SPECTRA

ENVIRONMENTAL GROUP, INC.

ENGINEERING, ARCHITECTURE AND SURVEYING, PC

PHASE I
REMEDIAL WORK PLAN
INCLUDING REMEDIAL DESIGN
FOR

BROWNFIELD CLEANUP PROGRAM
PHASE I SITE
DESTINY USA
SYRACUSE, NEW YORK

Prepared for:

New York State
Department of Environmental Conservation
Region 7

Prepared by:

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MAY 2009

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FIGURES

APPENDICES

ENGINEER'S CERTIFICATION

I, John H. Shafer (licensed Professional Engineer in New York State), certify under penalty of law that the Phase I RWP, including Remedial Design was prepared under my direction, supervision, and/or review.

Certified by:

John H. Shafer, P.E.
Professional Engineer
License Number: 42790

1.0 INTRODUCTION AND PURPOSE

1.1 PROJECT AUTHORIZATION AND PURPOSE

This Phase I Remedial Work Plan, including Remedial Design ("Phase I RWP" or "RWP") has been prepared by Spectra Engineering, Architecture and Surveying, P.C. ("SPECTRA"). This RWP applies to the real property shown on Figure 1 ("Phase I Site"), in connection with the first phase of the Destiny project located in Syracuse, New York (See Figure 1). This Phase I RWP evaluates and addresses (as necessary) subsurface soil, water and vapor contamination present within the Phase I Site boundaries.

The Phase I Site includes an 800,000+ square foot building expansion to the existing Carousel Center. The 450,000 square foot building expansion footprint is shown on Figures 1-9. The Phase I Site is located within the overall boundaries of the Destiny Site ("Destiny Site"), as shown on Figure 2.

The Phase I RWP is submitted in full compliance with all governing statutory and regulatory provisions, including, but not limited to, those set forth at ECL section 27-1403 et seq. and 6 NYCRR Part 375, and applicable guidance. In addition, this RWP has been prepared consistent with other similar projects approved by the New York State Department of Environmental Conservation ("NYSDEC") under the Brownfield Cleanup Program ("BCP"). The Phase I RWP described herein incorporates the findings of the Phase I Remedial Investigation Report ("Phase I RIR"), dated March 2009, and the Determination of Significant Threat Assessment, dated April 24, 2009, each of which were prepared by SPECTRA.

1.2 SITE DESCRIPTION

The Destiny Site consists of approximately 152 acres at the southeast end of Onondaga Lake (a Class C water body) (See Figure 1). It is bounded by: Onondaga Lake, Conrail tracks and Harbor side Drive, to the northwest; Interstate 81 (I-81) to the north and northeast; Bear Street on the south and southeast; and the New York State Barge Canal to the south and southwest. See Figures 1 and 2.

The Phase I Site is located in the southeast portion of the lands generally referred to as the Carousel Center site, between the existing Carousel Center building and West Hiawatha Boulevard. Site work has commenced and is ongoing on the first phase of the Destiny project. Prior to such site work, the Phase I Site consisted of surface parking lots and associated driveway areas for Carousel Center (See Figures 4 and 5). Prior to that (i.e. pre-1989), a portion of each of the following uses was located in the area of the Phase I Site: Marley Scrap yard, Buckeye Petroleum Tank Farm, and the Amerada Hess Petroleum Tank Farm.

Land uses surrounding the Destiny Site consist of business districts and mixed residential property to the north and east. Vacant land abuts the property to the south-southeast. The Onondaga County Metropolitan Sewage Treatment Plant is located across the Barge Canal to the south-southwest.

1.3 SITE HISTORY

The Phase I Site is located in a former area of extensive natural shoreline and lowland deposits consisting of marl (a naturally occurring deposit of clay, calcium carbonate, and shell fragments), and organic vegetation including roots, wood, and peat. Prior to development, the general area was known for its extensive salt marshes and spring deposits that were mined for the salt content. The salt deposits were created by the natural upward discharge of groundwater laden with dissolved salts derived from the evaporite (salt and gypsum) deposits located in the bedrock underlying the area, namely the Vernon and Syracuse Formations. The marsh and spring deposits were mined for the salt from the 1600s to early 1900s. In fact, during construction of the Erie Canal (in 1822) the level of Onondaga Lake was lowered by eleven feet, which accommodated access to more of the salt deposits for removal. During the 1800s and early 1900s, the area was the location of large evaporation lagoons where salt derived from the surficial deposits and from deep brine wells was concentrated. During this period, the lake level remained low for some 75 to100 years.

