DRAFT ANALYSIS OF BROWNFIELD CLEANUP ALTERNATIVES

For

Sapello Foundry
65 Broadway Street and Weatherby Road
Block 230, Lot 30
Township of Maurice River
Cumberland County, New Jersey
NJDEP Case No. 02-01-16-0159-32

1.0 INTRODUCTION AND BACKGROUND

This report presents an Analysis of Brownfields Cleanup Alternatives (ABCA) for the former Sapello Foundry (Site) located in the Township of Maurice River, Cumberland County, New Jersey. The purpose of this ABCA is to identify and evaluate cleanup alternatives that will mitigate risks to human health and the environment for priority cleanup areas identified at the Site based on the findings of assessments and investigations conducted to date. Woodard & Curran (W&C) conducted the ABCA in support of Maurice River Township's 2012 United States Environmental Protection Agency (USEPA) Brownfield Cleanup Grant Proposal for the Site.

This ABCA Report provides an overview of current Site conditions, historical, current, and proposed Site uses, and an evaluation of the effectiveness, implementability, and costs associated with potential remedial actions. Analysis of this data provides a means to synthesize a plan for the most suitable remedial alternative based on the results of assessments and investigations conducted at the Site to date as well as potential available funding.

This ABCA report was prepared using information obtained from a Site Investigation Report and Supplemental Site Investigation/Remedial Investigation Work Plan dated February 2009 prepared by CMX, Inc. (CMX), as well as additional documentation regarding investigations of ground water conducted by CMX between July and September 2009.

1.1 Site Location and Description

The site is located southeast of the intersection of Port Elizabeth Cumberland Road (County Route 645) and Broadway Street in the Township of Maurice River, Cumberland County, New Jersey. The Site is designated as Block 230, Lot 30, by the Township of Maurice River, and encompasses approximately 5.1 acres. Figure 1 displays the approximate location of the property on a portion of the United States Geologic Survey (USGS) 7.5 Minute Port Elizabeth Quadrangle. Figure 2 displays the boundaries of the property on the Township of Maurice River Tax Map.

The site is currently vacant and is overgrown with vegetation. Remnants of former site operations including two (2) warehouse buildings (Warehouse #1 and Warehouse #2), a storage building and an office building are present in the northern portion of the site. A large sand casting disposal area occupies the central portion of the site. The southern portion of the site is densely wooded. With the exception of the vacant structures on Site, the property consists entirely of pervious surfaces.

The Site is currently owned by the Township of Maurice River as a result of foreclosure. The Site is partially fenced, but unauthorized access is apparent from observed breaches in the fence in several locations, worn foot trails, and recreational vehicle tracks.

Residential properties are located north, south and west of the property. Portions of a railroad right-of-way flank the east side of the property.

1.1.1 Land Use

The Site was developed for use as an iron pump manufacturing foundry by Dale P. Sapello as early as 1930. Site improvements associated with the on-site foundry included four (4) masonry block and sheet metal buildings which currently remain in the north portion of the site. The remaining portions of the site historically did not contain any site improvements. Foundry operations continued at the Site until as late as 1993. The Site has been vacant since approximately 1993.

The Site is located within the Pinelands National Reserve. Land within the reserve is divided into nine (9) land use management areas with goals, objectives, development intensities and permitted uses for each. These are implemented through local zoning which must conform to Pinelands land use standards. The Site is located within an area designated as a Pinelands Village. A total of 47 small, existing, spatially discrete settlements are included in this designation. Land uses which are appropriate for infill residential, commercial, and industrial development which is compatible with the town's existing character is permitted. Residential development is permitted on minimum 1-acre lots if public sewer is not provided.

Because the Site is located in a designated Pinelands Village area which is not serviced by public sewer, the Township of Maurice River may redevelop the Site for use as a park or open space once remediation is complete.

1.1.2 Previous Investigations

The Township of Maurice River received a New Jersey Department of Environmental Protection (NJDEP) Hazardous Discharge Site Remediation Fund (HDSRF) grant in 2002 to conduct a Preliminary Assessment (PA) and Site Investigation (SI) of the Sapello Foundry property. CMX conducted a PA and SI of the subject site on behalf of the Township of Maurice River in accordance with Section 3 of the New Jersey Technical Requirements for Site Remediation (N.J.A.C. 7:26E). CMX's PA findings were summarized in a PA report dated January 2004, and SI findings were summarized in a SI report dated February 2009. The following areas of concern (AOCs) were identified in connection with the Site based on the findings of these investigations.

