PROPOSED REMEDIAL ACTION PLAN

Captain's Cove Condominiums
Operable Unit Number 02
State Superfund Project
Glen Cove, Nassau County
Site No. 130032
March 2016

Prepared by
Division of Environmental Remediation
New York State Department of Environmental Conservation

351586

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Glen Cove, Nassau County
Site No. 130032
February 2016

SECTION 1: SUMMARY AND PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), is proposing a remedy for the above referenced site. The disposal of hazardous wastes at the site has resulted in threats to public health and the environment that would be addressed by the remedy proposed by this Proposed Remedial Action Plan (PRAP). The disposal of hazardous wastes at this site, as more fully described in Section 6 of this document, has contaminated various environmental media. The proposed remedy is intended to attain the remedial action objectives identified for this site for the protection of public health and the environment. This PRAP identifies the preferred remedy, and discusses the reasons for the preferred remedy.

The New York State Inactive Hazardous Waste Disposal Site Remedial Program (also known as the State Superfund Program) is an enforcement program, the mission of which is to identify and characterize suspected inactive hazardous waste disposal sites and to investigate and remediate those sites found to pose a significant threat to public health and environment.

The Department has issued this document in accordance with the requirements of New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York; (6 NYCRR) Part 375. This document is a summary of the information that can be found in the site-related reports and documents in the document repository identified below.

Upon completion of the remedial elements contained herein, NYSDEC will re-evaluate the classification of the site on the registry of NYS Inactive Disposal Sites.

SECTION 2: CITIZEN PARTICIPATION

The Department seeks input from the community on all PRAPs. This is an opportunity for public participation in the remedy selection process. The public is encouraged to review the reports and documents, which are available at the following repository:

A public comment period has been set from:

03/8/2016 to 04/15/2016

A public meeting is scheduled for the following date:

3/23/2016 at 7:00PM

Public meeting location:

City Hall - City of Glen Cove
9 Glen Street
Glen Cove, NY 11542

At the meeting, the findings of the Pre-Construction Investigation will be presented along with a summary of the proposed remedy. After the presentation, a question-and-answer period will be held, during which verbal or written comments may be submitted on the PRAP.

Written comments may also be sent through 04/15/2016 to:

Heide-Marie Dudek
NYS Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, NY 12233
heidi.dudek@dec.ny.gov

The Department may modify the proposed remedy or select another of the alternatives presented in this PRAP based on new information or public comments. Therefore, the public is encouraged to review and comment on the proposed remedy identified herein. Comments will be summarized and addressed in the responsiveness summary section of the Record of Decision (ROD). The ROD is the Department's final selection of the remedy for this site.

Receive Site Citizen Participation Information By Email

Please note that the Department's Division of Environmental Remediation (DER) is "going paperless" relative to citizen participation information. The ultimate goal is to distribute citizen participation information about contaminated sites electronically by way of county email listservs. Information will be distributed for all sites that are being investigated and cleaned up in a particular county under the State Superfund Program, Environmental Restoration Program, Brownfield Cleanup Program, Voluntary Cleanup Program, and Resource Conservation and Recovery Act Program. We encourage the public to sign up for one or more county listservs at http://www.dec.ny.gov/chemical/61092.html

SECTION 3: SITE DESCRIPTION AND HISTORY

Location: The Captain's Cove Condominium site (Site) is located on Garvies Point Road in the City of Glen Cove. A site boundary modification was approved by the Department in March 2016 to incorporate areas of the Li Tungsten USEPA Superfund Site identified as Areas A, A', G and G' into the definition of the Captain's Cove State Superfund (Title 3) Site. The site is located along Glen Cove Creek. Operable Unit 2 (OU2) –which is the subject of this document, includes is defined as the areas of the Captain's Cove Site outside of the original Li Tungsten and Captain's Cove remedial areas. (see Figure 1)

Site Features and Current Zoning and Land Use: The site has been cleared of all buildings and foundations and now the City of Glen Cove is currently constructing a Ferry Terminal on the eastern portion of the site which includes the Li Tungsten Areas G and G'. The Ferry Terminal portion of the site is zoned commercial, while the remaining area has been zoned mixed use for restricted residential development.

