ATTACHMENT A
COMMENTS TO THE PROPOSED REMEDIAL ACTION PLAN
UNION ROAD SITE
SITE NO. 9-15-128

The Proposed Remedial Action Plan (PRAP) is inadequate for selecting the appropriate remedial measure for the site. Specific reasons are discussed below.

Areas of the Site to be Remediated

1. The PRAP does not provide a clear and logical link between the findings of the Health Risk Assessment (HRA) and the selection of areas at the site to be remediated. The description of the preferred alternative in the PRAP (Section 7.2, p. 24) states that the preferred alternative "basically comprises the excavation of select areas of the site containing contaminated soil and sediment" (emphasis added).

   In order to determine appropriate remedial measures, specific areas of the site, rather than "select areas", need to be identified. The results of the HRA and their application to those specific areas need to be discussed in order to provide a clear basis for remediating those areas. The PRAP does not identify these specific areas, nor does it use specific findings of the HRA to justify remediation of those areas.

Remediation of Creek Sediments

1. The PRAP does not attempt to determine the sources of upstream (i.e. off-site) contribution to downstream (i.e. on-site and off-site) contamination. The PRAP states that "surficial sediment on Slate Bottom and Deer Lik Creeks, both upstream and contiguous to the site, generally exhibits elevated levels of petroleum hydrocarbons and base neutral compounds..." (p. 6). Although the highest concentrations of these compounds are located downstream of the site, an attempt should be made to identify upstream sources of these compounds. Due to documented upstream sediment contamination, it is unreasonable to place sole responsibility for remediation of downstream sediments on the Union Road PRPs.

2. Adequate documentation justifying the remedial alternative of lining of the creek banks and bed in the PRAP is not provided. Creek sediment and surface water sampling was conducted in 1989. As discussed above, contamination was detected both upstream and downstream of the site. In the fall of 1990, an Interim Remedial Measure (IRM) was conducted and approximately 1700 cubic yards of material were removed from Slate Bottom Creek. No post-removal sampling has apparently been conducted to determine concentrations remaining after the IRM. Therefore, it is not clear whether lining of the creek bed and banks continues to be necessary or whether the IRM was adequate remediation.

   In addition, surface water sampling conducted prior to the IRM indicated that "analytical results of samples obtained from Slate Bottom and Deer Lik Creeks did not contravene NYS Surface Water Standards and Guidelines for either Class C or D water bodies..." (PRAP, p. 6). Thus, because there was no adverse impact to surface water quality prior to the IRM, there is no justification for remediation of sediments after the IRM.

   Analytical data collected prior to the IRM indicated no impact to water quality. No post-removal sediment sampling data was collected. Therefore, the remedial alternative of lining of the creek beds and bank in the PRAP is not justified.

Additional justification should be provided or this remedial measure should be removed from the PRAP.

3. Upstream sediment contamination has been documented. However, the PRAP does not address the possibility that this documented upstream contamination could migrate downstream and be deposited on top of the proposed concrete lining of the downstream bed and banks, and continue to migrate from there to downstream areas.

   Due to the possibility of the migration of upstream contamination and deposition on the downstream concrete lining, the lack of sampling after the IRM and the lack of adverse impact to surface water quality as indicated by surface water sampling, adquate justification for lining of the bed and banks as a remedial measure has not been provided. Additional justification should be provided or this remedial measure should be removed from the PRAP.

<u>Groundwater Cleanup Standards</u>

1. Groundwater cleanup standards have not been clearly defined. NYSDEC Standards and Guidelines for Class GA groundwater were identified as being selected as the chemical-specific site cleanup goal for perched groundwater at the site (Phase III Feasibility Study, p. 1-25; Class GA groundwater are developed for drinking water sources). However, it is also stated that USEPA Safe Drinking Water Act Maximum Contaminant Levels (MCLs) are not site-cleanup goals. None of the reports list actual groundwater cleanup goals.