Sapello Foundry AOCs			
AOC	**Description**	**Location**	**Additional Investigation Recommended**
AOC-1A	Aboveground Storage Tanks (550-gallon)	Central Portion of Site	No
AOC-1B	Aboveground Storage Tanks (275-gallon)	Office Building Exterior	No
AOC-1C	Aboveground Storage Tanks (275-gallon)	Warehouse #1 Exterior	No
AOC-1D	Aboveground Storage Tanks (290-gallon)	Storage Building Exterior	No
AOC-2	Underground Storage Tanks	Unknown	No
AOC-3A	Pits and Hydraulics	Warehouse #1	No
AOC-3B	Pits and Hydraulics	Warehouse #2	No
AOC-3C	Pits and Hydraulics	Warehouse #2	No
AOC-4A	Drum Staging Areas	Warehouse #1	Yes
AOC-4B	Drum Staging Areas	Warehouse #2 Exterior	Yes
AOC-4C	Drum Staging Areas	Storage Building	Yes
AOC-4D	Drum Staging Areas	Storage Building Exterior	Yes
AOC-5A	Septic System	Office Building Exterior	Yes
AOC-5B	Septic System	Warehouse #2 Exterior	No

Sapello Foundry AOCs			
AOC	**Description**	**Location**	**Additional Investigation Recommended**
AOC-6	Waste Pile	Central Portion of Site	Yes
AOC-7	Suspected Buried Drums	Central Portion of Site	Yes
AOC-8A	Discolored Areas	Warehouse #1	Yes
AOC-8B	Discolored Areas	Storage Building	Yes
AOC-8C	Discolored Areas	Central Portion of Site	Yes
AOC-9A	Disturbed Areas	Central Portion of Site	Yes
AOC-9B	Disturbed Areas	Central Portion of Site	Yes
AOC-9C	Disturbed Areas	Central Portion of Site	Yes
AOC-10	Potable Well	Warehouse #2 Exterior	No
AOC-11	Abandoned Vehicles	Northern Portion of Site	No
AOC-12	Storage Silo	Warehouse #1 Exterior	No
AOC-13	Slag	North of Warehouse #2	Yes

Following completion of the SI, no further investigation of AOCs 1A, 1B, 1C, 1D, 2, 3A, 3B, 3C, 5B, 10, 11, and 12 was recommended. Information regarding AOCs for which additional investigation was recommended is provided below.

Drum Staging Areas/Discolored Areas (AOC-4A/AOC-8A)

Ten (10) drums are staged at various locations within Warehouse #1, which measures approximately 50 feet by 75 feet. Drums observed included one (1) 35-gallon electrolytic nickel drum, one (1) 55-gallon Isopropyl 99 drum, one (1) 55-gallon drum of Lino-cure abm, one (1) 55-gallon drum of Foseco binder/coating material and several 55-gallon drums of 18-302 alkyd resin and 23-217 alkyd coreactant. In addition, CMX observed several five-gallon buckets of red grip adhesive and Universal tractor hydrastatic fluid and numerous bags of Morie industrial sand. The floor within Warehouse #1 was coated with a fine, black, sand-like material. In addition, a coagulated tar-like substance was observed at the base of several of the 18-302 alkyd resin and 23-217 alkyd coreactant drums.

Two (2) surface soil samples were collected from the area of the drums for total petroleum hydrocarbons (TPH) analysis (NJDEP Method OQA-QAM-025) and a Priority Pollutant scan (PP+40). Exceedances of NJDEP Residential and/or Non-residential Direct Contact Soil Remediation Standards (RDCSRS/NRDCSRS) for naphthalene, Aroclor-1242, and lead were reported. In addition, total chromium was reported at a concentration exceeding the hexavalent chromium Non-Residential Soil Cleanup Criteria (SCC). TPH was also reported at a concentration exceeding the NJDEP health based criterion for total organic contaminants in effect at the time of sampling of 10,000 mg/kg for one (1) soil sample. All other PP+40 compounds were reported as non-detect or at concentrations below their respective most stringent SRS for soil samples collected.

