# *REVISED*

# REMEDIAL INVESTIGATION WORK PLAN

**Operable Unit No. 2 (OU-2)**

**Off-Site Areas**

**Former Columbia Cement Company, Inc. Facility**

**159 Hanse Avenue**
**Freeport, New York**



**SITE # 1-30-052**

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# 1.0 INTRODUCTION

This Remedial Investigation Workplan ("RIW") presents a proposed scope of work to further characterize conditions at Operable Unit No. 2 (OU-2) of the former Columbia Cement Company (CCC) site located at 159 Hanse Avenue in Freeport, New York ("Site"). URS Corporation (URS) has prepared this RIW on behalf of the Atlantic Richfield Company, a BP affiliate (BP) and in response to requests from the New York State Department of Environmental Conservation (NYSDEC) as partial fulfillment of requirements of the New York State Inactive Hazardous Waste Disposal Remedial (Superfund) Program.

## 1.1 BACKGROUND INFORMATION

CCC, which was owned by Burmah Castrol, produced adhesives for a variety of applications. In 1988, while CCC operated the facility, approximately 1,760 gallons of 1,1,1-trichloroethane (1,1,1-TCA) was released to an unlined storm drain during filling of an underground storage tank (UST) due to a failure of a contractor's tanker truck. The spill was reported and response measures were performed under regulatory oversight. In 1996, the property was sold to Illinois Tool Works (ITW). In 1998, Burmah Castrol entered into a Consent Agreement (Index WI #W2-02-0813-98-05) with the NYSDEC regarding the 1,1,1-TCA spill. In 2001, British Petroleum (BP) purchased all Burmah Castrol holdings and assumed liability for the 1,1,1-TCA spill.

Numerous phases of a Remedial Investigation were conducted by Delaware Engineering (1997 through 2003) and URS (2003 through 2006). In December 2006, URS submitted a Supplemental Remedial Investigation Report, summarizing all data obtained to date. In January 2007, URS submitted a Feasibility Study Report ("FSR") that evaluated remedial alternatives to address subsurface impacts. In the FSR, groundwater fate and transport modeling was performed to assess whether Monitored Natural Attenuation (MNA), in conjunction with source control measures, would prevent the groundwater contaminant plume from migrating to Freeport Creek, approximately 500 feet west of the Site. A Site Location Map is presented as Figure 1. The modeling, when calibrated to the existing groundwater monitoring data, suggested that the plume would not reach Freeport Creek. In its March 8, 2007 letter, NYSDEC provided comments on the FSR. One comment stated that all modeling should be validated with empirical data.

To validate the modeling results, BP installed two monitoring wells (MW-07-16S and MW-07-17D) downgradient from adjacent to Freeport Creek. Sampling results indicated that chloroethane was present in well MW-07-16S at a concentration exceeding the NYSDEC

Ambient Groundwater Quality Standard. Based on these results, NYSDEC divided the site into two Operable Units. Operable Unit No. 1 consists of the former Columbia Cement Company property located at 159 Hanse Avenue. Operable Unit No. 2 (OU-2) consists of the properties immediately adjacent to and downgradient (west) of OU-1. The OU-2 RIW presents a scope of work to evaluate subsurface impacts in OU-2 resulting from the 1988 1,1,1-TCA spill in OU-1.

## 1.2 SITE GEOLOGY /HYDROGEOLOGY

Soil borings advanced during investigation activities at OU-1 and OU-2 encountered five stratigraphic units beneath the site. In order of increasing depth, these units are: fill material; tidal marsh deposits; gravelly sand; gray clay and silt; and gray sand. Each of these units is discussed below.

- The fill material is encountered across the entire site and consists of reworked native soil and various debris related to previous Site use as a municipal landfill. The fill material ranges in thickness from 3.1 feet (ft) to 22.9 ft, with an average thickness of about 11 ft.

- The tidal marsh deposits are encountered beneath the fill material over most of the site, but are absent in some areas, including the UST/spill area. The tidal marsh deposits consist of brown, dark gray and black organic clayey silt with some fine to medium sand and varying amounts of roots, wood and peat. Where present, the tidal marsh material is encountered at an average depth of 9.5 ft and has an average thickness of 4 ft.

- The gravelly sand is a relatively thick and flat-lying unit encountered beneath the tidal marsh deposits, and beneath the fill material where the tidal marsh deposits are absent. The unit consists of medium dense, brown to light gray, coarse to fine sand, with little medium to fine subrounded gravel. Minor amounts of silt and clay were found in isolated samples. The gravelly sand thickness ranges from 15 to 30 ft and is thickest in the western portion of the site. The base of the gravelly sand is relatively flat and is encountered at about 35 ft below grade.

- The gray clay and silt underlies the gravelly sand. It consists of a medium gray clayey silt to silt and clay with little to trace sand and becomes clayier with depth. In the two borings on Site that penetrated the entire clay unit, the thickness ranged from 14 ft to 15.3 ft. The gray clay and silt unit likely acts as a lower confining unit beneath the site.

- An undifferentiated light gray fine sand underlies the gray clay and silt. It is described as a gray to light gray medium to fine sand with little silt. Based on literature review, this unit ranges in thickness from 20 to 30 ft beneath the Site.

The shallow water-bearing units beneath the Site are not utilized as a drinking water source. Deeper confined units include the Jameco, Magothy and Lloyd aquifers, which are used for drinking water in some areas of Long Island. Due to saltwater encroachment near the southern shore of Long Island, these units are not a source of drinking water near the Site. Groundwater beneath the site is classified as Class GA.

Shallow groundwater at the Site is encountered in the fill material at depths ranging from 5.5 to 8.0 feet below grade (ft bgs). In various areas of the site, the water table is encountered in the fill material, the tidal marsh deposits, or the gravelly sand. Due to this fact and extensive connectivity between these units, particularly where the tidal marsh unit is thin or absent, these units have been treated collectively as a single unconfined aquifer. Some shallow monitoring wells are screened across all three units. Deep monitoring wells screened at the base of the gravelly sand have nearly identical groundwater elevations as adjacent shallow wells. The shallow unconfined groundwater discharges to Freeport Creek. The gray clay and silt unit acts as a lower confining layer or aquitard, separating the water table aquifer from the underlying gray sand. The gray sand is a separate confined water-bearing unit.

Groundwater flows primarily to the west, however, due to the Site's location, groundwater levels exhibit tidal influences, as described below. As is typical in coastal areas, shallow groundwater at the site is influenced by two tidal cycles per day. During tidal monitoring, groundwater level changes of 1 ft or less were recorded on Site. The tidal range is greatest to the west, suggesting a greater hydraulic connection to Freeport Creek than to Stadium Park Canal. The timing and degree of tidal response between the shallow and deep wells suggests that in some areas of the Site, the tidal marsh unit may restrict flow between the fill material and the gravelly sand.

As part of the RI, Delaware Engineering performed tidal monitoring of Site monitoring wells. During high tide, flow was generally to the west with a very shallow hydraulic gradient of 0.00095 ft/ft. During low tide, a groundwater divide forms in the north-central portion of the site. Groundwater east of this divide flows to the east and groundwater west of the divide flows to the west. Based on this observation, the gradient in the spill area alternates from east to west with a very minimal gradient in both directions. This alternating flow direction should serve to minimize contaminant transport from the site. The mean tide flow direction is east to west, with a hydraulic gradient of 0.0002 ft/ft net flow to the west.

## 1.3 SITE CONCEPTUAL MODEL

As described in Section 1.1, a 1988 spill of 1,1,1-TCA resulted in soil and groundwater contamination on OU-1. Numerous rounds of investigation were performed from 1997 through 2007. Results of the investigations suggest that:

- Spill-related soil contamination is restricted to the area immediately around the spill and former USTs;
- Due to natural attenuation, 1,1,1-TCA appears to biodegrade fairly rapidly to 1,1-DCA, and then to chloroethane;
- At the downgradient OU-1 boundary, chloroethane is the only spill-related compound present at levels exceeding the GWCS (chlorobenzene is also present, but is not related to the 1,1,1-TCA spill);
- The groundwater chloroethane impacts are restricted to the gray sand water-bearing unit. The gray clay at approximately 35 to 38 feet below grade acts as a lower confining layer.

The anaerobic conditions present at the Site promote rapid biodegradation of 1,1,1-TCA and 1,1-DCA. However, studies have shown that the daughter product of 1,1-DCA, chloroethane, only degrades aerobically. Therefore, chloroethane migrating from OU-1 to OU-2 is not attenuated significantly by any natural process. To date, the only spill-related compound detected in OU-2 groundwater is chloroethane. No potable wells are located in the vicinity of OU-1 or OU-2 (Delaware Engineering, 2003). Freeport Creek, approximately 500 feet from the spill location, represents a potential groundwater discharge point and ecological receptor.

# 2.0 SCOPE OF WORK

## 2.1 OBJECTIVES

The objectives of the OU-2 RI are to assess environmental impacts from the 1988 1,1,1-TCA spill on human and ecological receptors located in areas off site and downgradient from OU-1. Specifically, the RI objectives are:

- Delineate the lateral and vertical extent of the groundwater chloroethane plume migrating from OU-1;
- Assess potential for natural attenuation of the chloroethane plume;
- Evaluate the affects of tidal fluctuations in Freeport Creek on contaminant transport;
- Assess impacts for the groundwater chloroethane plume on Freeport Creek surface water and sediment;
- Evaluate the vapor intrusion pathway in adjacent buildings and buildings overlying the chloroethane plume downgradient from the Site.

To accomplish these objectives, BP will conduct the scope of work described below.

## 2.2 GROUNDWATER SCREENING SAMPLING

Groundwater samples collected from well couplet MW-05-14S / MW-05-15D, located in Hanse Avenue, and from well couplet MW-07-16S / MW-07-17D, adjacent to Freeport Creek, suggest that a groundwater plume of chloroethane extends from OU-1 westward, toward Freeport Creek. However, the northern and southern extent of the chloroethane plume is not known. BP will collect groundwater screening samples from temporary monitoring points to access the width of the plume. Samples will be collected on the west side of Hanse Avenue, at approximately 50-foot intervals north and south of MW-05-14S and MW-05-15D. Samples will be collected from two points north of the MW-05-14S / MW-05-15D well couplet, and from three points south of the MW-05-14S / MW-05-15D well couplet. Groundwater screening samples will also be collected on the east side of Hanse Avenue, at approximately 50-foot intervals north and south of MW-97-1S and MW-98-9D. Samples will be collected from two points north of the MW-97-1S / MW-98-9D well couplet, and from two points south of the MW-05-14S / MW-05-15D well couplet. Proposed sample locations are shown on Figure 3. Sample locations are subject to

change based on accessibility and subsurface utilities. At each location, groundwater samples will be collected every five feet from 10 feet below grade (fbg) to 30 fbg.

At each location, the boring will be cleared using either a hand auger or an air knife to a depth of 5 feet. Borings will be advanced using direct push methods to a depth of 32 fbg with an expendable point. The drill rods will be pulled up two feet to expose a stainless steel retractable screen from 30 fbg to 32 fbg. Dedicated tubing will be inserted into the screen and attached to a peristaltic pump. Samples will be collected using low-flow methods. The sample point will be purged at 0.2 liters per minute (lpm) to 0.5 lpm. Field parameters, including temperature, pH, conductivity, dissolved oxygen and redox potential will also be measured. When the field parameters have stabilized, the sample will be collected through the sample tubing. Groundwater samples will be collected in laboratory-supplied pre-preserved glassware. for analysis for the contaminants of concern (COCs), which includes chloroethane, chlorobenzene, 1,1,1-trichloroethane, 1,1-dichloroethane and methylene chloride. After the sample is collected, the rods and retractable screen will be raised five feet to collect a sample from 25 to 27 feet below grade, and the sampling procedure described will be repeated. This procedure will be repeated every five feet to the 10 fbg to 12 fbg interval.

Groundwater samples will be analyzed for the contaminants of concern, which include the VOCs:

- Chloroethane (CA);
- Chlorobenzene;
- 1,1,1-Trichloroethane (TCA);
- 1,1-Dichloroethane (DCA); and
- Methylene chloride.

The COCs represent spill related compounds (TCA, DCA, CA) and other compounds detected in wells at the downgradient (western) boundary of OU-1 (chlorobenzene and methylene chloride).

Samples will be submitted under chain of custody documentation to a NYSDOH-certified laboratory and will be analyzed using CLP methods with ASP Category B deliverables.

## 2.3 MONITORING WELLS

### 2.3.1 MONITORING WELL INSTALLATION

To enable future monitoring of the offsite VOC plume, BP will install up to four additional off-site monitoring wells. Wells will be installed as shallow and deep well couplets, similar to MW-05-14S and MW-05-15D. The exact locations and depths of the wells will depend on the results of the groundwater screening sampling. If conditions allow, the wells will be installed near the outer (north and south) edges of the groundwater chloroethane plume. Prior to installation, BP will present the groundwater screening sampling results and proposed well locations to NYSDEC.

Each well location will be cleared using either a hand auger or an air knife to a depth of 5 feet. The wells will be advanced using 4 1/4 –inch hollow stem augers. Continuous split spoon samples will be collected from 5 feet below grade to the end of the boring. Soils will be screened with a calibrated photoionization detector (PID) and logged by a URS geologist. Soil cuttings will be contained in 55-gallon drums and stored in the former CCC building pending subsequent off-site disposal.

The wells will be constructed of 2-inch ID, Schedule 40 PVC screen and riser pipe with a threaded bottom cap. The screens will be 10 feet in length with No. 10 slot (0.010 inch). In each well a sand pack will be placed in the annular space from the bottom of the well to 1 foot above the top of the well screen. A bentonite seal will be placed above the sand pack. The seal will be at least 2 feet thick. A cement-bentonite grout will be placed from the top of the bentonite seal to approximately 3 feet below grade. Each well will be finished with a flush-mount steel cover set in concrete, and a water-tight locking cap.

### 2.3.2 WELL DEVELOPMENT

After installation, the wells will be developed to remove residual materials from the well, increase hydraulic conductivity around the well and reduce turbidity of samples. Wells will be developed using a submersible pump. In-situ parameters (pH, conductivity, dissolved oxygen, redox potential and turbidity) will be monitored during well development. Development will continue until in-situ parameters stabilize and the turbidity reaches 50 Nephelometric Turbidity Units (NTU) or less. If this goal can not be reached, well development will continue until a volume equal to at least 10 well volumes has been evacuated. Development water will be

contained in 55-gallon drums and stored in the former CCC building pending subsequent off-site disposal.

### 2.3.3 WELL SURVEYING

After installation, monitoring wells will be surveyed by a licensed land surveyor. The location and elevation of the wells will be surveyed for inclusion on Site maps. In addition, the location and elevation of a selected point on the Freeport Creek bulkhead near the new wells will be surveyed. This point will be utilized during tidal monitoring, as described below. Soil boring logs and monitoring well construction diagrams will be prepared from field observations.