   The PRAP indicates that there are no known users of groundwater within three miles of the site and no known surface water intakes within three miles downstream of the site (p. 1). Due to the lack of groundwater use in the area, and because the investigation conducted at the site did not evaluate background levels and potential off-site (i.e. upgradient) sources, the selection of Class GA standards is not appropriate as a remedial goal.

   In addition, the Conceptual Design Report (Sept., 1991, p. 2-4) indicates that groundwater extracted from the waste disposal area and from dewatering the marsh will be treated to comply with NYSDEC Class C surface water quality standards prior to discharge into Slate Bottom or Deer Lik Creek. The Phase I/II Remedial Investigation report (p. 3-50) indicates that shallow perched groundwater appears to be recharging into the marsh and/or flowing toward Slate Bottom Creek.

   Therefore, it appears that treated water discharged to surface water will be treated to Class C standards but groundwater will be treated to Class GA standards. There is no rational basis for this discrepancy. Class C standards are appropriate for groundwater because under natural conditions site groundwater discharges to surface water. Therefore, groundwater cleanup to Class C standards will protect surface water quality because groundwater which may naturally flow from the site to surface water will be of the same quality as the surface water which it is entering.

<u>Remediation of Soils in the Roundhouse Area</u>

1. Selection of these soils for remediation was based on an improbable and therefore inappropriate risk calculation for arsenic (see Table 8-2 in Appendix to PRAP). This calculation was based on an exposure scenario that a child would be on-site in the roundhouse area 2.6 hr/day, 365 days/yr for 12 yrs. Exposure to aresenic was

calculated via ingestion of dust. The calculated risk level was 2.10 x 10-6; this value is very slightly greater than the NYSDEC target risk goal of 1.0 x 10-6. Considering the very unreasonable exposure scenario evaluated and the very slight exceedance of the target risk goal, it is unreasonable to require remediation in this area.

Furthermore, aresenic is a natural component of the human diet and studies have indicated that the human body can detoxify low levels of aresenic. The US Agency for Toxic Substances and Disease Registry (ATSDR, 1987) has estimated average daily human intakes to be 20-70 ug/day, most of which comes from food. According to Moseby'e Medical and Nursing Dictionary (1986), the average daily intake of arsenic is 900 ug/day.

The USEPA's Science Advisory Board (1989) concluded that arsenic risk assessments should account for the ability of the human body to detoxify low levels of arsenic. These studies indicate that daily doses of 250-1000 ug/day are largely metabolized into non-toxic substances.

The risk calculations for this site included in the HRA determined a daily intake of approximately 0.0011 ug/day arsenic (2.59E-08 mg/kg/day from Table 5-24 x 41.2 kg average body weight for child). Based on this very low intake and the unreasonable exposure scenario described above, it appears that the calculated risk value for arsenic is overly conservative and not representative of the actual toxicity of arsenic. Therefore, because the calculated target risk level only very slightly exceeded the target risk level, remediation of the roundhouse area is not fully justified and should not be considered necessary.

2. The Conceptual Design Report (Sept., 1991, p. 2-9) indicates that oil-contaminated soil at depths ranging from 6-9 ft will be excavated (approximately 7500 cubic yards). This excavated material will be deposited in the waste disposal area to be capped. However, the Phase III Feasibility Study (August, 1991, p. 5-12) does not include this area in the discussion of the preferred alternative. In addition, the HRA did not identify an elevated risks associated with subsurface soil in the roundhouse area (see Summary Table of Elevated Risks, Final Baseline Health Risk Assessment, Table 7-1).

   The Phase I/II RI report (June, 1991, p. 6-6) states that the level of contamination in this area could cause possible groundwater contamination but does not appear to pose a direct threat to human or environmental health because it is below ground surface. The oil-contaminated soil is indicated to be 1-5 ft below ground surface with an estimated volume of 1800 cubic yards. These numbers do not agree with the numbers presented for this material in the Conceptual Design Report discussed above.