Drum Staging Areas (AOC-4B)

During their September 24, 2008, site reconnaissance, CMX located approximately one-hundred thirty (130) 55-gallon drums staged south of Warehouse #2. Some of the drums were filled with rainwater while other drums contained miscellaneous metallic debris, slag and household rubbish. At least one (1) of the drums contained a coagulated tar-like substance which was observed leaking onto the ground surface. CMX was unable to determine the contents of many of the drums due to the presence of thick vegetation which inhibited accessibility, lid enclosures and the lack of proper drum labeling. CMX collected three (3) surface soil samples for TPH and PP+40 analyses to investigate this drum staging area. Exceedances of NJDEP

RDCSRS/NRDCSRS for nickel were reported. In addition, total chromium was reported at a concentration exceeding the hexavalent chromium Non-Residential SCC.

Drum Staging Areas/Discolored Areas (AOC-4C/AOC-8B)

CMX identified a drum staging area within the storage building. Staining was observed adjacent to a liquid/sludge filled drum that was partially submerged below the ground surface. CMX collected one (1) surface soil sample to investigate the discolored area (AOC-8B) identified. No elevated PID readings were recorded within the vicinity of the drum. The soil sample was analyzed for PP+40 and TPH-QAM. Benzo(a)pyrene was reported at concentrations exceeding NJDEP RDCSRS. In addition, total chromium was reported at a concentration exceeding the hexavalent chromium Non-Residential SCC.

Drum Staging Areas (AOC-4D)

CMX identified a liquid filled drum at the west exterior of the storage building. The drum was staged in a densely wooden portion of the site. No staining, odors or stressed vegetation were observed within the vicinity of the drum. One (1) surface soil sample was collected to investigate the drum staging area for TPH and PP+40 analyses. Benzo(a)pyrene was reported at a concentration exceeding the RDCSRS/NRDCSRS.

Septic Systems (AOC-5A)

Information obtained from the Maurice River Township tax assessor indicated that a septic system was present on the site. During a September 2008 geophysical survey, a subsurface structure (Anomaly-14) consistent with a septic system was identified at the south exterior of the office building. During the September 2008 test pit investigation, a subsurface seepage pit measuring five (5) feet in diameter and extending to a depth of 5.5 feet below grade was identified at this location. A discharge pipe which appeared to originate from the office building was observed within the seepage pit. To investigate the potential for impact due to the septic system, CMX collected subsurface soil sample Septic-1 from the base of the seepage pit beneath the discharge pipe. The soil sample was analyzed for PP+40 and TPH-QAM. Benzo(a)anthracene, benzo(b)flouranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, and dibenz(a,h)anthracene were reported at concentrations exceeding their respective most stringent RDCSRS/NRDCSRS.

Waste Pile/Discolored Areas/Disturbed Areas (AOC-6/AOC-8B/AOC-9A/AOC-9B/AOC-9C)

During the September 24, 2008 site reconnaissance, CMX identified a sand casting waste pile that encompassed an approximate 54,375 square foot area within the central portion of the site (AOC-6). Based on a review of historic aerial photographs, CMX attributes the disturbed areas (AOC-9A/AOC-9B/AOC-9C) identified during the PA to waste disposal activities associated with the sand casting waste pile. During the reconnaissance, black residue (AOC-8B) was observed on a majority of the sand castings and on the surface soil in the immediate vicinity of these materials.

During a geophysical survey conducted in September 2008, seven (7) anomalies were identified within the sand castings waste pile. The anomalies were variable in size ranging from approximately five (5) square feet to twenty-five (25) square feet. To determine the origin of the anomalies, CMX excavated a test pit at each of the anomalies identified. In addition, CMX advanced two (2) test trenches through the waste pile to characterize the waste pile contents. Non-native material was encountered within the upper fifty-four (54) inches of soil or less at each of the anomalies and within both of the test trenches. Material encountered included metal screens, miscellaneous metallic debris, sand castings, chemically-altered black sandy

material, a large piece of concrete, sheet metal, a round metal object, powdery white material, rubber and a metal cable.

