MALCOLM PIRNIE

Remedial Action Work Plan

COBEY, LLC SITE

BUFFALO LAKESIDE COMMERCE PARK – PORTIONS OF PARCELS 1 AND 2

Prepared for:

The Krog Corporation

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SECTION ES

1.0 Introduction

Malcolm Pirnie has prepared this Remedial Action Work Plan (RAWP) for the Cobey, LLC (Cobey) Site as an element of the Brownfield Cleanup Program. The Buffalo Lakeside Commerce Park (BCLP), which was formerly known as the Hanna-Furnace or Union Ship Canal site, encompasses four parcels totaling approximately 113 acres. Parcels 1 and 2 include the 43-acre Former Railroad Yard and the Former Manufacturing Area (32-acres), respectively. Other parcels of the BCLP include Parcel 3; the Union Ship Canal (8.7 acres) with a surrounding 200-foot Buffer zone; and the remaining area located north of Parcel 3 (Parcel 4).

The Cobey Site is located in the southern portion of the BCLP and consists of approximately 12.3 acres located on portions of Parcels 1 and 2 of the BLCP. The BCLP is bordered to the west by New York State Route 5, to the south by the Lackawanna Commerce Park, to the east by railroad tracks, and to the north by wetland areas and the Shenango Steel property. The location of the Cobey Site is shown on Figure 1-1. The location of all parcels is shown on Figure 1-2.

2.0 Constituents of Potential Concern

The environmental investigations found that the constituents of concern in the soil/fill include inorganic analytes and polyaromatic hydrocarbons (PAHs). With the exception of potentially elevated pH, groundwater was not significantly impacted by industrial activities at the site. The

results of site investigations have indicated that the constituents of potential concern (COPCs) are:

- Polyaromatic hydrocarbons (PAHs) were found in soils/fill across the Site. PAHs present at the Site are almost exclusively limited to byproducts of incomplete combustion and impurities in petroleum products. The presence of PAHs at this Site is consistent with its urban location and past use as a railroad yard.

- Metals and cyanide were found in soil/fill across the Site. The metals present at elevated concentrations relative to "background" concentrations include arsenic, chromium, copper, and zinc. Many of these metals are components of slag and are present in elevated concentrations as a result of slag deposited on the Site.

- Elevated pH measured in groundwater collected from wells, borings, and test pits in the western portion of the Parcel 1. The cause of the elevated pH may be lime used as a raw material in the pig iron manufacturing process or the material that was used as fill at the turn of the century prior to any construction at the site.

3.0 The Cleanup Plan

In order to eliminate potential exposure risks associated with direct contact with fill material, the entire Site will be covered as part of redevelopment. The cover system will be placed directly on top of the re-graded fill material and will include clean soil for outdoor, vegetated areas; asphalt for roads and parking lots; or concrete for sidewalks, buildings and heavy use areas. Surface coverage over the entire redeveloped Site will be required as a pre-condition of occupancy. An Operation, Monitoring, and Maintenance (OM&M) Work Plan, designed to verify the performance of the cover system, is included in Appendix D and will be implemented following remediation of the Cobey Site. Site use limitations will also be placed on the property limiting activities to commercial and light industrial uses only.

Protection of on-site workers and the off-site community, which includes surrounding residents and businesses as well as potential future commercial and public users of the Site during the redevelopment period, is addressed through the Soil/Fill Management Plan (Appendix A), which includes health and safety requirements (Section 4.1 and Attachment V) and a Community Air Monitoring Plan (Section 4.2). The Soil/Fill Management Plan provides

requirements for handling of soils/fill excavated during redevelopment (i.e., for foundation and subsurface utilities) and for placement of the cover system. The health and safety requirements establish protocols for use by on-site construction workers during invasive activities at the site. The Community Air Monitoring Plan establishes specific requirements for air monitoring and procedures to mitigate off-site migration of airborne particulates and vapors during the remediation and redevelopment periods.

4.0 Remedy Evaluation

The proposed cover system has been designed to be protective of human health and the environment. The primary exposure pathway for contaminants at the Site (metals and PAHs in soil and high pH in groundwater) is via direct contact. A qualitative risk assessment determined that the risk of direct contact exposure to the soil/fill and groundwater was potentially significant. The proposed plan of covering the fill material with clean soil, pavement or buildings as part of site development minimizes the potential for direct contact with soil and is therefore protective of human health and the environment. Based on the level of site contamination characterized in the previous site investigations, it was determined during the qualitative risk assessment that a cover of clean soil, pavement or buildings would provide adequate protection against the risk of direct contact. The proposed remedial action alternative effectively reduces the mobility of contaminants through control and isolation of the fill material. The inclusion of health and safety requirements and the Community Air Monitoring Plan are also effective in protecting on-site workers, the public, and the environment during site redevelopment.

TCLP analysis of select soil samples indicated that the contaminants present at the Site do not readily leach. Additionally, results of groundwater sampling indicated that constituents present in the fill material have not significantly impacted groundwater quality with the possible exception of elevated pH. Groundwater is not used at the Site and therefore no direct contact with elevated pH groundwater is anticipated except during invasive construction activities.

This RAWP includes provisions for routine monitoring and maintenance of the cover, and procedures for the proper testing and disposal of soil/fill, which might be excavated or disturbed in the future. To provide a greater degree of assurance that the cover will be protective, a set of

site-specific action levels (SSALs) has been established reflecting the previously characterized level of site contamination. As part of the remedial actions, soil/fill, which is excavated or otherwise moved during the development of the site, will be tested. If concentrations exceed the SSALs, the excavated soil/fill will be properly disposed off site. If the concentrations are below action levels, the soil/fill may be left on site, and properly covered. Section 5 of the RAWP discusses the protectiveness and effectiveness of the remedial actions in more detail.

MALCOLM PIRNIE

Introduction

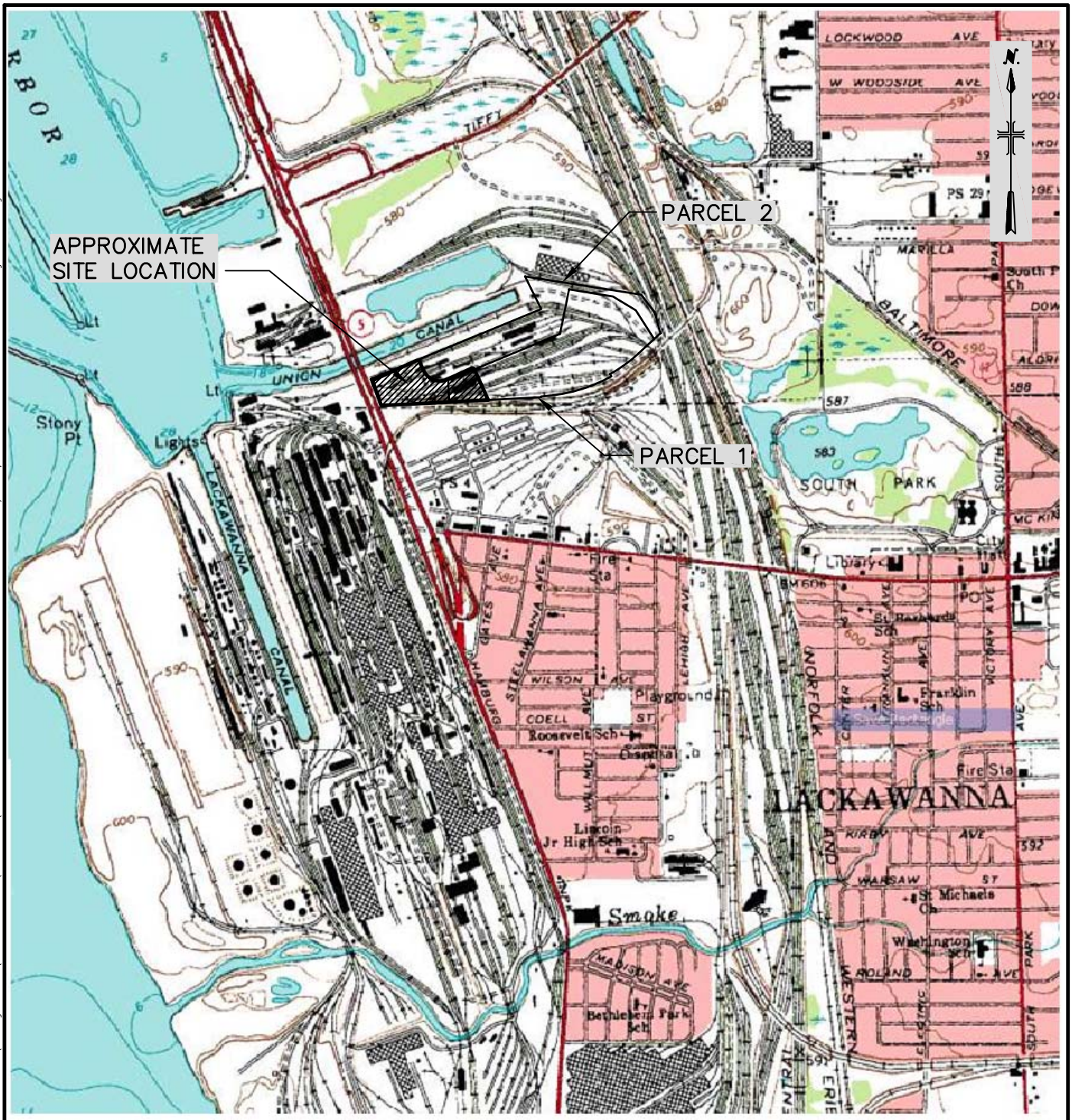
SECTION 1

1.1 Background

Malcolm Pirnie, Inc. (Malcolm Pirnie) has prepared this Remedial Action Work Plan (RAWP) for the Cobey, LLC (Cobey) Site as an element of a Brownfield Cleanup Program. The Buffalo Lakeside Commerce Park (BLCP), which was formerly known as the Hanna-Furnace or Union Ship Canal site, encompasses four parcels of approximately 113 acres. Parcels 1 and 2 include the 43-acre Former Railroad Yard and the Former Manufacturing Area (32-acres), respectively. Other parcels of the BCLP include Parcel 3; the Union Ship Canal (8.7 acres) with a surrounding 200-foot Buffer zone; and the remaining area located north of Parcel 3 (Parcel 4).

