January 2007

Alternatives Analysis Report

Environmental Restoration Project
Clean Water/Clean Air Bond Act of 1996

ERP Site No. E-510020
Durkee Street Parking Lot
Operable Unit 2
(Parking Lot and Farmer's Market)
City of Plattsburgh
Clinton County, New York

Prepared for:

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ENVIRONMENTAL RESTORATION PROJECT
ALTERNATIVES ANALYSIS REPORT
DURKEE STREET PARKING LOT OPERABLE UNIT 2
(PARKING LOT AND FARMER'S MARKET)
CITY OF PLATTSBURGH, NEW YORK

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1.0 INTRODUCTION

1.1 Purpose and Organization

The intent of this Alternatives Analysis Report (AAR) is to present site specific remediation alternatives based on the findings and conclusions of the Remedial Investigation (RI) Report for Operable Unit 2 (Parking Lot and Farmer's Market) of the Durkee Street Parking Lot Environmental Restoration Project (ERP) prepared by C.T. Male Associates, P.C., dated January 2007. The overall goal of the AAR is to develop and evaluate feasible remedial action(s) to either achieve compliance with established regulatory clean up guidance levels and/or to protect human health and the environment from contaminated media present at the subject site. The AAR is the technical support document for the NYSDEC's Proposed Remedial Action Plan (PRAP), which solicits public comments on the proposed remedy. The AAR and PRAP will be placed in the document repositories to allow a 45-day public comment period. Any public comments on the PRAP will be addresses by the NYSDEC in a Responsiveness Summary prior to the NYSDEC issuing a Record of Decision (ROD).

This AAR is organized and prepared in accordance with the New York State Department of Environmental Conservation (NYSDEC) DRAFT DER-10 Technical Guidance for Site Investigation and Remediation, issued December 25, 2002. The AAR consists of three (3) main sections. Section 1 is an introduction which presents the purpose of the project and background information including a site description, site history, nature and extent of site contamination, and contaminant fate and transport. Human and ecological exposure pathways are also discussed in this section. Section 2 identifies remedial alternatives available for addressing the on-site contamination and their objectives. Section 3 presents an individual and comparative analysis of each of the alternatives discussed within the report.

1.2 Project Background

The City of Plattsburgh (the City) submitted an application to the New York State Department of Environmental Conservation (DEC) for participation in the NYS Environmental Restoration Program (ERP) in relationship to the Durkee Street Parking Lot located along the east side of Durkee Street within the City of Plattsburgh, Clinton

County, New York (herein "the Site"). A Site Location Map is presented as Figure 1. NYSDEC subsequently notified the City of its eligibility to participate in the ERP and the City executed a State Assistance Contract (SAC) which required the submission, review, approval and implementation of investigative work plans under the ERP. Because southern portions of the parking lot were slated for near future re-development, the site was subdivided into two Operable Units (OU1 and OU2) to accelerate the investigation of the southern portion of the parking lot. OU2, which is the focus of this AAR, consists of an asphalt-paved public parking lot and Farmer's Market. The Remedial Investigation RI has been completed for OU2. The analysis of remedial alternatives for OU1 has been prepared under separate cover (AAR - Durkee Street Parking Lot Operable Unit 1 (Office Building/Parking Deck).

The ERP investigation of OU2 generally involved the collection and analysis of 15 near-surface soil samples; advancing 16 soil borings; collection and analysis of 18 subsurface samples from the soil borings; installation of 16 groundwater monitoring wells; collection and analysis of 19 groundwater samples from the installed monitoring wells; collection and analyses of 6 subsurface soil gas samples to aid in a vapor intrusion survey for any future buildings on the site; a survey of public and private wells; and a Data Usability Summary Report (DUSR). A supplemental investigation was conducted to further delineate the horizontal extent of chlorinated volatile organic compounds (CVOCs) which were detected at concentrations exceeding NYSDEC regulatory values from groundwater sampled at monitoring well MW-10. Monitoring well MW-10 was installed during the investigation of OU1 prior to the boundaries of the operable units being established. Upon establishment of the boundaries, it was determined that monitoring well MW-10 was located within the boundaries of OU2. Moreover, additional groundwater sampling was conducted at MW-10 and other select wells installed as part of the supplemental investigation to further evaluate the persistence and severity of CVOCs at these well locations.

Results of the site investigation were incorporated in a Remedial Investigation (RI) Report. The RI describes the investigations conducted at the site for defining the nature and extent of contamination in near-surface soil, subsurface soil, groundwater and soil gas. From this data decisions regarding the need for additional remedial actions were made and remedial options were evaluated based in part on the intended use of the Site, thus constituting the AAR. The target goals of the RI was to identify contaminants of concern, define the horizontal and vertical extent of such contamination, and to

produce data of sufficient quantity and quality to support the development and analyses of remedial alternatives analysis.

1.2.1 Site Description

OU2 is located adjacent to and east of Durkee Street in the City of Plattsburgh, Clinton County, New York. The site is approximately 3.07 acres in size, and makes up the central and northern portions of the 4.38-acre Durkee Street Parking Lot. The site consists primarily of an asphalt-paved public parking area with a partially enclosed Farmer Market pavilion located along its southeastern property boundary. The site boundaries are depicted on the Site Plan in Figure 2 (which was excerpted from the January 2007 OU2 RI Report).

1.2.2 Site History

A review of historical Sanborn mapping depicted past usages at OU2 to consist of a structure utilized for auto repair activities (1918 and 1927 maps) and the Plattsburgh Steam Laundry (1918 map) on western portions of OU2 adjacent to Durkee Street and a former mill (1909 map) on eastern portions of OU2. Other past site usages depicted on the maps included a bowling/billiards hall, various storage buildings, apartments and dwellings, and a structure historically utilized for retail and storage, and as a bakery and restaurant. An apparent manmade water inlet into northeastern portions of OU2 from the adjoining Saranac River was depicted on the 1918, 1927, 1935, and 1965 maps. The site was converted into its present use as a parking lot some time after 1965.

1.2.3 Potential Historical Contaminants of Concern

Potential historical contaminants of concern are affiliated with past manufacturing activities on the site and include petroleum and solvent related compounds. Additionally, fill materials of unknown origin underlie the entire site at thicknesses ranging from 0 to 1 foot beneath the asphalt pavement to 20 feet below grade.

1.2.4 Summary of the Remedial Investigation

The goal of the RI of the site was to identify and assess potential sources of contamination, and to develop a comprehensive strategy to remediate the identified

contamination, as necessary to protect human health and the environment. A report entitled "Remedial Investigation/Alternatives Analysis Report, Durkee Street Parking Lot, Operable Unit 2, Parking Lot and Farmer's Market, City of Plattsburgh, New York"; dated January 2007 details the investigative activities which were completed and is available for review within the document repositories. The following tasks were completed as part of the RI/AAR for the site:

- Site Survey;
- Near-Surface and Subsurface Soil Sampling and Analysis;
- Test Boring and Monitoring Well Installations;
- Groundwater Sampling and Analysis;
- Soil Gas Sampling and Analysis;
- Survey of Private and Public Wells; and
- Data Usability Summary Report (DUSR).

1.3 Nature and Extent of Contamination

1.3.1 General

Sampling and analysis of several media types was conducted during the RI to determine the nature and extent of contamination at the subject site. These media types included near-surface soils, subsurface soils/fill, groundwater and soil gas.

Table 1.3.1-1 lists the frequencies (i.e., 9 of 21 sampling locations) for the contaminants of concern (COCs) in each media type. The table presents compounds and analytes that were detected at concentrations which exceeded the project Standards, Criteria and Guidance Values (SCGs) which included NYSDEC TAGM 4046 guidelines for soils; NYSDEC Division of Water Technical and Operational Guidance Series (TOGS) for groundwater; and NYSDOH air guidance values and the EPA BASE Data Background Levels, as provided in the NYSDOH February 2005 Public Comment Draft entitled "Guidance for Evaluating Soil Vapor Intrusion in the State of New York" for soil gas. Compounds and analytes detected in the media samples at concentrations which

exceeded the laboratory detection limit, but at concentrations below SCGs are not included on the table. The table summarizes all of the samples collected as a function of the RI (OU2).