To investigate the potential for impact from the material encountered, CMX collected three (3) soil samples from the test pits advanced and one (1) sample from the test trenches advanced. In addition, CMX collected five (5) surface soil samples from the waste pile. Soil samples were analyzed for PP+40 and TPH-QAM. Exceedances of their respective most stringent NJDEP RDCSRS and/or NRDCSRS for benzo(a)anthracene, benzo(b)flouranthene, benzo(a)pyrene, indeno (1,2,3-cd) pyrene, dibenz (a,h) anthracene, and Aroclor-1242 were reported. In addition, total chromium was reported at a concentration exceeding the hexavalent chromium Non-Residential SCC.

Suspected Buried Drums (AOC-7)

According to a Maurice River Township Council member, drums were reportedly buried in the central portion of the site. During the geophysical survey, two (2) large anomalies (Anomaly-9 and Anomaly-12) were identified. Anonaly-9 was located directly north of the sand castings waste pile (AOC-6). Anonaly-12 was located at the east exterior of Warehouse #1. Due to the large size and location of the anomalies, CMX concluded that the anomalies were potentially the suspected buried drums (AOC-7) reportedly located in the central portion of the site.

CMX excavated a test pit (Test Pit-9) to investigate the potential for buried drums to be present at Anomaly-9. Material encountered within the upper twenty-four inches (24") of soil included a powdery blue material, miscellaneous metallic debris, black hardened material, slag and clam shells. In addition, a perforated drain pipe was observed in the central portion of the test pit. Native soil was encountered beneath the debris and extended to the base of the test pit. Three (3) soil samples were collected for PP+40 and TPH to evaluate these materials. Exceedances of RDCSRS and/or NRDCSRS were reported for benzo(b)flouranthene, benzo(a)pyrene, dibenz(a,h)anthracene, benzo(a)anthracene, benzo(k)flouranthene, and indeno(1,2,3-cd)pyrene. In addition, total chromium was reported at a concentration exceeding the hexavalent chromium Non-Residential SCC.

Slag (AOC-13)

A small anomaly (Anomaly-11) was identified directly north of Warehouse #2 during the geophysical survey. To investigate Anomaly-11, CMX excavated a test pit (Test Pit-11). Material encountered within the upper eighteen (18) inches of soil included a large amount of slag and minor amounts of chemically-altered black sandy material. Native soil was encountered beneath the debris and extended to the base of the test pit. CMX collected a subsurface soil sample to characterize the slag and chemically-altered black sandy material. One (1) soil sample was collected for PP+40 and TPH-QAM analyses. Benzo(a)anthracene, benzo(b)flouranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, and dibenz(a,h)anthracene were reported at a concentrations exceeding their respective most stringent RDCSRS and/or NRDCSRS. In addition, total chromium was reported at a concentration exceeding the hexavalent chromium Non-Residential SCC.

Ground Water

CMX performed a temporary well point ground water investigation at the site on December 16 and December 30, 2008. Five (5) temporary well points were installed, and grab ground water samples were collected and submitted for PP+40 analysis. Mercury, arsenic, beryllium, total chromium, nickel, lead, and thallium were reported at concentrations exceeding their respective New Jersey Ground Water Quality Standards (NJGWQS). Other constituents detected in ground water included toluene, phenanthrene, selenium, and zinc.

As a result of the initial temporary well point investigation, in August 2009 CMX installed eight (8) shallow monitoring wells to depths of approximately twenty (20) feet below ground surface (bgs) in locations throughout the Site. Analysis of ground water samples collected from the wells identified concentrations of arsenic, lead, and nickel at levels exceeding the NJGWQS.

Based on a review of NJDEP i-MapNJ electronic mapping software, the site is located within the New Jersey Pinelands Protection Area Boundary. According to Section 1.7 of the Ground Water Quality Standards (N.J.A.C. 7:9C) ground water quality criteria for Class I-A areas are the natural quality for each constituent. Therefore, the NJDEP will not permit any activity which would result in the degradation of background water quality within the Protection Area. Since ground water impact has been identified at the site, any concentration above the background concentrations would be considered an exceedance of the NJGWQS.

As a result of these exceedances, emergency HDSRF funding was authorized by the NJDEP to sample twenty (20) potable wells in close proximity to the Site. Wells were sampled between July and August of 2009. Lead was reported at concentrations as high as 6.5 ug/l. Nickel was reported at concentrations as high as 9.9 ug/l. Arsenic was not detected at concentrations exceeding the laboratory reporting limit for all twenty (20) samples.