## 2.4 TIDAL MONITORING

To evaluate effects of tidal fluctuations in Freeport Creek on groundwater levels and flow directions, BP will perform tidal monitoring. The tidal monitoring will include monitoring water levels in Freeport Creek and 8 monitoring wells in OU-1 and OU-2 over a 48-hour period. Measurements will be made in four well couplets:

- MW-97-1S and MW-98-9D
- MW-07-16S and MW-07-17D
- The two well couplets installed as described in Section 2.3.1.

Measurements will also be made at a surveyed point on the Freeport Creek bulkhead. The measurements will be made using electronic pressure transducers/data loggers secured in the wells and in Freeport Creek. The instruments will be secured in place and programmed to record water levels every 15 minutes for the 48-hour monitoring period. At the end of the tidal monitoring, the loggers will be removed from the wells and the data will be downloaded to a computer. If possible, the tidal monitoring will be scheduled so that it is not conducted within two days following a rain event.

The tidal monitoring data will be tabulated and hydrographs for each point will be prepared. Maps and cross-sections will be prepared showing groundwater elevations at high, low and mean tides. Also, hydraulic gradients at each of these points will be calculated.

## 2.5 GROUNDWATER SAMPLING

To assess current groundwater conditions at OU-2, groundwater samples will be collected from monitoring wells MW-97-1S, MW-98-9D, MW-05-14S, MW-15D, MW-07-16S and MW-07-17D, and any other wells installed as described in Section 2.3.1.

Prior to sampling, a synoptic round of water level measurements will be made. At each well, the steel cover and locking cap will be removed. The headspace in the casing will immediately be screened with a PID. The depth to water and total depth of the well will be sounded using an electronic interface probe.

Wells will be purged and sampled using low-flow methods (Puls and Barcelona, 1996). A Grundfos Rediflow® submersible pump with a flow controller and dedicated polyethylene tubing will be suspended in the well approximately 1 foot above the well bottom. Wells will be pumped at 0.2 to 0.5 liters per minute (lpm). Water will be pumped through a Horiba U22 water quality meter flow cell. The U22 contains probes that measure pH, specific conductance, temperature, turbidity, dissolved oxygen (DO) and oxidation-reduction potential (ORP). Measurements of these in-situ field parameters will be recorded every 3 to 5 minutes until they stabilize. A well will be considered stabilized when the in-situ parameters changed less than 10% over 3 consecutive readings. After, stabilization, the discharge will be disconnected from the flow cell and the sample will be collected from the discharge. Samples will be submitted under chain of custody documentation to a NYSDOH-certified laboratory and will be analyzed using CLP methods with ASP Category B deliverables. Samples will be analyzed for the volatile organic COCs listed in Section 2.2, dissolved gasses (methane, ethane and ethane), total iron, dissolved iron, alkalinity, chloride, sulfate and total organic carbon.

## 2.6 SURFACE WATER AND SEDIMENT SAMPLING

Surface water and sediment samples were collected in April 2000 at the stormwater outfall to Freeport, as well as upstream and downstream of the outfall. The sample results suggested that releases from the 1988 1,1,1-TCA spill through the storm sewer system to Freeport Creek did not result in significant impacts to creek surface water or sediment.

Groundwater sample results from monitoring wells MW-07-16S and MW-07-17D suggest that chloroethane has migrated from OU-1 in the direction of Freeport Creek. To evaluate whether the chloroethane has impacted Freeport Creek, BP will collect surface water and sediment

samples from Freeport Creek. Surface water and sediment samples will be collected from 3 locations:

- Directly west (downgradient) of OU-1, near wells MW-07-16S and MW-07-17D.
- Approximately 100 feet upstream well couplet MW-07-16S / MW-07-17D.
- Approximately 100 feet downstream well couplet MW-07-16S / MW-07-17D.

Sampling locations will be reviewed with NYSDEC and are subject to change based on access restrictions.

At each location, one surface water sample and one sediment sample will be collected from Freeport Creek. Sampling will be conducted within approximately one hour of low tide, to increase the likelihood of observing any impacts from groundwater contributions. At each location, the water column thickness in Freeport Creek will be measured using an electronic water level indicator. The location and elevation of each sampling location will be surveyed so that the groundwater-surface water relationship can be evaluated. Surface water samples will be collected first, since sediment sampling may result in increased suspended solids in the water column. Surface water samples will be collected from the mid-point of the water column using a horizontal discrete sampler. Surface water samples will be transferred to laboratory-supplied pre-preserved glassware for analysis for volatile organic COCs listed in Section 2.2.

Following surface water sampling, sediment samples will be collected at each location. Sediment samples will be collected from the upper six inches of Freeport Creek sediment using a stainless steel sediment sampler. Sediment samples will be be transferred to laboratory-supplied pre-preserved glassware for analysis for chloroethane and TOC. Samples will be submitted under chain of custody documentation to a NYSDOH-certified laboratory and will be analyzed using CLP methods with ASP Category B deliverables.

## 2.7 VAPOR INTRUSION SAMPLING

After the well installation and sampling described in Sections 2.3 and 2.5 are completed, BP will plot the results and evaluate the extent of the chloroethane plume in OU-2. BP will identify OU-2 buildings overlying the chloroethane plume. BP will present groundwater sampling results to NYSDEC and NYSDOH for review. If sampling results indicate that vapor intrusion sampling is warranted, BP will present a workplan to NYSDEC and NYSDOH to assess the vapor intrusion pathway in buildings overlying the chloroethane plume. A description of the sampling program,

including the sample locations and number of samples, will be presented in the workplan. A desription of the sampling procedures is presented below:

To obtain the samples when the potential for vapor intrusion is greatest, sampling will be conducted during the heating season (November 1 through March 31). Sampling will be conducted during Sub-slab vapor samples will be collected by drilling a ½-inch diameter through the slab using an electric hammer drill. A six-inch long stainless steel sampling screen will be inserted into the sub-slab aggregate. The screen will be attached to Teflon tubing. Samples will be obtained using laboratory supplied pre-cleaned 6-liter SUMMA ® canisters with flow controllers set to collect the samples over a 24-hour period. To evaluate the potential for "short circuit" of ambient air into soil vapor samples, a small polyethylene bucket, equipped with purge and vent ports as well as a grommet equipped with a ¼-inch diameter hole for the sampling tube will be placed upside down over the hole, with the sampling tube passing through the bottom of the bucket. A foam rubber gasket will be will be placed around the bucket edge, which will act as a seal between the bucket and the slab surface around the sampling point. The purge and vent ports on the bucket will be opened and helium will be introduced into the bucket space until 90 to 100 percent concentration is measured at the vent port. Both ports will then be closed.

The sampling line will be purged at 200 cc/min and checked for helium intrusion and, if, 10 percent helium or less is measured, sampling for sub-slab vapors will be initiated. The soil vapor sampling line will be attached to the SUMMA Canister after the pre-sampling vacuum has been recorded and the valve will be opened to begin sample collection. During the sampling period, the sampling line will be monitored periodically for the presence of helium by means of a tee port on the sampling line. Sampling will be interrupted and corrective action will be taken should helium be present at a concentration of greater than 10 percent. During the sampling period, the vacuum reading will be monitored.

An indoor air sample will be collected concurrently with each sub-slab sample. A 6-liter SUMMA canister will be placed at breathing level (3 to 5 feet above the floor). Sub-slab vapor and indoor air samples will be analyzed for the same set of VOCs that the sub-slab and indoor air samples at OU-1 were analyzed for. After the completion of sampling, the SUMMA canisters will be submitted under chain of custody documentation to a NYSDOH-certified laboratory and will be analyzed using CLP methods with ASP Category B deliverables. Samples will be analyzed for the volatile organic COCs listed above.

## 2.8 INVESTIGATION-DERIVED WASTE

During the OU-2 Remedial Investigation, waste materials will be generated. This investigation-derived waste (IDW) will include the following:

- Soil generated from drilling activities (drill cuttings);
- Groundwater from the development and purging of temporary groundwater sampling points and monitoring wells;
- Decontamination fluids (water and detergents used to clean drilling/field equipment) and solids that may settle out of these fluids;
- Personnel protection equipment (PPE) and associated debris produced during field activities.

These materials will be managed as described below:

### 2.8.1 SOIL

Soil Cuttings generated during the drilling program monitoring well installation will be contained in 55-gallon drums and staged in the former Columbia Cement Company building. Pending review of laboratory data, the soil will be disposed of properly.

### 2.8.2 GROUNDWATER

Groundwater generated from purging of groundwater screening points and existing monitoring wells and development of newly installed monitoring wells will be contained in 55-gallon drums and staged in the former Columbia Cement Company building. Pending review of laboratory data, the water will be transported off-site for treatment and/or disposal at a permitted facility.

### 2.8.3 DECONTAMINATION FLUIDS

Decontamination fluids will be contained in 55-gallon drums and staged in the former Columbia Cement Company building. Pending review of laboratory data, the water will be transported off-site for treatment and/or disposal at a permitted facility.

### 2.8.4 PPE AND ASSOCIATED DEBRIS

Used PPE and other associated debris (e.g., disposable sampling equipment) will be containerized and stored temporarily on-site. These materials will be characterized at the conclusion of field activities, and transported off-site for disposal at an appropriate facility.

## 2.9 HEALTH AND SAFETY

### 2.9.1 WORKER HEALTH AND SAFETY

All field activities will be conducted under an approved site-specific Health and Safety Plan (HASP). The HASP will document procedures to be followed during field activities, including use of PPE, traffic control, emergency response, and air monitoring. The project HASP is presented as Appendix A.

### 2.9.2 COMMUNITY HEALTH AND SAFETY

Drilling activities in OU-2 present the potential for community exposure to COCs. To prevent community exposures, all field work will be conducted in accordance with a NYSDOH approved Community Air Monitoring Plan (CAMP). During all ground-intrusive activities (drilling), the CAMP requires continuous monitoring for particulates and VOCs at the downwind perimeter of the work area. If any action levels are exceeded at the perimeter of the work area, the work will be stopped and corrective measures employed. The site-specific CAMP is presented as Appendix B.

## 2.10 DATA EVALUATION AND REPORTING

Upon receipt of laboratory data, BP will prepare a Remedial Investigation Report for OU-2. The RIR will include the following:

- Site maps include all sampling locations;
- Boring logs and monitoring well construction diagrams will be included;
- Hydrographs from the tidal monitoring;
- Water level elevation contour maps for the high tide, low tide and mean tide from the tidal monitoring;
- A discussion of the tidal monitoring results with respect to hydraulic gradients and flow

toward Freeport Creek;

- Maps and tables presenting groundwater, surface water, sediment and vapor intrusion data.
- A discussion of the extent of the chloroethane plume;
- A discussion of the groundwater geochemistry with respect to natural attenuation of the chloroethane plume;
- A discussion of the potential affects of OU-1 remedial measures on observed OU-2 impacts.

## 3.0 REFERENCES

Puls, R.W., and Barcelona, M.J., 1996, *Low-flow (minimal drawdown) Ground-water Sampling Procedures:* EPA/540/S-95/504.

# Tables

TABLE 1
SUMMARY OF SAMPLING PLAN
REMEDIAL INVESTIGATION
OPERABLE UNIT NO. 2
FORMER COLUMBIA CEMENT COMPANY SITE
FREEPORT, NEW YORK

GROUNDWATER SCREENING SAMPLES

| SAMPLE LOCATION | SAMPLE ID | SAMPLE MATRIX | SAMPLE DEPTH (ft below grade) | SAMPLE METHOD | ANALYTICAL PARAMETERS |
|---|---|---|---|---|---|
| GW-01 | GW-01A | Groundwater | 10 - 12 | Hydropunch | COCs [1] |
| | GW-01B | Groundwater | 15 - 17 | Hydropunch | COCs |
| | GW-01C | Groundwater | 20 - 22 | Hydropunch | COCs |
| | GW-01D | Groundwater | 25 - 27 | Hydropunch | COCs |
| | GW-01E | Groundwater | 30 - 32 | Hydropunch | COCs |
| GW-02 | GW-02A | Groundwater | 10 - 12 | Hydropunch | COCs |
| | GW-02B | Groundwater | 15 - 17 | Hydropunch | COCs |
| | GW-02C | Groundwater | 20 - 22 | Hydropunch | COCs |
| | GW-02D | Groundwater | 25 - 27 | Hydropunch | COCs |
| | GW-02E | Groundwater | 30 - 32 | Hydropunch | COCs |
| GW-03 | GW-03A | Groundwater | 10 - 12 | Hydropunch | COCs |
| | GW-03B | Groundwater | 15 - 17 | Hydropunch | COCs |
| | GW-03C | Groundwater | 20 - 22 | Hydropunch | COCs |
| | GW-03D | Groundwater | 25 - 27 | Hydropunch | COCs |
| | GW-03E | Groundwater | 30 - 32 | Hydropunch | COCs |
| GW-04 | GW-04A | Groundwater | 10 - 12 | Hydropunch | COCs |
| | GW-04B | Groundwater | 15 - 17 | Hydropunch | COCs |
| | GW-04C | Groundwater | 20 - 22 | Hydropunch | COCs |
| | GW-04D | Groundwater | 25 - 27 | Hydropunch | COCs |
| | GW-04E | Groundwater | 30 - 32 | Hydropunch | COCs |
| GW-05 | GW-05A | Groundwater | 10 - 12 | Hydropunch | COCs |
| | GW-05B | Groundwater | 15 - 17 | Hydropunch | COCs |
| | GW-05C | Groundwater | 20 - 22 | Hydropunch | COCs |
| | GW-05D | Groundwater | 25 - 27 | Hydropunch | COCs |
| | GW-05E | Groundwater | 30 - 32 | Hydropunch | COCs |
| GW-06 | GW-06A | Groundwater | 10 - 12 | Hydropunch | COCs |
| | GW-06B | Groundwater | 15 - 17 | Hydropunch | COCs |
| | GW-06C | Groundwater | 20 - 22 | Hydropunch | COCs |
| | GW-06D | Groundwater | 25 - 27 | Hydropunch | COCs |
| | GW-06E | Groundwater | 30 - 32 | Hydropunch | COCs |