Past Use of the Site: Historically, the site was used recreationally for boating, fishing, and swimming. Starting in the 1950's a portion of the site turned into a community dump. Municipal wastes, such as garbage, street debris, and yard waste, along with incinerator residues, wastewater treatment plant sludges, construction and demolition (C&D) debris, hazardous wastes including spent solvents, printing wastes, drums, and Li Tungsten mill tailings were dumped on the site. Disposal continued into the early 1980's. From the 1930's through 1965 the redefined site, the exception of the western end, was also used for the disposal of materials dredged from Glen Cove Creek.

Due to interest in the 1980's in redeveloping the Glen Cove Creek area, the site was the focus of several environmental investigations. These investigations identified metals in the soil exceeding background concentrations. On January 7, 1986, the NYSDEC placed the Captain's Cove Site on the New York State Registry of Inactive Hazardous Waste Disposal Sites (Registry) as a Class 2A site. The site classification was subsequently changed to Class 2 indicating substantial threat to human health or the environment.

The City of Glen Cove, the site owner at the time (Village Green Realty) wastes were placed, signed a Consent Order to perform a Title 3 remedial program to address the hazardous waste disposal. Subsequent to signing the Consent Order, Village Green Realty declared bankruptcy. The City of Glen Cove completed the work under the Consent Order. A Remedial Investigation and Feasibility Study were completed in 1999 with the Record of Decision requiring the excavation of waste to industrial/commercial standards signed in March 1999. The City of Glen Cove completed the Remedial Action in 2001.

During the Title 3 Remedial Investigation of the Captains Cove site, the City of Glen Cove identified radiological and metal contamination associated with the Li Tungsten site. The USEPA issued a Record of Decision for the Li Tungsten Operable Unit 2 in 1999 requiring the excavation of the contamination. The USEPA completed the work at Captain's Cove Condominium site in 2006.

In 2009, the City of Glen Cove received Federal Stimulus money to begin the construction of a high speed ferry terminal on the eastern portion of the site. Construction of the new ferry terminal began in 2010 and is scheduled for completion in 2016.

Subsequent to the construction of the Ferry Terminal foundation, a site boundary modification was prepared to better define the overall Captain's Cove Site and to clarify that the Li Tungsten's Areas A, A', G and G' which overlap part of the original Title 3 remediation area are included.

Site Geology and Hydrogeology: The Site is located along the northern shore of Glen Cove Creek. Soils observed at the site are similar to those observed throughout the Garvies Point Road area, the vadose zone consists of silt or silt and fine grained sand, while the saturated zone consists of sand underlain by an extensive and thick peat layer with a clay layer beneath it (observed off-site at 12- to 16-feet below ground surface).

Groundwater, which varies with tidal cycles, was encountered at the site between 7 and 10-feet below ground surface. Regional groundwater flow is in a southerly direction towards Glen Cove Creek.

Operable Units (OU): OU1: is the original NYSDEC Title 3 Area and Li Tungsten OU2 Areas A and A'. OU2 is defined as all areas of the Captain's Cove Site outside of the original Li Tungsten and Captain's Cove remedial areas. OU3 is the Ferry Terminal Area, which includes a small portion of the original Title 3 Area and Li Tungsten OU2 Areas G and G'.
OU22 is the subject of this document.

A Record of Decision was issued previously for OU1. The Department intends to issue a separate Amended Record of Decision for OU1 and a Record of Decision for OU3.

A site location map is attached as Figure 1.

SECTION 4: LAND USE AND PHYSICAL SETTING

The Department may consider the current, intended, and reasonably anticipated future land use of the site and its surroundings when evaluating a remedy for soil remediation. For this site, alternatives (or an alternative) that restrict(s) the use of the site to restricted residential use as described in Part 375-1.8(g) are/is being evaluated in addition to an alternative which would allow for unrestricted use of the site.

A comparison of the results of the investigation to the appropriate standards, criteria and guidance values (SCGs) for the identified land use and the unrestricted use SCGs for the site contaminants is included in the Tables for the media being evaluated in Exhibit A.