In the early 1900s, the Solvay Process Company brought the "Solvay Process" for generating Soda Ash (Sodium Carbonate) to the United States from Germany. The Company settled in Syracuse and commenced operation in or about 1907. The Solvay process generated large quantities of waste materials, including calcium carbonate, calcium oxide, and calcium chloride. These wastes are generally characterized as being white to grey, relatively soft, clayey or "tooth paste-like" material. Areas were needed for the disposal of such waste materials. Thus, available areas of unoccupied land at the Solvay plant and on vacant land located throughout the south end of Onondaga Lake were utilized for such disposal. These disposal areas included a large portion of the area between Onondaga Lake and West Hiawatha Boulevard (current Carousel Area), including the Phase I Site. Throughout the first half of the 1900s, additional miscellaneous fill, including more Solvay waste and, most likely, various construction and demolition debris (C&D) waste, were deposited on and near the Phase I Site. Similar activities, excluding the additional deposition of Solvay wastes, continued from the 1930s to the 1980s. A portion of the former Marley Property was (Haley & Aldridge, 2002) used as a salvage yard for scrap metal. The salvage yard on the former Marley Property, which overlaps the Phase I Site, operated from the late 1930s up to the construction of the Carousel Center (Dunn, 1988).

From the 1940s to the 1980s, a five acre parcel of land at the south-central end of the Marley Property, known as the Clark (Clark Concrete Co.) Property was used as a concrete batch plant for local construction projects. A DOT field station was also formerly located on this property. The former Clark Property is immediately adjacent to the Phase I Site. In or about 1987, the Clark Property was found to be contaminated with chlorinated and non-chlorinated hydrocarbons, including solvents. As a result, the Clark Property was listed on NYSDEC's Registry of Inactive Hazardous Waste Disposal Sites, as a Class 2 Site (significant threat to the public health or environment-action required) in April of 1989.

Major oil storage facilities were located on and immediately south of the Phase I Site. These facilities were owned by Amerada Hess and Buckeye Petroleum. These facilities were part of a larger petroleum storage complex at the south end of Onondaga Lake known as "Oil City". A more complete summary of these properties and associated environmental activities is provided below.

1.3.1 Former Marley Property

The northeast half of the existing Carousel Center was used as a scrap yard and for the recycling of metallic waste from the late 1930s until the construction of the Carousel Center. This area, known as the Marley Property, is approximately 45 to 50 acres in size, or more than 60% of the Carousel Center Site. The northern end of the Phase I Site lies in the former Marley Property as shown on Figure 3 "Site Plan" of the Remedial Investigation Report. Surficial scrap metal materials were removed from the Marley Property prior to and during construction of the Carousel Center. During previous subsurface investigations, metallic objects and debris were encountered in many of the borings drilled on the property. Samples collected during those previous investigations indicated soils contaminated with volatile and semi-volatile organic compounds and metals. In addition, several surface locations on the Marley Property were found to be contaminated with PCBs. While some PCB removal on the Marley property was conducted in the past, PCB contamination is known to remain in these areas.