2.0 SUMMARY OF PRIORITY CLEANUP AREAS

An evaluation of Site data indicates that interim remedial cleanup actions are warranted to address the following priority cleanup AOCs based on the following conditions:

2.1 Drum Staging and Storage Areas (AOC4A/8A, 4B, 4C/8B)

Approximately 150, 55-gallon drums are located throughout the Site. Some of the drum contents are open to the environment. The drums are in varying conditions and leaking has been observed in several locations.

In addition, the floor within Warehouse #1 [which contains ten (10) of the 150, 55-gallon drums], was covered with a fine, black, sand-like material. Laboratory analyses of the material indicated exceedances of RDCSRS and/or NRDCSRS for naphthalene, Aroclor-1242 and lead for soil samples collected to investigate the drum staging and storage areas. In addition, total chromium was reported at a concentration exceeding the hexavalent chromium Non-Residential SCC.

There is a potential for direct contact with the drums and their contents. In addition, there is a potential for direct contact with the fine, black, sand-like material within Warehouse #1. These items also have the potential to impact the underlying soil and ground water. The adjacent properties are largely residential and utilize well water. Therefore, there is additional potential for impact to human receptors by exposure to contaminated ground water.

2.2 Waste Pile/Discolored Areas/Disturbed Areas (AOC-6/AOC-8B/AOC-9A/AOC-9B/AOC-9C)

An area measuring approximately 54,375 square feet in area and 4.5 feet in depth (or approximately 9,000 cubic yards) is located in the central portion of the Site and consists of discarded sand castings. Other items observed during investigation of this area included metal screens, miscellaneous metallic debris, sand castings, chemically-altered black sandy material, a large piece of concrete, sheet metal, a round metal object, powdery white material, rubber and a metal cable.

Exceedances of the respective most stringent NJDEP RDCSRS and/or NRDCSRS benzo(a)anthracene, benzo(b)flouranthene, benzo(a)pyrene, indeno (1,2,3-cd) pyrene, dibenz (a,h) anthracene, and Aroclor-1242 were reported for soil samples collected to investigate the sand casting waste pile and its vicinity. In addition, total chromium was reported at a concentration exceeding the hexavalent chromium Non-Residential SCC.

There is a potential for direct contact with contaminated waste pile materials. The contaminated waste pile materials also have the potential to impact the underlying soil and ground water. The adjacent properties are largely residential and utilize well water. Therefore, there is additional potential for impact to human receptors by exposure to contaminated ground water.

3.0 APPLICABLE REGULATIONS AND CLEANUP STANDARDS

Applicable regulations and cleanup standards to be used during the course of this cleanup include:

- New Jersey Technical Requirements for Site Remediation (N.J.A.C. 7:26E);
- New Jersey Remediation Standards (Soil) (N.J.A.C. 7:26D);
- Resource Conservation and Recovery Act (40 CFR Part 261 et seq);
- Occupational Health and Safety Administration - Construction Standard (40 CFR Part 1926);
- Occupational Health and Safety Administration - HAZWOPER (40 CFR Part 1910.120);

Remedial standards to be used with regard to soil remediation will be the Soil Remediation Standards outlined at N.J.A.C. 7:26D. Determination of whether any waste to be removed from the site is determined to be hazardous will be in accordance with the regulations set forth in 40 CFR Part 261 et seq. Work on Site will be conducted in accordance with the health and safety requirements outlined in the OSHA construction standard (40 CFR Part 1926) and HAZWOPER regulations (40 CFR Part 1910.120).

4.0 EVALUATION AND SELECTION OF CLEANUP ALTERNATIVES

The following sections provide a summary of the cleanup alternatives evaluated for priority cleanup areas described in Section 2.0.

4.1 Drum Staging and Storage Areas (AOC-4A/8A, 4B, 4C/8B)

Cleanup alternatives evaluated for this AOC included no action, removal and off-site disposal, and stabilization/containment. Further details are discussed below.

4.1.1 No Action Alternative

Due to the potential for direct contact as well as contact through the ground water pathway, this alternative was not determined to be a valid option.