TABLE 1
SUMMARY OF SAMPLING PLAN
REMEDIAL INVESTIGATION
OPERABLE UNIT NO. 2
FORMER COLUMBIA CEMENT COMPANY SITE
FREEPORT, NEW YORK

| GROUNDWATER SCREENING SAMPLES (cont.) | | | | | |
|---|---|---|---|---|---|
| SAMPLE LOCATION | SAMPLE ID | SAMPLE MATRIX | SAMPLE DEPTH (ft below grade) | SAMPLE METHOD | ANALYTICAL PARAMETERS |
| GW-07 | GW-07A | Groundwater | 10 - 12 | Hydropunch | COCs |
| | GW-07B | Groundwater | 15 - 17 | Hydropunch | COCs |
| | GW-07C | Groundwater | 20 - 22 | Hydropunch | COCs |
| | GW-07D | Groundwater | 25 - 27 | Hydropunch | COCs |
| | GW-07E | Groundwater | 30 - 32 | Hydropunch | COCs |
| GW-08 | GW-08A | Groundwater | 10 - 12 | Hydropunch | COCs |
| | GW-08B | Groundwater | 15 - 17 | Hydropunch | COCs |
| | GW-08C | Groundwater | 20 - 22 | Hydropunch | COCs |
| | GW-08D | Groundwater | 25 - 27 | Hydropunch | COCs |
| | GW-08E | Groundwater | 30 - 32 | Hydropunch | COCs |
| GW-09 | GW-09A | Groundwater | 10 - 12 | Hydropunch | COCs |
| | GW-09B | Groundwater | 15 - 17 | Hydropunch | COCs |
| | GW-09C | Groundwater | 20 - 22 | Hydropunch | COCs |
| | GW-09D | Groundwater | 25 - 27 | Hydropunch | COCs |
| | GW-09E | Groundwater | 30 - 32 | Hydropunch | COCs |

| MONITORING WELL GROUNDWATER SAMPLES | | | | | |
|---|---|---|---|---|---|
| SAMPLE LOCATION | SAMPLE ID | SAMPLE MATRIX | SAMPLE DEPTH (ft below grade) | SAMPLE METHOD | ANALYTICAL PARAMETERS |
| MW-08-18S | MW-08-18S | Groundwater | 15 to 25[4] | Low-Flow | COCs, Bio Parameters[2], Field Parameters[3] |
| MW-08-19D | MW-08-19D | Groundwater | 27 to 37[4] | Low-Flow | COCs, Bio Parameters, Field Parameters |
| MW-08-20S | MW-08-20S | Groundwater | 15 to 25[4] | Low-Flow | COCs, Bio Parameters, Field Parameters |
| MW-08-21S | MW-08-21S | Groundwater | 27 to 37[4] | Low-Flow | COCs, Bio Parameters, Field Parameters |
| MW-97-1S | MW-97-1S | Groundwater | 14 to 24 | Low-Flow | COCs, Bio Parameters, Field Parameters |
| MW-98-9D | MW-98-9D | Groundwater | 27 to 37 | Low-Flow | COCs, Bio Parameters, Field Parameters |
| MW-05-14S | MW-05-14S | Groundwater | 15 to 25 | Low-Flow | COCs, Bio Parameters, Field Parameters |
| MW-05-15D | MW-05-15D | Groundwater | 28 to 38 | Low-Flow | COCs, Bio Parameters, Field Parameters |
| MW-07-16S | MW-07-16S | Groundwater | 15 to 25 | Low-Flow | COCs, Bio Parameters, Field Parameters |
| MW-07-17D | MW-07-17D | Groundwater | 27 to 37 | Low-Flow | COCs, Bio Parameters, Field Parameters |

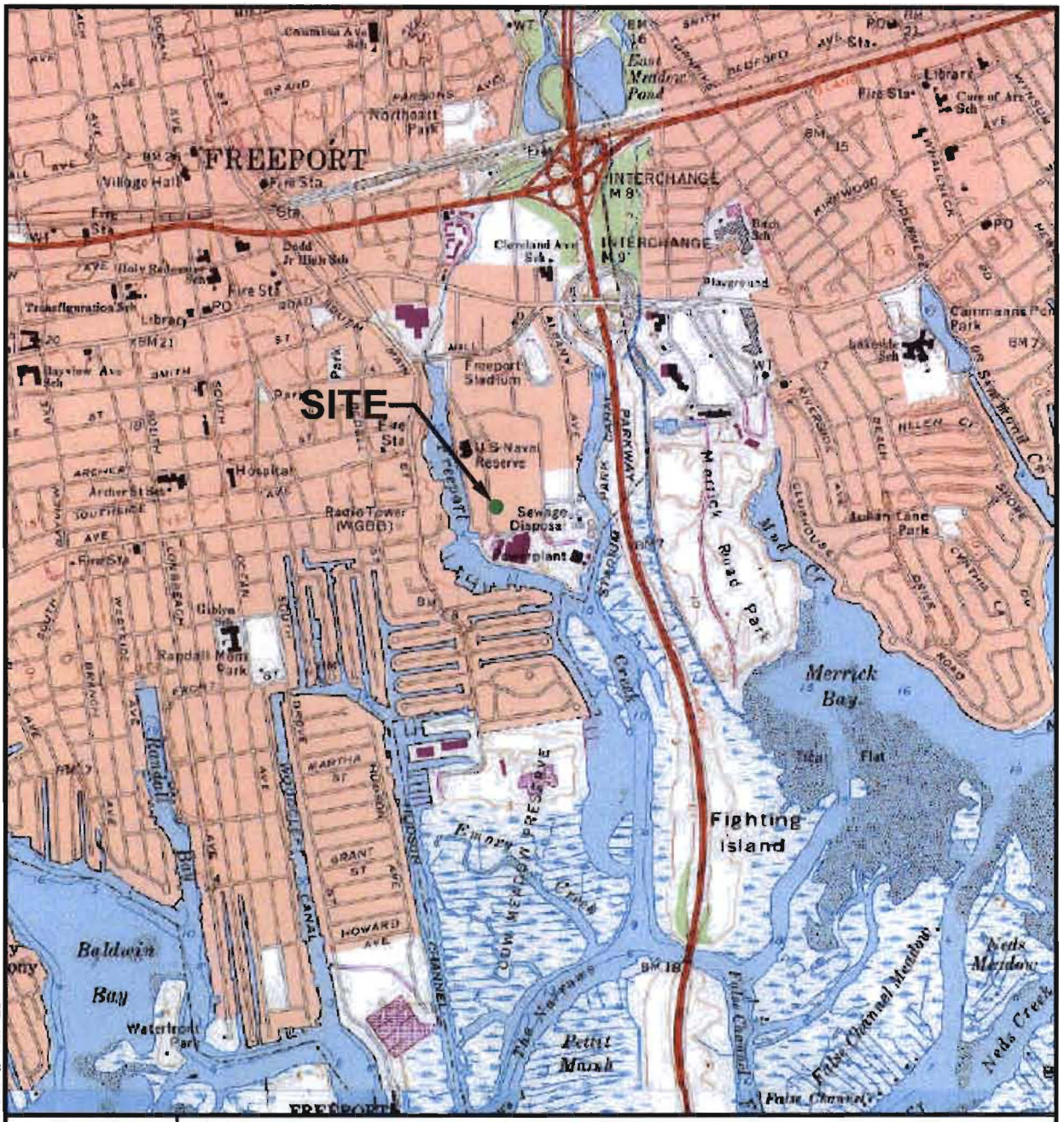
TABLE 1
SUMMARY OF SAMPLING PLAN
REMEDIAL INVESTIGATION
OPERABLE UNIT NO. 2
FORMER COLUMBIA CEMENT COMPANY SITE
FREEPORT, NEW YORK

| SURFACE WATER SAMPLES | | | | | |
|---|---|---|---|---|---|
| SAMPLE LOCATION | SAMPLE ID | SAMPLE MATRIX | SAMPLE DEPTH (ft below creek surface) | SAMPLE METHOD | ANALYTICAL PARAMETERS |
| SW-1 | SW-1 | Surface Water | Dependant on water depth[5] | Horizontal Discrete Sampler | COCs |
| SW-1 | SW-1 | Surface Water | Dependant on water depth[5] | Horizontal Discrete Sampler | COCs |
| SW-1 | SW-1 | Surface Water | Dependant on water depth[5] | Horizontal Discrete Sampler | COCs |

| SEDIMENT SAMPLES | | | | | |
|---|---|---|---|---|---|
| SAMPLE LOCATION | SAMPLE ID | SAMPLE MATRIX | SAMPLE DEPTH (ft below creek bottom) | SAMPLE METHOD | ANALYTICAL PARAMETERS |
| SED-1 | SED-1 | Sediment | 0 - 0.5 | Sediment Sampler | COCs |
| SED-2 | SED-2 | Sediment | 0 - 0.5 | Sediment Sampler | COCs |
| SED-3 | SED-3 | Sediment | 0 - 0.5 | Sediment Sampler | COCs |

1 : COCs include chloroethane, chlorobenzene, 1,1,1-TCA, 1,1-TCA and methylene chloride.
2 : Field Paramameters include temperature, pH, conductivity, dissolved oxygen and redox potential
3 : Bio Parameters include dissolved gasses (methane, ethane, ethene), total organic carbon, total, iron, dissolved iron, chloride and alkalinity.
4 : Anticipated depth based on obeservation at other locations.
5 : Sample will be collected from midpoint of water column.

# Figures




**FORMER COLUMBIA CEMENT COMPANY, INC.**

**159 HANSE AVENUE**
**FREEPORT, NEW YORK**

# SITE LOCATION MAP

**REFERENCE:**
**U.S.G.S. 7.5 MINUTE QUADRANGLE:**
**FREEPORT, N.Y., 1994**

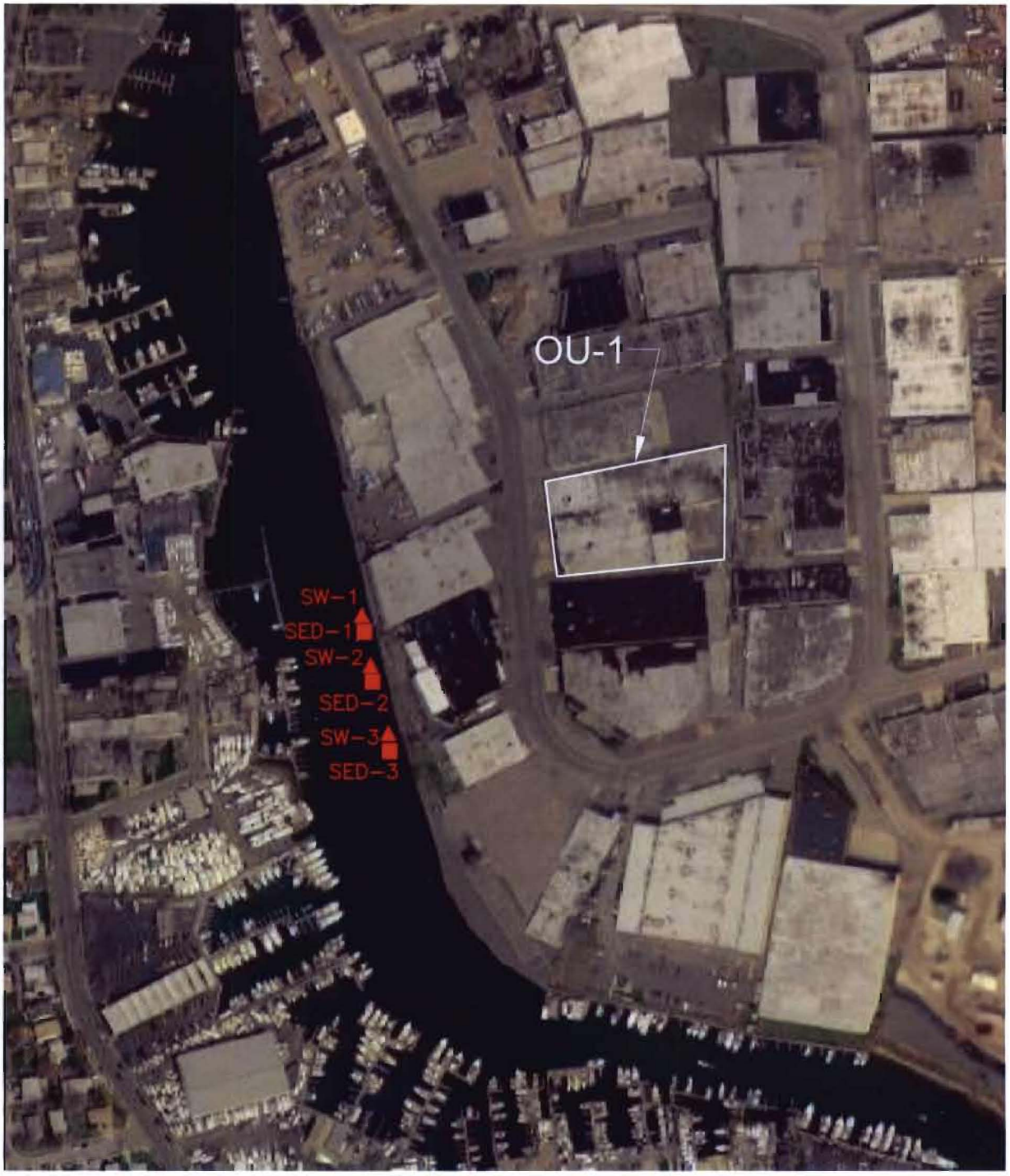
URS
12 COMMERCE DRIVE
CRANFORD, NJ, 07016
PHONE: (908) 272-8300
FAX: (908) 272-3940

DATE: 11/08/03
JOB: 18564-060-175

**FIGURE 1**

S:\18564\060\PLOT\060-001.dwg 04/05/2004 11:31:12 AM EDT

For Figures 2 & 3, see Project Manager.




## LEGEND

SW-1 ▲ SURFACE WATER SAMPLE LOCATION

SED-1 ■ SEDIMENT SAMPLE LOCATION

0 150 300 600

SCALE (FEET)

PROPOSED SEDIMENT AND SURFACE SAMPLING LOCATIONS–OPERABLE UNIT No. 2

FORMER COLUMBIA CEMENT COMPANY, INC. FREEPORT, NEW YORK

URS
WAYNE, NEW JERSEY

| | | | | | |
|---|---|---|---|---|---|
| DR. BY | ET | SCALE | AS SHOWN | DWG. NO. 30272002 | PROJ. NO. 11130272 |
| CK'D. BY | MB | DATE | OCTOBER 23, 2008 | FIG. NO. | 4 |

K:\Cadd\Columbia Cement\11130272(Columbia Cement)\UNIT No2(2008)\30272002.dwg, 10/23/2008 12:07:19 PM

# APPENDIX A

# HEALTH AND SAFETY PLAN

# SITE-SPECIFIC HEALTH AND SAFETY PLAN

# FORMER COLUMBIA CEMENT COMPANY, INC. FACILITY
# 159 HANSE AVENUE
# FREEPORT, NEW YORK

## SITE # 1-30-052

## URS PROJECT NO. 11130272

*Prepared for*

Atlantic Richfield Company (ARCO)
a BP affiliated company

August 2008

URS Corporation
201 Willowbrook Boulevard
Wayne, New Jersey 07470

# Table of Contents HASP A

# For Use On
# The Former Columbia Cement Company Site

Foreword: This Project Health and Safety Plan is a summary of specific site hazards and supporting documentation required for field events.