1.3.2 Former Clark Property

The former Clark Concrete Company Property, encompassing between 3.5 and 5 acres, is located near the middle of the southerly end of the Carousel Center. An approximate 1.75-acre portion of the Clark Property was identified in 1987-1988 as being contaminated with chlorinated and non-chlorinated hydrocarbons, including solvents. This area of contamination is located along the western boundary of the Phase I Site and, in a very limited area, extends into the Phase I Site. This portion of the Clark Property was listed by the NYSDEC as a Class 2 Inactive Hazardous

Waste Disposal Site in April 1989. In response, the Clark Property was extensively investigated, and remediation was conducted to enable the construction of the Carousel Center. However, residual chlorinated and non-chlorinated hydrocarbons contamination was found on the Phase I Site adjacent to the former Clark Property. Initially, a pilot study consisting of the installation and operation of a vapor control system (VCS) was implemented to remove VOCs from the subsurface soils. Approximately 6,000 pounds of VOCs were reportedly removed from the soil during this pilot study (Dunn, 1995). Additional remediation of the property in 1990 involved the excavation of approximately 60,000 cubic yards of contaminated soil, to depths of about 20 ft., and the installation of a groundwater under drain system that extends to the western boundary of the Phase I Site as shown on Figure 3 of the Remedial Investigation Report. Groundwater collected in the under drain system is currently piped to a water treatment plant located at the southwest end of the Phase I Site. This water is pumped to the Carousel Center property water-treatment system for processing, and discharged through a NYSDEC SPDES Permit No. NY0232386.

A slurry wall was constructed around the Clark Property and was tied into the main slurry wall that surrounds the Carousel Center foundation, as shown on Figure 4 “Existing Hydraulic Controls Plan”. A steel sheet pile wall was also installed at the southwest end of the Clark Property as part of the construction of the containment structure. Excavation of contaminated soil at the Clark Property occurred immediately prior to and during construction of Carousel Center. A small portion of the excavation extended onto the Phase I Site. The contaminated soil was placed in a waste containment cell located in the northwest corner of the Carousel Center Area, near the confluence of the Barge Canal and Onondaga Lake. Groundwater quality, surrounding the containment cell is subject to ongoing monitoring in a series of upgradient and downgradient wells.

1.3.3 Amerada Hess Property

Amerada Hess owned land southwest of the Carousel Center building. The southern end of the Phase I Site lies in the former Amerada Hess Property. At maximum build out, the westernmost portion of the Hess parcel contained eight petroleum bulk storage tanks. During the early 1990s, the tanks were decommissioned and removed from the property. A small area of VOC contamination in soil was found adjacent to, and attributed to, the Clark Property. This soil was excavated and moved to the secure containment cell during Carousel Center construction, however, subsequent soil investigations also identified petroleum and lead contaminated soil on the property associated with the “loading rack” and “manifold” areas.

1.3.4 Buckeye Pipeline Property

Buckeye Pipeline owned two parcels of land between Carousel Center and West Hiawatha Boulevard, east of the Amerada Hess Property. The central portion of the Phase I Site lies on the former Buckeye Pipeline Property. The Buckeye property was used for the storage of petroleum product in a large bulk-storage tank and was decommissioned as a petroleum storage facility circa 1989. An above-ground storage tank was also removed from the property at this time. VOC contaminated soil associated with, or attributed to the contamination on the adjacent Clark Property, was excavated and moved to the secure storage cell during construction of Carousel Center.

1.4 CURRENT PHASE I SITE USES

The Phase I Site was most recently used for Carousel Center parking, vehicle driveways, and pedestrian walkways into the Carousel Center building. Site work has commenced on the first phase of the Destiny project.

As indicated in its letters dated June 19, 2008, July 2, 2008 and July 11, 2008, the Developer notified NYSDEC of the anticipated Phase I Site activities and that under the circumstances, it had no option but to comply with the BCP process concurrent with construction. Construction of the expansion is currently ongoing.

1.5 SUMMARY OF ENVIRONMENTAL CONDITIONS

1.5.1 Current Soil Conditions

The following sections summarize the current Phase I Site soil conditions. Contaminants identified within the soils on the Phase I Site include metals, VOCs, SVOCs, and PCBs, as described below. Complete summaries of current soil and groundwater conditions are available in the Phase I Remedial Investigation Report dated March 2009.

Target Analyte List (TAL) Metals in Subsurface Soil

Nine metals: arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel and zinc were detected at concentrations exceeding the BCP regulatory standards, 6 NYCRR Part 375.