The Cobey Site is located in the southern portion of the BCLP and consists of approximately 12.3 acres located on portions of Parcels 1 and 2 of the BLCP. The BCLP is bordered to the west by New York State Route 5, to the south by the Lackawanna Commerce Park, to the east by railroad tracks, and to the north by wetland areas and the Shenango Steel property. The location of the Cobey Site is shown on Figure 1-1. The location of all parcels is shown on Figure 1-2.

A Brownfield Cleanup Program Application was submitted to the New York State Department of Environmental Conservation (NYSDEC). This application allows for future redevelopment of the property for commercial and industrial purposes. The current development plan for the Cobey Site is light manufacturing.



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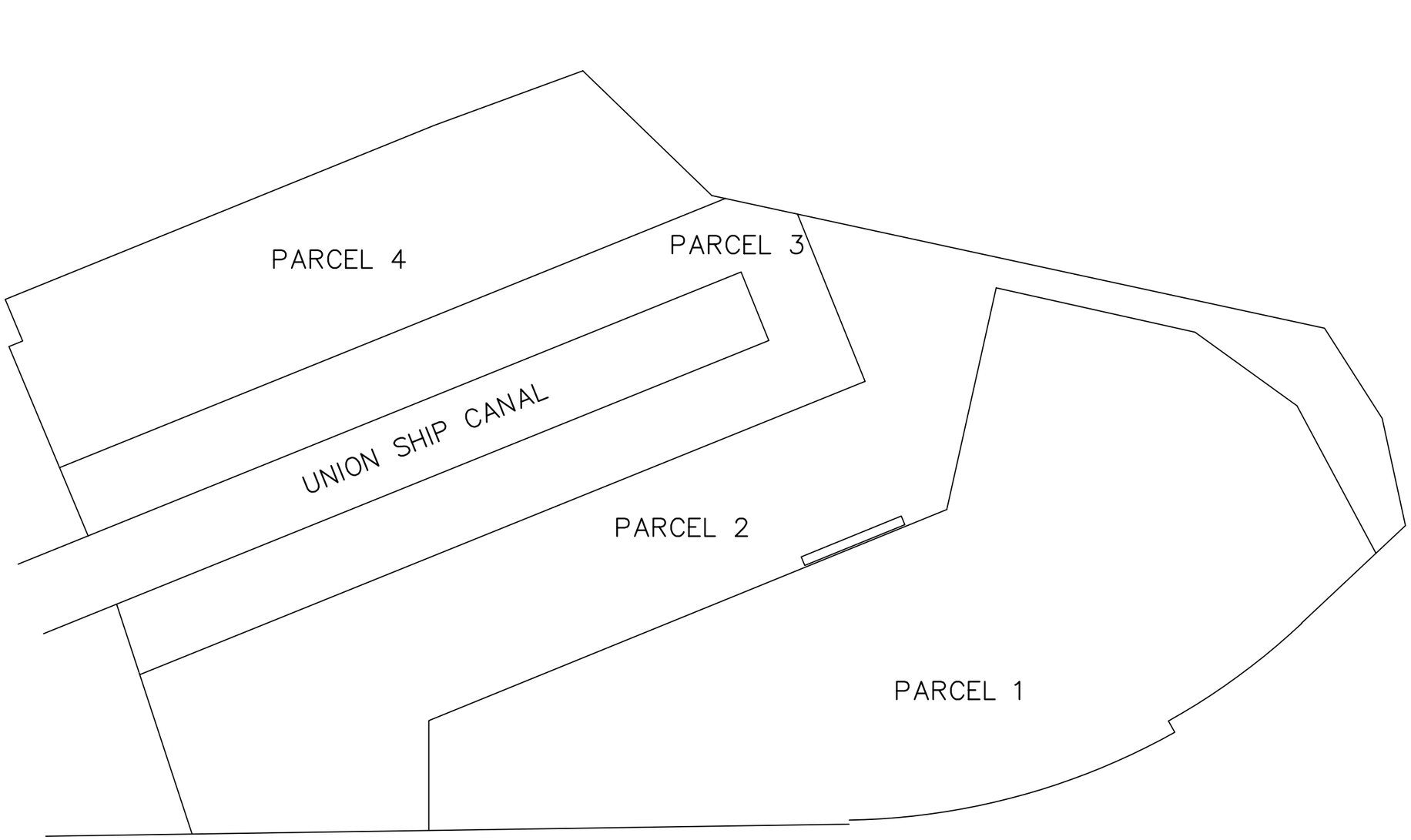
COBEY LLC (PORTIONS OF PARCELS 1 AND 2)
BUFFALO, NEW YORK

FIGURE 1–1

SITE LOCATION MAP



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COBEY, LLC

REMEDIAL ACTION WORK PLAN

BUFFALO, NEW YORK

FIGURE 1–2

BUFFALO LAKESIDE COMMERCE PARK

PARCEL MAP

1.2 Purpose

This document summarizes the findings of the historical investigations and details the methods required for the protection of human health and the environment during redevelopment and long-term maintenance activities. This RAWP establishes the procedures necessary to protect workers during redevelopment activities and the protocols to be followed during the excavation and handling of the soil/fill material during redevelopment or routine maintenance activities. This RAWP also includes a plan for the placement of cover in the form of clean soil (vegetated), asphalt, concrete, or buildings over the entire Site. Any redevelopment activity that is inconsistent with this RAWP and the Soil/Fill Management Plan (attached to this report as Appendix A) will void New York State's release from liability.

1.3 Site History

The Buffalo Union Steel Corporation purchased the manufacturing and railroad yard portions of the site in 1900. The Union Ship Canal was constructed near the northern edge of the Buffalo Union Steel property in 1910 to service the facility. Pig iron manufacturing commenced during the period of 1900 to 1915 with the construction of the blast furnaces. Following the construction of the blast furnaces, the Hanna Furnace Company acquired the property from Buffalo Union Steel. The National Steel Company subsequently purchased the property in 1929, and the corporate entity became known as the Hanna Furnace Corporation. During peak production, the Hanna Furnace Corporation employed over 800 personnel.

The Union Ship Canal is approximately 20 feet deep. Iron ore, lime, coke and other raw materials were received via the canal, and were stockpiled along the northern and southern edges of the canal. In the area immediately to the south of the canal and north of the manufacturing area, the raw materials were placed on massive concrete pads that occupy the bulk of the southern portion of parcel 3. The concrete pads are assumed to be approximately four feet thick.

The Pennsylvania Railroad was first to acquire the land to the north of the canal and used the property for unloading raw material ores into train cars. The Hanna Furnace Corporation

purchased an approximately 25-acre portion of the property located to the north of the canal from the Pennsylvania Railroad in 1960. The property included the northern portion of the designated 200-foot Buffer Area. Wetland areas that included ponds with depths up to 15 feet occupied much of the property at the time. The swampy area was subsequently backfilled with silty sand and gravel, with some black cinders, as described in Recra Environmental, Inc.'s 1988 report.

The Hanna Furnace Corporation ceased all operations at the site in 1982 due to foreign competition and the closure of the Shenango Furnace Company, formerly a primary recipient of pig iron from Hanna Furnace. The Jordan Foster Scrap Corporation purchased the site in 1983 and subsequently dismantled many of the buildings and removed the rails from the Former Railroad Yard for scrap. The Jordan Foster Scrap Corporation filed for bankruptcy during 1986, and leased the site briefly to the Equity Scrap Processing Company. In 1998, the City of Buffalo gained title to the Hanna Furnace Site due to nonpayment of taxes. The Hanna Furnace Site was vacant and unsecured from 1986.

Since 1998, the City of Buffalo has proactively initiated efforts to characterize and remediate the BLCP site under the auspices of New York State's Brownfield Cleanup Program. Consequently, development of Parcels 1 and 2 have included soil and groundwater characterization, removal of soil/debris piles, railroad ties, and building demolition materials.