   Adequate justification has not been provided concerning why excavation of this material is required. Justification should be provided or this remedial measure should be removed from the PRAP. If remediation is deemed necessary, the appropriate volume of material should be more clearly identified.

<u>Discrepancies in Remedial Cost Estimates and Description of the Preferred Alternative</u>

The PRAP contains several discrepancies concerning the estimated costs for implementing the preferred alternative. Specific examples of these discrepancies are as follows:

1. *Concrete lining of bed and banks, Deer Lik and Slate Bottom Creek*: Table C1 in the PRAP indicates an estimated capital cost for this remedial measure of $2,884,000. Section 7.1 of the PRAP (p. 24) indicates that this remedial measure is described in Section 6.5.2 (p. 18). Section 6.5.2 discusses three alternative designs for the construction of the concrete channel. The cost estimates associated with these three designs range from $3,500,000 to $8,700,000. The discrepancy between these values and the value of $2,884,000 needs to be explained.

2. *Marsh water and shallow groundwater extraction and treatment*: Table C1 in the PRAP indicates an estimated total present worth cost for this remedial measure of $864,000. Section 7.1 of the PRAP (p. 24) indicates that this remedial measure consists of extraction, treatment, and disposal of contaminated shallow groundwater. However, Table C1 identifies the selected alternative as extraction and treatment of marsh water and shallow groundwater. The discussion of the recommended remedial action (Section 7.1, p. 24) addresses shallow groundwater only. There is no mention of marsh water, which is included on the cost estimate on Table C1. This discrepancy needs to be explained.

3. *Excavation and soil cover in the Roundhouse Area*: Table C1 in the PRAP indicates an estimated total present worth cost for this remedial measure of $585,000. Section 7.1 of the PRAP (p. 24) indicates that this remedial measure consists of covering of the select areas of the roundhouse with clean soil fill and vegetation as discussed in Section 6.6.1. Section 6.6.1 discusses only covering this area with clean soil; no mention is made of excavation. Table C1 presents a cost estimate for covering with clean soil and excavation of $585,000. The cost estimate presented in Section 6.6.1 is $300,000. It needs to be explained why excavation is part of the cost estimate but is not included in the discussion of the recommended alternative.

Response to Comments from Integrated Environmental Services on Behalf of Penn Central Corporation

The following is a response to comments from Integrated Environmental Services (IES) on behalf of Penn Central Corporation (PCC), letter dated February 20, 1992.

Areas of the Site to be Remediated

Comment 1: The PRAP does not provide a clear and logical link between the findings of the Health Risk Assessment (HRA) and the selection of areas at the site to be remediated. The description of the preferred alternative in the PRAP (Section 7.2, page 24) states that the preferred alternative "basically comprises the excavation of select areas of the site containing contaminated soil and sediment" (emphasis added).

In order to determine appropriate remedial measures, specific areas of the site, rather than "select areas", need to be identified. The results of the HRA and their application to those specific areas need to be discussed in order to provide a clear basis for remediating those areas. The PRAP does not identify these specific areas, nor does it use specific findings of the HRA to justify remediation of those areas.

Response 1: The findings of the HRA are summarized in Section 8.0 of the Final Baseline Human Health Risk Assessment Report (June 1991), Volume 1. Based on the findings of the HRA and the Environment Assessment, Section 6.0 and Figure 6.1 of the Phase I/Phase II RI Report (June 1991) identifies and recommends the specific areas of the site for remediation. Additional information about the extent of remediation and specific areas needing remediation is provided in the IRM Report (June 1991) and Conceptual Design Report (September 1991). The purpose of the PRAP was to summarize the various alternatives available and outline the Department's preferred alternative. Specific areas needing remediation and justification for remediation is provided in one or more of the following Union Road Site documents: Phase I/Phase II RI Report (June 1991); HRA Report (June 1991); Environment Assessment Report (June 1991); Biological Study Report (June 1991); IRM Report (June 1991); and Conceptual Design Report (September 1991).