*Disclaimer:*

*This Health and Safety Plan, and each of its provisions, is applicable only to, and for use only by, URS Corporation, its affiliates, and its subcontractors. Any use of this Plan by other parties, including, without limitation, third party contractors on projects where URS is providing engineering, construction management or similar services, without the express written permission of URS, will be at that party's sole risk, and URS Corporation shall have no responsibility therefore. The existence and use of this Plan by URS shall not be deemed an admission or evidence of any acceptance of any safety responsibility by URS for other parties unless such responsibility is expressly assumed in writing by URS in a specific project contract.*

*Please contact your Health and Safety Representative or Regional Health and Safety Manager if you have any questions.*

**THIS HASP IS TO BE USED FOR THE SPECIFIC PROJECT DESCRIBED HEREIN. IT IS NOT TO BE USED FOR ANY OTHER PROJECT, NOR IS IT TO BE USED FOR PROJECTS IN WHICH SIGNIFICANT CONTAMINANT REMOVAL IS REQUIRED.**

## 2.1 Identifications

| | |
|---|---|
| **Project Number:** | 38546433 |
| **Plan Preparer:** | Angela Ledgerwood |
| **BP Environmental Business Manager (EBM):** | Kevin Endriss |
| **BP Regional HSE Manager (RHM):** | Dan Hardisty |
| **Project Manager (PM):** | Mark Becker |
| **Site Safety Officer(s) (SSO):** | Angela Ledgerwood |
| **Preparation Date:** | June 20, 2008 |
| **Expiration Date:** | June 20, 2009 |

## 2.2 HASP Critical Tasks Summary

| | | | PRE-APPROVAL | | | |
|---|---|---|---|---|---|---|
| **DESCRIPTION** | **LOCATION** | **FREQUENCY** | **EBM** | **RHM** | **PM** | **SSO** |
| Scope of Work | Section 4 | Inception | no | YES | YES | no |
| Emergency Response Notification | Section 6.3 | Inception | no | YES | YES | no |
| Chemical Hazards | Table 4-1 | Inception | no | YES | YES | no |
| Hazard Communication (MSDSs) | Appendix H | Inception | no | YES | YES | no |
| Health and Safety Equipment | Section 5.2 | Inception | no | YES | YES | no |
| Monitoring Equipment | Section 5.2 | Inception | no | YES | YES | no |
| Action Levels | Table 4-2 | Inception | no | YES | YES | no |
| Medical Emergency / Contingency Information | Emergency Contact Info | Inception | no | YES | YES | YES |
| Hospital Directions | Emergency Contact Info | Inception | no | YES | YES | YES |
| Hospital/Occupational Clinic Map | Emergency Contact Info | Inception | no | no | YES | YES |
| Site Map | Emergency Contact Info | Inception | no | no | YES | YES |

| | | | PRE-APPROVAL | | | |
|---|---|---|---|---|---|---|
| DESCRIPTION | LOCATION | FREQUENCY | EBM | RHM | PM | SSO |
| **Emergency Response Plan** | Section 6.1 | Inception | no | YES | YES | YES |
| URS Safety Management Checklist | Section 5.5 | Inception | no | YES | YES | YES |
| Project/Job Safety Analysis | Appendix A | Inception | no | YES | YES | YES |
| Remediation Management – Authorization to Work Form | Appendix B | **Daily** | no | no | no | no |
| Air Monitoring Log | Appendix D | **Daily** | no | no | no | no |
| RM Marketing Pre-Drilling / Subsurface Checklist | Appendix D if applicable | Inception | YES | no | YES | YES |
| Remediation Management – Permits to Work | Appendix E if applicable | Event | YES | no | YES | YES |
| Pre-Work Plan | Included in Scope of Work, Section 4 | Event | Yes | Yes | Yes | Yes |
| Post Field Work Safety Evaluation | Project Manager | Conclusion | no | no | YES | YES |
| URS Safety Management Standards (SMSs) | Appendix I | Inception | no | YES | YES | no |
| Decontamination Procedures | Section 5.3 | Inception | no | no | no | no |

## 2.3 HASP Approvals

ALL SIGNATURES REQUESTED IN THIS SECTION MUST BE PRESENT PRIOR TO BEGINNING FIELDWORK.

**Regional Health, Safety and Environment Manager Approval:**

Signature Date

**Project Manager Approval:**

Signature Date

**Site Safety Officer Approval:**

Signature Date

Signature Date

Signature Date

Signature Date

## 2.4 HASP Acknowledgement / Compliance Acceptance

I have reviewed the URS Project HASP. I am familiar with the contents of the HASP and understand the URS and BP safety protocols for this site.

| Name | Affiliation | Signature | Date |
|---|---|---|---|
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## 2.5 Kick-off Meeting Content

A kick-off meeting shall occur at the beginning of every work day or after an agreed change in the scope of work. Everyone having business, activities or interest in the project shall attend. At a minimum the following items should be discussed:

- Introductions of all persons present and identification of their roles and responsibilities, verification of API Safety Keys, Safety Moment, all participants will sign the authorization to work (ATW) form;
- Control of work/authorization to work process, including necessary permits;
- Job Safety Analyses for the tasks, MSDS review;
- Management of Change, conditions that may have changed overnight or since the last time the task was performed at the site and remembering to continually "Take 5" as appropriate (eg. After lunch break, weather change events, new staff on site, etc.);
- Appropriate PPE;
- Golden Rules of Safety;
- Discussion of the emergency response plan including the clinic/hospital routes, proper incident management, and evacuation plan;
- HSSE policy issues, including driving safety, Core Values Statement, Weapons Free Workplace;
- Specific issues relating to the site and location, (e.g. heat stress, biological hazards, coordination of multiple activities);
- Confirmation of everyone understands that all persons could stop work if an unsafe or questionable condition was noted and examples of relevant stop work triggers; and
- The importance of positive safety observations, near miss reporting, and incident reporting.

At the conclusion of the Tailgate/Kick-Off Safety Meeting, all parties will sign the ATW form.

## 3.1 Project Description

| | |
|---|---|
| **Project Name:** | *Former Columbia Cement Company (CCC)* |
| **Field Dates:** | *July 2008 through December 31, 2009* |
| **Site Address:** | *159 Hanse Avenue in Freeport, New York* |

Activities covered under this Health & Safety Plan (HSP) include water sample collection, soil vapor sampling, soil sampling, the installation of a sub-slab vapor collection system, injection of various *in-situ* chemical oxidation reagents, and other activities. This plan has been developed for URS personnel, but is also intended for subcontractor and/or client use.

URS personnel on this project must meet the training requirements of 29 CFR 1910.120(e) and be participating in a medical surveillance program as per 29 CFR 1910.120(f). Eating, drinking and smoking will only be allowed in designated areas of the site.

This plan is valid only for the specific project identified in the following project description. The Project Manager and Site Safety Officer are responsible for implementation of this plan that includes the site safety briefing. Field activities are limited to providing general oversight in accordance with the workplan, and obtaining soil and/or groundwater samples for laboratory analysis. URS Safety Management Standards (SMSs) referenced herein are included as Appendix I.

## 3.2 Site Map

A recent copy of a site map is located in the **Emergency Contact Information**.

## 3.3 Site History/ Special Hazards

CCC, which was owned by Burmah Castrol, produced adhesives for a variety of applications. In 1988, while CCC operated the facility, approximately 1,760 gallons of 1,1,1-trichloroethane (1,1,1-TCA) was released to a storm drain during filling of an underground storage tank (UST) due to a failure of a contractor's tanker truck. The soil and groundwater at the site are presently impacted with 1,1,1-TCA and breakdown products, including 1,1-dichloroethane and chloroethane. Tetrachloroethene, trichloroethene, cis-1,2-dichloroethene and vinyl chloride also have been detected on site. The on-site facility is currently inactive and vacant.

Freeport Creek is located 500 feet west of the site and Stadium Park Canal is 1,000 feet east of the site. Stadium Park Canal merges with Freeport Creek approximately 1,500 feet southeast of the site. From this point, surface water flows south through tidal marshes to the Atlantic Ocean, approximately 5 miles south of the site.

## 3.4 Responsible Personnel

| | | |
|---|---|---|
| BP EBM | Kevin Endriss | 410-825-7853 (office)<br>410-790-6016 (cell) |
| Project Manager | Mark Becker | 973-812-6835 (office)<br>908-347-7234 (cell) |
| Site Manager | Mark Becker | 973-812-6835 (office)<br>908-347-7234 (cell) |
| Site Safety Officer | Angela Ledgerwood | (office) 212-609-6061<br>(cell) 415-246-1787 |

## 3.5 Training Requirements

Field personnel must be enrolled and current in a medical monitoring program. Additionally, the field personnel must be current in Hazardous Waste Course Training in accordance with OSHA 29 CFR 1910.120(e)(8). Medical monitoring and training certificates are on file.

Field personnel and all subcontractors must be current with the API WorkSafe training and carry a valid API Safety Key while working at the site.

All field staff will be trained in RM Authorization to Work, Permit to Work, and Hazard Recognition.

## 4.1 Groundwater Gauging and Sampling

URS will collect groundwater samples from monitoring wells located both on-site and off-site. URS will the monitor well headspace and the breathing zone with a calibrated photo-ionization meter. URS will gauge the wells with a water level indicator. URS will collect the sample in laboratory-supplied glassware, then seal the well.

Initially, the depth to water and the total depth of the well are to be observed using an electronic water level indicator. Data collected during well purging will be recorded on a well sampling form. Each well will be purged using a submersible pump. Wells will be purged and sampled using low-flow techniques.

Between sampling each monitoring well, flow through cells and instruments will be decontaminated using Alconox and distilled water rinse, with a final rinse of distilled water. If this process does not fully decontaminate, hexane may be used as an intermediate rinse, followed by thorough distilled water rinse.

## 4.2 Baseline Sampling

URS will direct contractors to advance three direct-push soil borings to approximately 24 feet below grade. Continuous soil samples will be collected from 12 feet to 24 feet. URS will collect one grab groundwater sample from each boring using Hydropunch methods. After completion of sampling, URS will direct the contractor to backfill the borings with grout and finish the top of each boring with a concrete patch.

## 4.3 Radius of Influence Testing

URS will conduct radius of influence (ROI) testing at four locations in the site building. Each ROI test will consist of drilling six holes in the building slab. One hole will be used to extract sub-slab vapors using a portable shop vacuum. Pressure gages will be inserted into the other five holes to monitor the pressure created by the vacuum. The extracted vapors will be piped through flexible hose to the building exterior. At the completion of the testing, the holes will be sealed with concrete patch.

## 4.4 EHC-O Injections

URS will direct contractors to advance three direct-push soil borings to a depth of approximately 36 feet. In each boring, the contractor will inject EHC-O, a controlled oxygen release compound, in a slurry preparation. The contractor will mix the slurry in accordance with the manufacturer's instructions. The slurry will be injected at 2-foot intervals in a bottom-up fashion from approximately 36 feet to 10 feet below grade. After completion of injections, URS will direct the contractor to backfill the borings with grout and finish the top of each boring with a concrete patch.

## 4.5 ISCO Injection

URS will direct contractors to advance three direct-push soil borings to a depth of approximately 22 feet. In each boring, the contractor will inject a mixture of sodium persulfate and hydrogen

peroxide. Because of varying contaminant levels, the mixture will vary with depth. The contractor will combine sodium persulfate, hydrogen peroxide and water in desired mixtures in accordance with the manufacturer's directions. After completion of injections, URS will direct the contractor to backfill the borings with grout and finish the top of each boring with a concrete patch.

## 4.6 Investigation Derived Waste

The used sample tubing and acetate core liners will be collected in a trash bag along with PPE used on site for waste disposal.

Additionally, purge water/product and any decontamination fluids will be contained onsite in a 55-gallon steel drum. The drum will be staged onsite until a timely proper disposal of the purge water can be arranged.

## 4.7 Physical Hazards

Physical hazards are inherently present during site soil boring, remediation and groundwater monitoring well installation activities. Common physical hazards include electrical shock, flying particulates, objects striking head, and inhalation and contact of organic vapors, mechanical hazards; noise exposure associated with the operation of heavy equipment; slip-trip-fall hazards associated with the field environment; hazards associated with weather conditions; musculoskeletal injury resulting from lifting tasks; nuisance dust associated with drilling; and explosion hazards from underground pipes or lines that may be encountered during the drill process.

Drilling equipment will be operated, inspected, and maintained according to manufacturers' operating manuals. URS will subcontract the drilling and installation of all wells at this site. URS field personnel will be present during these activities to supervise and monitor the health and safety of field personnel. Prior to the start of any drilling activities, a survey of the site will be completed. This survey will include all overhead hazards and any underground utilities or hazards. The survey results and maps will be used to determine any previously unknown hazards; this information will be discussed in the Tailgate Meeting and will determine the location of extraction and injection wells.

The typical physical hazards anticipated being present on the site and the methods for preventing injury due to these hazards are described below.

### 4.7.1 Drilling Operation

Operation of drilling equipment presents potential physical hazards to personnel. All personnel working the vicinity of drilling equipment will follow the safety guidelines outlined in **URS SMS 056**, Drilling Operations, as provided in Appendix I.

The following precautions must be observed whenever heavy equipment is in use:

- Personal protective equipment (PPE) such as steel-toed shoes, safety glasses or goggles, hard hats, and protective gloves must be worn whenever such equipment is present.
- The Long Island One Call center shall be contacted at least 72 hours in advance.

- Traffic safety vests **are required at all times** for all personnel and subcontractors working on BP sites. • Keep all non-essential personnel out of the work area.
- Any heavy equipment that is used in the exclusion zone should remain in that zone until its task is completed. The equipment subcontractor should completely decontaminate such equipment in the designated equipment decontamination area as required prior to moving the equipment outside of the EZ/CRC. See **URS SMS 19** in Appendix I and the Environmental Remediation Drilling Safety Guidelines for additional information

### 4.7.2 Heavy Equipment Operation

Operation of heavy equipment during subsurface and investigation activities presents a potential "run over" or collision hazard to personnel. The hazards associated with heavy equipment can be effectively eliminated if personnel maintain a constant visual or verbal contact with the equipment operator. Never assume that the equipment operator sees you; make eye contact and use hand signals to inform the operator of your intent. **Never walk directly in back of, or to the side of, heavy equipment without the operator's knowledge.** See **URS SMS 019** in Appendix I for additional information.

### 4.7.3 Noise

Whenever feasible, noise levels, identified as exceeding 85 decibels, will be reduced by means of personal protective equipment. Ear plugs and/or muffs will be worn at all times when URS personnel are within 25 feet of operating equipment. Hearing protection will also be worn in the vicinity of generators, concrete cutters, and any other high noise emitting equipment. See **URS SMS 026** in Appendix I for additional information.