In 2005, Cobey, began redevelopment of a portion of the BCLP in accordance with a Brownfield Cleanup Agreement and Remedial Action Work Plans prepared for Parcel 1 (Malcolm Pirnie, 2002) and Parcel 2 (OB&G, 2002). In accordance with NYSDEC's letter dated March 9, 2006, this stand-alone work plan specifically for the Cobey Site was drafted. Construction activities began at the site in the Fall of 2005.

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Previous Investigations

SECTION 2

A number of environmental site assessments and investigations have been completed for Parcels 1 (Former Railroad Yard) and 2 (Former Manufacturing Area). The assessment work included collection and analysis of numerous soil/fill, groundwater, surface water and sediment samples distributed on both parcels. The environmental assessments and investigations that have been completed at the Site, which consists of Parcels 1 and 2 are documented in the following reports:

Rupley, Bahler and Burke, Solid Waste Management Facility Report, 1979 - In 1979 Rupley, Bahler, and Blake, Consulting Engineers prepared a Solid Waste Management Facility Report for the Hanna Furnace Corporation. This report includes an evaluation of surface water quality in the Union Ship Canal and an on-Site pond. The water samples contained phenols and soluble iron at concentrations above NYSDEC Class GA (drinking water) groundwater standards. It should be noted that groundwater is not used as a drinking water supply in the area of the Site.

Erie County Department of Environmental Protection, Inactive Site Profile Report, 1982 - In April 1982, after the cessation of pig iron manufacturing at the Site, the Erie County Department of Environmental Protection inspected the Site and prepared a report entitled "Inactive Site Profile Report". The report recommended that the NYSDEC downgrade the classification of the Site to a "class F" which pertains to a Site where no further action is warranted and little to no environmental hazard potential exists.

NYSDEC, Inactive Hazardous Waste Disposal Site Report, 1983 - In 1983, the NYSDEC, after inspection of the Hanna Furnace property, prepared an Inactive Hazardous Waste Disposal Site Report, also known as the "Registry". The on-property inactive landfill was assigned a site number (#915029). The Hanna Furnace property was initially assigned a classification of 2A, which indicates a potential hazardous waste site with insufficient data to properly characterize potential site issues.

United States Geological Survey, Draft Report of Preliminary Evaluation of Chemical Migration to the Niagara River from Hazardous Disposal Sites in Erie and Niagara Counties, 1983 - In 1983, the United States Geological Survey (USGS) drilled and sampled seven test borings on the north side of the Union Ship canal. Samples from these borings were analyzed for a short list of heavy metals. In their report entitled "Draft Report of Preliminary Evaluation of Chemical Migration to the Niagara River from Hazardous Waste Disposal Sites in Erie and Niagara Counties," the USGS concluded that there was potential for lateral migration of contaminants at and away from the Site. No samples were collected in the Former Manufacturing Area (Parcel 2) during this investigation.

Engineering Science and Dames and Moore, Phase I Investigation, 1985 - In 1985, a site inspection and Phase I Investigation were performed for the NYSDEC by Engineering-Science and Dames and Moore. The Phase I Investigation was limited to areas north of the Union Ship Canal and included a record search and scoring the Hanna Furnace property using the Hazard Ranking Scoring (HRS) System. The study area was assigned a score greater than 28.5 are generally considered to pose an immediate threat to human health and the environment and are recommended for placement on the National Priorities List. Additional data needs were identified by the Phase I Investigation and a Phase II Investigation was recommended and outlined.

Recra Environmental, Site Characterization and Environmental Assessment, 1988 - In August 1988, Recra Environmental, Inc. (Recra) performed a Site Characterization and Environmental Assessment for the New York State Department of Transportation. The characterization and assessment included the entire 113-acre Hanna Furnace property. The work involved the collection of samples of surface and subsurface soil/fill, surface water, sediment and groundwater, performance of a risk assessment, and an evaluation of remedial alternatives.

The investigation in the Former Railroad Yard Area (Parcel 1) included the collection of five surface soil samples (SS-19 to SS-24). The soil samples were collected from the 0.5 to 1.5 feet below grade, and were analyzed for PCBs, oil and grease, cyanide, ammonia, and phenols, and metals including arsenic, chromium, copper and lead. Analytical results indicated that PCBs were detected in all five samples at concentrations ranging from 0.074 to 1.5 parts per million. The four inorganic analytes were detected in at least one sample at concentrations exceeding the NYSDEC Technical and Administrative Guidance Memorandum (TAGM) 4046 soil cleanup guidelines. but below the guidelines proposed for other commercial/industrial development on former steel manufacturing properties.

The investigation of the Former Manufacturing Area (Parcel 2) included the collection and analysis of eight surface soil samples, six subsurface soil samples, and two groundwater

samples. The soil and groundwater samples were analyzed for arsenic, chromium, copper, lead, cyanide, oil and grease, ammonia, and PCBs. Analytical results indicated elevated levels of metals and low (less than 1 part per million) concentrations of PCBs in the soil samples. Groundwater samples from the monitoring wells contained arsenic, chromium, lead, and cyanide at concentrations above the class GA standards. The pH of the groundwater was also above the range of the class GA standard. The HRS score of the Hanna Furnace Site was recalculated using the data collected from the site characterization. The revised HRS, as scored by Recra, remained low at 12.28 out of 100, and Recra concluded that the Site does not pose an immediate threat to human health and the environment.

New York State Department of Environmental Conservation, 1990 **-** The NYSDEC collected two surface soil samples (one composite and one discrete) from the Former Manufacturing Area (Parcel 2) for analysis of PCBs. The composite sample was collected from three locations in the vicinity of the oil shack building where it was identified that transformer salvaging apparently had been conducted. The discrete sample was collected from oil-stained soil in the vicinity of a suspected transformer pen in the southwest corner of the Site, near the former office building. PCBs were not detected in either sample.

New York State Department of Environmental Conservation, 1994 **-** In 1994, the NYSDEC collected 36 surface soil samples from the Hanna Furnace property, of which 13 were collected in the Former Manufacturing Area (Parcel 2). The 13 samples were analyzed for PCBs using immunoassay techniques, and were analyzed for metals (arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, and selenium) using standard laboratory methodologies. PCBs were not detected in the samples, and all the metals except for silver were detected at concentrations exceeding the current NYSDEC soil cleanup guidelines in at least one sample.

ABB Environmental Services, Preliminary Site Assessment, 1995 **-** ABB Environmental Services performed a Preliminary Site Assessment (PSA) for the NYSDEC. The PSA included not only the 113-acre Hanna Furnace Site but also the adjacent Shenango Steel Site. The purpose of the PSA was to more thoroughly characterize the Hanna Furnace property, recalculate the Site score using the HRS system, and reclassify the Hanna Furnace property.

Former Railroad Yard Area (Parcel 1): Only one soil (BS-104) and one groundwater sample (MW-104) were collected in the Former Railroad Yard. The soil sample was collected from a boring in the south central portion of the Former Railroad Yard Area from fill at a depth of 6 to 8 feet below grade and the water sample was collected from a monitoring well installed at the same location. The well was screened from 5 to 15 feet below grade. Water levels measured during ABB's investigation indicated that the water table was present at a depth of approximately 8.7 feet below grade in MW-104.

The samples were analyzed for TCL VOCs, SVOCs, pesticides, and PCBs, and TAL metals and cyanide. Analytical results indicate that aluminum, beryllium, calcium, and magnesium were present in the soil sample at concentrations exceeding by up to four times the Eastern United States Background concentrations listed in the TAGM 4046 soil cleanup guidelines. Total cyanide was detected at a concentration of 32.1 ppm in the soil sample. Analysis of the groundwater sample indicated that only cyanide (240 ug/L) and sodium (26,300 ug/L) were detected in concentrations exceeding the NYSDEC Glass GA Groundwater Quality Standards (100 and 20,000 ug/L, respectively). TCL VOCs, SVOCs, pesticides, and PCBs were not detected in the soil and groundwater samples.

Former Manufacturing Area (Parcel 2): Five surface soil, two subsurface soil, and two groundwater samples were collected from the Former Manufacturing Area. The soil and groundwater samples were analyzed for Target Compound List (TCL) volatile organic compounds (VOCs), SVOCs, pesticides/PCBs, and Target Analyte List (TAL) metals plus cyanide. The surface soil samples were also analyzed for EPTox metals.

Analytical results for the surface soil samples indicated that SVOCs, primarily polycyclic aromatic hydrocarbons (PAHs), and a number of metals were detected at concentrations exceeding the TAGM 4046 soil cleanup guidelines. Metals were detected in the EPTox analysis at low concentrations. The analytical results for the two subsurface samples indicated that no VOCs, SVOCs, pesticides, or PCBs were detected, and a number of metals were detected at concentrations exceeding the soil cleanup guidelines.

Analysis of the groundwater samples indicated that only iron, magnesium, manganese, and sodium were detected at concentrations exceeding the NYSDEC Glass GA Groundwater Quality Standards. VOCs, SVOCs, and pesticides/PCBs were not detected in the groundwater samples.