Remediation of Creek Sediments

Comment 1: The PRAP does not attempt to determine the sources of upstream (i.e. offsite) contribution to donwstream (i.e. on-site and offsite) contamination. The PRAP states that "surficial sediments on Slate Bottom and Deer Lik Creeks, both upstream and contiguous to the site, generally exhibits elevated levels of petroleum hydrocarbons and base neutral compounds..." (page 6). Although the highest concentrations of these compounds are located downstream of the site, an attempt should be made to identify upstream sources of these compounds. Due to documented upstream sediment contamination, it is unreasonable to place sole responsibility for remediation of downstream sediments on the Union Road PRPs.

Response 1: Investigation of the upstream sources of contamination (if any) is beyond the scope of this study. Samples were taken from upstream of Deer Lik Creek at a location which is known as Satellite Site Number 6 (SS-6) and from a tributary to the Deer Lik Creek (which is upstream of the site) at a location known as Satellite Site Number 2 (SS-2). The analytical results of these samples are presented in the Satellite Site Report, of the Union Road site (October 1989). These samples may not be representative of the actual upstream conditions. The evidence of contamination at SS-6 was insignificant (see page 2-33 of SS Report). Some PAH contamination was detected at the SS-2, and may have been the result of asphalt paving. This location was resampled during the Phase II RI (see Section 5-6 or Phase I/Phase II RI Report). The RI has determined that waste in the Creek in the vicinity of the site has originated from the disposal activities at the site and will require remediation. At this time we do not believe any upstream source (other than NYCRR past activities) of contamination exists, which can be attributed to the contamination of the portion of the Creek in question.

Comment 2: Adequate documentation justifying the remedial alternative of lining of the Creek banks and bed in the PRAP is not provided. Creek sediments and surface water sampling was conducted in 1989. As discussed above, contamination was detected both upstream and downstream of the site. In the fall of 1990, an IRM was conducted and approximately 1,700 cubic yards of material were removed from Slate Bottom Creek. No post-removal sampling has apparently been conducted to determine concentrations remaining after the IRM. Therefore, it is not clear whether lining of the Creek bed and banks continues to be necessary or whether the IRM was adequate remediation.

In addition, surface water sampling conducted prior to the IRM indicated that "analytical results of samples obtained from Slate Bottom and Deer Lik Creeks did not contravene NYS Surface Water Standards and Guidelines for either Class C or D water bodies..." (PRAP, page 6). Thus, because there was no adverse impact to surface water quality prior to the IRM, there is no justification for remediation of sediments after the IRM.

Analytical data collected prior to the IRM indicated no impact to water quality. No post-removal sediment sampling data was collected. Therefore, the remedial alternative of lining of the Creek beds and bank in the PRAP is not justified. Additional justification should be provided or this remedial measure should be removed from the PRAP.

Response 2: IRM Report (June 1991) documents the IRM work done during the fall of 1990. The post-removal sampling was done and the analytical results are documented in this Report. This Report indicates that contaminated soil continues to be present deep within its banks (page 5-1). Additional waste material is present along the eastern bank of Deer Lik Creek just north of Slate Bottom Creek. The IRM work was limited to the waste material in the banks above the water line. No attempt was made to remove the waste material from the bed of the Creeks because that would have required the diversion of the Creek flow and was not in the scope of the IRM. Existence of the waste in the bed of the Creek is documented on page 2-3 of the June 1991 IRM Report and page 5-52 of the Phase I/Phase II RI Report. It was determined that erosion of the banks will have the potential of exposing the waste material again and coming in contact with the children who frequently play in that area.

The surface water sampling conducted prior to the IRM was done on undisturbed samples. Visual inspection has indicated presence of the tar-like waste in the bed of the Creek. Oil release on disturbance of Creek sediments is documented in the RI Report. Therefore, the IRM was not adequate and further remediation of the Creek will be required.

One of the options considered for Creek remediation was to periodically remove the exposed wastes from the banks and beds of the Creeks. This alternative would have required extensive long term O & M.