### 4.7.4 Slip-Trip-Fall Hazards

Slip-trip fall hazards are common at investigation and underground storage tank sites due to open trenches, pits, and holes; muddy, slippery or unstable surfaces; and equipment on the ground. While it is difficult to eliminate all slip-trip-fall hazards, risk of injury will be minimized by implementing safe work practices, utilizing proper footwear, and keeping the excavation area free of obstructions. See **URS SMS 021 and SMS 040** in Appendix I for additional information.

### 4.7.5 Lifting Hazards

Field operations often require the performance of laborious tasks. All employees must implement proper lifting procedures, such as keeping the load close to the body, and using leg muscles instead of back muscles to perform lifting tasks. Additionally, employees will not attempt to lift large, heavy, or awkwardly shaped objects without assistance. See **URS SMS 069** in Appendix I for additional information.

### 4.7.6 Weather

Weather conditions are an important consideration in planning and conducting site operations. Extremely hot or cold weather can cause physical discomfort, loss of efficiency and personal injury. Of particular importance is heat stress, often resulting from the use of impermeable protective clothing, which decreases the body's natural cooling processes.

During storms, rain may cause slippery surfaces and also weaken the excavation walls making the walls more susceptible to collapse. Lightning may also accompany storms, creating an

electrocution hazard during outdoor operations. To eliminate this hazard, weather conditions will be monitored and work suspended during electrical storms.

The following potential weather hazard exists at the site:

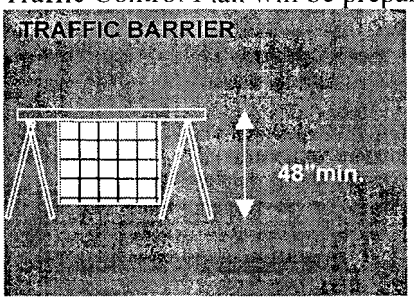
_X_ Heat Stress (See Appendix I for **URS SMS 018** for additional information)

_X_ Cold Stress (See Appendix I for **URS SMS 059** for additional information)

### 4.7.7 Traffic

This work will begin at BP Traffic Protection (TPL) Level. If necessary, the TPL of 2 will be utilized. If work requires field activities on or near highways or roads, **URS SMS 032** in Appendix I will be implemented.

A Traffic Control Plan will be prepared as warranted on a site/task specific basis. In the event the scope of work or the use of heavy equipment effects the site's regular traffic flow or business operation, a pre-work site evaluation will determine traffic flow, high volume time frame, location of exclusion zone, foot traffic pattern, emergency evacuation plan, location of protective barriers and equipment, parking, vehicle turn around point, and any other site protection issues that need to be addressed in the site specific Traffic Control Plan. For such occurrences, a Traffic Control Plan will be prepared and included in Appendix I.




The traffic control plan and equipment will be discussed during the tailgate safety meeting. The appropriate level of job site protection, based on BP's Traffic Control Guidance Document and API Guidance, will be maintained at all times.

### 4.7.8 Fire/Explosion

URS personnel will protect against the hazard by implementing the following safety procedures (**SMS 014 and SMS 015** in Appendix I):

- **URS SMS 033** in Appendix I (Underground Storage Tank Removal) will be followed, including American Petroleum Institute recommended practices;
- All potential ignition sources will be kept away from an explosive or flammable environment;
- Non-sparking, explosion-proof equipment will be used when necessary;
- A Hot work permit will be issued before hot work is performed within the hazardous zone; and
- Fire extinguisher(s) will be provided at appropriate locations (**URS SMS 014** in Appendix I).

In the event fire or explosion becomes a threat, all personnel will be evacuated to a predetermined evacuation area until the hazardous situation is properly controlled or eliminated. See URS SMS 014 for in the Appendix I for additional information.

### 4.7.9 Work Area Protection/ Site Control

As the project operation may be undertaken in a roadway or parking lot, motor vehicles may be a hazard. Guidance on properly coning and flagging the work area is located in the Attachments. See **URS - SMS 032** in Appendix I for additional information.

### 4.7.10 Dust

Drilling activities can result in airborne hazards. The mixing of amendments can also generate dust. In the event drilling or injection operations generate sustained visible dust, the drilling contractor should apply a water mist to the site to reduce dust generation. If the dust mitigation is not feasible, field personnel should wear dust masks. See **URS SMS-042** in Appendix I for additional information. Safety equipment is summarized on Table 4.

### 4.7.11 Hands

Injury to hands during field activities can be avoided by employing preventative procedures (See Appendix I for **URS SMS 016 and SMS 064** for additional information):

- Identify possible sources of hazard and procedures to mitigate them;
- Reevaluate hazards when arrive on site and make necessary adjustments to procedures to diminish the risk;
- Knowledge of proper use of tools and equipment and relay information during tailgate meetings;
- Discuss safety precautions when a subcontractor has equipment on site;
- Appropriate PPE for activities to control hazard, i.e., leather gloves, work gloves, nitrile gloves;
- Keep hand tools and portable equipment in good repair;
- **FIXED OPEN BLADE KNIVES (E.G. UTILITY KNIVES, LEATHERMAN, MULTI-TOOLS, ETC.) ARE PROHIBITED FROM USE;**
- Use tools and equipment appropriately; and
- Evaluate the proper method to move drums to prevent injury to hands.

### 4.7.12 Underground Utilities

All proximal underground utility locations must be located by either utility locating service, URS, or the excavation contractor prior to the commencement of excavating activities. URS field personnel shall note the location(s) of above and below ground utilities on a map and in the field notebook. The deactivation of utilities should be certified by the proper utility company personnel. See **URS SMS 034** in Appendix I for additional information.

### 4.7.13 Overhead Hazards

Overhead power lines pose a danger of shock or electrocution if the power line is contacted or severed during site operations. Prior to conducting work in areas where overhead lines could be impacted, the appropriate utility company will be notified and information will be obtained regarding the line voltage and the minimum separation distance required for work in this area. See **URS SMS 034** in Appendix I for additional information.

## 4.8 Chemical Hazards

The chemical hazards previously identified at the Site through soils and/or groundwater sampling consist of petroleum compounds and chlorinated volatile organic compounds. These chemical contaminants are listed on Table 4-1. Table 4-1 also presents chemical information, common and identifying characteristics. Action levels to be adhered during site work are presented in Table 4-2. During all Site activities, air monitoring will be performed. If any action levels are exceeded in the work area, work will be stopped and re-evaluated. Action levels are listed in Table 4-2. If possible engineering controls will be employed to prevent worker exposure. If levels persist, workers in the work area will upgrade PPE as necessary before continuing work.

## 4.9 Biological Hazards

There is a risk of injury from biological hazards at the Site at or near areas of the building where exposure to insects, birds, feral cats and dogs and other dangerous vertebrates is possible. Protective boots, clothing, repellents and other appropriate equipment are recommended (See Appendix I for **URS SMS 047**).

Appropriate clothing should be worn if poison ivy, oak, and/or sumac are present. Exposed skin should be washed with a strong soap (e.g., Liqui-Nox) as soon as possible after suspected exposure. If mosquitoes are present, repellent should be used according to label directions to prevent possible transmission of encephalitis or other transmitted diseases. The use of repellents must be addressed to ensure sample integrity when there is a potential for sample medium exposure. See "Biological Hazards" (Appendix I – for **URS SMS 047**).

Ticks are another concern in grassy areas. Ticks do not jump, crawl, or fall onto a person. They are picked up when clothing or hair brushes a leaf or other object that a tick is on. Precautionary measures include tucking pant legs into socks or otherwise taping pant legs closed, wearing repellant with DEET, etc. In case of a tick bite, do not remove the tick with your bare hands. See additional information "Biological Hazards" (-**URS SMS 047** in Appendix I).

## 5.1 Hazard Communication

Copies of all MSDS are included in Appendix H of this HASP, General HASP Requirements and Supporting Documentation. Project managers will use this checklist to indicate which MSDS are applicable to this site. Any additional MSDS will be attached here and added to the checklist.

- ☐ Acetone
- ☐ Active Carbon
- ☒ Alconox/Liquinox
- ☒ Bentonite
- ☒ Calibration Solutions (ORP, pH, Conductivity, etc)
- ☒ Chloroform
- ☒ Fire Extinguisher
- ☒ 1,1,1-Trichlorothane
- ☒ 1,1-Dichlorothane
- ☒ 1,2-Dichlorothene
- ☒ Chlorothane
- ☒ Hydrochloric Acid (33-40%)
- ☒ Methylene Chloride
- ☒ Nitric Acid (50-70%)
- ☒ Trichloroethylene
- ☒ 1,1,2- Trichloroethene
- ☒ Tetrachloroethene
- ☒ 1,1,2,2-Tetrachloroethene
- ☒ Vinyl Chloride
- ☒ Other: EHC-O
- ☒ Other: Sodium Permanganate
- ☒ Other: Hydrogen Peroxide
- ☐ Other: Activated Carbon
- ☐ Other:

## 5.2 PPE, Air Monitoring Equipment, Calibration Confirmation and Action Levels

PPE

| Minimum PPE required on any BP sites | Additional PPE to be added as required by the site or task |
|---|---|
| ☑ **Hard Hat** | ☑ **Hearing Protection** |
| ☑ **Steel-toed Boots** | ☐ Fire Retardant Clothing |
| ☑ **High-Visibility Safety Vest** | ☐ Tyvek Coveralls |
| ☑ **Eye Protection** (Type) Safety Glasses | ☐ Chemical-resistant steel-toed Boots |
| ☑ **Gloves** (Type) Nitrile gloves when handling contaminated materials and Leather gloves during all other activities | ☐ Respirator (Type) Full-face APR |
| ☑ **First Aid Kit** | ☐ Cartridges (Type) Organic Vapor |
| ☑ **Long-sleeve shirts** | ☐ Chemical Resistant Safety-Toed Boots |
| ☑ **Eye Wash Kit** | ☐ Form Fitting Goggles |
| ☑ **Fire Extinguisher** | ☑ **Dust Masks** |
| | ☐ Poly-coated Tyvek |
| | ☐ Other |
| | ☑ **Face shield and safety glasses for workers handling hydrogen peroxide** |

**Notes:**

The HSP Preparer has conducted a Hazard Assessment for this project based upon information provided by the Project Manager, in accordance with 29 CFR 1910.132 (d).

* Safety clothing should be evaluated for its "**high-visibility**" aspects.

** Effective September 1, 2007, it is a requirement that when working at a BP US Pipelines and Logistics managed site you must wear fire retardant clothing (FRC).

Monitoring Equipment

The following monitoring equipment or equivalent will be used during site investigation and remediation activities involving soil, groundwater and/or soil vapor:

- ☐ **Organic Vapor Analyzer**
- ☒ **Methane Meter (1)**
- ☐ **Explosimeter**
- ☒ **Dust Monitor (1)**
- ☐ **Organic Vapor Monitor w/lamp eV**
- ☒ **MiniRAE PID w/lamp 11.7 eV**
- ☐ **Colormetric Tubes (Type)**
- ☒ **Draeger Tube (Vinyl Chloride)**

(1) Required as part of the site-specific Community Air Monitoring Program.

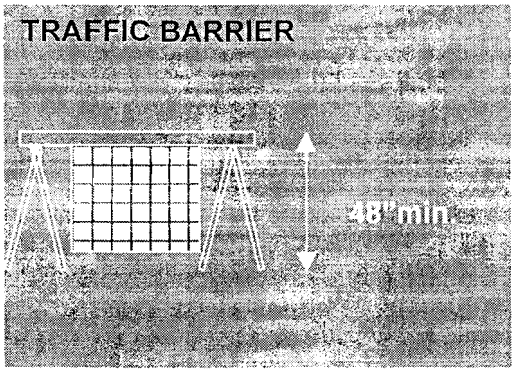
The monitoring equipment must be calibrated in accordance with the manufacturer's instructions. In addition, the results of daily instrument calibrations shall be logged in the field logbook, or on the Daily Instrument Calibration Check Sheet, **Appendix D**. Monitoring will be performed continuously in the work area.

## 5.3 Decontamination Procedure

Wash hands thoroughly before eating; clean-up and wash hands and face when work activities are completed. Formal decontamination procedures are required if the analyzer reading exceeds 15 ppm in the OBZ.

## 5.4 Traffic Control Plan

A Traffic Control Plan will be prepared as warranted on a site/task specific basis. In the event the scope of work or the use of heavy equipment effects the site's regular traffic flow or business operation, a pre-work site evaluation will determine traffic flow, high volume time frame, location of exclusion zone, foot traffic pattern, emergency evacuation plan, location of protective barriers and equipment, parking, vehicle turn around point, and any other site protection issues that need to be addressed in the site specific Traffic Control Plan. For such occurrences, a Traffic Control Plan will be prepared and included in **Appendix G** of this HASP.




The traffic control plan and equipment will be discussed during the tailgate safety meeting. The appropriate level of job site protection, based on BP's Traffic Control Guidance Document and API Guidance, will be maintained at all times.

### URS SMS Checklist

Copies of all the below listed SMSs are found in Appendix I.
The SMSs in the first section are required for all sites, the Project Manager is required to indicate the additional SMSs that are specific to this site or task (second section).

| | | |
|---|---|---|
| ☒ | SMS 1 | Regulatory Inspections |
| ☒ | SMS 2 | Worker Right to Know |
| ☒ | SMS 3 | Emergency Action Plan |
| ☒ | SMS 9 | Corrosive and Reactive Materials |
| ☒ | SMS 12 | Electrical Safety |
| ☒ | SMS 14 | Fire Prevention |
| ☒ | SMS 15 | Flammable and Combustible Liquids and Gases |
| ☒ | SMS 16 | Hand and Portable Equipment |
| ☒ | SMS 17 | Hazardous Waste Operations |
| ☒ | SMS 18 | Heat Stress |
| ☒ | SMS 21 | Housekeeping |
| ☒ | SMS 24 | Medical Screening & Surveillance |
| ☒ | SMS 25 | New Employee Safety Orientation |
| ☒ | SMS 29 | Personal Protective Equipment |
| ☒ | SMS 32 | Traffic Control |
| ☒ | SMS 43 | Personal Monitoring (Industrial Hygiene) |
| ☒ | SMS 46 | Subcontractor Health and Safety Requirements |
| ☒ | SMS 47 | Outdoor Environments |
| ☒ | SMS 49 | Incident Reporting |
| ☒ | SMS 50 | Specific Chemical Hazards |

| | | |
|---|---|---|
| ☒ | SMS 51 | Bloodborne Pathogens |
| ☒ | SMS 57 | Vehicle Safety Program |
| ☒ | SMS 59 | Cold Stress |
| ☒ | SMS 64 | Hand Safety |
| ☒ | SMS 65 | Injury Management |
| ☒ | SMS 66 | Incident Investigation |
| ☒ | SMS 69 | Manual Material Handling |
| ☒ | SMS 72 | Behavior Based Safety |
| ☒ | SMS 78 | Short Service Employees |
| ☒ | SMS 84 | Lone Worker Safety |
| ☒ | SMS 85 | Drive Safely |

| | | |
|---|---|---|
| ☐ | SMS 4 | Accessing Industrial Sites |
| ☐ | SMS 8 | Asbestos Operations |
| ☐ | SMS 10 | Confined Space Entry |
| ☐ | SMS 13 | Excavation Safety |
| ☐ | SMS 19 | Heavy Equipment Operations |
| ☐ | SMS 20 | Hot Work |
| ☐ | SMS 23 | Lockout and Tagout Safety |
| ☒ | SMS 26 | Noise and Hearing Conservation |
| ☒ | SMS 28 | Portable Ladders |
| ☐ | SMS 30 | Sanitation |
| ☐ | SMS 33 | Underground Storage Tank Removal |
| ☒ | SMS 34 | Utility Clearances |
| ☐ | SMS 40 | Fall Protection |
| ☐ | SMS 41 | Rigging |
| ☒ | SMS 42 | Respiratory Protection |
| ☒ | SMS 48 | Hazardous Materials/Dangerous Goods Shipping |
| ☒ | SMS 56 | Drilling Safety Guidelines |

Occupational Clinic/Emergency Room

The Site supervisor should always contact the URS Occupational Health Advisor (Jeanette Schrimsher) to determine the proper incident management plan. Jeanette and her team will talk you through first aid procedures and proper treatment if you need it.