It should be noted, and as discussed in the RI report, that metals were not analyzed from groundwater sampled at MW-13, MW-14 and MW-15 due to an insufficient volume of groundwater within the wells during sampling. Metals were not included in the analytical suite for monitoring wells MW-21 to MW-26, which were installed during the supplemental investigation of the site, as the parameters of interest included chlorinated volatile organic compounds only.

TABLE 1.3.1-1: Summary Table of Compounds and Analytes Exceeding SCGs

Media	Class	Contaminant of Concern	Detected Concentration Range	Frequency of Exceeding Standard	Applicable SCG [1][3]	Eastern USA Background [2]
Near-Surface Soils (mg/kg)	Metals	Beryllium	0.171 to 0.386	6 of 15	0.16 or SB	0 to 1.75
		Calcium	36,300 to 266,000	8 of 15	SB	130 to 35,000
		Copper	49.0	1 of 15	25 or SB	1 to 50
		Iron	4,810 to 12,200	15 of 15	2,000 or SB	2,000 to 550,000
		Magnesium	5,150 to 24,500	7 of 15	SB	100 to 5,000
		Nickel	14.4 to 18.2	3 of 15	13	0.5 to 25
		Zinc	22.7 to 153	5 of 16	20 or SB	9 to 50
Subsurface Soil/fill (mg/kg)	SVOCs	Dibenzofuran	8.9	1 of 18	6.2	NA
		Benzo(a)anthracene	0.4 to 20	6 of 18	0.224 or MDL	NA
		Chrysene	0.49 to 19	5 of 18	0.4	NA
		Benzo(b)fluoranthene	0.45 to 17	5 of 18	1.1	NA
		Benzo(k)fluoranthene	0.23 to 8.4	4 of 18	1.1	NA
		Benzo(a)pyrene	0.11 to 17	8 of 18	0.061 or MDL	NA
		Indeno(1,2,3-cd)pyrene	5.5	1 of 18	3.2	NA
		Dibenzo(a,h)anthracene	0.064 to 0.78	4 of 18	0.014 or MDL	NA
	Metals	Beryllium	0.173 to 0.368	8 of 11	0.16	0 to 1.75
		Calcium	38,100 to 117,000	5 of 11	SB	130 to 35,000
		Copper	57.7	1 of 11	25	1 to 50
		Iron	5,560 to 14,600	11 of 11	2,000 or SB	2,000 to 550,000
		Magnesium	5,610 to 16,700	6 of 11	SB	100 to 5,000
		Mercury	0.110 to 1.0	3 of 11	0.1	0.001 to 0.2
		Zinc	21.0 to 237	9 of 11	20 or SB	9 to 50
Ground Water (ug/l)	VOCs	Methyl tert-butyl ether	57	1 of 16	10	NA
	CVOC[4]	Vinyl Chloride	2.2 to 170	3 of 16	2	NA
		1,1-Dichloroethene	6.0	1 of 16	5	NA
		trans-1,2-Dichloroethene	8.0 to 410	2 of 16	5	NA
		cis-1,2-Dichloroethene	6.0 to 680	4 of 16	5	NA

TABLE 1.3.1-1: Summary Table of Compounds and Analytes Exceeding SCGs						
Media	**Class**	**Contaminant of Concern**	**Detected Concentration Range**	**Frequency of Exceeding Standard**	**Applicable SCG (1)(3)**	**Eastern USA Background (2)**
Ground Water (ug/l)		Trichloroethene	11 to 99	1 of 16	5	NA
	SVOCs	bis(2-Ethylhexyl) phthalate	5.3	1 of 16	5	NA
	Metals	Iron	1,380 to 38,200	6 of 7	300	NA
		Lead	80.5	1 of 7	25	NA
		Magnesium	50,400 to 128,000	7 of 7	35,000 (GV)	NA
		Manganese	713 to 1,720	6 of 7	300	NA
		Sodium	224,000 to 1,790,000	6 of 7	20,000	NA
Soil Gas (ug/m^3)		n-Hexane	7.8 to 120	2 of 6	6.4	NA
		Chloroform	2.4 to 11	2 of 6	<0.4	NA
		Benzene	4.5 to 12	6 of 6	3.7	NA
		Toluene	20 to 53	6 of 6	16	NA
		Ethylbenzene	4.2 to 38	6 of 6	1.6	NA
		Xylene (m,p)	12 to 120	5 of 6	7.3	NA
		Xylene (o)	3.7 to 43	5 of 6	2.6	NA
		Styrene	2.5 to 5.1	3 of 6	<1.6	NA
		1,2,4-Trimethylbenzene	3.2	1 of 6	3.1	NA

Table Notes:

(1) Technical and Administrative Guidance Memorandum #4046, Determination of Soil Cleanup Objectives and Cleanup Levels, NYSDEC, January 24, 1994, Revised April 1995 for soil. NYSDEC Division of Water Technical and Operational Guidance Series (1.1.1), Ambient Water Quality Standards and Guidance Values and Effluent Limitations, June 1998 for groundwater and surface water.

(2) Eastern USA background concentrations as reported in a 1984 survey of reference material by E. Carol McGovern, NYSDEC.

(3) The SCG for Soil Gas is the highest reference value promulgated in either the NYSDOH Air Guidance Values, the EPA BASE Data Background Levels or the Ambient Analytical data obtained during the sampling event.

(4) Groundwater was sampled at select monitoring wells on three separate occasions to gage the persistence and severity of CVOCs. The wells were samples during the RI, as part of the supplemental investigation and during an additional groundwater sampling event in Fall of 2006. The "detected concentration ranges" and "frequency of exceeding standard" columns for the five listed CVOCs are a summation of results obtained from all sampling events.

GV Guidance Value
NA Not Applicable
MDL The Laboratory Method Detection Limit (MDL)
SB Site Background

As depicted on the table, the primary contaminants of concern at the site are metals in near-surface soils; semi-volatile organic compounds (SVOCs) and metals in subsurface soils and fill material; volatile organic compounds (VOCs), one SVOC and metals in groundwater; and organic vapors in soil gas. The following summarizes the nature and extent of contamination for the project site per media type.

Near-Surface Soils

VOCs, SVOCs, pesticides and PCBs were not detected at concentrations exceeding SCGs from the near-surface soil sampling locations.

Seven (7) metals were detected above SCGs at varying frequencies from the sampling locations. These metals included beryllium, calcium, copper, iron, magnesium, nickel and zinc. Of the metals detected above SCGs, calcium, magnesium and zinc were detected at concentrations exceeding their respective Eastern USA Background ranges.

Subsurface Soils and Fill Material

Eight (8) SVOCs were detected above SCGs at varying frequencies at select sampling locations. Eight (8) of the 8 SVOCs above SCGs were detected at SB-14. Six (6) of the 8 SVOCs above SCGs were each detected at SB-22 and SB-24. Five (5) of the 8 SVOCs above SCGs were detected at SB-21.

Seven (7) metals were detected above SCGs at varying frequencies at the sampling locations. Of the metals detected, calcium, copper, magnesium, mercury and zinc were detected at concentrations exceeding both SCGs and their Eastern USA Background values.

Based on the number and frequency of SVOCs and metals above SCGs, the RI concluded that the site's subsurface soils and fill are impacted by these constituents.

Groundwater

Five (5) CVOCs and MTBE were detected at concentrations exceeding SCGs from the sampled wells. Five (5) of the 5 CVOCs were detected at monitoring well MW-10 while two (2) of the 5 CVOCs were detected in monitoring wells MW-25 and MW-26. One (1) of the 5 CVOCs was detected at MW-23. Monitoring wells MW-23, MW-25 and MW-26 were completed as part of the supplemental investigation within the southern portions of OU2. From the foregoing, it can be concluded that monitoring well MW-10 and three down gradient monitoring wells (MW-23, MW-25 and MW-26) are impacted by CVOCs above SCGs. MTBE, which is a constituent of gasoline, was detected above its SCG at monitoring well MW-17, which is located within the northern portion of OU2 adjacent to an off-site gasoline station.

One SVOC (bis(2-Ethylhexyl)phthalate) was detected in groundwater above its applicable SCG at MW-10. Bis(2-Ethylhexyl)phthalate is a common laboratory contaminant that was not detected in the equipment blank, and the DUSR report did not flag the compound as a laboratory contaminant.

Five (5) metals were detected at concentrations exceeding their respective SCGs. These included iron (7 of 7 sampling locations), lead (1 of 7 sampling locations), magnesium (7 of 7 sampling locations), manganese (6 of 7 sampling locations) and sodium (6 of 7 sampling locations).