No disposal of listed or characteristic hazardous waste was documented at the Site. Therefore, the NYSDEC removed the Hanna Furnace Site from its Registry of Inactive Hazardous Waste Disposal Sites.

Ecology and Environment, Inc., Environmental Site Assessment, 1997 - Ecology and Environment, Inc., performed an Environmental Site Assessment for the Buffalo Urban Renewal Agency in May 1997. The objective of the assessment was to summarize all available and pertinent environmental information, to identify variations in current Site conditions relative to those defined in earlier investigations, and to identify potential areas of concern. The assessment

involved a review of records as well as the performance of three site inspections. The assessment report presented the findings in order of environmental concern by area.

Within the Former Railroad Yard Area (Parcel 1), the only environmental concern was solid waste disposal. Several waste piles of railroad ties, tires, C&D debris, household trash, firebrick and black material were noted in the report. Only those debris piles with black material were considered to have potential contamination by E&E.

Within the Former Manufacturing Area (Parcel 2), the following concerns were identified:

- Potential contamination in the machine shop (2-story brick building).
- Discolored firebrick at blast furnace No. 3.
- An area containing brown black material with lack of vegetation.
- Sediment contamination within sumps and trenches.
- Oil and lubricant staining in the Oil Shack.
- Potential releases from an AST in the former coal bin drums.
- Elevated pH in monitoring wells MW-104, MW-105, and MW-106.

Malcolm Pirnie, Inc, Characterization of the Former Railroad Yard, June 1999, Revised October 1999 - Malcolm Pirnie collected surface and subsurface soil samples from 36 boring locations within the Former Railroad Yard Area (Parcel 1) during the period from December 1998 to January 1999. The report detailing the results of this investigation was submitted to the NYSDEC in October 1999. As described in the report, the results of sampling performed indicated that no VOCs, phenols, or PCBs were detected in any of the samples collected. However, metals and polycyclic aromatic hydrocarbons (PAHs) were present in the samples at concentrations above TAGM guidelines.

The concentrations of PAHs detected in both the surface and subsurface soil samples are primarily within the range typically found in urban soils. The TAGM soil cleanup guidelines for PAH compounds were contravened in 17 of the 18 surface soil composite samples.

The PAH concentrations detected in the subsurface soil samples were significantly lower than those in the surface soil composite samples. The TAGM soil cleanup guidelines for PAH compounds were contravened in only 5 of the 18 subsurface soil composite samples.

Because PAHs are formed through anthropogenic combustion processes such as the burning of coal, oil and gasoline, they are generally ubiquitous in soils, especially industrial and urban soils. The presence of PAHs at in the Former Railroad Yard Area is consistent with its industrial

location and past use as a railroad yard located adjacent to an active pig iron manufacturing facility.

The analysis of composite soil samples for inorganic analytes (TAL metals plus cyanide) indicated that a number of metals were detected at concentrations above the soil cleanup guidelines.

The analysis of the surface soil composite samples indicated that aluminum, arsenic, beryllium, cadmium, calcium, chromium, copper, lead, magnesium, manganese, mercury, nickel, and zinc were detected in at least one sample at concentrations exceeding the soil cleanup guidelines and/or the Eastern U.S. background concentrations. The concentrations of metals in the composite subsurface soil samples were generally lower than or similar to those of the surface soil samples. Aluminum, arsenic, beryllium, cadmium, calcium, magnesium, manganese, nickel, and zinc were detected in at least one composite surface sample at concentrations exceeding the soil cleanup guidelines and/or the Eastern U.S. background concentrations.

Total cyanide concentrations in the composite surface and subsurface soil samples ranged from 1 to 33 mg/kg. Analysis of the sample of blue-green sandy material collected from boring SB-20 revealed that no reactive cyanide was detected in the sample, and that the total cyanide concentration was 38.8 mg/kg. Although there currently is no NYSDEC soil cleanup guideline for cyanide, the United States Environmental Protection Agency (USEPA) soil screening level (SSL) can be used for comparison. The SSL for amenable cyanide is 1,600 mg/kg. Amenable cyanide is that portion which is amenable to chlorination. The susceptibility of cyanide complexes to chlorination is indicative of its availability to organisms. Total cyanide includes the cyanide that is amenable and that is not amenable to chlorination. Because the total cyanide concentrations detected in the samples from the Site are less than 40 mg/kg, the concentrations detected in the soil at the Former Railroad Yard Area are well below the USEPA soil screening levels for amenable cyanide.

The Toxicity Characteristic Leaching Procedure (TCLP) analysis of 5 subsurface composite samples indicated that only barium is present in leachable quantities. Barium concentrations ranged from 0.2 to 0.6 ug/L in the samples of fill material, well below the USEPA Maximum Concentration Value for Toxicity Characteristics of 100 ug/L for barium.

Malcolm Pirnie, Inc., Qualitative Human Health and Ecological Risk Assessment. Hanna Furnace Site, Former Railroad Yard (Parcel 1), 2000 - In May 2000, Malcolm Pirnie developed Qualitative Human Health and Ecological Risk Assessments for the Former Railroad Yard Area (Parcel 1). The purpose of the risk assessments was to identify relevant environmental media and chemicals of potential concern that may present health risks to the populations in and around the vicinity of the Former Railroad Yard Area. The risk assessments concluded that, given the redevelopment plans for the Hanna Furnace property, exposures to future on-site workers, trespassers, and wild life would be effectively precluded by covering the Former Railroad Yard Area with 12-inches of vegetated soil, asphalt or concrete.

Malcolm Pirnie, Inc., Supplemental Investigation Report. Hanna Furnace Site, Former Railroad Yard (Parcel 1), Revised January 2001 - Based on the results of Malcolm Pirnie's investigation of the Former Railroad Yard Area, the NYSDEC requested additional activities for more complete characterization. The additional investigatory activities included the installation and sampling of monitoring wells, the characterization of fill piles, and the characterization of blue material encountered at depth in borings.

To address outstanding issues at the Former Railroad Yard, Malcolm Pirnie implemented a Supplemental Investigation in 2000, which included the drilling of seven borings. Three of those borings were completed as monitoring wells and were sampled as part of then investigation. Additionally, the characterization of on-site debris piles was performed and included a thorough inventory, test pit program, and sample collection. The results of the Supplemental Investigation were detailed in the January 2001 Supplemental Investigation Report, and are discussed below.

Drilling activities were conducted from January 24 through January 26, 2000 and included the advancement of seven borings and the installation of shallow groundwater monitoring wells in three those borings. The borings and monitoring wells were designated B-37 through B-40 and MW-001 through MW-003, respectively.

Additional Characterization of Blue-Colored Fill Material

During the January 1999 characterization, a blue-colored layer of fill material was encountered beneath the majority of the Former Railroad Yard. To further characterize the chemical composition of the blue material, additional samples were collected from completed borings during the Supplemental Investigation.

Soil that is described as blue soil, especially Prussian Blue, is often a result of industrial activities, and often contains cyanide at very high concentrations. The blue-colored material at the Hanna Furnace Site is not a Prussian Blue color. The color of the material ranges from grayish blue-green to grayish blue to white-gray. The blue-green material generally underlies the white-gray

material, and the transition from one color to the other was sometimes observed to be at approximately the water table.

The analysis of the blue-green material samples collected during the Supplemental Investigation indicated that VOCs were detected at concentrations below the soil cleanup guidelines, and pesticides and PCBs were not detected. Two SVOCs (i.e., benzo(a)anthracene and benzo(a)pyrene) were detected at concentrations above the conservative TAGM soil cleanup guidelines.

Eight metals (i.e., aluminum, barium, beryllium, calcium, iron, magnesium, selenium, and zinc) were detected in at least one of the blue-colored soil samples at concentrations above the conservative TAGM soil cleanup guidelines.

One sample was collected from the blue-green material in boring BS-20 for analysis of total cyanide and reactive cyanide due to concerns regarding cyanide contamination. The total cyanide concentration was low (38.8 mg/kg), and no reactive cyanide was detected in this sample. Additional samples were collected specifically for the characterization of the blue-green material during the Supplemental Investigation. These samples were analyzed for total cyanide, and the results showed that cyanide concentrations were low and ranged from 3.1 to 43 mg/kg. Groundwater samples collected from monitoring wells in areas that contain this blue-green material (MW-104, MW-105, and MW-001) contained cyanide at concentrations ranging from 20 to 90 µg/L. These concentrations are below the NYSDEC groundwater standard of 200 µg/L.

Characterization of Eastern Portion of Former Railroad Yard Area

At the request of the NYSDEC, one additional soil boring was drilled to sample the fill overburden in the extreme eastern portion of the Site. Additionally, one boring was completed in the northeastern portion of the Former Railroad Yard because that area also was not characterized in previous investigations. These borings were sampled during advancement using the same techniques employed during the January 1999 investigation.

The material encountered during the drilling of the monitoring wells was similar to that encountered in the borings throughout the area. The analytical results of the soil samples collected from the two borings indicated that VOCs were detected at concentrations below the soil cleanup guidelines, and pesticides and PCBs were not detected. Only one SVOC (chrysene) was detected at concentrations above the soil cleanup guidelines. Chrysene was detected in the sample collected from boring MW-002 at a concentration of 480 µg/kg, slightly above the soil cleanup guideline of 400 µg/kg.