Jeanette Schrimsher's contact information is:

| | |
|---|---|
| Direct: | 512.419.6440 |
| Cell: | 512.656.0203 |
| Toll Free: | 1-866-326-7321 |

A detailed injury reporting flow chart is found in Section 6.3.

## 6.1 Emergency Response Plan

bp

**SITE EMERGENCY RESPONSE PLAN**
**BP RETAIL PETROLEUM CLASS III**

### I. Purpose & Scope of Plan

The Site Emergency Response Plan provides the on-site user with critical information to be used in the event of an emergency for a RETAIL SITE Type situation. For operating facilities, including active BP retail and terminal facilities, also refer to the Facility Response Plan. **IN AN EMERGENCY (e.g., fire, major injury, crime, major release) CALL 911 FIRST (if Available) and NOTIFY the ON SITE OPERATOR.**

### II. Notification Guidelines

The BP\URS **Notification Guidelines** are found in Sections 6.3 and 6.4 of this document.

**Emergency Contacts – Call Contacts in the order listed below until you speak to someone LIVE:**

| URS | Name or Description | Work | 24-hr. Contact |
|---|---|---|---|
| Portfolio Manager | Mark Becker | 973-812-6835 | 908-347-7234 |
| Project Manager | Mark Becker | 973-812-6835 | 908-347-7234 |
| Site Manager | Mark Becker | 973-812-6835 | 908-347-7234 |
| Program Manager | Van Ekambaram | 973-812-6827 | 201-303-1393 |
| Portfolio HSSE Coordinator | Rebecca Carew | 301-258-5849 | 443-799-5390 |
| URS HSSE Managers | Bob Gabrois | 973-812-6836 | 973-997-2079 |
| Alternate: | Steve Sherman | 716-923-1363 | 716-445-4219 |
| RM Supplier Performance Manager | Jennifer Biland | 334-348-2285 | 919-395-1889 |

| BP | Name or Description | Work | 24-hr. Contact |
|---|---|---|---|
| Environmental Business Manager | Kevin Endriss | 410-8257853 | 410-790-6016 |
| Regional Manager | Patricia Gallery | 630-836-7109 | 630-333-6388 |
| Regional HSSE Manager | Dan Hardisty | 630-836-7614 | 630-337-9368 |
| BP Notification Center | EMERGENCIES ONLY** | (800) 321-8642 | (800) 321-8642 |

**Only to be used if you are not able to speak to one of the above URS or BP contacts:

| Other Contacts | Name or Description | Work | 24-hr. Contact |
|---|---|---|---|
| Site Owner | Bob Hank, ITW | 847-657-4949 | |
| Applicable Regulatory Agency | Girish Desai, NYSDEC | 631-444-0243 | |

## III. Maps

Occupational Health Facilities: Map and Directions with route to nearest facilities are provided behind the Emergency Contact Information.
Hospital Route\Area Map: Map and Directions with route to the nearest facility are provided behind the Emergency Contact Information.
Traffic Guide\Site Map: Refer to the PM approved Site Specific Traffic Control Plan and attached Site Map located in this HASP.

## IV. External/Emergency Contact Information

**See Emergency Response Section**

## V. Local Emergency Response Resources

| | | | |
|---|---|---|---|
| Oil Spill Contractor | AB Environmental<br>1599 Ocean Ave.<br>Bohemia, NY 11716<br>(631) 567-6545 | Vac Truck (Vapor & Liquid) | AB Environmental<br>1599 Ocean Ave.<br>Bohemia, NY 11716<br>(631) 567-6545 |
| Drilling Contractor | Zebra Environmental<br>30 No. Prospect Avenue<br>Lynbrook, New York 11563<br>Tel (516) 596-6300 | Waste Disposal | AB Environmental<br>1599 Ocean Ave.<br>Bohemia, NY 11716<br>(631) 567-6545 |
| Hotel for Operations Center: | Best Western Mill River Manor<br>173 Sunrise Hwy<br>Rockville Centre, NY<br>(516) 678-1300<br>4.5 miles / 11 minutes from Site<br>1.5 miles / 6 minutes from Hospital | Utility Clearance | X-Ray Locating Services, Inc.<br>173 Terry Road<br>Smithtown, NY 11787<br>(631) 979-2891 |

## VI. Evacuation Procedures

| | |
|---|---|
| **Emergency Meeting Site**: | To be determined and disseminated to all workers during the daily tailgate safety meeting. Considerations in determining meeting site shall include conditions such as wind direction, egress hazards, etc. |
| **Evacuation Route/Procedures**: | To be determined and disseminated to all workers during the daily tailgate safety meeting. Considerations in determining route/procedures shall include conditions such as egress hazards, notification, etc. |

**VII. Incident Management Team & Organization Chart**

BP EBM or URS Portfolio Manger/HSSE Lead will have a copy of the BP America's Response Guide.

**VIII. Incident Management Team Descriptions** (and how to activate the team)

BP EBM or URS Portfolio Manger/HSSE Lead will have a copy of the BP America's Response Guide.

**IX. Emergency Operations Center**

Locate at local Hotel -- See V. Local Resources

**X. Linked Plans:** BP Business Support Plan (BSP) – RM website.

http://rm.bpweb.bp.com/?wmsID=b6d939e6-e659-4b8a-8ee8-2c5a21cb4811.

**For active BP facilities also refer to the site specific Facility Response Plan:**

Contact Name: _____ Title: _____

Contact Number: (office) _____ (cell) _____

Location of Plan: _____

**XI. Plan Maintenance**

Schedule --- Updated annually or more frequently as information changes.

Contact name --- Project Manager is responsible for the update of this plan.

**XII. Training & Exercising**

New employees MUST review and become familiar with this Plan before arriving at site.

**XIII. Non-regulatory Reporting Guidelines**

See BP RM Incident & Near-Miss Notification and Reporting Guidance Manual

**XIV. Distribution List**

HASP

## 6.2 Map and Directions to Occupational Clinic & Hospital Emergency Room

All Maps and Directions are located in the **Emergency Contact Information Section.**

## 6.3 URS Incident/Injury Notification Call Chain

This call chain will be used when any incident occurs (OSHA recordable or first aid), any near miss, or any vehicle incidents (including no vehicle damage). This chain will be used regardless of the day of the week or hour of the day.

**Injured Employee MUST call:**

Other URS field personnel with the injured employee may also make the required contacts.

| | | |
|---|---|---|
| URS Project Manager (PM) | Mark Becker | Office: 973-812-6835<br>Cell: 908-347-7234 |
| Alternate URS Project Manager | Fayaz Lakhwala | Office: 973-812-6887<br>Cell: 908-230-9567 |
| URS Occupational Nurse | Jeanette Schrimsher | Office: 866-326-7321<br>Cell: 512-656-0203 |

If the URS PM (or PM Alternate) is not available, the injured employee must proceed to contact the individuals below.

**URS PM MUST notify all of the following individuals:**

Emergency Contacts – Call Contacts in the order listed below until you speak to someone LIVE. If an individual is not available in the office, leave a voicemail and attempt to contact them on their cell phone.

**BP Contacts**

| | | |
|---|---|---|
| BP EBM | Kevin Endriss | Office: 410-825-7853<br>Cell: 410-790-6016 |
| BP EBM Alternate | Greg Miller | Office: 410-825-7965<br>Cell: 443-921-7906 |
| BP Deputy Regional Manager | Gary Umberhagen | Office: 410-825-8060<br>Cell: 410-948-5961 |
| BP Regional Manager | Patricia Gallery | Office: 630-836-7109<br>Cell: 630-333-6388 |
| BP Notification Center | EMERGENCIES ONLY** | 800-321-8642 |

**URS Contacts**

| | | |
|---|---|---|
| URS Portfolio Manager | Mark Becker | Office: 973-812-6835<br>Cell: 908-347-7234 |
| URS HSSE Manager | Bob Gaibrois | Office: 973-812-6836<br>Cell: 973-997-2079 |
| URS HSSE Manager Alternate | Steve Sherman | Office: 716-923-1363<br>Cell: 716-445-4219 |
| URS Portfolio HSSE Coordinator | Rebecca Carew | Office: 301-258-5849<br>Cell: 443-799-5390 |
| URS Global HSSE Coordinator | Jennifer Biland | Office: 334-348-2285<br>Cell: 919-395-1889 |
| URS Corporate HSSE Liaison | Cece Weldon | Office: 248-994-7466<br>Cell: 248-752-3405 |
| URS Client Account Manager – Americas | Dennis Kasner | Office: 312-697-7215<br>Cell: 312-961-9869 |
| URS Global Account Manager | Jim Garrett | Office: 757-271-9784<br>Cell: 757-295-1226 |

## 6.4 BP Incident Notification and Reporting Matrix

### INCIDENT NOTIFICATION AND REPORTING PROCESS TABLE

| Incident Severity | NOTIFICATION | | | INITIAL REPORTING | | | INVESTIGATION | | | | CORRECTIVE ACTION | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Notification required | Accountability By ** | When | Forms / Reports | Accountability By ** | When | Forms / Reports | Accountability By ** | When | Distribution To | Forms / Reports | Accountability By ** | Distribution To |
| **MAJOR/ HIGH POTENTIAL** Refer to BP Group Major Incident and High Potential Incident Reporting Guideline | Head of Function<br>Chief Operating Officer/VP Operations<br>HSSE Manager<br>Regional Manager<br>EBM/HSSE Coordinator<br>Operating Facility Contact (if applicable)<br>BP Notification Center (as needed) | RM Employee or PM | Immediately (within 1 hour) | Major Incident Announcement Forms<br>OSHA 300 Log (as applicable)<br>Tr@ction Report<br>(See Appendix E) | Regional Manager | Within 24 Hours | MIA/HiPO Report<br>Tr@ction Incident Report updated with investigation results<br>RCA based on the Comprehensive List of Causes (CLC) Methodology | Regional Manager<br>Investigation Team Leader from RM LT as agreed with the Head of Function<br>See Section 4 | 10 Days (Preliminary)<br>30 Days (Final) | Refer to Appendix B & C | Incident Report in Tr@ction<br>Lessons Learned document | Regional Manager | Refer to Appendix B & C |
| **NON-MAJOR (excluding Recordables)** | Head of Function *<br>Chief Operating Officer/VP Operations<br>HSSE Manager<br>Regional Manager<br>EBM/HSSE Coordinator<br>Operating Facility Contact (if applicable)<br>BP Notification Center (as needed) | RM Employee or PM | Immediately (within 1 hour) | Incident Report in Tr@ction | Regional Manager | Within 24 Hours | Tr@ction Incident Report<br>RCA based on the Comprehensive List of Causes (CLC) Methodology | EBM or Regional Manager (as appropriate)<br>Investigation Team Leader as agreed with the Head of Function | 10 Days (Preliminary)<br>30 Days (Final) | LT<br>XLT<br>PMs<br>HSSE Manager | Incident Report in Tr@ction<br>Lessons Learned document | Regional Manager | LT<br>XLT<br>PMs<br>HSSE Manager |

## INCIDENT NOTIFICATION AND REPORTING PROCESS TABLE

| | NOTIFICATION | | | INITIAL REPORTING | | | INVESTIGATION | | | | CORRECTIVE ACTION | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Notification required | Accountability By ** | When | Forms / Reports | Accountability By ** | When | Forms / Reports | Accountability By ** | When | Distribution To | Forms / Reports | Accountability By ** | Distribution To |
| DAFW CASE | Head of Function*<br>Chief Operating Officer/VP Operations<br>HSSE Manager<br>Regional Manager<br>EBM/HSSE Coordinator<br>Operating Facility Contact (if applicable)<br>BP Notification Center (as needed) | RM Employee or PM | Immediately (within 1 hour) | Incident Report in Tr@ction<br>OSHA 300 Log – as applicable | Regional Manager | Within 24 Hours | Tr@ction Incident Report<br>RCA based on the Comprehensive List of Causes (CLC) Methodology | EBM or Regional Manager (as appropriate)<br>Investigation Team Leader from RM LT as agreed with the Head of Function<br>RCA Investigations for DAFWCs will be led by member of RMLT | 10 Days (Preliminary)<br>30 Days (Final) | LT<br>XLT<br>PMs<br>HSSE Manager | Incident Report in Tr@ction<br>Lessons Learned document | Regional Manager | LT<br>XLT<br>PMs<br>HSSE Manager |
| INJURY (Recordables) | See notification list above for Non-Major | RM Employee or PM | Immediately (within 1 hour) | Incident Report in Tr@ction<br>OSHA 300 Log – as applicable | Regional Manager | Within 24 Hours | Tr@ction Incident Report<br>RCA using CLC for all recordable injuries | EBM or Regional Manager as appropriate<br>Maybe led by RM LT member if serious injury | 10 Days (Preliminary)<br>30 Days (Final) | LT<br>XLT<br>PMs<br>HSSE Manager | Incident Report in Tr@ction<br>Lessons Learned document. | Regional Manager | LT<br>XLT<br>PMs<br>HSSE Manager |
| FIRST AID | EBM/HSSE Coordinator<br>Operating Facility Contact (if applicable) | RM Employee or PM | Immediately (within 1 hour) | Incident Report in Tr@ction | Regional Manager | Within 72 Hours | Incident Report in Tr@ction | EBM/HSSE Coordinator | Within 72 Hours | Via Tr@ction | Incident Report in Tr@ction | As appropriate | As appropriate |
| NEAR MISS/HSSE OPPORTUNITY | EBM/HSSE Coordinator<br>Operating Facility Contact (if applicable) | RM Employee or PM | Report | Incident Report in Tr@ction | Regional Manager | Within 72 Hours | Incident Report in Tr@ction (Incident Type: Near Miss/HSSE Opportunity) | EBM/Regional Manager or next level of authority (as appropriate) or HSSE Coordinator | At the discretion of the EBM, PM or HSSE Coordinator | Via Tr@ction | Incident Report in Tr@ction | Regional Manager | Via Tr@ction |

NOTE: If EBM or PM is not available, Contractor is responsible for notifying the next applicable level.