Several additional detections of TAL metals; including aluminum, antimony, beryllium, calcium, cobalt, iron, magnesium, manganese, potassium, selenium, silver, sodium, thallium, and vanadium were also reported in the subsurface Phase I soil samples. Metals were identified in soils across the Phase I Site at depths ranging from 2- 13 feet below ground surface (bgs).

Volatile Organic Compounds (VOCs) in Subsurface Soil

Three VOCs: m&p- xylenes, vinyl chloride and acetone were reported exceeding the BCP regulatory standards. M&p- xylenes and vinyl chloride were reported at soil sample location 2008-2 at a depth of 6-8 ft bgs at concentrations of 260 ppb and 20 ppb, above the regulatory standard. Acetone was reported at soil sample locations 2008-19 7'-9' (120 ppb), 2008-20 9'-11' (110 ppb) and 2008-21 9'-11' (140 ppb) and above the regulatory standard of 50 ppb.

Additionally, sixteen additional VOCs; 1,2,4-Trichlorobenzene, 1,2,4-Trimethylbenzene, 1,2-Dichlorobenzene, 2-Isopropoyltoluene, cis-1,2-dichloroethene, ethylbenzene, methyl ethyl ketone-MEK (2-butanone), n-buthylbenzene, n-propoylbenzene, naphthalene, o-xylene, p-isopropyltoluene, sec-butylbenzene, toluene, total xylenes, and trichloroethene were detected across eighteen (18) of the twenty (20) soil samples collected during the Phase I RI. Although detections of these constituents were below the BCP regulatory standards they are widespread across the Phase I Site and are present between depths of 2- 13 feet bgs in varying degrees.

Semi-volatile Organic Compounds (SVOCs) in Subsurface Soil

Nine SVOCs: benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(ghi)perylene benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, naphthalene, and phenol were detected above the regulatory standards set forth in 6 NYCRR Part 375.

Fifteen additional SVOCs: 2-methylnaphtalene, acenaphthene, anthracene, benzo (g,h,i) perylene, benzl butyl phthalate, bis (2-ethyhexyl) phthalate, carbozole, di-n-butylphthalate, dibenzofuran, fluoranthene, fluorene, phenanthrene, phenol, pyrene, and 3,3,'-dichlorobenzidine were detected across sixteen (16) of the twenty (20) soil samples collected during the Phase I Site Investigation. Although detections of these constituents were below the BCP regulatory standards, they are widespread across the Phase I Site and are present between depths of 2- 13 feet bgs in varying degrees.

Polychlorinated Biphenyls (PCBs) in Subsurface Soil

PCBs were detected at RI soil sample locations 2008-2 (6'-7,' 2,400 ppb), 2008-3 (4'-6', 460 ppb), 2008-4 (10'-12', 960 ppb), 2008-6 (6'-8', 1,700 ppb), 2008-7 (6'-8', 5,200 ppb), 2008-9 (8'-10', 1,600 ppb), 2008-10 (8'-10', 1,000 ppb), 2008-12 (6'-8', 3,100 ppb), 2008-13 (6'-8', 1,000 ppb), 2008-15 (6'-8', 1,600 ppb), 2008-17 (11'-13', 136 ppb), 2008-18 (11'-13', 630 ppb), 2008-19 (7'-9', 1,490 ppb), 2008-20 (9'-11', 1,300 ppb) and 2008-21 (9'-11', 480 ppb), during the RI. These concentrations of total PCBs are each above the regulatory standard of 100 ppb. All other PCB soil sample locations were non-detect and below the 100 ppb standard.

Based on the soil analytical results obtained during the RI, it is apparent that PCBs are widespread across the Phase I Site and are present between depths of 2- 13 feet bgs in varying degrees.

1.5.2 Current Groundwater Conditions

The Remedial Investigation included collection of three groundwater samples from two newly installed and one existing monitoring well. The following sections summarize the Phase I Site groundwater conditions.

Target Analyte List (TAL) Metals in Groundwater

Total Metals

Total metals analysis indicates six TAL Metals; barium, chromium, copper, lead, manganese and sodium at concentrations above 6 NYCRR Part 703 Water Quality Standards during the Phase I RI.