Nine metals (aluminum, arsenic, beryllium, calcium, copper, iron, magnesium, selenium, and zinc) were detected in at least one of the soil samples at concentrations above the soil cleanup guidelines.

Debris Pile Characterization

Numerous debris piles of admixed soil and construction debris have been documented and were observed in the Former Railroad Yard during the January 1999 site characterization effort. The debris piles are generally located along the southern and southeastern perimeters of the Former Railroad Yard Area.

Since these piles had not yet been sampled for chemical analyses, a thorough inventory and sampling program was implemented during the Supplemental Investigation to characterize the contents of the debris piles. To best characterize the debris piles, Malcolm Pirnie verified and updated the inventory to provide an accurate estimate of the number, location, volume, and apparent contents of all on-Site debris piles.

Debris Pile Inventory

As part of the Supplemental Investigation, Malcolm Pirnie verified Ecology and Environmental Inc.'s 1997 soil pile inventory and amended the inventory to include the contents of the debris piles. Malcolm Pirnie's estimate of the volume of all above grade debris in the piles is approximately 24,000 cubic yards**.** The materials observed in the debris piles during the investigation were generally categorized as construction and demolition debris mixed with sand and gravel with occasional railroad ties, slag, and metal refuse.

Debris Pile Screening and Sampling

Subsequent to an inventory of all debris piles, sampling of the debris was performed. A backhoe was used to breach select debris piles to ascertain the contents and provide access to non-weathered debris for sampling. Samples were visually characterized and screened for VOCs using a PID equipped with a 10.2 eV lamp and the observations were recorded on the stratigraphic logs.

A total of 20 debris pile test pits designated SS-1 through SS-20 were excavated on January 23 and 24, 2000, and one sample was collected from each test pit. The Supplemental Investigation Report includes a descriptive log for each sampled excavation. The 20 debris pile samples were submitted to the laboratory for analysis of TCL VOCs, SVOCs, pesticides, and PCBs, and TAL metals plus cyanide**.**

The analytical results of the debris pile sampling indicated that no VOCs were detected at concentrations above the soil cleanup guidelines. Aldrin was the only pesticide detected above the soil cleanup guidelines. Aldrin was detected in three samples, but the concentrations exceeded the soil cleanup guidelines in only sample SS-4. PCBs were detected in two samples at concentrations above the soil cleanup guidelines.

Only six SVOCs were detected at concentrations exceeding the conservative TAGM soil cleanup guidelines. These six compounds are PAHs, and were also detected in samples collected during the 1999 Site Characterization. The concentrations of these compounds detected in the soil/fill material are primarily within the range typically found in urban soils. Because PAHs are formed through anthropogenic combustion processes such as the burning of coal, oil and gasoline, they are generally ubiquitous in soils, especially urban soils. The presence of PAHs at this Site is consistent with its urban location and past use as a railroad yard. Eleven metals were detected in at least one debris pile sample at concentrations above the soil cleanup guidelines.

Groundwater Characterization Results

Based on the findings of the Supplemental Investigation, the groundwater flow direction at the Former Railroad Yard is generally north and west, toward the canal. This groundwater flow direction is consistent with that described during previous investigations. No VOCs or SVOCs were detected in the groundwater samples above the Class "GA" Groundwater Quality Standards. Pesticides and PCBs were not detected in the groundwater samples. Six metals (iron, magnesium, manganese, selenium, sodium, and thallium) were detected at concentrations exceeding the standards in at least one groundwater sample.

Malcolm Pirnie, Inc., Remedial Action Work Plan. Hanna Furnace Site, Former Railroad Yard Area (Parcel 1), pH Investigation, 2001 - A total of five soil borings were completed around monitoring wells MW-104 and MW-105 in January 2001 to assess whether the high pH observed in the groundwater in the wells was due to grout contamination of the wells. Groundwater was collected from each boring using either a bailer or a bottle lowered on a string. The pH of each groundwater sample was measured using a portable pH meter that was calibrated immediately prior to the start of the boring program. The pH of the groundwater collected from these five borings ranged from 10.00 to 11.53.

Based on the results of the boring program, Malcolm Pirnie completed on May 17, 2001 a total of 10 test pits to delineate the areal extent of high pH in the groundwater in Parcel 1. Groundwater was collected from each test pit either by lowering a bottle into the excavation or by collecting water from the backhoe bucket. The pH of each groundwater sample was measured using a portable pH meter that was calibrated immediately prior to the start of the test

pit program. The pH of the groundwater collected from these five borings ranged from 8.67 to 11.95. The results of the pH Investigation were reported to the NYSDEC in a June 6, 2001 letter report.

O'Brien and Gere, Engineers Inc., Site Investigation Report, Hanna Furnace Site (Parcel 2), June 2002 - In July/August 2001 Environmental Resources Management (ERM) performed a site investigation at Parcel 2 of the Hanna Furnace property on behalf of the NYSDEC. ERM conducted the investigation in accordance with a work assignment prepared by O'Brien and Gere Engineers, Inc. and the NYSDEC. The investigation consisted of installation of soil borings, installation of new groundwater monitoring wells, and excavation of test pits. Samples from soil borings were analyzed for VOCs, SVOCs, PCBs, and target analyte list (TAL) metals. Groundwater samples were analyzed for VOCs, SVOCs, PCBs, and TAL metals. Fourteen test pits were completed in Parcel 2 to evaluate the nature and extent of NAPL that was discovered during the 2001 Malcolm Pirnie investigation. Soil and groundwater samples were collected from two test pits and analyzed for SVOCs, PCBs, and TAL metals.

The 2001 ERM investigation, as well as previous investigations, indicate that of the existing contaminants detected in soil and groundwater within the Site, SVOCs (PAHs in particular), and metals were the most prevalent. VOCs and PCBs were sporadically detected and when encountered, were detected at concentrations below SSALS, and regulatory soil and groundwater standards or guidance. An area of elevated pH in groundwater and areas of NAPL-impacted soils were also encountered.

MALCOLM PIRNIE

The Remedial Plan

SECTION 3

Redevelopment of the Cobey Site (portions of Parcels 1 and 2) began in September 2005 following the RAWPs for Parcels 1 and 2 (i.e., Remedial Action Work Plan for the Former Railroad Yard Area by Malcolm Pirnie, Inc. dated February 2002 and Remedial Action Work Plan, Hanna Furnace Site: Subparcel 2 by O'Brien and Gere Engineers, Inc. dated November 2002. In their March 9, 2006 letter to Mr. Robert Murray of Harris Beach PLLC, the NYSDEC stated that they felt it would be more appropriate for the project if a revised, stand-alone work plan was written specifically for the Cobey Site. As such, sections of both RAWPs have been restated and revised, where appropriate, and project specific documents such as the Health and Safety Plan and the Stormwater Pollution Prevention Plan have been included in this RAWP.

In order to eliminate potential exposure risks associated with direct contact with site fill material, the entire Cobey Site will be covered as part of redevelopment. The cover system will be placed directly on top of the regraded on-site fill material and will include clean soil for outdoor, vegetated areas, asphalt for roads and parking lots, or concrete for sidewalks, buildings and heavy use areas. Surface coverage over the entire redeveloped subparcel or portion thereof will be required by the Site owner or developer as a pre-condition of occupancy. Responsibility for monitoring and maintenance of the Site cover system is delineated in the BCP Agreement. An Operation, Monitoring, and Maintenance (OM&M) Work Plan for implementation following remediation of the Site is included as Appendix C.

The proposed cover system has been designed to be protective of human health and the environment. The primary exposure pathway for contaminants at the Site (metals and PAHs in soil and high pH in groundwater) is via direct contact. The proposed plan of covering the on-site fill material will eliminate the potential for direct contact with soil and is therefore protective

of human health and the environment. TCLP analysis of select soil samples indicated that the contaminants present at the Site do not readily leach. Additionally, results of groundwater sampling indicated that constituents present in the fill material have not significantly impacted groundwater quality with the possible exception of elevated pH. Groundwater is not/will not be used at the Site and therefore no direct contact with elevated pH groundwater is anticipated except during invasive construction activities.

The Qualitative Risk Assessment performed as part of the Supplemental Investigation (Malcolm Pirnie, 2000) evaluated the risk posed by chemicals of potential concern (COPCs) to human health and wildlife. The Risk Assessment also evaluated the adequacy of the cover system placed during Site redevelopment to protect human health and wildlife from these COPCs.

Given the redevelopment plans, exposure to the soil fill piles and surface soil would be precluded for future on-site workers. For the trespasser, potential exposure to contaminated soil is expected to be precluded due to the planned redevelopment activities.

Following redevelopment, the Cobey Site will not present a significant risk to wildlife because it will be completely covered with clean fill, asphalt or concrete. Additionally, although some wildlife may occasionally use the Site, the presence of human activities will inhibit significant use of the Site by wildlife.