SECTION 5: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

The PRPs for the site, documented to date, include:

City of Glen Cove
Village Green Realty at Garvies Point, Inc.
Old Court Savings & Loan (In Receivership)
AGI-VR/Wesson Company;
Adams Carbide Corporation;
Alloy Carbide Company;
Chi Mei Corporation;
Climax Molybdenum Company;
Climax Molybdenum Marketing Corporation;
County Of Nassau, New York;
Cyprus Amax Minerals Company;
General Electric Company;
GTE Corporation;
H.C. Starck, Inc.;

Kennametal Inc.;
Kulite Tungsten Corporation:
M & R Industries, Inc.;
Minmetals Inc. /China National Metals and Minerals Import and Export Corporation;
OSRAM Sylvania Incorporated;
Philips Electronics North America Corporation;
Sandvik AB;
TDY Holdings, LLC;
TDY Industries, Inc.;
United States Department of Defense;
United States Department of the Treasury;
United States General Services Administration

On March 18, 1997, the City of Glen Cove (the site owner at the time wastes were placed), Village Green Realty at Garvies Point, Inc. (the then owner) and Old Court Savings & Loan (In Receivership) signed a Consent Order to perform a Title 3 RI/FS to address the hazardous waste disposal. Subsequent to signing the Consent Order, Village Green Realty at Garvies Point, Inc. declared bankruptcy. The City of Glen Cove completed the work under the Consent Order.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

A Pre-Construction Investigation (PCI) has been conducted which is now being used as the remedial investigation (RI) for this OU. The investigation defined the nature and extent of contamination resulting from previous activities at the site. The field activities and findings of the investigation are described in the PCI Report.

The following general activities are conducted during an RI:

- Research of historical information,
- Geophysical survey to determine the lateral extent of wastes,
- Test pits, soil borings, and monitoring well installations,
- Sampling of waste, surface and subsurface soils, groundwater, and soil vapor,
- Sampling of surface water and sediment,
- Ecological and Human Health Exposure Assessments.

The analytical data collected on this site includes data for:

- groundwater
- soil

6.1.1: Standards, Criteria, and Guidance (SCGs)

The remedy must conform to promulgated standards and criteria that are directly applicable or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, Criteria and Guidance are hereafter called SCGs.

To determine whether the contaminants identified in various media are present at levels of concern, the data from the PCI were compared to media-specific SCGs. The Department has developed SCGs for groundwater, surface water, sediments, and soil. The NYSDOH has developed SCGs for drinking water and soil vapor intrusion. The tables found in Exhibit A list the applicable SCGs in the footnotes. For a full listing of all SCGs see: http://www.dec.ny.gov/regulations/61794.html

6.1.2: RI Results

The data have identified contaminants of concern. A "contaminant of concern" is a hazardous waste that is sufficiently present in frequency and concentration in the environment to require evaluation for remedial action. Not all contaminants identified on the property are contaminants of concern. The nature and extent of contamination and environmental media requiring action are summarized in Exhibit A. Additionally, the PCI Report contains a full discussion of the data. The contaminant(s) of concern identified for this Operable Unit at this site is/are:

Arsenic, Lead, Radium-226 and Thorium-232

As illustrated in Exhibit A, the contaminant(s) of concern exceed the site-specific excavation criteria for arsenic and lead.

6.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before issuance of the Record of Decision.

There were no IRMs performed at this site during the PCI.

6.3: Summary of Environmental Assessment

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts may include existing and potential future exposure pathways to fish and wildlife receptors, wetlands, groundwater resources, and surface water.

The Fish and Wildlife Resources Impact Analysis (FWRIA) for OU1, which is included in the 1999 Captain’s Cove RI report, presents a detailed discussion of the existing and potential impacts from the site to fish and wildlife receptors.

Soils: The recent investigations have identified isolated pockets of metals contamination exceeding the site-specific excavation criteria established for the site for lead and arsenic to address the potential for these metals to migrate or leach to the groundwater. Contaminants of concern in the soil include arsenic, lead, radium-226 and thorium-232.

Groundwater: In accordance with the original Captain's Cove and Li Tungsten RODs, groundwater monitoring has continued to evaluate groundwater attenuation for semi volatile organic compounds (SVOCs) and metals. Although, the SVOCs 2-methylnatphalene, acenapthalene, fluorine, naphthalene, and phenanthrene and volatile organic compound (VOC) chlorobenzene continue to be detected above the site SCGs, overall concentrations continue to decrease. The additional VOCs detected are indicative of a petroleum spill located near the north-western section of OU2. Metals however have not shown expected reductions leading to the development of the site-specific excavation criteria.

6.4: Summary of Human Exposure Pathways

This human exposure assessment identifies ways in which people may be exposed to site-related contaminants. Chemicals can enter the body through three major pathways (breathing, touching or swallowing). This is referred to as *exposure*.