* For OSHA Recordables, DAFW Cases, or otherwise determined.
** Accountable for circulating to distribution list and ensuring details are entered into Tr@ction.
*(A)* At Discretion of Regional Manager / HSSE Coordinator
*(B)* Contractor's Employer regardless of work being done for RM/BP fills out OSHA 300 Logs.

## Incident Notification and Reporting Table Definitions

| Incident Severity | Vehicle Incidents | Spill / Release / Vapor Disc | Agency Action | Unplanned Business Interruption | Fire / Explosion | Security | Personal Injury / Illness | 3rd Party Complaint Media Issues | Property Damage |
|---|---|---|---|---|---|---|---|---|---|
| **MAJOR / HIGH POTENTIAL** Refer to BP Group Major Incident and High Potential Incident Reporting Guideline | Any incident resulting in a fatality or multiple serious injuries | Any spill or release > 100 barrels or less in a sensitive area, RQ, off site impact, any spill on navigable water, release of 10 tonnes of classified material, or any spill > 1 barrel and has a High Potential | SIGNIFICANT Adverse reaction from authorities | Any accidental damage having a cost exceeding US$500,000 | Any fire or explosion with offsite or significant onsite impact / any use of fire fighting equipment – High Potential | Any serious threats to security, bomb threats, or kidnapping threats – High Potential<br><br>See Attachment | Any injuries or illnesses resulting in fatalities, 3 or multiple serious injuries | SIGNIFICANT Adverse reaction from media, NGO's or the general public | Any property damage > $500,000 |
| **NON-MAJOR INCIDENTS** | Any incident involving a BP Amoco vehicle including under the influence of D&A ($0 Cost Threshold) | Any spill < 100 barrel | Any notice of fine, NOV, consent order, citations, penalties, or regulatory audits | Any unplanned business interruption including hitting underground utilities, product lines, or claim, impact on operating facility business. | Any other fire / explosion not categorized as a Major Incident | Any non-serious, threat to security including vandalism. | Any injury or illness resulting in a DAFWC, BP Amoco exposure, or OSHA Recordable | Any incident that causes adverse reaction from the public, or received significant media attention | Any property damage of $500 to $499,999 |
| **NEAR MISS / UNSAFE CONDITION** or Behavior and/or doesn't meet the definitions of a Major or Non-Major Incident | Any contractor vehicle incident without injury or property damage | Any potential for spill or release | Any adverse reaction from authorities | Any complaint filed by an Operating Facility Business | Any risk of fire or explosion (i.e. working in LEL conditions, etc.) | N/A | All other injuries or illness including First Aid which does not result in medical treatment. | N/A | Any property damage less than $500 |

## 7.1 Job Safety Analysis (JSA)

The JSA will be completed prior to starting work and will be updated as conditions change throughout the day. The JSAs are located in **Appendix A**. This is your Management of Change documentation.

## 7.2 Authorization to Work (ATW)

The ATW must be completed daily prior to starting work. Both sides must be completed. Verify the subcontractors are listed in **Appendix B**.

## 7.3 Required Permits and Forms

**NOTE: If there is a check next to the permit/form, that permit/form is required**

- ☐ Hot Work Permit
- ☐ Ground Disturbance Permit
- ☐ Confined Space Permit
- ☐ Work at Heights Permit
- ☐ Trenching and Excavation
- ☒ Predrilling/Subsurface Checklist
- ☒ Required Agency Permits
- ☒ Subcontractor Pre-Work Appendix D Package
- ☒ Incident Reporting Form
- ☒ Near Miss Form
- ☐ Field Work Checklist
- ☒ Drilling Checklist
- ☐ Field Data Sheets
- ☐ Work Request Forms
- ☒ Calibration Sheets
- ☒ Site Specific Traffic Control Plan
- ☒ URS-BP RM Daily Safety Observation Form
- ☒ URS-BP RM Safety Conversation Form
- ☐ Other: _____

# EMERGENCY CONTACT INFORMATION

## Contact Numbers
## Urgent Care Map and Directions
## Hospital Map and Directions
## Site Map

# CONTACT NUMBERS

**LOCAL EMERGENCY TELEPHONE NUMBERS (provide area code): Call 911 FIRST if needed!!**

| Can 911 be used at this site? | Yes | x | No | | If yes, be certain it is activated and enhanced. |
|---|---|---|---|---|---|

**Cellular telephones may not reach a local 911 operator; therefore, supply the following information:**

| | | | |
|---|---|---|---|
| Ambulance | (516) 378-2332 | Fire Department | (516) 378-0400 |
| Hospital Emergency Room | (516) 632-3900 | Police Department | (516) 573-6100 |
| Poison Control Center | (800) 848-6946 | HazMat Response Unit | (800) 881-1098 |

## Emergency Routes:

## Occupational Health Facility:

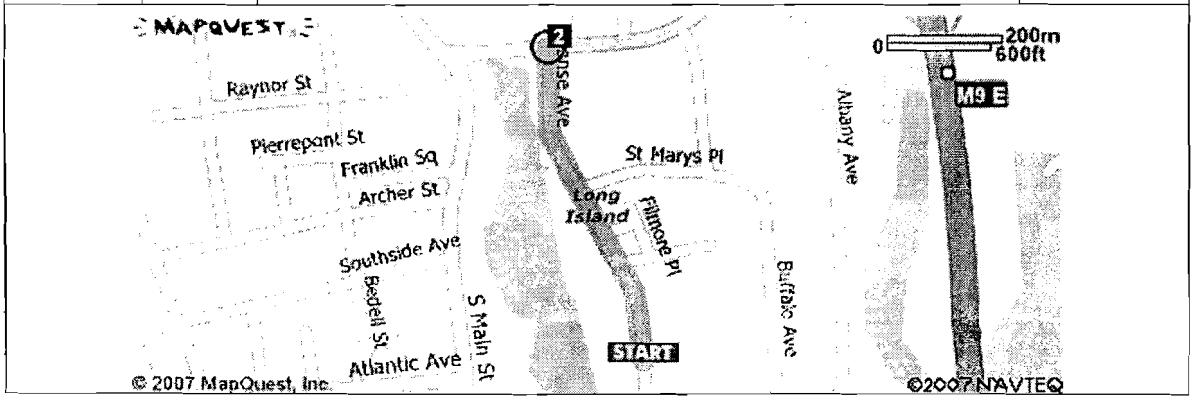
**The nearest Occupational Health Facility listed is approximately 30 miles away, which in this area is unreasonable. Go to Hospital.**

## Hospital:

| | | | |
|---|---|---|---|
| South Nassau Communities Hospital | | Phone number: | 516-632-3000 |
| Hospital Address: | 1 Healthy Way, Oceanside, NY | | |
| Directions to Hospital: | See following Map | | |
| Estimated driving distance: | 3.95 miles | Estimated driving time: | 11 minutes |
| Does hospital accept chemically contaminated patients? | Yes x | No | |

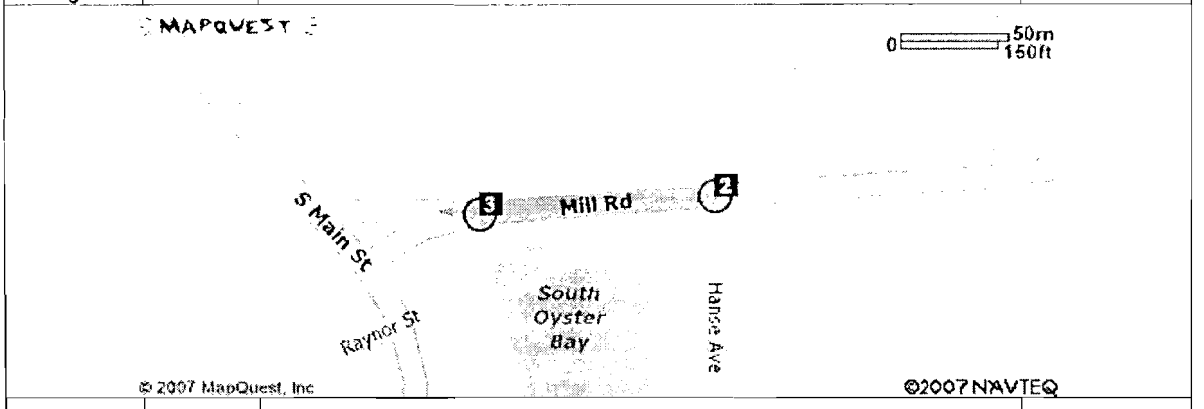
**URS (live contact) should be <u>notified immediately</u> if an injury occurs which requires medical attention.**

| | | | |
|---|---|---|---|
| START | 1: | Start out going NORTHWEST on HANSE AVE toward RIDER PL. | 0.3 miles |

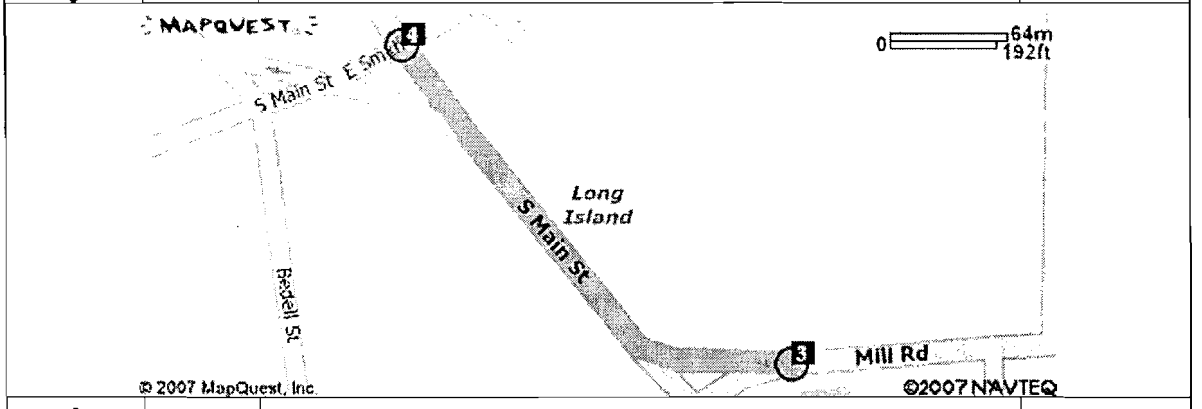


## CONTACT NUMBERS

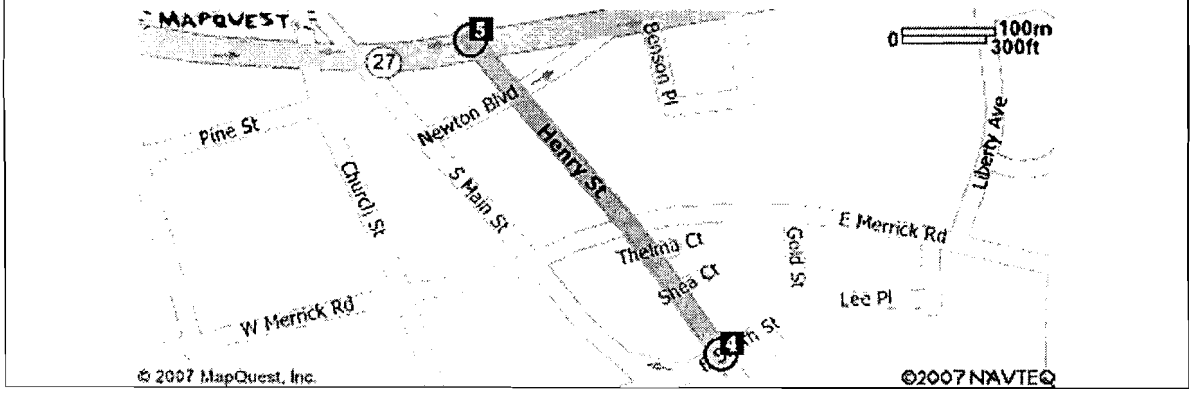
| | | | |
|---|---|---|---|
| ← | 2: | Turn LEFT onto MILL RD. | <0.1 miles |




| | | | |
|---|---|---|---|
| → | 3: | Turn RIGHT onto S MAIN ST. | 0.1 miles |

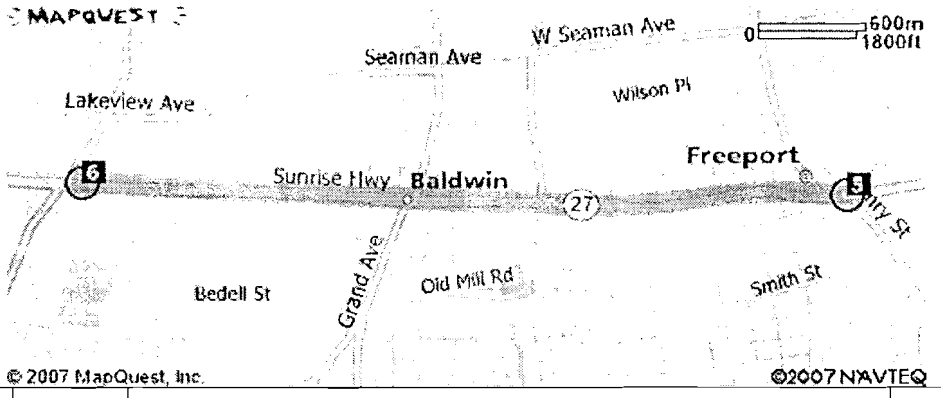



| | | | |
|---|---|---|---|
| ↑ | 4: | S MAIN ST becomes HENRY ST. | 0.2 miles |

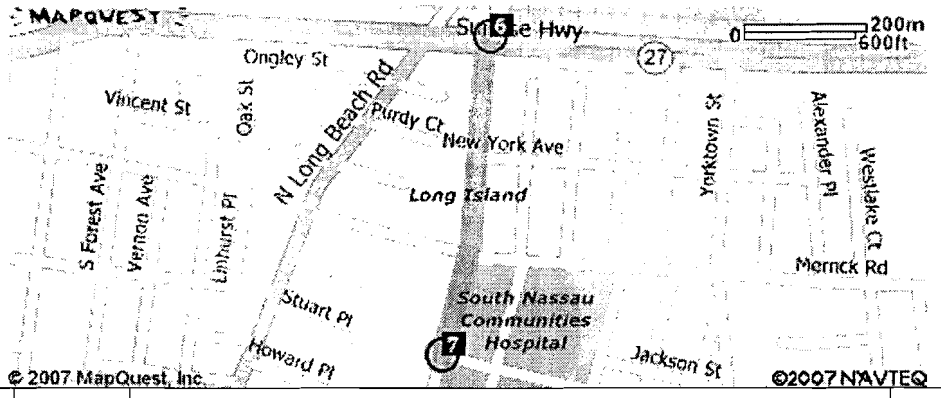


# CONTACT NUMBERS

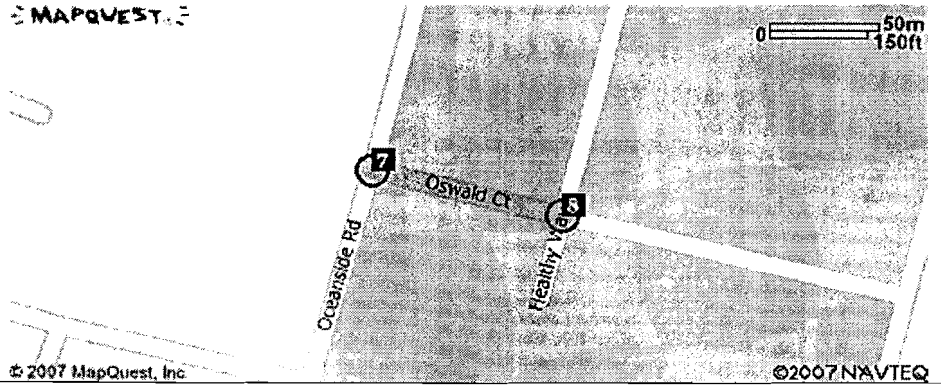
| | | | |
|---|---|---|---|
| | 5: | Turn LEFT onto E SUNRISE HWY / NY-27 W / POW / MIA MEMORIAL HWY. | 2.6 miles |




| | | | |
|---|---|---|---|
| | 6: | Turn LEFT onto N OCEANSIDE RD. | 0.3 miles |