3.1 Preparation of Site Surface

The Site will require grading prior to cover placement activities. Any fill material or debris piles will be graded to a regular topographic surface as planned for redevelopment. Following placement of the cover material, the grading will be completed such that precipitation events will not cause the formation of standing water. All trees, shrubs, stumps, roots, brush, masonry, rubbish, scrap, debris, pavement, curbs, fences and miscellaneous structures will either be buried, or removed and disposed of off-site at a permitted disposal facility in accordance with solid waste regulations. Prior to placement of the cover soil, all protruding material will be removed from the ground surface. Burning will not be allowed on the Site.

3.2 Cover System

3.2.1 Soil

In areas that will not receive significant equipment or vehicular use, the minimum cover system will be composed of soil/fill tested in accordance with Section 2.2 of the Soil/Fill Management Plan and found to contain constituent concentrations less than those specified in NYSDEC TAGM 4046. The completed soil cover will be of a thickness required to maintain sufficient vegetative cover to prevent exposure to the on-site fill material. The soil thickness required must be 12-inches and must be verified through pre- and post-development surveys.

In order to reduce the potential for disturbance of the surface cover material, berms or mounds composed of clean soil will be constructed in areas in which trees and shrubs will be planted. The berms or mounds will be of sufficient thickness to allow the excavation of only clean fill deep enough to plant the tree or shrub root ball. Unless additional soil is required for the plantings, the soil cover thickness will be 12 inches. The material used in the berms or mounds will contain sufficient organic material to allow the growth of the trees and/or shrubs and will be of sufficient strength to support trees and/or shrubs at their maximum height. Fill containing lumps, pockets, or concentrations of silt or clay, rubble, debris, wood or other organic matter will not be acceptable. Fill containing unacceptable material shall be removed and disposed appropriately.

Prior to placement of final cover, a demarcation layer between the existing contaminated soil/fill and the clean final cover material will be placed in areas that are not being paved. The demarcation layer will be InterNet ¾-inch polypropylene orange mesh (product number OD-1670).

Topsoil used for the final cover shall meet the following general specifications:

1. Fertile, friable, natural loam surface soil, capable of sustaining plant growth, and free of clods of hard earth, plants or roots, sticks or other extraneous material harmful to plant growth. The topsoil shall be well-graded with the following approximate analysis:

1670).

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   a.

Sieve Size	Percent Passing by Weight
3-inch	100
No. 4	>75
No. 200	>30
0.002 mm	<20

   b. pH 5.5 to pH 7.6.

   c. Minimum organic content of 2.5 percent as determined by ignition loss.

   d. Soluble salt content not greater than 500 ppm.

Before delivery, soil samples will conform to the criteria specified in Sections 2.3 and 2.4 of the Soil/Fill Management Plan.

Grass seed used for final cover shall meet the following general specifications:

1. The grass seed mixture will be fresh, clean, new-crop seed complying with the tolerance for purity and germination established by the Official Seed Analysts of North America.

2. The entire ground surface disturbed by construction operations shall be seeded with 100 lbs/acre of seed conforming to the following:

3.

a.

Name of Grass	Application Rate (lbs/acre)	Purity (%)	Germination (%)
Perennial Ryegrass	10	95	85
Kentucky Bluegrass	20	85	75
Strong Creeping Red Fescue	20	95	80
Chewings Fescue	20	95	80
Hard Fescue	20	95	80
White Clover	10	98	75

b. Germination and purity percentages should equal or exceed the minimum seed standards listed. If it necessary to use seed with a germination percentage less than the minimum recommended above, the seeding rate will be increased accordingly to compensate for the lower germinations.

c. Weed seed content will be less than 0.25 percent and free of noxious weeds.

d. All seed shall be rejected if the label lists any of the following grasses:

1) Sheep Fescue.
2) Meadow Fescue.
3) Canada Blue.
4) Alta Fescue.
5) Kentucky 31 Fescue
6) Bent Grass.

4. In addition to the seed mixtures listed above, one bushel per acre of oats or rye seed shall be sowed over the entire area, including drainage ditches, to provide a quick shade cover and to prevent erosion during turf establishment.

A certificate of completion will not be issued by the NYSDEC until the soil cover has established itself. Grading and seeding of the soil cover will occur at the start of a growing season.

3.2.2 Asphalt

The cover system in areas that will become roads, sidewalks, and parking lots will consist of a minimum of two inches of asphalt that will be placed over the soil/fill material at the Site. The asphalt will be placed on a minimum four-inch gravel subbase to provide stability for construction and to limit subsidence. Prior to placement of the subbase, all protruding material will be removed from the ground surface and the area regraded to a regular surface.

3.2.3 Concrete

The cover system in areas that will become slab-on-grade structures will consist of a minimum of two inches of concrete that will be placed above the soil/fill material. The concrete will be placed on a minimum four-inch gravel sub-base to provide stability for construction and to limit subsidence. A vapor barrier consisting of polyethylene sheeting with a minimum thickness of 8-mils will be installed under all structures to provide additional protection for on-site workers. Concrete may also be used instead of asphalt for roads, sidewalks, and parking lots. Prior to placement of the subbase, all protruding material will be removed from the ground surface and the area regraded to a sufficient regular surface.

MALCOLM PIRNIE

Soil/Fill Management Plan

SECTION 4

During construction activities at the Cobey Site, the excavation of soil/fill material will be necessary for the construction of utility corridors. Excavation may also be necessary during the construction of footings for structures and for other activities including the planting of trees. Although a number of environmental investigations have been conducted at the Site to characterize the nature and extent of contamination, the nature of investigations does not allow for a 100 percent complete or accurate characterization. Therefore, it is possible that some quantity of unsuspected contamination may be encountered during redevelopment of the activities.

Soil management protocols are necessary to limit the potential for exposure of workers to contaminated fill material. The soil handling protocols will also be necessary for assisting with the determination of whether soil/fill removed during excavation activities may be reused on-site or must be disposed off-site. The Soil/Fill Management Plan is included as Appendix A.

MALCOLM PIRNIE

SECTION 5

Remedy Evaluation

5.1 Introduction

Based on the contaminant characterization results and the Qualitative Risk Assessment performed as part of the Supplemental Investigation (Malcolm Pirnie, 2000), soil/fill material and groundwater are the media of concern for the Site. The constituents of potential concern (COPC) for soils consist primarily of metals and polyaromatic hydrocarbons (PAHs). Results of groundwater sampling indicate that constituents present in the soil/fill material have not significantly impacted groundwater quality with the possible exception of elevated pH. Since groundwater is not an exposure pathway, except during invasive construction activities, groundwater treatment or containment is not required following construction.

5.2 Remedial Action Objective

The identification of the remedial action objective (RAO) for the soil/fill material at the Site is based primarily on the human health and environmental risks posed by the Site as identified in the Qualitative Risk Assessment (Malcolm Pirnie, 2000). The RAO for the Site is minimizing potential exposure risks associated with direct contact with soil/fill material and groundwater.

5.3 Remedial Action Alternative

In order to achieve the RAO, the entire Cobey Site will be covered as part of redevelopment. The remedial action alternative is a cover system that will be placed directly on top of the regraded soil/fill material. The proposed cover system will include clean material; vegetated soil

cover in areas that will not receive significant equipment or vehicular use; asphalt in areas that will become roads, sidewalks, and parking lots; and concrete in areas that will become slab-on-grade structures.

The following Sections present a detailed analysis of the remedial action alternative with respect to the evaluation criteria outlined in 6 NYCRR Part 375-1.10 and the RAO for the Site.

5.4 Standards, Criteria, and Guidance (SCGs)

A Site's remedial program must be designed so as to conform to standards and criteria that are generally applicable, consistently applied, and officially promulgated, that are either directly applicable, or that are not directly applicable but are relevant and appropriate, unless good cause exists why conformity should be dispensed with [6 NYCRR 375-1.0(c)(1)(i)].

While the Site is not a State or Federal hazardous waste site, the proposed remedial program has been developed consistent with the requirements of the National Oil and Hazardous Substance Pollution Contingency Plan of March 8, 1990. The proposed remedial program was developed giving consideration to the following three categories of SCGs:

1. Ambient- or chemical-specific SCGs are usually health- or risk-based numerical values (standards or criteria) that are applied to environmental media and must be achieved by a remedy for an affected medium or in discharges from the site to the ambient environment. In the absence of such values, chemical-specific SCGs may be derived using methodologies which, when applied to site-specific conditions, result in the establishment of numerical criteria.

2. Action-specific SCGs are usually technology or activity based requirements or limitations on actions taken with respect to hazardous or toxic wastes. These action-specific requirements are not used to determine the remedial alternative; rather, they govern the design and performance of the alternative.

3. Location-specific SCGs are restriction placed on the concentrations of hazardous substances or the conduct of activities solely because they are in specific locations.

5.4.1 Chemical-Specific SCGs

Based on the known levels of contamination at the Site, as determined during previous investigations and a qualitative assessment of the risks to the public health and the environment, it was determined that the only exposure route of significance was one of direct contact. It was further determined that for the established level of Site contamination, a soil cover would provide adequate protection for the intended commercial/light industrial use of the Site. To verify protection, any soil/fill materials encountered during redevelopment and determined to be significantly more contaminated than what has been previously characterized would be properly disposed. The site-specific action levels (SSALs), developed to assess soil/fill excavations or disturbances, define levels for the site contaminants of concern, above which off-site disposal will be required. The SSALs presented in Appendix A, Table 2-1 has been approved by the NYSDEC and NYSDOH.