People may come into contact with contaminants in soils in OU1 and OU2 by walking on the site, digging or otherwise disturbing the soils. Measures are in place to prevent contact with residual soil contamination in OU-3. People are not drinking the contaminated groundwater because the area is served by a public water supply not affected by this site. Volatile organic compounds in the groundwater may move into the soil vapor (air spaces within the soil), which in turn may move into overlying buildings and affect the indoor air quality. This process, which is similar to the movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor intrusion. Because the site is vacant, the inhalation of site-related contaminants due to soil vapor intrusion does not represent a current concern. The potential exists for people to inhale site contaminants for any future on-site redevelopment or occupancy.

6.5: Summary of the Remediation Objectives

The objectives for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375. The goal for the remedial program is to restore the site to pre-disposal conditions to the extent feasible. At a minimum, the remedy shall eliminate or mitigate all significant threats to public health and the environment presented by the contamination identified at the site through the proper application of scientific and engineering principles.

Based on the RI and PCI data the Remedial Action Objectives (RAOs) for the site are:

Groundwater

RAOs for Public Health Protection

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.
- Prevent contact with, or inhalation of volatiles, from contaminated groundwater.

RAOs for Environmental Protection

- Restore groundwater aquifer to pre-disposal/pre-release conditions, to the extent practicable
- Remove the source of groundwater or surface water contamination

Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.

Soil Vapor

RAOs for Public Health Protection

- Mitigate impact to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at a site.

SECTION 7: SUMMARY OF THE PROPOSED REMEDY

To be selected, the remedy must be protective of human health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. The remedy must also attain the remedial action objectives identified for the site, which are presented in Section 6.5.

The proposed remedy is referred to as the Excavation and Backfill remedy.

The elements of the proposed remedy are as follows:

1. Remedial Design: A remedial design program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follow:
    - Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
    - Reducing direct and indirect greenhouse gases and other emissions;
    - Increasing energy efficiency and minimizing use of non-renewable energy;
    - Conserving and efficiently managing resources and materials;
    - Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
    - Maximizing habitat value and creating habitat when possible;
    - Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals; and
    - Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.

2. Excavation: Excavation and off-site disposal of soil delineated by the PCI or during development which concentrations of the following contaminants, above these site specific removal criteria:
    - Arsenic above 175 parts per million (ppm);
    - Lead above 660 ppm;
    - Radium-226 above 5pCi/g (not including the natural background radiation of nuclide of approximately 1pCi/g)

- Thorium-232 above 5pCi/g (not including the natural background radiation of nuclide of approximately 1pCi/g)

In addition to soil exceeding the above criteria, soil or waste meeting the following definitions will also be excavated and disposed when identified during development:

- Grossly contaminated soil, as defined by 6NYCCR Part 375-1.2(u); and
- Non-aqueous phase liquid, as defined by 6NYCCR Part 375-1.2(ac).

Soil from the site which does not exceed the site-specific excavation criteria may be used to backfill the excavation below the cover system described in remedy element 2, to the extent that sufficient volume of on-site is available. As needed, clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to complete the backfilling of the excavation and establish the designed grades and the site will be graded to accommodate installation of a cover system as described in remedy element 3.

3. Cover System: A site cover will be required to allow for restricted residential use of the site. The cover will consist either of the structures such as buildings, pavement, sidewalks comprising the site development or a soil cover in areas where the upper two feet of exposed surface soil will exceed the restricted residential SCOs. Where the soil cover is required, it will be a minimum of two feet of soil placed over a demarcation layer, with the upper six inches of soil of sufficient quality to maintain a vegetative layer. Soil cover material, including any fill material brought to the site, will meet the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d).

4. Institutional Control: Establish an institutional control in the form of an environmental easement for the controlled property which will: (a) require the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3); (b) allow the use and development of the controlled property for restricted residential as defined by Part 375-1.8(g), although land use is subject to local zoning laws; (c) restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or County DOH ; and (d) require compliance with the Department approved Site Management Plan.

5. Site Management: Require a Site Management Plan, which includes the following:
    - an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:
        - Institutional Controls: The environmental easement discussed in element 4 above.
        - Engineering Controls: The soil cover listed above in element 3.

    - Any remaining contamination and the depth of contamination that will be managed under the SMP Plan will be delineated on a Site Plan/Survey

    - This plan includes, but may not be limited to:

1. An excavation plan which details the provisions for management for future excavations of remaining contamination. Details shall include, but are not limited to:
   a. All soil disturbed during redevelopment or site management will need to be handled in accordance to the approved excavation plan.
   b. all soil excavated during development that exceeds the removal criteria defined in element 1 above must be disposed of offsite at an appropriate facility.
   c. All excavated material that will be used onsite must be sampled in accordance with DER 10 for Backfill.