Therefore, lining the bed and the banks of the Slate Bottom and Deer Lik Creeks within the limits shown in the Conceptual Design Report (September 1991) is justified and is cost effective.

Comment 3: Upstream sediment contaminants has been documented. However, the PRAP does not address the possibility that this documented upstream contamination could migrate downstream and be deposited on top of the proposed concrete lining of the downstream bed and banks, and continue to migrate from there to downstream areas.

Due to the possibility of the migration of upstream contamination and deposition on the downstream concrete lining, the lack of sampling after the IRM and the lack of adverse impact to surface water quality as indicated by surface water sampling, adequate justification for lining of the bed and banks as a remedial measure has not been provided. Additional justification should be provided or this remedial measure should be removed from the PRAP.

Response 3: See Responses 1 and 2 above. The monitoring program will include sediment sampling from the Creek including upstream locations. This will help in the evaluation of the effectiveness of the remediation and also to find out if any contamination is migrating from upstream.

Groundwater Cleanup Standards

Comment 1: Groundwater cleanup standards have not been clearly defined. NYSDEC Standards and Guidelines for Class GA groundwater were identified as being selected as the chemical-specific site cleanup goals for perched groundwater at the site (Phase III Feasibility Study, page 1-25; Class GA groundwater are developed for drinking water sources). However, it is also stated that the USEPA Safe Drinking Water Act Maximum Contaminant Levels (MCLs) are not site cleanup goals. None of the reports list actual groundwater cleanup goals.

The PRAP indicates that there are no known uses of groundwater within three miles of the site and no known surface water intakes within three miles downstream of the site (page 1). Due to the lack of groundwater use in the area, and because the investigation conducted at the site did not evaluate background levels and potential offsite (i.e. upgradient) sources, the selection of Class GA standards is not appropriate as a remedial goal.

In addition, the Conceptual Design Report (September 1991, page 2-4) indicates that groundwater extracted from the waste disposal area and from dewatering the marsh will be treated to comply with NYSDEC Class C surface water quality standards prior to discharge into Slate Bottom or Deer Lik Creeks. The Phase I/II Remedial Investigation Report (page 3-50) indicates that shallow perched groundwater appears to be recharging into the marsh and/or flowing toward Slate Bottom Creek.

Therefore, it appears that treated water discharged to surface water will be treated to Class C standards but groundwater will be treated to Class GA standards. There is no rational basis for this discrepancy. Class C standards are appropriate for groundwater because under natural conditions site groundwater discharges to surface water. Therefore, groundwater cleanup to Class C standards will protect surface water quality because groundwater which may naturally flow from the site to surface water will be of the same quality as the surface water which it is entering.

Response 1: The ARARs are identified in Table 1-2 of the FS Phase III Report (August 1991) and Appendix "G" of the Phase I/Phase II RI Report (June 1991). Although there are no known users of the groundwater within three miles of the site at the present time, all the groundwater in New York State is considered a potential source of drinking water and must be protected. According to the Remedial Investigation Report the groundwater at the Union Road site has been impacted by the disposal activities at the site. In addition, the surface water in the marsh area is found to be contaminated by the disposal activities. Therefore, the contaminated groundwater from the site (estimated to be 1.8 mg to 5.4 mg) will be extracted and contaminated surface water (app. 0.6 mg) will be collected. These contaminated waters will require treatment before discharge. If the water is discharged to the sewer system, it will be treated to meet Buffalo Sewer Authority (BSA) effluent criteria. If the treated water is discharged to the Creek, the treatment will have to meet the effluent limitations and monitoring requirements provided by the NYSDEC Division of Water under surface water SPDES program. The effluent limitations are developed based on the technology assessment (which can be achieved based on the available technology) and which are protective of the quality of the receiving water. Therefore, the treatment will be done to meet the effluent limitations as the case may be. The groundwater Class GA standards will be used for end-point sampling of the groundwater to ensure that groundwater at the site has been restored to at least Class "GA" standards.