In areas of high pH, the pH of the water in excavations will be measured using a field pH meter. Water pumped from excavations will be discharged to the ground surface unless staining or elevated PID measurements are observed in the excavation, a sheen is present on the water surface, or the pH of the groundwater is less than 6.5 or greater than 8.5. If any of these conditions exist, the water pumped from the excavations may be discharged to the Buffalo Sewer Authority under a discharge permit if the water quality falls within the conditions of the permit. If the water quality is such that the permit requirements will be exceeded, the groundwater removed from the excavation will be containerized and sampled. Containerized water not meeting the Surface Water and Groundwater Quality Standards set forth in 6 NYCRR Part 703.5 will be transported off-site for proper disposal.

5.4.2 Action-Specific SCGs

During clearing, grading, excavating, and stockpiling of excavated soil, dust suppression and air monitoring will be conducted in accordance with NYSDEC TAGM HWR-89-4031, Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites. The program to be implemented at the site is described in Section 2.6 of the Soil/Fill Management Plan (S/FMP) in Appendix A.

Erosion control measures will be implemented for soil/fill stockpiles and unvegetated soil surfaces during redevelopment activities to prevent migration of contaminated soil/fill to the Union Ship Canal.

Soil/fill material containing analytes above the SSALs will be further classified for disposal purposes with respect to hazardous characteristics, as outlined in 6 NYCRR Part 371, Identification and Listing of Hazardous Wastes. Soil/fill material determined to be a hazardous waste will be handled in accordance with the requirements of: 6 NYCRR Part 372, Hazardous Waste Manifest System and Related Standards for Generators, Transporters, and Facilities; and 49 CFR 107-171, DOT Rules for Hazardous Materials Transport.

The water pumped from excavations in areas of elevated pH will be monitored for pH prior to handling and discharge. Because water with elevated pH may act as a skin irritant, care must be taken to inhibit dermal contact when handling any groundwater at the site. Actions to inhibit contact with groundwater may include the use of latex or other waterproof gloves.

Consideration will be given to use of construction materials resistant to elevated pH when designing and constructing utility corridors known to contain elevated pH groundwater. Clay plugs will be installed at the connections to utilities at the perimeter of the Cobey Site to limit the potential for the migration of elevated pH groundwater via utility corridors.

5.4.3 Location-Specific SCGs

Redevelopment of the Cobey Site is part of the overall redevelopment of the BCLP as a commercial/light industrial park. Review of the New York State Coastal Management Program (19 NYCRR Part 600/601) was performed as part of the Generic Environmental Impact Statement (GEIS) for the Hanna Furnace Site. The redevelopment complies with both State and local coastal zone policies, and is compatible with the Local Waterfront Revitalization Plan.

The Union Ship Canal is designated as a Class C fresh surface water. According to 6 NYCRR Part 701.8, the best usage of Class C waters is fishing. These waters are suitable for fish propagation and survival. The water quality will be suitable for primary and secondary contact

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Parcel 4 of the BLCP is located near wetland areas; however, redevelopment activities on the Cobey Site will not impact this area.

5.5 Overall Protectiveness of Public Health and the Environment

This threshold assessment addresses whether a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled. This evaluation allows for consideration of whether the alternative poses any unacceptable short-term or cross-media impacts.

As determined by the site-specific Qualitative Risk Assessment (Malcolm Pirnie, 2000), the placement of asphalt, concrete, and clean soil cover provides adequate protection of public health and the environment and, therefore, achieves the RAO for the site. The cover material, with routine maintenance, will effectively reduce the potential for direct contact with the contaminated soil/fill and elevated pH groundwater. Additionally, this RAWP includes a Soil/Fill Management Plan (Appendix A) that was created to protect on-site workers, the public, and the environment during site redevelopment. The Soil/Fill Management Plan (S/FMP) also requires the off-site disposal of soil/fill material determined to contain contaminant concentrations above the SSALs.

5.6 Short-Term Effectiveness

The effectiveness of alternatives in protecting human health and the environment during construction and implementation of the remedial action is evaluated under this criterion. Short-

The Union Ship Canal is designated as a Class C fresh surface water. According to 6 NYCRR Part 701.8, the best usage of Class C waters is fishing. These waters are suitable for fish propagation and survival. The water quality will be suitable for primary and secondary contact recreation, although other factors may limit the use for these purposes. During redevelopment, surface water will be collected and discharged to the Union Ship Canal in accordance with the Water Quality Standards set forth in 6 NYCRR Part 703.5.

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5.6 Short-Term Effectiveness

The effectiveness of alternatives in protecting human health and the environment during construction and implementation of the remedial action is evaluated under this criterion. Short-

term effectiveness is assessed by protection of the community, protection of workers, environmental impacts, and time until protection is achieved.

Initially, the restriction of access to the Site in its present condition will reduce the risks posed by the Site to the general public. The construction of a cover system composed of clean soil, asphalt, and concrete will effectively reduce the risk to public health and the environment in the short-term by covering the soil/fill material. The material used for the cover system will be certified clean material and its presence will limit the potential for exposure of the public to on-site soil/fill material. Although the remedial activities will require the covering of all habitat at the Site with clean soil, asphalt, or concrete, the existing habitat is of such poor quality that the immediate impact is negligible.

This RAWP includes a S/FMP that was created to protect on-site workers, the public, and the environment during site redevelopment activities. During redevelopment activities, workers engaged in subsurface construction or maintenance activities will be required to implement a site-specific, activity specific health and safety plan. A Health and Safety Plan is included as part of the S/FMP. Additionally, Appendix A, Section 2.6 includes a description of methods of dust suppression to be implemented during site redevelopment activities, thereby reducing potential exposure to contaminated dust.

In the short-term, the redevelopment activities will be effective and the impact to human health and the environment will be negligible. The proposed remedy should achieve the RAO for the Cobey Site in approximately one year.

5.7 Long-Term Effectiveness and Permanence

This criterion evaluates the long-term protection of human health and the environment at the completion of the remedial action. Effectiveness is assessed with respect to the magnitude of residual risks; adequacy of controls, if any, in managing treatment residuals or untreated wastes that remain at the site; reliability of controls against possible failure; and potential to provide continued protection.

The remedial action alternative will effectively reduce the long-term risk to public health and the environment by eliminating the potential exposure risk of direct contact with soil/fill material through the placement and maintenance of a cover system over the entire Site. Maintenance of the soil cover may include additional soil or replanting of grass to achieve a vegetative cover that will eliminate the potential for soil erosion. Maintenance of the asphalt and concrete cover may include repair of cracks or damage caused by weathering or vehicular use.

The poor quality habitat existed at the site prior to redevelopment activities will be destroyed; however, the clean soil cover will reduce the potential for direct contact by animals and the new vegetation will provide a higher quality habitat. Leaving contaminated soils in-place presents an ecological risk for burrowing animals; however, the presence of human activities will inhibit significant use of the Site by these animals.

The contaminants that will remain in the soils at the Site following redevelopment will be present at concentrations below the SSALs agreed on by the NYSDEC and NYSDOH. In addition, the contaminants are generally immobile and, therefore, do not pose a threat via migration to adjacent properties via groundwater flow.

In addition, the industrial/commercial use of the Site will be controlled through City zoning, land use and design guidelines, and deed restrictions. Therefore, with proper maintenance, the cover system will provide long-term effectiveness and permanence in achieving the RAO for the Site.

5.8 Reduction of Toxicity, Mobility, and Volume

This evaluation criterion addresses the preference for selecting a remedial action alternative that permanently and significantly reduces the volume, toxicity, and/or mobility of the hazardous wastes and/or constituents. This preference is satisfied when the treatment is used to reduce the principal threats at a site through destruction of toxic contaminants, irreversible reduction in contaminant mobility, or reduction of total volume of contaminated media. The following is the hierarchy of remedial technologies ranked from most preferable to least preferable:

(1) Destruction.

(2) Separation/treatment.

(3) Solidification/chemical fixation.

(4) Control and isolation.

The proposed remedial action alternative will effectively reduce the mobility of the contaminants through control and isolation of the on-site fill material. The contaminants present at the site are generally immobile and are present at concentrations below the SSALs agreed on by the NYSDEC and NYSDOH. Placement of a properly maintained cover system will eliminate contaminant mobility due to soil erosion. As discussed in the Qualitative Risk Assessment (Malcolm Pirnie, 2000), the proposed remedial action alternative is sufficient to be protective of public health and the environment. Therefore, other remedial action alternatives (e.g., destruction, separation/treatment, and solidification/ chemical fixation) are unwarranted.

If concentrations of contaminants detected in soils during redevelopment are higher than the SSALs, the impacted soil/fill material will be removed from the Site and properly disposed, thereby decreasing the toxicity and volume of contamination at the Site.