2. A provision, should redevelopment occur, to ensure no soil exceeding protection of groundwater concentrations as defined in Part 375.6.8 (b) will remain below storm water retention basin or infiltration structures
3. A provision for evaluation of the potential for soil vapor intrusion in future buildings developed onsite, including provision for implementing actions recommended to address exposures related to soil vapor intrusion.

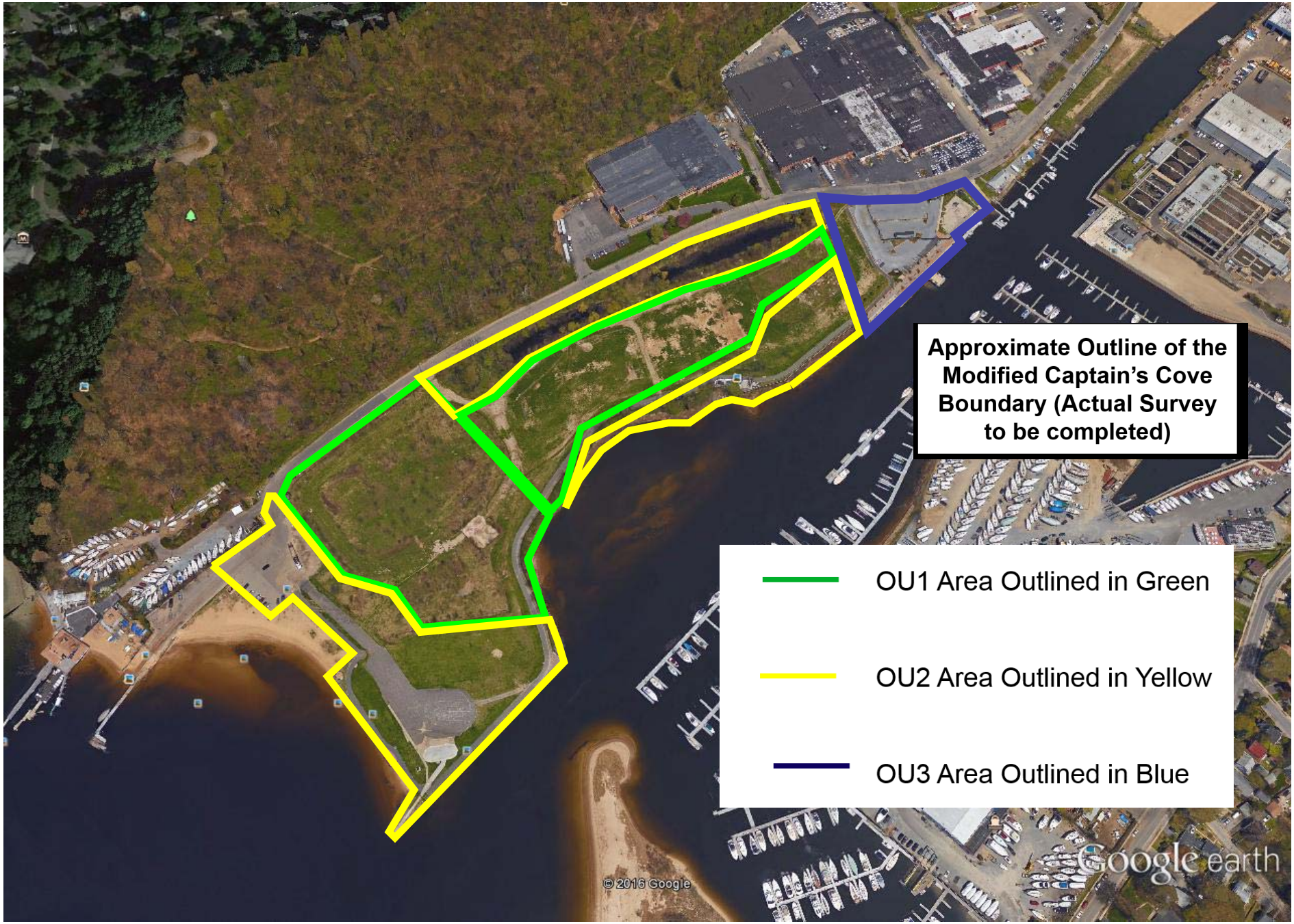
4. A provision for the management and inspection of the identified engineering controls;

5. Maintaining site access controls and Department notification;

6. The steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

7. Descriptions of the provisions of the environmental easement including any land use and/or groundwater use restrictions.