Soil Gas

Seven (7) petroleum related organic vapors were detected above SCGs at varying frequencies at the soil gas sampling locations, which would be expected in relation to the site's current usage as a parking lot. One chlorinated volatile organic compound, chloroform, was found at a concentration exceeding its SCG at SG-4 and SG-8.

The NYSDOH has verbally indicated that the elevated soil gas concentrations would require a sub slab vapor barrier system be constructed and maintained beneath any future site structures.

Summary

Calcium, magnesium and zinc were the only metals detected above SCGs and Eastern USA Background levels in near-surface soils. Eight (8) SVOCs and seven (7) metals were detected at varying frequencies from all subsurface soil/fill sampling locations. Metals and SVOCs are typical constituents of urban fill. Low level CVOCs, one SVOC, and metals were detected in groundwater. The CVOCs were confined to groundwater sampled from MW-10 (highest concentrations) and monitoring wells MW-23, MW-25 and MW-26, which are located downgradient of MW-10. Monitoring wells MW-23, MW-25 and MW-26 were installed within the southern portion of the site as part of the supplemental investigation of OU2.

1.3.2 Contaminant Fate and Transport

The primary contaminants of concern at the site are metals in near-surface soils; SVOCs and metals in subsurface soils and fill material; CVOCs, one SVOC and metals in groundwater; and organic vapors in soil gas.

The SVOCs and metals in near-surface and subsurface soil/fill will tend to adhere to surrounding soil and fill particles and not readily leach into underlying groundwater. This is exemplified by the presence of only two (2) of the eight (8) metals and none of the SVOCs detected above SCGs in the near-surface soil and subsurface soil/fill samples being detected above SCGs within the sampled groundwater. SVOCs in subsurface soils may volatilize to the atmosphere should the soils/fill be disturbed or leach into groundwater. VOCs were not detected above SCGs in near-surface and subsurface soils and fill.

The CVOCs, MTBE and SVOC in groundwater are in a dissolved phase and will tend to migrate with groundwater towards the Saranac River. Metals in groundwater (except sodium, which dissolves in water) are expected to adhere to surrounding soil and fill particles but may migrate in the direction of groundwater flow.

The transport mechanisms for the contaminants present at the site are migration within the groundwater and/or volatilization into the atmosphere. The chlorinated VOCs, with the exception of vinyl chloride, tend to migrate in the lower portions of the aquifer due to their densities being greater than 1. Vinyl chloride and MtBE, which each have densities that are less than one, will tend to remain in upper portions of the aquifer. The SVOCs are currently confined to the soil and fill materials and could be dispersed to the atmosphere should this media be disturbed. However, should the SVOCs migrate downwards into the groundwater, they will tend to sink to the bottom of the aquifer to a less permeable soil type (glacial till) and migrate in the direction of groundwater flow and/or the surface of the less permeable unit. Most metals are strongly held, reducing their migration and extent of contamination, with the exception of calcium and sodium, which readily dissolve in groundwater. CVOC contaminants within the groundwater and vadose zone will volatilize into the unsaturated soils above the water table, and eventually will diffuse into the atmosphere. The CVOCs were detected at concentrations slightly above their SCGs and are viewed as "daughter" products of more persistent solvents that have degraded over time under anaerobic conditions. Should current and future anaerobic conditions be similar to those that have degraded the principal chlorinated contaminants to their current state, then CVOCs remaining in groundwater should further bio-attenuate into ethene, which is considered a non-toxic end product.

1.4 Human Exposure Pathways

Exposure pathways are means by which contaminants move through the environment from a source to a point of contact with humans. A complete exposure pathway must have five (5) parts: 1) a source of contamination; 2) a mechanism for transport of a substance from the source to the air, surface water, groundwater and/or soil; 3) a point where people come in contact with contaminated air, surface water, groundwater or soil (point of exposure); 4) a route of entry (exposure) into the body; and 5) a receptor population. Routes of entry include ingesting contaminated materials, breathing contaminated air, or absorbing contaminants through the skin. If any part of an exposure pathway is absent, the pathway is said to be incomplete and no exposure or risk is possible. In some cases, although a pathway is complete, the likelihood that significant exposure will occur is small.

The potential site related contaminants were identified as those contaminants detected in various media at the site above SCGs. The potential site related contaminants that have been identified in various media at the site are presented in Table 1.4-1.

TABLE 1.4-1: Potential Site Related Contaminants

Compound	Near-Surface Soil	Subsurface Soil	Groundwater
Volatile Organic Compounds:			
Methyl tert-butyl Ether	No	No	Yes
Vinyl Chloride	No	No	Yes
1,1-Dichloroethene	No	No	Yes
Trans-1,2-Dichloroethene	No	No	Yes
Cis-1,2-Dichloroethene	No	No	Yes
Trichloroethene	No	No	Yes
Semi- Volatile Organic Compounds:			
Bis(2-Ethylhexyl)phthalate	No	No	Yes
Dibenzofuran	No	Yes	No
Benzo(a)anthracene	No	Yes	No
Benzo(a)pyrene	No	Yes	No
Benzo(b)fluoranthene	No	Yes	No
Benzo(k)fluoranthene	No	Yes	No
Chrysene	No	Yes	No
Indeno(1,2,3-cd)pyrene	No	Yes	No
Dibenzo(a,h)anthracene	No	Yes	No
Metals:			
Beryllium	Yes	Yes	No
Calcium	Yes	Yes	No
Copper	Yes	Yes	No
Iron	Yes	Yes	Yes

TABLE 1.4-1: Potential Site Related Contaminants			
Compound	**Near-Surface Soil**	**Subsurface Soil**	**Groundwater**
Lead	No	No	Yes
Magnesium	Yes	Yes	Yes
Manganese	No	No	Yes
Mercury	No	Yes	No
Nickel	Yes	No	No
Sodium	No	No	Yes
Zinc	Yes	Yes	No
Soil Gas:			
n-Hexane	No	Yes	No
Chloroform	No	Yes	No
Benzene	No	Yes	No
Toluene	No	Yes	No
Ethylbenzene	No	Yes	No
Xylene (m,p)	No	Yes	No
Xylene (o)	No	Yes	No
Styrene	No	Yes	No
1,2,4-Trimethylbenzene	No	Yes	No

Potential exposure pathways for site contaminants are a function of the contaminant, the affected media, contaminant location and the potentially impacted population. The potential exposure routes and pathways for the site include dermal contact and/or ingestion of potentially contaminated near-surface and subsurface soils; inhalation of potentially contaminated dust or vapors emanating from near-surface soils and from subsurface soils should these soils be disturbed; and dermal contact and/or ingestion of potentially contaminated groundwater.

It is the intent of the City of Plattsburgh to leave the site in its current state as a parking lot and Farmer's Market. The majority of the contaminants of concern were detected in near-surface soil, subsurface soil, soil gas and at select groundwater sampling locations. At the Durkee Street Parking Lot (OU2) site and its surroundings, potential impacted populations include employees and residents of nearby commercial, residential and institutional entities, site visitors, trespassers on the site, and workers that may be engaged in excavation work should any site development and/or maintenance occur. The following details the site COCs per media type on a site wide basis and their potential to impact receptor populations.

- Several semi-volatile organic compounds and metals were detected in near-surface and subsurface soils and fill materials at concentrations exceeding SCGs. Disturbance of the subsurface soils and fill materials during any future site development or maintenance could potentially create airborne contaminants that may be inhaled and/or ingested. The potential for dermal contact, inhalation and ingestion of the impacted subsurface soil and fill material is, therefore, anticipated to be high during development and/or maintenance activities, if any, but remains low at present as the site is currently covered with asphalt and the Farmer's Market building.

- Several metals, VOCs, and one SVOC were detected in groundwater at concentrations exceeding SCGs. Considering that the depth to groundwater is greater than 4 feet below grade, the potential for dermal contact through exposure to groundwater and the associated impact is anticipated to be low, unless groundwater is encountered and subsequently disturbed during future development and/or maintenance activities, if any. Ingestion of the contaminated groundwater is unlikely since the area surrounding and hydraulically down gradient of the site is serviced by public water and no private water supply wells are known to exist in the area.