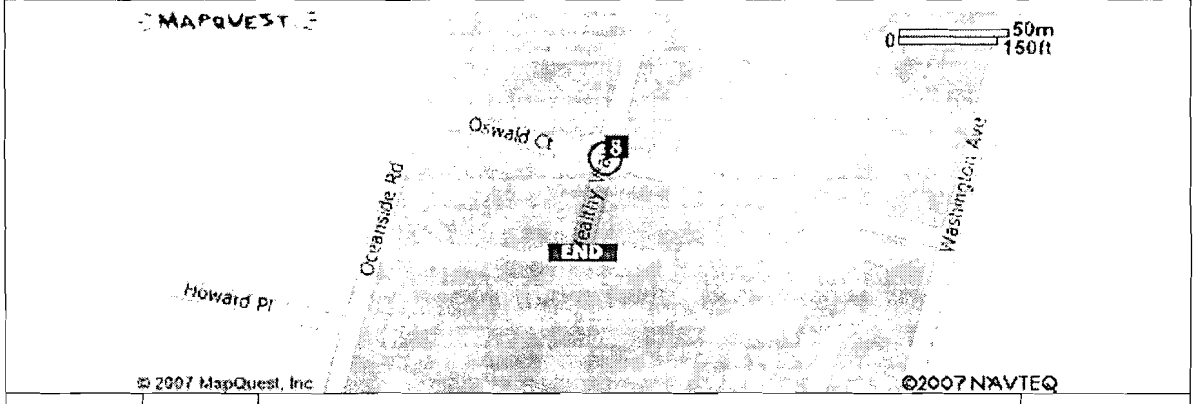



| | | | |
|---|---|---|---|
| | 7: | Turn LEFT onto OSWALD CT. | <0.1 miles |

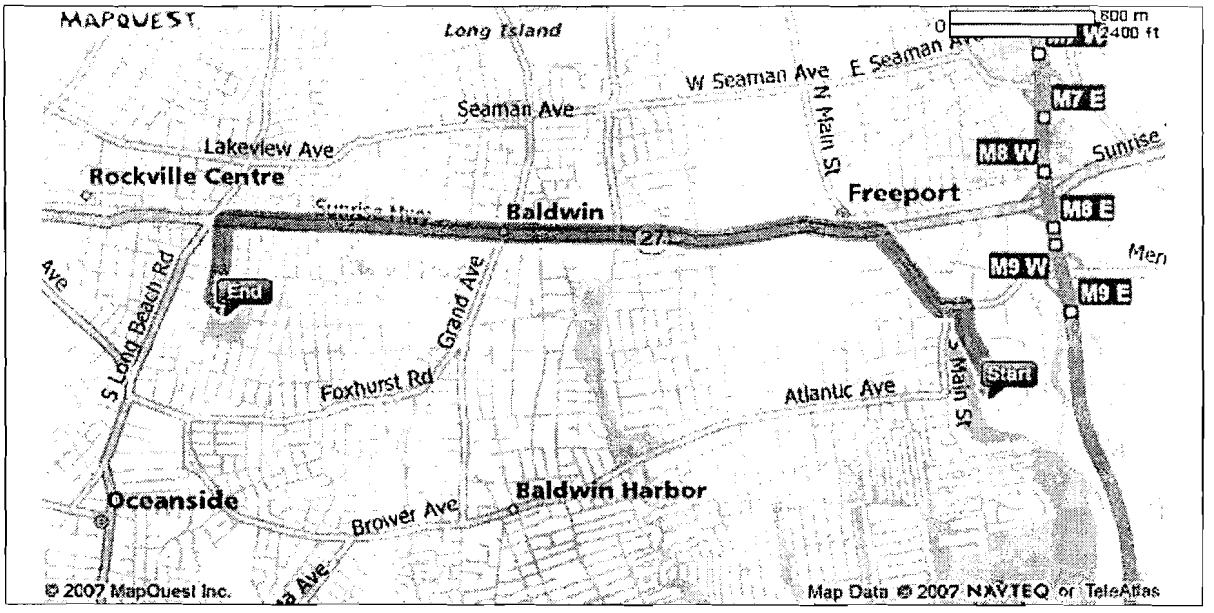


# CONTACT NUMBERS

| | | | |
|---|---|---|---|
| | 8: | Turn RIGHT onto HEALTHY WAY. | <0.1 miles |




| | | |
|---|---|---|
| END | 9: | End at **1 Healthy Way**<br>Oceanside, NY 11572-1551, US |



# APPENDIX A

## JSAs

# APPENDIX B

## Authorization to Work

## Site Security Checklist

# APPENDIX C

## Safety Reporting Forms

# APPENDIX D

## Field Forms

# APPENDIX E

## Permits to Work

# APPENDIX F

## Package

# APPENDIX G

## Traffic Control Plan

Traffic Control Plan usually contained in this appendix of URS' Health and Safety Plans for BP sites is not required for the scheduled scope of work.

# APPENDIX H

## MSDSs Relevant To Site

# APPENDIX I

## Safety Management Standards
## [SMSs]

# APPENDIX B

# COMMUNITY AIR MONITORING PLAN

# COMMUNITY AIR MONITORING PLAN

# OPERABLE UNIT NO. 2

# FORMER COLUMBIA CEMENT COMPANY SITE

# FREEPORT, NEW YORK

# SITE NUMBER 1-30-052

*Prepared for:*
**Atlantic Richfield Company**
**1 West Pennsylvania Avenue**
**Suite 440**
**Towson, Maryland 21204**

*Prepared by:*
**URS Corporation**
**201 Willowbrook Boulevard**
**Wayne, New Jersey 07470**

## 1.0 INTRODUCTION

The Former Columbia Cement Company (CCC) Site located at 159 Hanse Avenue (Site) has undergone extensive environmental investigation in response to a 1988 release of 1,1,1-trichloroethane (TCA). A supplementary Remedial Investigation Report was submitted to NYSDEC in December 2006 and a Feasibilty Study Report was submitted in February 2008. A Record of Decision was prepared by NYSDEC in March 2008, indicating selected remediation/mitigation measures for impacted soil, groundwater and soil vapor. The remediation/mitigation measures will commence in 2008. This Community Air Monitoring Plan (CAMP) was prepared to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air. Protection of Site workers will be addressed through a site-specific Health and Safety Plan (HASP).

## 2.0 BACKGROUND

CCC, which was owned by Burmah Castrol, produced adhesives for a variety of applications. In 1988, while CCC operated the facility, approximately 1,760 gallons of 1,1,1-trichloroethane (1,1,1-TCA) was released to an unlined storm drain during filling of an underground storage tank (UST) due to a failure of a contractor's tanker truck. The spill was reported and response measures were performed under regulatory oversight. In 1996, the property was sold to Illinois Tool Works (ITW). In 1998, Burmah Castrol entered into a Consent Agreement (Index WI #W2-02-0813-98-05) with the NYSDEC regarding the 1,1,1-TCA spill. In 2001, British Petroleum (BP) purchased all Burmah Castrol holdings and assumed liability for the 1,1,1-TCA spill.

Numerous phases of a Remedial Investigation were conducted by Delaware Engineering (1997 through 2003) and URS (2003 through 2006). In December 2006, URS submitted a Supplemental Remedial Investigation Report, summarizing all data obtained to date. In January 2007, URS submitted a Feasibility Study Report ("FSR") that evaluated remedial alternatives to address subsurface impacts. In the FSR, groundwater fate and transport modeling was performed to assess whether Monitored Natural Attenuation (MNA), in conjunction with source control measures, would prevent the groundwater contaminant plume from migrating to Freeport Creek, approximately 500 feet west of the Site. A Site Location Map is presented as Figure 1. The modeling, when calibrated to the existing groundwater monitoring data, suggested that the plume would not reach Freeport Creek. In its March 8, 2007 letter, NYSDEC provided comments on the FSR. One comment stated that all modeling should be validated with empirical data.

To validate the modeling results, BP installed two monitoring wells (MW-07-16S and MW-07-17D) downgradient from adjacent to Freeport Creek. Sampling results indicated that chloroethane was present in well MW-07-16S at a concentration exceeding the NYSDEC Ambient Groundwater Quality Standard. Based on these results, NYSDEC divided the site into

two Operable Units. Operable Unit No. 1 consists of the former Columbia Cement Company property located at 159 Hanse Avenue. Operable Unit No. 2 (OU-2) consists of the properties immediately adjacent to and downgradient (west) of OU-1. The OU-2 RIW presents a scope of work to evaluate subsurface impacts in OU-2 resulting from the 1988 1,1,1-TCA spill in OU-1.

## 3.0 COMMUNITY AIR MONITORING PLAN

### 3.1 GROUND INTRUSIVE ACTIVITIES

During ground intrusive activities, real-time air monitoring for volatile organic compounds (VOCs) and particulate levels at the perimeter of the exclusion zone or work area will be necessary. **Continuous monitoring will be required for all ground intrusive activities.** Ground intrusive activities include, but are not limited to, the installation of soil borings or monitoring wells, advancement of soil borings for the purpose of injection of amendments and drilling or cutting the building slab to install sub-slab vapor testing or extraction points. Specifically, anticipated situations where continuous monitoring will be required are described below:

- Drilling activities will take place on the east and west sides of Hanse Avenue. The drilling activities during the OU-2 RI will include soil sampling, groundwater screening sampling and monitoring well installation. During these activities, the work area/exclusion zone will be delineated by barricades, traffic cones and caution tape. Continuous monitoring for VOCs and methane will be performed in the work area near the drill rig and injection equipment. In addition, continuous VOC and particulate monitoring will be performed at the downwind perimeter of the work area, as described in Sections 3.3 and 3.4. Readings will be recorded in a CAMP Log Book.
- The sub-slab vapor testing work will take place inside the OU-2 buildings. During ground intrusive work, continuous monitoring for VOCs will be performed in the work area near the drilling equipment. In addition, periodic VOC and particulate monitoring will be performed at the nearest open exterior doorway. Readings will be recorded in a CAMP Log Book.

### 3.2 NON-INTRUSIVE WORK

**Periodic monitoring** for VOCs will be required during non-intrusive activities such as the collection of groundwater samples from existing monitoring wells or management of drums of waste. "Periodic" monitoring during sample collection will consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or drum, monitoring during well bailing/purging, and taking a reading prior to leaving a sample location.

## 3.3 VOC MONITORING, RESPONSE LEVELS, AND ACTIONS

Volatile organic compounds (VOCs) will be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a **continuous** basis or as otherwise specified. Wind direction will be determined by observing the windsock in the rear of the adjacent Rohm & Haas facility. Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background conditions, and/or if the work location changes. The monitoring work will be performed using equipment appropriate to measure the contaminants known or suspected to be present (a PID with an 11.7 eV lamp). The equipment will be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below. Calibration information will be recorded in a CAMP Log Book.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities will be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities will resume with continued monitoring.

- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities will resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities will be shutdown.

All 15-minute readings will be recorded in a CAMP Log Book and be available for State (DEC and DOH) personnel and local (county or municipal) health departments to review. Instantaneous readings, if any, used for decision purposes will also be recorded.

## 3.4 PARTICULATE MONITORING, RESPONSE LEVELS, AND ACTIONS

Particulate concentrations will be monitored at the start of the day and periodically at the upwind perimeter of the exclusion zone. Particulate concentrations will be monitored continuously at the downwind perimeters of the exclusion zone at a temporary particulate monitoring station. The particulate monitoring will be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The

equipment will be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration will be visually assessed during all work activities.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/$m^3$) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/$m^3$ above the upwind level and provided that no visible dust is migrating from the work area.

- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/$m^3$ above the upwind level, work will be stopped and a re-evaluation of activities initiated. Work will resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/$m^3$ of the upwind level and in preventing visible dust migration.

All readings will be recorded in a CAMP Log Book and be available for State (DEC and DOH) personnel and local (county or municipal) health departments to review.

## 3.5 METHANE AND OXYGEN MONITORING, RESPONSE LEVELS, AND ACTIONS

Methane concentrations will be monitored **continuously** near the drill rig and injection equipment. The monitoring work will be performed using a landfill gas meter, or other appropriate equipment. The equipment will be calibrated at least daily following the manufacturer's instructions. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below. Calibration information will be recorded in a CAMP Log Book.

- If the methane concentration in the work area breathing zone exceeds 5%, work will be stopped and a re-evaluation of activities initiated. Work may continue only after the methane concentration falls below 5%.

All readings will be recorded in a CAMP Log Book and be available for State (DEC and DOH) personnel and local (county or municipal) health departments to review.

## 3.6 NUISANCE ODOR MONITORING, RESPONSE LEVELS, AND ACTIONS

Periodic monitoring of nuisance odors will be conducted at the downwind perimeter of the exclusion zone by smelling the ambient air. If nuisance odors are detected the work area will be checked to evaluate whether the odors are emanating from the source area. Other businesses in the area may produce nuisance odors. If the origin of the nuisance odors is determined to be the work area, work will be stopped and a re-evaluation of activities initiated.