Remediation of Soils in the Roundhouse Area

Comment 1: Selection of these soils for remediation was based on an improbable and therefore inappropriate risk calculation for arsenic (see Table 8-2 in Appendix to PRAP). This calculation was based on an exposure scenario that a child would be on-site in the roundhouse area 2.6 hr/day, 365 days/year for 12 years. Exposure to arsenic was calculated via ingestion of dust. The calculated risk level was 2.10×10^{-6}; this value is slightly greater than the NYSDEC target risk goal of 1.0×10^{-6}. Considering the very unreasonable exposure scenario evaluated and the very slight exceedence of the target risk goal, it is unreasonable to require remediation in this area.

Furthermore, arsenic is a natural component of the human diet and studies have indicated that the human body can detoxify low levels of arsenic. The US Agency for Toxic Substances and Disease Registry (ATSDR, 1987) has estimated average daily human intakes to be 20-70 ug/day, most of which comes from food. According to Moseby's Medical and Nursing Dictionary (1986), the average daily intake of arsenic is 900 ug/day.

The USEPA's Science Advisory Board (1989) concluded that arsenic risk assessments should account for the ability of the human body to detoxify low levels of arsenic. These studies indicates that daily doses of 250-1,000 ug/day are largely metabolized into non-toxic substances.

The risk calculations for this site included in the HRA determined a daily intake of approximately 0.0011 ug/day arsenic (2.59 E-08 mg/kg/day from Table 5-24 x 41.2 kg average body weight for child). Based on this very low intake and the unreasonable exposure scenario described above, it appears that the calculated risk value for arsenic is overly conservative and not represenative of the actual toxicity of arsenic. Therefore, because the calculated target risk level only very slightly exceeded the target risk level, remediation of the roundhouse area is not fully justified and should not be considered necessary.

Response 1: Due to the proximity of the area to residents and contamination in the surficial soil which could present an elevated incremental health risk it was proposed to cover the area with clean fill. This will prevent wind erosion of soils eliminating inhalation pathway and will protect from exposure by contact. The final HRA is based on less conservative exposure scenario as compared to the more conservative assumptions given in the USEPA guidance documents. This less conservative exposure scenario was developed in consultation with NYSDOH and is considered appropriate for the site conditions. The frequency of exposure to ingestion is 74 days/year for children (page 5-28 of HRA), the frequency of exposure to fugitive dust from wind erosion is 365 days/year and to children from recreational vehicles at the site is 74 days/year (page 5-50 of HRA). Based on the incremental health risk remediation of roundhouse area is justified. Covering the area with clean fill was considered cost effective and was preferred over removing the contaminated soil.

Comment 2: The Conceptual Design Report (September 1991, page 2-9) indicates that oil-contaminated soil at depths ranging from 6-9 feet will be excavated (approximately 7,500 cubic yards). This excavated material will be deposited in the waste disposal area to be capped. However, the Phase III Feasibility Study (August 1991, page 5-12) does not include this area in the discussion of the preferred alternative. In addition, the HRA did not identify an elevated risk associated with subsurface soil in the roundhouse area (see Summary Table of Elevated Risks, Final Baseline Health Risk Assessment, Table 7-1).

The Phase I/II RI Report (June 1991, page 6-6) states that the level of contamination in this area could cause possible groundwater contamination but does not appear to pose a direct threat to human or environmental health because it is below ground surface. The oil-contaminated soil is indicated to be 1-5 foot below ground surface with an estimated volume of 1,800 cubic yards. These numbers do not agree with the numbers presented for this material in the Conceptual Design Report discussed above.

Adequate justification has not been provided concerning why excavation of this material is required. Justification should be provided or this remedial measure should be removed from the PRAP. If remediation is deemed necessary, the appropriate volume of material should be more clearly identified.