- One chlorinated vapor and several petroleum related vapors were detected in soil gas beneath the site. Should buildings be constructed on the site that will be occupied in the future, there is a moderate potential for future occupants to be exposed to vapors potentially emanating from the ground. The NYSDOH has indicated that a vapor mitigation system will need to be installed as part of any future building construction.

1.5 Ecological Exposure Pathways

The value of the fish and wildlife resources located within the study area is considered low. The project site was developed with various commercial and industrial structures back to as late as 1884 before becoming a surface parking lot in as early as 1966. Surrounding commercial and residential areas have eliminated much of the natural habitat in the area and have replaced it with urban wildlife habitats consisting primarily of mowed lawns with trees, paved roads, parking lots and urban structure exteriors.

The value of fish and wildlife resources to humans is very limited within the study area. Access to the Saranac River is restricted by the residential and business properties and fences; there is no hunting allowed within the City of Plattsburgh. As a result, the value of these resources to humans was determined to be low.

2.0 DEVELOPMENT OF ALTERNATIVES

2.1 Introduction

The RI of the site included intrusive and non-intrusive investigations to determine the nature and extent of COCs within near-surface soils, subsurface soils, groundwater and subsurface soil gas. The results of the RI were used to develop and evaluate the remedial alternatives described within this report.

Feasible remedial action(s) are identified to achieve compliance with established regulatory cleanup guidance levels and/or to protect human health and the environment. The remedial alternatives for the site are developed based on published literature and current knowledge of the technologies commonly employed in similar situations and circumstances.

2.2 Remedial Action Objectives

Table 2.2-1 summarizes the COCs within each medium and the remedial action objectives (RAOs) identified for each medium. The COCs include compounds and analytes which exceeded their respective SCGs. Potentially affected populations described in the table include employees and residents of nearby residential, institutional and commercial entities, site visitors, trespassers on the site, and workers that may be engaged in excavation work should the site undergo future development and/or maintenance.

Table 2.2-1: Contaminants of Concern for Site Media and Remedial Action Objectives

Media Type	COCs	Remedial Action Objectives
Near-Surface Soil	Metals	Prevent affected populations from direct contact and ingestion of contaminated surface soils and inhalation of airborne dust that may emanate from the soils should they be disturbed.

Table 2.2-1: Contaminants of Concern for Site Media and Remedial Action Objectives		
Media Type	**COCs**	**Remedial Action Objectives**
Subsurface Soils/Fill	SVOCs and Metals	Prevent affected populations from contact, ingestion and inhalation of airborne particulates that may emanate from subsurface soils/fill that may be disturbed during any future site development and/or maintenance.
Groundwater	VOCs, Metals and one SVOC	Prevent affected populations from contact and ingestion of groundwater should it be encountered during any future development of the site.
Soil Gas	Organic Vapors	Prevent occupants of any future site building(s) from inhalation of organic vapors that may migrate from the subsurface into the building structure.

The remedial action objectives are to control and possibly eliminate COCs present in the various areas and media within the site, with the ultimate goal of protecting human health and the environment.

2.3 General Response Actions

The project site is impacted by varying concentrations of VOCs, SVOCs, metals and chlorinated and petroleum based organic vapors above SCGs. As such, general response actions were developed for addressing COCs present within the site through site specific remedial alternatives. The intent of the general response actions is to address contamination and mitigate the potential for exposure to the contamination and to a lesser extent potential off-site impacts from the subject site. The following provides the approximate areas to which treatment, containment, or exposure reduction technologies may be applied to the site.

- Soils and fill material underlying the site are impacted by SVOCs and metals. The site has an approximate area of 3.07 acres (133,728 square feet) and is underlain with soils/fill at depths that range from the surface to 20 feet bgs for an average thickness of 10 feet of soils/fill. Multiplying the total site area by the average soil/fill thickness equates to approximately 49,528 cubic yards of impacted fill material.

- Groundwater, which is perched atop a glacial till soil unit, is impacted by metals, CVOCs, MTBE and one SVOC. The CVOCs were detected at four (4) monitoring well locations only, with the most elevated concentrations being located at monitoring well MW-10. MTBE was detected at monitoring well MW-17 only, which is located on northeastern portions of the site in the vicinity of an off-site gasoline service station. The metals and SVOC were detected at different frequencies within each of the monitoring wells within the boundaries of OU2. Because groundwater was collected at discrete locations across the site and the site was not exhaustively investigated, an assumption is made that all groundwater beneath the site is impacted to varying degrees and would need to be evacuated and treated should any site excavation take place. In lieu of treatment, long term groundwater monitoring of the site would be from monitoring wells impacted by CVOCs and MTBE, which would include monitoring wells MW-10, MW-17, MW-23, MW-25 and MW-26 in order to evaluate future exposure.

- The soil gas survey identified chlorinated and petroleum related organic vapors above SCGs within soils/fill interstitial spaces across the site. The NYSDOH has indicated that a soil vapor mitigation system will need to be installed during construction of any future buildings upon the site.

In developing remediation goals for the subject site, the following design considerations were evaluated relative to economical and feasible solutions for addressing the site contaminants:

- Current zoning allows future development of the site or the site may remain as its current use as a parking lot and Farmer's Market. The remedial action should reduce and possibly eliminate potential exposure to COCs by current parking lot and Farmer's Market patrons and workers should the site undergo future development and/or maintenance activities.

2.4 Development of Alternatives

The following sections present a selection of remedial alternatives that may be implemented to address the general response actions discussed in the previous section of this report. The alternatives under consideration include:

1. No action;

2. Implementation of existing site features as a barrier to contact, institutional controls, establishment of a Site Management Plan (SMP), and monitoring well abandonment;

3. Implementation of existing site features as a barrier to contact, institutional controls, establishment of a SMP, and long-term groundwater monitoring; and

4. Excavation and disposal of impacted soils and fill material and replacement with clean fill; dewatering and treatment of impacted groundwater, institutional controls and monitoring well abandonment.

2.4.1 Alternative No. 1 - No Action

The No Action Alternative is evaluated as a procedural requirement and is a requirement of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). This alternative would leave the site in its present condition (parking lot and farmer's market) and would not provide any additional protection to human health and the environment.

2.4.2 Alternative No. 2 – Implementation of Existing Site Features as a Barrier to Contact, Institutional Controls, Establishment of a SMP, and Well Abandonment

This alternative would utilize the site's existing features as an asphalt-paved parking lot and slab on grade Farmer's Market building as a barrier to contact with the addition of institutional controls to restrict future land use and notify future owners or prospective purchasers of the presence of contamination. The institutional controls would be in the form of an environmental easement granted to the NYSDEC, who would enforce the terms of the easement. A SMP is included in this alternative should the site undergo future development. Installation of a soil vapor mitigation system is included in this alternative in the event that future site development includes the construction of an occupied structure(s). The monitoring wells would be abandoned, which would eliminate the ability to perform long-term groundwater monitoring.

2.4.3 Alternative No. 3 – Implementation of Existing Site Features as a Barrier to Contact, Institutional Controls, Establishment of a SMP, and Long-Term Groundwater Monitoring

This alternative would include the same features as those presented in Alternative No. 2 except that the monitoring wells will remain to perform long-term groundwater monitoring to evaluate the persistence of known site contaminants.

2.4.4 Alternative No. 4 – Excavation and Disposal of Impacted Soils and Fill Material and Replacement with Clean Fill; Dewatering and Treatment of Impacted Groundwater, Institutional Controls and Monitoring Well Abandonment

This alternative would involve the excavation and disposal of contaminated soil/fill at the site and evacuation, treatment and disposal of impacted groundwater encountered during the excavations. Upon completion of the remedy, the site would be backfilled with clean fill and institutional controls would be implemented to address residual contaminants that may remain on the site. The institutional controls would restrict future land use and notify future owners or prospective purchasers of residual contamination at the site, if any. The institutional controls would be in the form of an environmental easement granted to the NYSDEC, who would enforce the terms of the easement. Monitoring wells installed as part of the RI and supplemental investigation of the site would be abandoned by implementation of this alternative, as groundwater monitoring would not be warranted.

3.0 DETAILED ANALYSIS OF ALTERNATIVES

3.1 Introduction

Each remedial alternative was evaluated based on specific criteria set forth in 6NYCRR Part 375-1.10. The evaluation criteria will be used by the NYSDEC in the selection process for the most appropriate remedy considering the site conditions, level of implementation, and cost-effectiveness. From this AAR and the RI Report, the Department will prepare a Proposed Remedial Action Plan (PRAP) to be submitted to the public with the RI Report and the AAR. The Department will address any issues raised by the public in a Responsiveness Summary. The final remedy for the site will be documented in the Record of Decision (ROD) prepared by NYSDEC after a 45 day public comment period.