8. A monitoring Plan to assess the performance and effectives of the remedy. The plan includes, but may not be limited to:
   a. Monitoring of groundwater to assess the performance and effectiveness of the remedy;
   b. A schedule of monitoring and frequency of submittals to the Department;
   c. Monitoring for vapor intrusion for any occupied existing or future buildings developed on the site, as may be required by the Institutional and Engineering Control Plan discussed above.



Google earth

feet 1000

meters 400

Figure 1: OU2 Site Boundaries

Exhibit A

Nature and Extent of Contamination

This section describes the findings of the Pre-Construction Investigation (PCI) for all environmental media that were evaluated. As described in Section 6.1, samples were collected from various environmental media to characterize the nature and extent of contamination.

Groundwater

As part of the Pre-Construction Investigation 21 groundwater samples were collected throughout the Captain's Cove Parcel to evaluate the success of the original OU1 remedy and to determine if there continuing impacts to the groundwater. 12 samples were collected from OU2. As noted in the table below, semivolatile organic compounds (SVOCs), volatile organic compounds (VOCs), radiologicals and metals were detected above their Ambient Water Quality Standards and Guidance Values. The SVOCs 2-methylnatphalene, acenapthalene, fluorine, naphthalene, and phenanthrene and the VOC chlorobenzene, which were all found during the original OU1 remedial investigation continue to be detected above the Ambient Water Quality Standards and Guidance Values, however overall their concentrations continue to decrease. The additional VOCs detected are indicative of a petroleum spill located near the north-western section of OU2. Overall, metals concentrations in the groundwater have not shown the reductions that would be expected.

Table 1 - Groundwater

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
VOCs			
1,2,4 – Trimethybenzene	ND –1.2	5	0 of 4
Chlorobenzene	ND – 91	1	2 of 16
Ethylbenzene	ND –2	5	0 of 16
Toluene	ND – 10.77	5	0 of 16
Xylenes, Total	ND – 8.2	5	1 of 16
SVOCs			
2-Methylnapthalene	ND – 56	4.2	3 of 16
Acenapthene	ND - 220	20	3 of 16
Anthracene	ND - 31	50	0 of 16
Benzo(a)anthracene	ND – 31	0.002	2 of 16
Benzo(a)pyrene	ND – 19	ND	3 of 16
Benzo(b)fluoranthene	ND – 29	0.002	3 of 16

Benzo(k)fluoranthene	ND – 11	0.002	1 of 16
Bis(2-Ethyhexyl)phthalate	ND - 14	5	1 of 16
Chrysene	ND – 30	0.002	2 of 16
Fluoranthene	ND – 240	50	1 of 16
Fluorene	ND – 150	50	2 of 16
Indeno(1,2,3-cd)pyrene	ND – 9.4	0.002	2 of 16
Naphthalene	ND – 59	10	3 of 16
Phenanthrene	ND -500	50	2 of 16
Pheno	ND – 7.7	1	1 of 16
Pyrene	ND – 200	50	1 of 16
Inorganics			
Antimony (Total)	ND	3	0 of 17
Antimony (Dissolved)	ND	3	0 of 17
Arsenic (Total)	ND – 480	25	6 of 17
Arsenic (Dissolved)	ND – 296	25	3 of 17
Barium (Total)	ND – 1,240	1,000	1 of 17
Barium (Dissolved)	ND – 390	1,000	0 of 17
Beryllium (Total)	ND	3	0 of 17
Beryllium (Dissolved)	ND	3	0 of 17
Cadmium (Total)	ND – 33.8	5	1 of 17
Cadmium (Dissolved)	ND – 2.5	5	0 of 17
Chromium (Total)	ND – 160	50	1 of 17
Chromium (Dissolved)	ND – 216	50	1 of 17
Copper (Total)	ND – 146	200	0 of 17
Copper (Dissolved)	ND – 80.4	200	0 of 17