Barium was detected above the 6 NYCRR Part 703 Water Quality Standard of 1,000 ppb at monitoring well 2008-17 (1,240 ppb) and the duplicate sample collected from 2008-17 (1,250 ppb) during the Phase I RI.

Chromium was detected above the 6 NYCRR Part 703 Water Quality Standard of 50 ppb at monitoring well 2008-21 (320 ppb) during the Phase I RI.

Copper was reported above the 6 NYCRR Part 703 Water Quality Standard of 200 ppb at monitoring well MW-7 (370 ppb) during the Phase I RI.

Iron was reported above the 6 NYCRR Part 703 Water Quality Standard of 300 ppb at monitoring wells 2008-17 (1,300 ppb; Duplicate-1,350 ppb), 2008-21 (720 ppb), and MW-7 (50,900 ppb) during the Phase I RI.

Manganese was reported above the 6 NYCRR Part 703 Water Quality Standard of 300 ppb at monitoring wells 2008-17 (503 ppb-Duplicate-509 ppb) and MW-7 (1,040 ppb) during the Phase I RI.

Sodium was reported above the 6 NYCRR Part 703 Water Quality Standard of 20,000 ppb at monitoring wells 2008-17 (4,710,000 ppb/Duplicate- 4,960,000 ppb), 2008-21 (421,000 ppb), and MW-7 (18,700,000 ppb) during the Phase I RI.

Five additional metals; aluminum, calcium, magnesium, potassium, and zinc were noted in each of the groundwater samples collected, but at concentrations below their applicable 6 NYCRR Part 703 Water Quality Standards.

Dissolved Metals

Dissolved metals analysis indicates four TAL Metals; barium, iron, manganese, and sodium at concentrations above 6 NYCRR Part 703 Water Quality Standards during the Phase I RI.

Dissolved barium was detected above the 6 NYCRR Part 703 Water Quality Standard of 1,000 ppb at monitoring well 2008-17 (1,410 ppb) and the duplicate sample collected from 2008-17 (1,250 ppb) during the Phase I RI.

Dissolved iron was reported above the 6 NYCRR Part 703 Water Quality Standard of 300 ppb at monitoring wells 2008-17 (1,040 ppb/ Duplicate-1,030 ppb), 2008-21 (600 ppb), and MW-7 (480 ppb) during the Phase I RI.

Dissolved manganese was reported above the 6 NYCRR Part 703 Water Quality Standard of 300 ppb at monitoring wells 2008-17 (559 ppb/Duplicate-554 ppb) and MW-7 (350 ppb) during the Phase I RI.

Dissolved sodium was reported above the 6 NYCRR Part 703 Water Quality Standard of 20,000 ppb at monitoring wells 2008-17 (5,380,000 ppb/Duplicate- 5,510,000 ppb), 2008-21 (410,000 ppb), and MW-7 (20,300,000 ppb) during the Phase I RI.

Five additional dissolved metals; aluminum, calcium, magnesium, and potassium were noted in each of the groundwater samples collected, but at concentrations below their applicable 6 NYCRR Part 703 Water Quality Standards.

Volatile Organic Compounds (VOCs) in Groundwater

The laboratory results indicated six VOCs in site groundwater during the RI.

Two exceedances of the 6 NYCRR Part 703 Water Quality Standards were reported at monitoring well 2008-21. Benzene was reported at (3.7 ppb) and above the applicable 6 NYCRR Part 703 Water Quality Standard of 1 ppb. Chlorobenzene was reported at (40 ppb) and above the applicable 6 NYCRR Part 703 Water Quality Standard of 5 ppb.

Four additional VOCs: 1,4-diclorobenzene, 4-Methyl-2-pentanone (MIBK), acetone, and vinyl chloride were noted in the groundwater samples collected during the RI, but at concentrations below their applicable 6 NYCRR Part 703 Water Quality Standards. No additional VOCs were reported in any of the groundwater samples collected during the Phase I RI.