The first seven (7) of the following eight (8) criteria form the basic components of the detailed analysis of each alternative whereby each criteria is compared to the others to determine the most cost effective, protective remedy. The Department will use criteria #8 in their evaluation once the public comment period has ended.

1. Overall protection of public health and the environment;
2. Compliance with Standards, Criteria, and Guidance (SCGs);
3. Short-term effectiveness;
4. Long-term effectiveness and permanence;
5. Reduction of toxicity, mobility, or volume with treatment;
6. Implementability;
7. Cost; and
8. Community acceptance.

The remedial alternative approach of "No Action" could be applied to most sites where low level contamination is present and fully delineated, and does not pose a significant threat to human health or the environment. This alternative is best suited for low level contamination, but could also be applied if higher levels of contamination are present and there is no significant threat to the human health or the environment.

Institutional controls are means of attaching restrictions to the property to limit site activities and future use of the property, and to assure due diligence in notification of prospective purchasers and the public. These restrictions could also include installation of fencing or other means to limit access to the site or a particular area of the site. The site's current and future land use plays a significant role in selecting the most effective institutional controls. Examples of institutional controls typically include land use and drinking water use restrictions, deed restrictions, and notification in public registries of excavation and construction work activity, and appropriate posting of informational signs at the site. Depending on the severity of contamination, institutional controls could be required along with other feasible remedial alternatives. For the purpose of analyzing the alternatives below, specific examples of institutional controls (as discussed above) are not referenced, but would ultimately be selected based on the results of remedial action performed.

3.2 Overall Protection of Human Health and the Environment

3.2.1 Alternative No. 1: No Action

Limited overall protection of human health and the environment would be achieved through implementation of Alternative No. 1 as existing site features may qualify as an acceptable barrier to contact. However, the barrier to contact would more than likely deteriorate over time without periodic inspections and maintenance, and uncontrolled future development and/or maintenance of the site may create exposure of site contaminants to affected populations.

3.2.2 Alternative No. 2: Implementation of Existing Site Features as a Barrier to Contact, Institutional Controls, Establishment of a SMP, and Monitoring Well Abandonment

Limited overall protection of human health and the environment would be achieved through implementation of Alternative No. 2 as existing site features may qualify as an acceptable barrier to contact. However, the level of protection to human health and the environment would be greater than Alternative No. 1 with the preparation and implementation of a SMP. A SMP would provide the preferred methods of site disturbance during future construction, site maintenance activities, institutional controls to restrict groundwater, soil, and fill material usage and disturbance

restrictions on current and future site owners and/or developers. The abandonment of the monitoring wells would effectively eliminate the ability for long term monitoring of contaminant persistence.

3.2.3 Alternative No. 3: Implementation of Existing Site Features as a Barrier to Contact, Institutional Controls, Establishment of a SMP, and Long-Term Groundwater Monitoring

Protection of human health and the environment would be further enhanced by implementation of this alternative because in addition to Alternative No. 2, protection to human health and the environment would be evaluated over time by periodically assessing the contaminant concentrations in groundwater through long-term groundwater sampling and analysis.

3.2.4 Alternative No. 4: Excavation and Disposal of Impacted Soils and Fill Material and Replacement with Clean Fill; Dewatering and Treatment of Impacted Groundwater, Institutional Controls and Monitoring Well Abandonment

Protection of human health and the environment would effectively be realized through the implementation of Alternative 4 as the contaminated soil, fill and groundwater in excess of SCGs would be remediated through the excavation and disposal of impacted soil and fill material and the evacuation, treatment and disposal of impacted groundwater. Institutional controls would be implemented in the event that residual contaminants remain in site media, and for limiting groundwater usage.

3.3 Compliance with Standards, Criteria, and Guidance (SCGs)

3.3.1 Alternative No. 1: No Action

Compliance with SCGs will not be attained if Alternative No. 1 is implemented because the impacted media will remain on-site and would not be addressed through any forms of site control. The potential exists for volatile organic compounds to naturally attenuate over time and may one day meet SCGs, however, metals concentrations in soil and groundwater would remain unchanged.

3.3.2 Alternative No. 2: Implementation of Existing Site Features as a Barrier to Contact, Institutional Controls, Establishment of a SMP, and Monitoring Well Abandonment

Compliance with SCGs will not be attained through implementation of Alternative No. 2 because remaining impacts within soils, fill and groundwater will remain in place.

Abandonment of the monitoring wells would eliminate the ability to perform long term monitoring of contaminants in groundwater thereby not allowing compliance to SCGs over time to be evaluated. The potential exists for volatile organic compounds to naturally attenuate over time and may one day meet SCGs, however, metals concentrations in soil and groundwater would remain unchanged.

3.3.3 Alternative No. 3: Implementation of Existing Site Features as a Barrier to Contact, Institutional Controls, Establishment of a SMP, and Long-Term Groundwater Monitoring

Compliance with SCGs will not be attained through implementation of Alternative No. 3 because remaining impacts within soils, fill and groundwater will be allowed to be left in place. Contaminant persistence would be evaluated over time through groundwater sampling and analysis. The potential exists for volatile organic compounds to naturally attenuate over time and may one day meet SCGs, however, metals concentrations in soil and groundwater would remain unchanged.

3.3.4 Alternative No. 4: Excavation and Disposal of Impacted Soils and Fill Material and Replacement with Clean Fill; Dewatering and Treatment of Impacted Groundwater, Institutional Controls and Monitoring Well Abandonment

Compliance with SCGs would effectively be realized through the implementation of Alternative 4 as all of the contaminated soil, fill and groundwater in excess of SCGs would be remediated. Institutional controls would be implemented in the event that residual contaminants remain in the media, and for limiting groundwater usage.

3.4 Short Term Effectiveness

3.4.1 Alternative No. 1: No Action

The effectiveness of Alternative No. 1 will be realized in the short term and could be implemented immediately. There would be no short term reduction in the potential for impacts to human health. There will be no impact to the community or the environment during implementation of this alternative, other than what may be currently present at the site.

3.4.2 Alternative No. 2: Implementation of Existing Site Features as a Barrier to Contact, Institutional Controls, Establishment of a SMP, and Monitoring Well Abandonment

The short term effectiveness of this remedy will be immediate, as the barrier to contact is already in place and will only require an inspection, maintenance and certification. The inspection of the barrier to contact can be accomplished in a short period of time, and maintenance issues can be completed shortly after discovery with minimal disturbances to the site. The legal documents for the institutional control can be quickly drafted and filed, and become binding upon affected populations in a short period of time.

There are no short term adverse impacts to affected populations concerning implementation of this alternative. The existing barrier to contact is intact, and will not need to be modified through implementation of invasive construction activities. Existing monitoring wells can be quickly abandoned with little physical disturbance to the site.

3.4.3 Alternative No. 3: Implementation of Existing Site Features as a Barrier to Contact, Institutional Controls, Establishment of a SMP, and Long-Term Groundwater Monitoring

In addition to short-term effectiveness presented in Alternative No. 2, the existing monitoring wells installed, being strategically located, would be utilized to monitor contaminant persistence and cause little disturbance during sampling of these wells. There are no short term adverse impacts to affected populations concerning implementation of this alternative.

3.4.4 Alternative No. 4: Excavation and Disposal of Impacted Soils and Fill Material and Replacement with Clean Fill; Dewatering and Treatment of Impacted Groundwater, Institutional Controls and Monitoring Well Abandonment

The short-term impacts of the excavation and disposal of impacted soils/fill and dewatering, treatment and disposal of impacted groundwater will be significant as affected populations will not have the use of the parking lot during implementation of this alternative. Short-term impacts to the community and workers during site disturbance will be mitigated through limiting unauthorized personnel on-site, implementing dust control measures, and particulate and organic vapor monitoring. Engineering controls including dust and erosion are effective and reliable controls that are commonly employed at construction sites. The length of time to implement this alternative is estimated to be one year.