4.1.2 Removal and Off-Site Disposal

Under this scenario, remediation of this AOC would be conducted in two (2) phases:

1. Removal of fine, black sandy material within Warehouse #1
   Removal of contaminated black, sandy material within Warehouse #1 will be conducted prior to removal of the drums to prevent the spread of this material to areas outside of the warehouse during drum removal, to prevent exposure of contaminants to individuals performing drum over-

packing and removal activities, and to prevent potential exposure to unauthorized personnel who may enter the Warehouse.

A task-specific Health and Safety Plan (HASP) will be prepared prior to mobilization. The fine, black sandy material will be removed by 40 hour OSHA trained staff using an industrial Vac-Tron air excavation machine. Material will be stockpiled on plastic and covered with plastic prior to final disposal. Water mist will be used to minimize the generation of dust during removal and stockpiling. Following removal, the material will be properly characterized for disposal at a licensed facility.

W&C estimates that an average of approximately four (4) inches of black, sandy material covers the floor of the warehouse. A vacuum excavation system will be utilized to remove this material prior to removal of the drums. Based on the dimensions of the warehouse (75' x 50') and an average thickness of four (4) inches, approximately 70 tons of material is estimated to be removed.

2. Drum Removal
   Approximately 150, 55-gallon drums and their contents will be properly characterized prior to for removal and proper disposal in accordance with applicable local, State, and Federal regulations by 40 hour OSHA trained staff. Following inspection, drums will be moved to a separate staging area if appropriate prior to opening. The drums will be sampled and their contents characterized to determine hazardous waste characteristics and compatibility with similar wastes. Similar drum contents will be transferred into bulk containers if possible. Following characterization, all wastes will be transferred offsite to a treatment or disposal facility.

The following table presents an estimate of costs for a removal and off-site disposal strategy.

Removal and Off-Site Disposal Cost Estimate – Drum Staging and Storage Areas (AOC-4A/8A, 4B, 4C/8B)			
Task	**Phase**	**Low Estimate**	**High Estimate**
Collection and Disposal of Black Sandy Material In Warehouse #1	Labor and Materials	$36,450.00	$36,450.00
	Disposal of Vacuumed Debris	$4,050.00	$17,500.00
Drum and Debris Containment With Off-Site Disposal	Waste Classification	$2,500.00	$2,500.00
	Overpacking	$12,500.00	$12,500.00
	Liquid Disposal	$2,530.00	$2,530.00
	Soil Disposal	$1200.00	$7,500.00
	Drum Disposal	$16,500.00	$109,450.00
	Transportation Fee	$4,632.00	$4,632.00
	Roll-Off	$4,800.00	$4,800.00
	Total Estimate	$85,162.00	$197,862.00

4.1.3 Stabilization/Containment

Stabilization of the drums and their contents would still require the removal of the fine, black sandy material within Warehouse #1, as well as characterization of the drums as described in Removal and Off-Site Disposal above; however, the drums and contents would not be removed from the Site. Stabilization of liquid-filled drums would still require removal of the liquid within the drums prior to overpacking.

The following table presents an estimate of costs for a stabilization/containment strategy.

Stabilization/Containment Estimate – Drum Staging and Storage Areas (AOC-4A/8A, 4B, 4C/8B)			
Task	**Phase**	**Low Estimate**	**High Estimate**
Collection and Disposal of Black Sandy Material In Warehouse #1	Labor and Materials	$36,450.00	$36,450.00
	Disposal of Vacuumed Debris	$4,050.00	$17,500.00
Drum and Debris Containment	Waste Classification	$2,500.00	$2,500.00
	Overpacking	$12,500.00	$12,500.00
	Liquid Disposal	$2,530.00	$2,530.00
	Total Estimate	$58,030.00	$71,480.00

4.2 Waste Pile/Discolored Areas/Disturbed Areas (AOC-6/AOC-8B/AOC-9A/AOC-9B/AOC-9C)

Cleanup alternatives evaluated for this AOC included no action, removal and off-site disposal, and stabilization/containment. Further details are discussed below.

4.2.1 No Action Alternative

Due to the potential for direct contact this alternative was not determined to be a valid option.