5.9 Feasibility

A feasible remedy is one that is suitable to site conditions, is capable of being successfully carried out with available technology, and considers, at a minimum, implementability.

The proposed remedial action alternative for the Site is suitable to current and future conditions and uses. Materials and equipment for clearing, grading, and placing and maintaining the cover system are readily available. The cover system will be easily implementable since all structures, debris, and vegetation will be removed; the Site will be graded to a regular topographic surface for redevelopment; and access to the Site is good.

Operation, maintenance, and monitoring (OM&M) of the cover systems will be the responsibility of the property owner. Erosion of the soil cover system will be reduced by maintaining a good vegetative cover. In order to reduce the potential for disturbance of the soil cover material, berms or mounds composed of clean soil will be constructed in areas in which

trees and shrubs will be planted. Asphalt roadways, sidewalks, and parking lots will be sealed regularly and cracks will be filled.

Redevelopment of BLCP is a key first step in the City of Buffalo's plan for redevelopment of South Buffalo. These redevelopment efforts will create positive economic benefits for the City of Buffalo and Western New York.

MALCOLM PIRNIE

SECTION 6

Health and Safety Issues

Invasive work performed at the Cobey Site will be performed in accordance with all applicable local, state, and federal regulations to protect worker health and safety. All contractors performing redevelopment or maintenance activities involving intrusive work at the Cobey Site are required to prepare a site-specific, activity-specific Health and Safety Plan. In order to facilitate the creation of an appropriate Health and Safety Plan by the contractor(s) performing work, the ranges of concentrations of contaminants detected in soil and groundwater samples collected during previous site investigations are shown in Table 6-1 and 6-2, respectively. Additionally, copies of the reports detailing the procedures and findings of these site investigations are available at the offices of the NYSDEC and Malcolm Pirnie, Inc. These reports are included in the List of References (Section 8.0).

The Health and Safety Plan developed by SafteyWISE, Inc. is included as Attachment V of the Soil/Fill Management Plan.

TABLE 6-1
SUMMARY OF ANALYTICAL RESULTS - MINIMUM AND MAXIMUM DETECTED CONCENTRATIONS IN SOIL SAMPLES
REMEDIAL ACTION WORK PLAN
COBEY SITE

PARAMETER[1]	NYSDEC TAGM VALUES[2]	EASTERN U.S. BACKGROUND RANGE[2]	MIN. DETECTED[3] CONCENTRATION	MAX. DETECTED[3] CONCENTRATION
VOLATILE ORGANIC COMPOUNDS (ug/kg)				
Chloromethane	-	-	16	16
Carbon Disulfide	2,700	-	2	12
cis-1,2-Dichloroethene	-	-	5	5
Chloroform	300	-	2	7
2-Butanone	300	-	4	27
Trichloroethene	700	-	220	220
Benzene	60	-	2	11
2-Hexanone	-	-	14	14
4-Methyl-2-pentanone	1000	-	2	4
Tetrachloroethene	1400	-	1	2
1,1,2,2-Tetrachloroethane	600	-	3	59
Toluene	1,500	-	1	56
Ethylbenzene	5,500	-	2	33
Styrene	-	-	20	20
Xylenes	1,200	-	2	28
SEMIVOLATILE ORGANIC COMPOUNDS (ug/kg)				
4-Methylphenol	900	-	120	120
Naphthalene	13000	-	42	720
2-Methylnaphthalene	36400	-	83	230
Acenaphthylene	41000	-	66	210
2,6-Dinitrotoluene	1000	-	120	120
Acenaphthene	50000	-	47	690
Dibenzofuran	6,200	-	47	670
Fluorene	50000	-	69	900
Phenanthrene	50,000	-	43	6000
Anthracene	50,000	-	57	2500
Carbazole	-	-	40	570
Di-n-butylphthalate	8100	-	47	120
Fluoranthene	50,000	-	53	8500
Pyrene	50,000	-	78	9700
Butylbenzylphthalate	50000	-	130	790
Benzo(a)anthracene	224	-	51	3700
Chrysene	400	-	66	3800
Bis(2-Ethylhexyl)phthalate	50,000	-	41	650
Benzo(b)fluoranthene	1,100	-	89	6400
Benzo(k)fluoranthene	1,100	-	39	1900
Benzo(a)pyrene	61	-	57	5100
Ideno(1,2,3-cd)pyrene	3,200	-	100	3700
Dibenzo(a,h)anthracene	14	-	110	960
Benzo(ghi)perylene	50,000	-	89	4100

TABLE 6-1
SUMMARY OF ANALYTICAL RESULTS - MINIMUM AND MAXIMUM DETECTED CONCENTRATIONS IN SOIL SAMPLES
REMEDIAL ACTION WORK PLAN
COBEY SITE

PARAMETER[1]	NYSDEC TAGM VALUES[2]	EASTERN U.S. BACKGROUND RANGE[2]	MIN. DETECTED[3] CONCENTRATION	MAX. DETECTED[3] CONCENTRATION
PESTICIDES / PCBs (ug/kg)				
Aldrin	41	-	2.6	500
4,4'-DDE	2100	-	3.9	13.8
4,4'-DDT	2100	-	5	32
alpha-Chlordane	540	-	29.3	500
gamma-Chlordane	540	-	2.1	2.1
Aroclor 1242	1,000	-	150	370
Aroclor 1254	1,000	-	350	1300
Aroclor 1260	1,000	-	74	3820
Heptachlor	100	-	3.2	3.2
METALS (mg/kg)				
Aluminum	SB	33,000	2,950	54,000
Antimony	SB	-	7.0	16.6
Arsenic	7.5 or SB	3 - 12	3.0	61.7
Barium	300 or SB	15 - 600	40.2	327
Beryllium	0.16 or SB	0 - 1.75	0.73	9.61
Cadmium	(10)	0.1 - 1	0.707	19.9
Calcium	SB	130 - 35,000	14,200	296,000
Chromium	(50)	1.5 - 40	4.36	4,700
Cobalt	30 or SB	2.5 - 60	1.89	16.0
Copper	25 or SB	1 - 50	5.0	640
Iron	2,000 or SB	2,000 - 550,000	1,780	244,000
Lead	(1000)	4 - 500	1.9	3,300
Magnesium	SB	100 - 5,000	3,070	38,200
Manganese	SB	50 - 5,000	194	10,400
Mercury	0.1	0.001 - 0.2	0.022	0.67
Nickel	13 or SB	0.5 - 25	6.93	96.9
Potassium	SB	8,500 - 43,000	655	6,120
Selenium	2 or SB	0.1 - 3.9	2.3	35.9
Silver	SB	-	2.27	1,170
Sodium	SB	6,000 - 8,000	6.26	1,400
Thallium	SB	-	2.4	4.8
Vanadium	150 or SB	1 - 300	8.4	1,150
Zinc	20 or SB	9 - 50	5.4	2,380
Cyanide	-	-	0.99	43

Notes:
(1) Only those parameters detected in at least one sample are shown. Concentrations of 'non-detect' are not included.
(2) Soil Cleanup Guidelines and Eastern U.S. Background Range from NYSDEC TAGM 4046 (1/24/94). Value in parentheses are NYSDEC revised values for nonresidential sites but have not yet been incorporated into TAGM 4046.
- Soil cleanup guideline or background range not available.

TABLE 6-2

SUMMARY OF ANALYTICAL RESULTS - MINIMUM AND MAXIMUM CONCENTRATION DETECTED IN GROUNDWATER SAMPLES
REMEDIAL ACTION WORK PLAN
COBEY SITE

PARAMETER [1]	MIN. DETECTED CONCENTRATION	MAX. DETECTED CONCENTRATION	NYSDEC Class GA Standards[2]
VOLATILE ORGANIC COMPOUNDS (ug/L)			
4-Methyl-2-pentanone	4	4	-
2-Hexanone	9	9	50
SEMI-VOLATILE ORGANIC COMPOUNDS (ug/L)			
Di-n-butylphthalate	3	4	50
PESTICIDES / PCBs (ug/L)			
None Detected	-	-	-
METALS (ug/L)			
Cyanide	10	90	200
Aluminum	150	1630	-
Barium	23.2	175	1000
Calcium	45100	171000	-
Copper	10.9	10.9	200
Iron	231	11700	300
Lead	3.8	5.1	25
Magnesium	6940	55700	35000
Manganese	13.6	846	300
Potassium	1080	61000	-
Selenium	8.7	114	10
Silver	35.9	41.2	50
Sodium	14700	64600	20000
Thallium	16.6	16.6	0.5
Zinc	10.0	86.2	2000
OTHER			
pH	6.6	12.25	-

Notes:
(1) Only those parameters detected in at least one sample are shown. Concentrations of 'non-detect' are not included.
(2) NYSDEC Water Quality Guidance Values for Class GA Waters from NYS Ambient Water Quality Standards and Guidelines (June 1998).
- Not available.

MALCOLM PIRNIE

Citizen Participation Plan

SECTION 7

In accordance with NYSDEC'S guidance for BCP Agreements, a Citizen Participation Plan has been included in the RAWP as Appendix B.

MALCOLM PIRNIE

SECTION 8

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