3.5 Long Term Effectiveness

3.5.1 Alternative No. 1: No Action

There will be limited long term effectiveness if this remedy is chosen and this remedy is not considered permanent. Some reduction in contaminant persistence may be achieved by natural attenuation. However, metals and SVOCs in surface and subsurface soils and metals in groundwater will more likely persist for an undefined period of time. The remedy may meet RAOs in that there will be limited protection to site contaminants via the existing site conditions serving as a barrier to contact. However, the barrier to contact will deteriorate over time and exposure to contaminants may occur in the event the barrier is not maintained or the site is disturbed by future development.

3.5.2 Alternative No. 2: Implementation of Existing Site Features as a Barrier to Contact, Institutional Controls, Establishment of a SMP, and Monitoring Well Abandonment

The long term effectiveness and permanence of Alternative 2 is based on the frequency that the barrier to contact is inspected and maintained/certified, and if the institutional controls are implemented by current and future site owners and developers. If the barrier is maintained and institutional controls are followed, then the long-term effectiveness of this alternative is good (i.e. protection from underlying site contaminants). The abandonment of the monitoring wells will eliminate the ability for long-term groundwater sampling and analysis, thereby not allowing contaminant persistence to be evaluated over time.

3.5.3 Alternative No. 3: Implementation of Existing Site Features as a Barrier to Contact, Institutional Controls, Establishment of a SMP, and Long-Term Groundwater Monitoring

In addition to the long-term effectiveness described in Alternative No. 2 above, long-term groundwater monitoring would aid in evaluating contaminant persistence over time.

3.5.4 Alternative No. 4: Excavation and Disposal of Impacted Soils and Fill Material and Replacement with Clean Fill; Dewatering and Treatment of Impacted Groundwater, Institutional Controls and Monitoring Well Abandonment

Implementing Alternative No. 4 is a long term and permanently effective means of remediating soil and groundwater contamination at the site. There should be no residual risks remaining upon completion of this alternative unless contaminated media remains due to site constraints. This alternative is considered to be a reliable means of reducing and possibly eliminating the potential impacts to human health and the environment and will be further accentuated by implementation of institutional controls for remaining impacts, if any.

3.6 Reduction of Toxicity, Mobility or Volume with Treatment

3.6.1 Alternative No. 1: No Action

This remedy will not reduce the toxicity, mobility or volume of the site contaminants, although some contaminant reduction (for volatile organic compounds, not metals) may be achieved by natural attenuation.

3.6.2 Alternative No. 2: Implementation of Existing Site Features as a Barrier to Contact, Institutional Controls, Establishment of a SMP, and Monitoring Well Abandonment

This remedy will not reduce the toxicity, mobility or volume of the site contaminants, although some contaminant reduction (for volatile organic compounds, not metals) may be achieved by natural attenuation. Abandonment of the monitoring wells would eliminate the ability for long-term groundwater monitoring for contaminant persistence.

3.6.3 Alternative No. 3: Implementation of Existing Site Features as a Barrier to Contact, Institutional Controls, Establishment of a SMP, and Long-Term Groundwater Monitoring

This remedy will not reduce the toxicity, mobility or volume of the site contaminants, although some contaminant reduction (for volatile organic compounds, not metals) may be achieved by natural attenuation. Long-term groundwater monitoring will aid in evaluating contaminant reduction over time.

3.6.4 Alternative No. 4: Excavation and Disposal of Impacted Soils and Fill Material and Replacement with Clean Fill; Dewatering and Treatment of Impacted Groundwater, Institutional Controls and Monitoring Well Abandonment

Implementation of Alternative No. 4 will effectively eliminate the toxicity, mobility and volume of the site contaminants in soil and groundwater.

3.7 Implementability

3.7.1 Alternative 1: No Action and Long-Term Groundwater Monitoring

Alternative No. 1 can be easily implemented as no action will be taken relative to reducing contaminants that exist at the site. This alternative provides no avenue for monitoring the effectiveness of the remedy.

3.7.2 Alternative No. 2: Implementation of Existing Site Features as a Barrier to Contact, Institutional Controls, Establishment of a SMP, and Monitoring Well Abandonment

The barrier to contact is already in place and requires only repair of the existing barrier to contact uncovered during an initial inspection. Based on current site conditions, repair to the barrier would be minimal and would require less than one week to repair. Local pavement contractors would be readily and locally available to correct deficiencies. The implementation of institutional controls involves only the drafting of legal documents that will be binding on future site owners and developers. Monitoring wells installed during the RI will be abandoned by a drilling contractor that is locally available, which would only take two to three days.

3.7.3 Alternative No. 3: Implementation of Existing Site Features as a Barrier to Contact, Institutional Controls, Establishment of a SMP, and Long-Term Groundwater Monitoring

In addition to the implementability of alternative 2 above, monitoring wells installed during the RI will be utilized for groundwater monitoring. Sampling of the monitoring wells and laboratory analysis of groundwater samples is a routine service provided by most environmental consultants and environmental laboratories.

3.7.4 Alternative No. 4: Excavation and Disposal of Impacted Soils and Fill Material and Replacement with Clean Fill; Dewatering and Treatment of Impacted Groundwater, Institutional Controls and Monitoring Well Abandonment

This alternative is the most difficult to implement, as it will involve the excavation of the entire site, including soil/fill located adjacent to and likely beneath the seasonally operated Farmer's Market, which will compromise the integrity of this structure. The site is currently operated as a dense-use parking lot for downtown businesses,

institutions and residences and implementation of this remedy will effectively eliminate a vital parking area for approximately one year.

The implementation of institutional controls involves only the drafting of legal documents that will be binding on future site owners and developers.

3.8 Cost

The associated costs for each of the remedial alternatives are presented in detail in Table 3.8-2, which is located within the Tables section of the report. The following Table 3.8-1 presents the approximate lump costs for each of the alternatives.

TABLE 3.8-1: Lump Sum Costs Per Alternative

Description of Alternative	Estimated Lump Sum Cost
Alternative 1: No Action.	$5,000
Alternative 2: Implementation of Existing Site Features as a Barrier to Contact, Institutional Controls, Site Management Plan, and Monitoring Well Abandonment. .	$75,000
Alternative 3: Implementation of Existing Site Features as a Barrier to Contact, Institutional Controls, Site Management Plan, and Long-Term Groundwater Monitoring.	$105,680
Alternative 4: Excavation and Disposal of Impacted Soils and Fill Material and Replacement with Clean Fill; Dewatering and Treatment of Impacted Groundwater, Institutional Controls and Monitoring Well Abandonment.	$7,098,203.50

3.9 Comparative Analysis

Utilizing the evaluation criteria, each remedial alternative is compared to the other on the basis of cost and effectiveness as a means to identify the most cost effective, protective remedy. For comparative purposes the criteria are based on a high, moderate and low basis.

Four (4) remedial alternatives were presented for the site. These included 1) No Action, 2) Implementation of Existing Site Features as a Barrier to Contact, Institutional Controls, SMP, and Monitoring Well Abandonment, 3) Implementation of Existing Site Features as a Barrier to Contact, Institutional Controls, SMP, and Long-Term Groundwater Monitoring and 4) Excavation and Disposal of Impacted Soils and Fill Material and Replacement with Clean Fill; Dewatering and Treatment of Impacted Groundwater, Institutional Controls, and Monitoring Well Abandonment.

Alternative 1 (No Action) is the least expensive, yet least effective alternative for the protection of human health and the environment. Existing site features would be utilized as a barrier to contact. However, the barrier to contact would not be periodically inspected for deterioration and would not require periodic maintenance. This will more than likely offer limited, short-term protection to affected populations relative to site contaminants. The evaluation criterion for Alternative 1 is low.

Alternative 2 would be more effective and more costly than the No Action alternative in that it would include the inspection, maintenance and certification of the existing barrier to contact and impose institutional controls that would restrict groundwater use and future land use and notify future owners or prospective purchasers of the presence of site contamination. The evaluation criterion for Alternative 2 is moderate.

Alternative 3 would be more effective and slightly more costly than Alternative 2 in that it would provide for long-term monitoring to evaluate contaminant persistence in groundwater. The evaluation criterion for Alternative 3 is moderate to high.