Semi-volatile Organic Compounds (SVOCs) in Groundwater

One SVOC was detected in monitoring well MW-7 during the RI. Bis (2-ethylhexyl) phthalate was reported at 56 ppb and above the applicable 6 NYCRR Part 703 Water Quality Standard of 5 ppb.

All other SVOCs concentrations were reported as non-detect during the Phase I RI.

Polychlorinated Biphenyls(PCBs) in Groundwater

Groundwater analytical testing for PCBs did not indicate PCBs in any of the groundwater samples collected during the Phase I RI.

Groundwater pH Results

Laboratory analytical testing for pH indicates that site groundwater has a pH ranging from 7.46 to 8.57 pH units. Measurements recorded in the field during groundwater sampling indicated a range between 7.25 and 8.66 pH units.

1.5.3 Current Soil Vapor Conditions

Volatile Organic Compounds (VOCs) in Soil Vapor

Site investigations have identified nineteen compounds above laboratory detection limits across the six soil vapor samples collected; fifteen of which are above the background values (75th percentile) published by NYSDOH. Elevated concentrations of vinyl chloride, acetone, trichlorofluoromethane, 1,1-dichloroethene, 1,1,2-trichloro 1,2,2-trifluoroerthane, carbon disulfide, trans-1,2-dichloroethene, 1,1-dichloroethane, 2-butonone (MEK), cis-1,2-dichloroethene, chloroform, benzene, trichloroethene (TCE), toluene, tetrachloroethene (PCE), chlorobenzene, ethylbenzene, m&p-xylene, and o-xylene were identified above background values published by NYSDOH across the six vapor sample locations.

Additionally, elevated concentrations of TCE at vapor points VP-1, VP-3, VP-4, VP-5 and VP-6) exceed the NYSDOH AGVs of 5 ug/m3. Table 19, "Phase I Site Remedial Investigation Soil Vapor and Ambient Analytical Results", and Figure 17, "Phase I Site NYSDOH VOC Soil Vapor Results Map" presented in the Phase I Remedial Investigation Report, denote sample locations with elevated VOC concentrations in exceedance of NYSDOH AGVs and expected (75th percentile) background values published by NYSDOH.

TCE was detected at a concentration of 25 ug/m3 (VP-1), 8.3 ug/m3 (VP-3), 660 ug/m3 (VP-4), 19 ug/m3 at (VP-5 and 27 ug/m3 at VP-6, which exceeds the AGV of 5 ug/m3. Concentrations of TCE detected could require mitigation dependent on indoor air concentrations according to decision Matrices 1 and 2 published in the NYSDOH Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York, dated October 2006.

1.6 REMEDIAL ACTION OBJECTIVES (RAOS)

Remedial action objectives are goals developed for the protection of human health and the environment. Identifying these objectives requires an assessment of the contaminants and media of concern, potential migration pathways, exposure routes and potential receptors. Typically, remediation goals are established based on standards, criteria and guidelines (SCGs) to protect human health and the environment.

The RAOs for this Phase I RWP include:

- Utilization of a remedy that is fully protective of public health and the environment;
- Protect on-site workers and the surrounding community from exposure to site-related contaminants both during construction and after the implementation of the remedy;
- Establish procedures for the proper management and disposal of soil, water and other wastes that would be generated as part of the implementation of the remedy;
- Establish procedures associated with the operation and maintenance of any expansions in connection with the Destiny project to reduce the potential for future exposure of workers and the community to site-related contaminants;
- NYSDEC and NYSDOH regulatory standards and guidelines were used to evaluate the soil, soil vapor, and groundwater quality and assess remedial alternatives; and
- Other Applicable Guidance.

1.7 CONTEMPLATED END USE AND SELECTION OF CLEANUP TRACK

The Phase I Site is part of the Destiny project, a project that is anticipated to be operated as a unique development that will include major research, retail, entertainment, dining, hospitality, and tourism facilities. Site work has commenced and is currently ongoing on the first phase of the Destiny project, which includes the 800,000+ square foot building expansion of the existing Carousel Center. The anticipated ground floor use includes commercial retail space with parking on the surrounding land. Subsurface uses or activities at the Phase I Site (to a depth of approximately 15 feet below the ground surface) include installation of a concrete slab building foundation, pile caps, and required utility corridors. Construction of the expansion is currently ongoing.