4.2.2 Removal and Off-Site Disposal

Initial estimates of the volume of material present are on the order of 9,000 cubic yards or approximately 13,500 tons. A description of costs to dispose of the pile is provided below.

Removal of the pile would be completed with two excavators loading triaxle dump trucks operating 10 hours per day. Time required to removal the pile using this method would be on the order of 24 days. Prevention of dust and aerosols would be required, as well as monitoring of trucks entering and exiting the facility to prevent residual contamination off-Site.

Removal and Off-Site Disposal Cost Estimate - Waste Pile/Discolored Areas/Disturbed Areas (AOC-6/AOC-8B/AOC-9A/AOC-9B/AOC-9C)			
Task	**Phase**	**Low Estimate**	**High Estimate**
Removal and Off-Site Disposal	Labor	$83,400.00	$83,400.00
	Waste Classification	$5,750.00	$5,750.00
	Equipment	$201,200.00	$201,200.00
	Clean Fill	$162,000.00	$162,000.00
	Disposal	$445,500.00	$3,375,000.00
	Total Estimate	$897,850.00	$3,897,380.00

Costs required to remove and dispose this material off site would be prohibitive based on these quantities. In addition, additional remedial investigation of the material needs to be conducted to determine what species of chromium are present in the waste pile, as well as to determine whether contaminant leaching into the underlying ground water represents a significant concern.

4.2.3 Stabilization/Containment

To aid in the prevention of impact to the underlying ground water, a temporary cap consisting of an impermeable geomembrane composed of polyvinyl chloride (PVC), polyethylene, polypropylene, or the like, will be placed on top of the pile. A sufficient amount of ballast material consisting of a 6" layer of stone, clean fill, or other suitable material will be placed on top of the membrane to keep it in place and provide

drainage. Hay bales and silt fence will be placed around the base of the pile to provide additional drainage and soil/sediment controls.

Costs associated with the proposed course of action are as follows:

Stabilization/Containment Cost Estimate - Waste Pile/Discolored Areas/Disturbed Areas (AOC-6/AOC-8B/AOC-9A/AOC-9B/AOC-9C)		
Task	**Phase**	**Estimate**
Stabilization/Containment	Labor	$9,540.00
	Geomembrane	$15,000.00
	Ballast/Fill	$12,000.00
	Hay Bales/Silt Fence	$1,500.00
	Total Estimate	$38,040.00

5.0 CONCLUSION

W&C conducted this ABCA for the Sapello Foundry property located 65 Broadway Street and Weatherby Road, Township of Maurice River, Cumberland County, New Jersey. This ABCA Report was prepared to support Maurice River Township's 2012 USEPA Brownfield Cleanup Grant Proposal for the Site.

This ABCA included an evaluation of three (3) cleanup alternatives for two (2) priority cleanup areas identified based on the findings of assessments and investigations conducted at the Site to date. The two (2) priority cleanup areas identified include Drum Staging and Storage Areas (AOC-4A/8A, 4B, 4C/8B), and Waste Pile/Discolored Areas/Disturbed Areas (AOC-6/AOC-8B/AOC-9A/AOC-9B/AOC-9C). The three (3) cleanup alternatives evaluated included no action, removal and off-site disposal, and stabilization/containment. The following bulleted items provide a summary of the cleanup alternatives evaluated.

- A no action alternative is not recommended for the priority cleanup areas as direct contact threats would remain if this alternative were implemented.

- While a removal and off-site disposal alternative would eliminate direct contact threats, the potential costs for this alternative prove to be prohibitive based on the potential funding available to remediate the Site (estimated costs of $980,000.00 to $3,970,000.00 vs. $200,000 potentially available funds).

- While considered an interim remedial measure, the stabilization/containment alternative will reduce the potential for direct contact threats at a reasonable cost considering the potential funding available to remediate the Site (estimated costs of $96,000.00 to $110,000.00 vs. $200,000.00 potentially available funds).

Based on the above, W&C recommends that the stabilization/containment alternative be implemented as an interim remedial measure for the waste pile until such time that funds are available to implement a removal and off-site disposal alternative. In addition, the black sandy material within Warehouse #1 should be collected and disposed off site and as many drums as available funds will allow should be removed and disposed off site. The balance of drums should be addressed via stabilization/containment until such time that funds are available to completely remove and dispose off site.