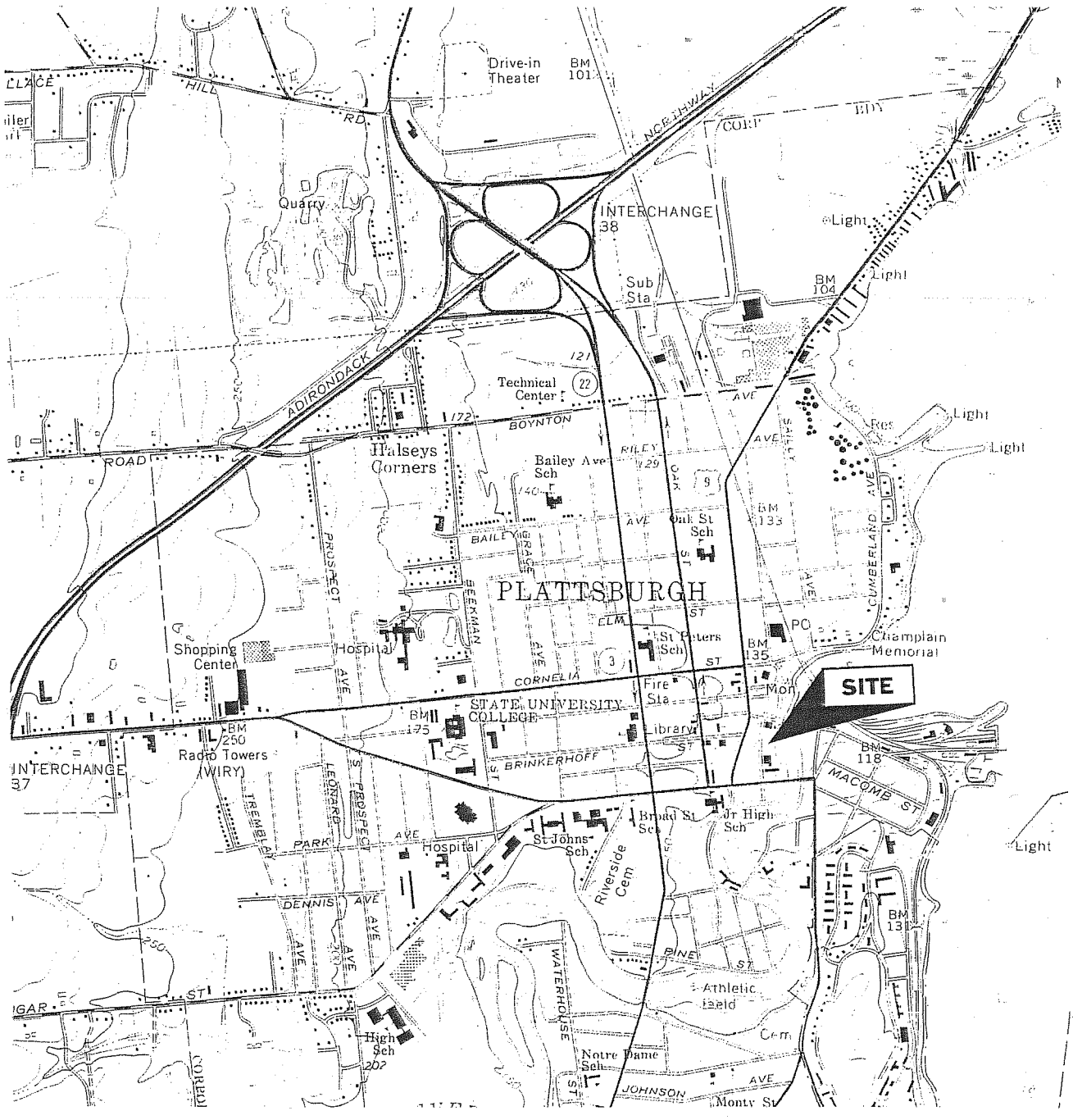
Alternative 4 is the most costly and least implementable of the alternatives as it involves the excavation and disposal of impacted soils/fill beneath the entire site and replacement with clean fill material, and the evacuation, treatment and disposal of impacted groundwater during soil excavations. Implementing this alternative will be

difficult due to the existence of the Farmer's Market building and the site's current use as a high-density parking lot. The evaluation criterion for Alternative 4 is low to moderate.

Based on the criterion assigned to each of the alternatives, Alternative 3 appears to be the most cost effective remedy that would be best suited to the site.

FIGURE 1

SITE LOCATION MAP



MAP REFERENCE
United States Geological Survey
7.5 Minute Series Topographic Map
Quadrangles: Plattsburgh, NY
Date: 1966

N

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C.T. MALE ASSOCIATES, P.C.

50 CENTURY HILL DRIVE, PO BOX 727, LATHAM, NY 12110
PHONE (518) 786-7400 FAX (518) 786-7299

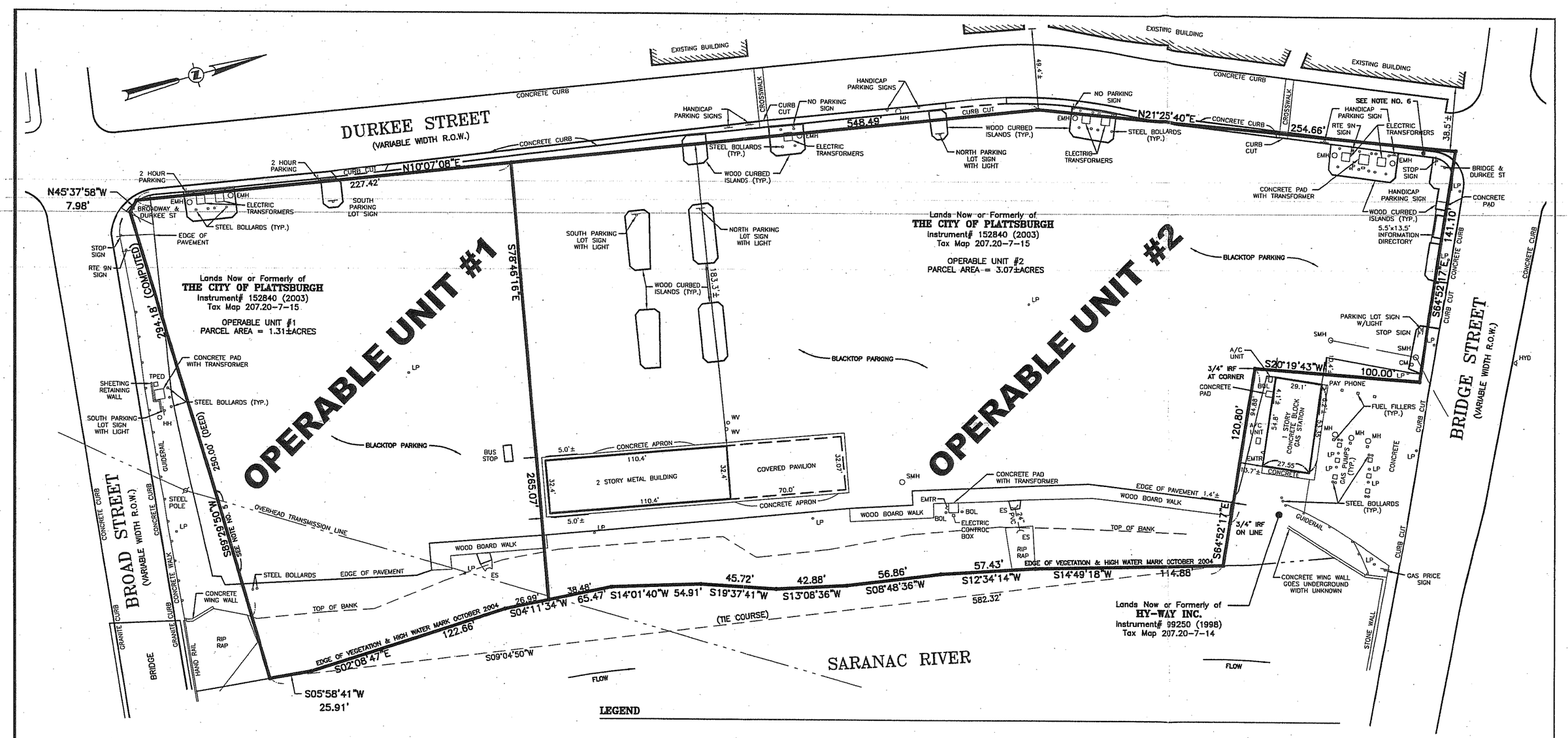
SITE LOCATION MAP

DURKEE STREET PARKING LOT

CITY OF PLATTSBURGH	CLINTON COUNTY, NY
SCALE: 1" = 2000'	
DRAFTER: SHB	
PROJECT No. 04.9498	

FIGURE 2

SITE PLAN



BAR SCALE

60 0 30 60 120

1 inch = 60 ft.