Iron (Total)	ND – 111,000	300	17 of 17
Iron (Dissolved)	ND – 93,400	300	7 of 17
Lead (Total)	ND – 98	25	4 of 17
Lead (Dissolved)	ND – 148	25	2 of 17
Magnesium (Total)	ND – 66,200	35,000	2 of 17
Magnesium (Dissolved)	ND – 76,400	35,000	3 of 17
Manganese (Total)	ND – 19,400	300	17 of 17
Manganese (Dissolved)	ND – 19,200	300	17 of 17
Mercury (Total)	ND – 1.4	0.7	2 of 17
Mercury (Dissolved)	ND – 0.49	0.7	0 of 17
Nickel (Total)	ND – 77	100	0 of 17
Nickel (Dissolved)	ND – 98.7	100	0 of 17
Selenium (Total)	ND – 26.2	10	4 of 17
Selenium (Dissolved)	ND – 30.5	10	4 of 17
Sodium (Total)	ND – 829,000	20,000	17 of 17
Sodium (Dissolved)	ND – 908,000	20,000	17 of 17
Thallium (Total)	ND – 7.5	0.5	1 of 17
Thallium (Dissolved)	ND – 14.3	0.5	1 of 17
Radiological			
Radium-226 (Total)	0.441 - 6.13	3	1 of 3
Radium-226 (Dissolved)	1.06 - 6.89	3	1 of 3
Radium-226+Radium-228 (Total)	0.821 - 11.65	5	1 of 3
Radium-226+Radium-228 (Dissolved)	1.719 - 10.97	5	1 of 3

a - ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, in water.
b- SCG: Standard Criteria or Guidance - Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1), 6 NYCRR Part 703, Surface water and Groundwater Quality Standards, and Part 5 of the New York State Sanitary Code (10 NYCRR Part 5).

Soil

Approximately 380 surface and subsurface soil samples were collected across the Captain's Cove Site as part of the PCI. The results of the soil sampling are presented below are for OU2. Review of the soil samples collected as part of the PCI shows isolated pockets of residual metals contamination were within OU1 and OU2.

Table 2- Soil

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Excavation Criteria (ppm)	Frequency Exceeding Excavation Criteria
Inorganics					
Arsenic	ND to 67.8	13	22 of 168	175	0 of 168
Lead	1.4 to 19,900	63	85 of 175	660	7 of 175

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.

As shown above, the surface and subsurface soil data collected as part of the Pre-Construction Investigation indicate that no significant areas of gross contamination exist within OU2. However, isolated pockets of elevated metals contamination were noted in the soil across the entire site at levels which could impact groundwater. To ensure a consistent remedial approach, contaminants of concern were derived for both OU1 and OU2. As noted above, ongoing groundwater monitoring as part of the OU1 remedy and the PDI has noted that while VOC and SVOC groundwater contamination continues to decline, metals contamination has not shown the expected reductions. Therefore, to evaluate the potential impact that the isolated pockets may have on groundwater, a site-specific evaluation of the potential of arsenic and lead migration (leaching) to the groundwater was performed. The evaluation calculated the site-specific partition coefficient (Kd) for arsenic and lead using leachate test data collected at the site. Utilizing the Kd and the methodology outlined in the NYSDEC *Development of Soil Cleanup Objectives Technical Support Document* September 2006, site-specific excavation criteria were developed to mitigate the potential of arsenic and lead to leach to groundwater. The methodology presented in the Technical support document utilizes the site-specific Kd with a Dilution Attenuation Factor (DAF). The DAF is representative of the five mechanisms that occur during contaminant transport from the soil to the groundwater. However, because two of the mechanisms (volatilization and sorption/desorption) in general do not apply to inorganic compounds, the DAF presented in the Technical Support document was modified reducing it from 100 to 60 to account for only the remaining three mechanisms (leaching and diffusion, transformation and degradation, and change in concentration of contaminants after reaching and/or mixing with the groundwater surface). Therefore, utilizing the DAF of 60 and the site-specific Kd value for arsenic and lead, the arsenic and lead site specific excavation criteria to protect groundwater are 175 parts per million (ppm) and 660 ppm, respectively.

Based on the findings of the Pre-Construction Investigation, metals contamination attributed to the Li Tungsten and Captain's Cove OU1 site was found in isolated locations exceeding the excavation criteria.

While data collected to date indicates that there is no evidence of significant residual radiological contamination left onsite, based on the historical documentation of contamination at the site, the excavation criteria for radium-226 and thorium-232 will be the soil cleanup objectives as outlined in the USEPA Li Tungsten 2005 Explanation of Difference.