Response 2: The initially estimated quantity of the oil-contaminated soil and one foot of underlying soil in the roundhouse area was approximately 1,800 c.y. and 500 c.y. This has been identified in the Phase III FS Report (August 1991) in Table 1-1 on page 1-19 and in Phase I/Phase II RI Report (June 1991) on pages 6-6 and 6-12. During the Conceptual Design the quantity of this oil contaminated soil was recalculated to 7,500 c.y. and is identified on pages 2-10 and 4-2 of the Conceptual Report. This is a "hot-spot" and there is a potential of groundwater contamination from this waste. Remediation of this hot-spot is justified along with the rest of the site. If not treated at this time, this area could become a separate site in the future and will not be cost effective to treat it at a later date.

Discrepancies in Remedial Cost Estimates and Description of the Preferred Alternative

The PRAP contains several discrepancies concerning the estimated costs for implementing the preferred alternative. Specific examples of these discrepancies are as follows:

Comment 1: Concrete lining of bed and banks, Deer Lik and Slate Bottom Creeks: Table C1 in the PRAP indicates an estimated capital cost for this remedial measure of $2,884,000. Section 7.1 of the PRAP (page 24) indicates that this remedial measure is described in Section 6.5.2 (page 18). Section 6.5.2 discusses three alternative designs for the construction of the concrete channel. The cost estimates associated with these three designs range from $3,500,000 to $8,700,000. The discrepancy between these values and the value of $2,884,000 needs to be explained.

Response 1: Preliminary estimates were developed for all the alternatives during development of the Feasibility Study Report. An attempt was made in the Conceptual Design Report to refine the cost estimate for the preferred alternative (Section 4.0 of the Conceptual Report). Table C1 is based on the cost estimate given in the Conceptual Report. Footnotes on Table C1 explains the discrepancy pointed out in this comment.

Comment 2: Marsh water and shallow groundwater extraction and treatment: Table C1 in the PRAP indicates an estimated total present worth cost for this remedial measure of $864,000. Section 7.1 of the PRAP (page 24) indicates that this remedial measure consists of extraction, treatment and disposal of contaminated shallow groundwater. However, Table C1 identifies the selected alternative as extraction and treatment of marsh water and shallow groundwater. The discussion of the recommended remedial action (Section 7.1, page 24) addresses shallow groundwater only. There is no mention of marsh water, which is included on the cost estimate on Table C1. This discrepancy needs to be explained.

Response 2: The cost of the treatment is for both the marsh water and the shallow groundwater. The quantity of contaminated marsh water is estimated at 0.6 mg. The quantity of contaminated shallow groundwater is estimated at 1.8 mg to 5.4 mg based on 1 to 3 pore volumes of contaminated groundwater to be removed (page 4-13 of FS Phase III Report). The remediation of the marsh water is discussed in Section 7.1 of the PRAP (page 24, last paragraph; page 25, first bullet).

Comment 3: Excavation and soil cover in the roundhouse area: Table C1 in the PRAP indicates an estimated total present worth cost for this remedial measure of $585,000. Section 7.1 of the PRAP (page 24) indicates that this remedial measure consists of covering of the select areas of the roundhouse with clean soil fill and vegetation as discussed in Section 6.6.1. Section 6.6.1 discusses only covering this area with clean soil; no mention is made of excavation. Table C1 presents a cost estimate for covering with clean soil and excavation of $585,000. The cost estimate presented in Section 6.6.1 is $300,000. It needs to be explained why excavation is part of the cost estimate but is not included in the discussion of the recommended alternative.

Response 3: The estimated cost of the remedial work in the roundhouse area as given in Table C1 is $585,000. This consists of $300,000 for excavation of oil contaminated subsurface soil (Item No. 7, page 4-2 of the Conceptual Design Report) and $285,000 for a one foot cover (Item No. 19, page 4-3 of the Conceptual Report).

The cost of $300,000 for excavation of the subsurface soil is based on the revised quantity of 7,500 c.y. as discussed in Response 2 under remediation of soils in the roundhouse area above.