LEGEND

IRF	IRON ROD FOUND	HYD	FIRE HYDRANT	UP	UTILITY POLE
BOL	BOLLARD	LP	LIGHT POLE	WV	WATER VALVE
EMH	ELECTRIC MANHOLE		STREET SIGN		
HH	ELECTRIC HANDHOLE	SMH	SANITARY SEWER MANHOLE		
ES	END SECTION	TPED	TELEPHONE PEDESTAL		

NOTE:
1. THE LOCATIONS AND FEATURES DEPICTED ON THIS MAP ARE APPROXIMATE AND DO NOT REPRESENT AN ACTUAL FIELD SURVEY.

MAP REFERENCE:
1. SHEET SP-1, PREPARED BY RABIDEAU ARCHITECTS OF BURLINGTON, VT, DATED 12/15/03, LAST REVISED 3/17/04.

2. BOUNDARY SURVEY, PORTION OF LANDS OF CITY OF PLATTSBURGH DURKEE STREET PARKING LOT, PREPARED BY C.T. MALE ASSOCIATES, P.C., DWG NO. 04-0670, DATED OCTOBER 5, 2004, REVISED 11/30/04.

DATE		REVISIONS RECORD/DESCRIPTION	DRAFTED	CHECK	APPR.
	1				
	2				
	3				
	4				
	5				
	6				
	7				
	8				
	9				

DESIGNED :
DRAFTED : J.MARX
CHECKED : SB
PROJ. NO: 04.9498
SCALE : ±1"=60'
DATE : OCTOBER 2004

FIGURE 2
SITE PLAN

PLATTSBURGH GATEWAY PROJECT
DURKEE STREET PARKING LOT

CITY OF PLATTSBURGH — CLINTON COUNTY, NY

C.T. MALE ASSOCIATES, P.C.
50 CENTURY HILL DRIVE, P.O. BOX 727, LATHAM, NY 12110
518.786.7400 * FAX 518.786.7299
ARCHITECTURE & BUILDING SYSTEMS ENGINEERING * CIVIL ENGINEERING
ENVIRONMENTAL SERVICES * SURVEY & LAND INFORMATION SERVICES

SHEET 1 OF 3
DWG. NO: 04-0684

CAD DWG. FILE NAME:WP MAPS_REV.DWG

APPENDIX A

TABLE 3.8-2

ALTERNATIVE ANALYSES COST ESTIMATES

TABLE 3.8-2: Alternatives Analysis Cost Estimate
Durkee Street Parking Lot (OU2), Plattsburgh, New York
C.T. Male Project No.: 04.9498

Bid Item #		Work Item	Units	Est. Units		Unit Rate		Estimated Fee
Alternative 1		**No Action**						
	1	Legal and Filing Fees	LS	1	$	5,000.00	$	5,000.00
		Total Cost (Alternative 1)					***$***	***5,000.00***
Alternative 2		**Implementation of Existing Site Features as a Barrier to Contact, Institutional Controls, Site Management Plan, and Monitoring Well Abandonment**						
	1	Legal and Filing Fees (Institutional Controls)	LS	1	$	5,000.00	$	5,000.00
	2	Site Management Plan	LS	1	$	10,000.00	$	10,000.00
	3	Abandon Existing Monitoring Wells	EACH	16	$	500.00	$	8,000.00
	4	Periodic Site Inspection and Certification by an Environmental Professional (Present Value)	EACH	30	$	720.00	$	11,000.00
	5	Periodic O&M-Cover Maintenance and Repair (Present Value)	EACH	30	$	1,500.00	$	23,000.00
	6	Miscellaneous Site Work (2 days annually-Present Value)	EACH	30	$	1,200.00	$	18,000.00
		Total Cost (Alternative 2)			***$***	***18,920.00***	***$***	***75,000.00***
Alternative 3		**Implementation of Existing Site Features as a Barrier to Contact, Institutional Controls, Site Management Plan, and Long-Term Groundwater Monitoring**						
	1	Legal and Filing Fees (Institutional Controls)	LS	1	$	5,000.00	$	5,000.00
	2	Site Management Plan	LS	1	$	10,000.00	$	10,000.00
		Subtotal - Institutional Controls and SMP			**$**	**15,000.00**	**$**	**15,000.00**
	2	Periodic Site Inspection and Certification by an Environmental Professional (Present Value)	EACH	30	$	720.00	$	11,000.00
	2a	Periodic O&M-Cover Maintenance and Repair (Present Value)	EACH	30	$	1,500.00	$	23,000.00
	2b	Miscellaneous Site Work (2 dats annually-Present Value)	EACH	30	$	1,200.00	$	18,000.00
		Subtotal - Cover Inspection and Maintenance Costs			***$***	***3,420.00***	***$***	***52,000.00***
	5	Groundwater Sampling and Analyses (Years 1 - 5, 10 & 15) (Present Value)						
		Analytical	EACH	7	$	2,925.00	$	16,490.00
		Data Validation	EACH	7	$	550.00	$	3,100.00
		Field Work	EACH	7	$	960.00	$	5,415.00
		Equipment	EACH	7	$	480.00	$	2,705.00
		Disposal of Drummed Purge Water	EACH	7	$	250.00	$	1,410.00
		Reporting	EACH	7	$	1,500.00	$	9,560.00
		Subtotal - Long Term Costs (Annual & Present Value)			***$***	***6,665.00***	***$***	***38,680.00***
		Total Cost (Alternative 3)			***$***	***25,085.00***	***$***	***105,680.00***
Alternative 4		**Excavation and Disposal of Impacted Soils and Fill Material and Replacement with Clean Fill; Dewatering and Treatment of Impacted Groundwater, Institutional Controls and Abandonment of Existing Monitoring Wells**						
	1	Legal and Filing Fees (Institutional Controls)	LS	1	$	5,000.00	$	5,000.00
		Abandon Existing Monitoring Wells	EACH	16	$	500.00	$	8,000.00
		Excavation of Fill and Replacement with Clean Imported Backfill						
	2	Mobilization/Demobilization	LS	1	$	5,000.00	$	5,000.00
	3	Site Preparation, Clearing and Decon Pad	LS	1	$	2,000.00	$	2,000.00
	4	Remove Existing Asphalt and Subbase	LS	1	$	18,450.00	$	18,450.00
	5	Disposal of Asphalt and Subbase	TON	8,670	$	12.00	$	104,040.00
	6	Sheeting Installation (remaining northern excavation wall, western wall and one-third of southern wall))	SF	5,000	$	25.00	$	125,000.00
	7	Sheeting and Piling Installation (Site Perimeter)	SF	15,900	$	75.00	$	1,192,500.00
	8	Excavator, 2.0 CY	DAY	200	$	909.80	$	181,960.00
	9	Payloader	DAY	200	$	600.00	$	120,000.00
	10	Transportation and Disposal of Impacted Soil (assume non-hazardous)	TON	49,528	$	60.00	$	2,971,680.00
	11	Supply and place general fill to increase site grade (to replace the fill removed)	CY	49,528	$	20.00	$	990,560.00
	12	Dozer to spread fill	DAY	120	$	925.00	$	111,000.00
	13	Compactor to compact fill	DAY	120	$	850.00	$	102,000.00
	14	Soil Dewatering & Treatment	DAY	200	$	1,000.00	$	200,000.00
	15	Placement of Type 2 Stone Subbase, 1' Thick	CY	500	$	28.00	$	14,000.00
	16	Placement of Type 3 Binder Course, 3" Thick	SY	3,715	$	11.50	$	42,722.50
	17	Placement of Type 6 Top Course, 1" Thick	SY	500	$	7.00	$	3,500.00
		Consulting						
	19	Site Survey (topography)	LS	1	$	5,000.00	$	5,000.00
	20	Field Oversight and Air Monitoring	DAY	200	$	900.00	$	180,000.00
	21	Soil Analytical	EACH	235	$	300.00	$	70,500.00
	22	Engineering (10%)					$	645,291.00
		Total Cost (Alternative 4)			***$***	***41,673.30***	***$***	***7,098,203.50***