Spectra has concluded that a Track 4 Restricted (Commercial) use cleanup utilizing engineering controls as described herein meets the RAOs.

2.0 REMEDIAL ALTERNATIVES EVALUATION

2.1 INTRODUCTION

The section provides an evaluation of remedial alternatives for the Phase I Site to demonstrate how the selected remedy best meets the various criteria outlined by 6 NYCRR Part 375 and ECL Article 27 Title 14, including protection of public health and the environment.

Four alternatives were evaluated, including:

Alternative 1 – No-Action

Alternative 2 – In-Situ Soil Treatment with Excavation (Track 2)

Alternative 3 – Excavation – On/Off-Site Disposal (Track 1)

Alternative 4 – Excavation, Capping and Vapor Barrier with Vapor Control, (Track 4)

2.2 POTENTIAL THREAT TO PUBLIC HEALTH AND THE ENVIRONMENT

A qualitative exposure assessment was performed and was previously included in Section 8.0 of the Phase I RIR. Soil contamination as well as contaminants in other media, were considered. The assessment evaluated current and foreseeable exposure pathways for the Phase I Site, including human and wildlife exposure potential, i.e. dermal contact with soil, surface water, and groundwater; ingestion of soil, surface water and groundwater; and inhalation of particulate matter and chemical vapors. These potential exposures were evaluated in the development of remedial alternatives and addressed in the alternatives analysis herein.

2.3 LAND USE

The Phase I Site is anticipated to be operated as a unique development that will include major research, retail, entertainment, dining, hospitality, and tourism facilities. Detailed information about the history of the Phase I Site and its surroundings is provided in the Phase I RIWP and Phase I RIR. In assessing the reasonable certainty of these anticipated land uses, we have evaluated the regulatory factors, including but not limited to, the factors set forth in 375-1.8(f)(9) et seq.

2.3.1 Current Use/Historical and/or Recent Development Patterns

As discussed more fully in Section 1.4 of the Phase I RIR, the Phase I Site was most recently used for Carousel Center parking, vehicle driveways, and pedestrian walkways into the Carousel Center building (See Figure 5 “Existing Topography”). Site work at the Phase I Site is currently underway. In line with current development patterns, the Phase I Site construction is a part of a major development anticipated to transform this previously underutilized industrial area into a major research, retail, entertainment, dining, hospitality, and tourism venue.

2.3.2 Applicable Zoning Laws and Maps

The Destiny project is a permitted use pursuant to the Syracuse zoning rules and regulations. *See* City of Syracuse Zoning Ordinance, B-IX-6(6).

2.3.3 Brownfield Opportunity Areas

There are currently no established Brownfield Opportunity Areas in or near the Phase I Site.

2.3.4 Applicable Comprehensive Community Master Plans

The Destiny project, including the Phase I Site is consistent with and supports the goals of the existing City of Syracuse Comprehensive Plan 2025. The City of Syracuse Comprehensive Plan 2025 recognizes that this area is a destination for retail, entertainment, recreation, and regional transportation and that there are ongoing plans for even more retail travel and entertainment opportunities as well as recreation adventures through the proposed new Destiny USA resort center. *See* City of Syracuse Comprehensive Plan 2025, Page 18. There are no local waterfront revitalization plans or other applicable land use plans.

2.3.5 Proximity to Residential and Other Uses

A description of the Phase I Site and surrounding features is found in the Phase I RIR at Section 1.2. Additionally, the nearest urban residences are separated by Interstate 81 and are located approximately 0.5 miles away. The nearest recreational facilities are those associated with the surface water features Onondaga Lake, located 0.6 miles from the Phase I Site. The Carousel Center is a commercial and recreational use immediately adjacent to the Phase I Site.

2.3.6 Public Comment

To date, no public comments have been received associated with the Citizen Participation Plan.

2.3.7 Environmental Justice

As noted in prior submittals, there are no low-income minority communities on or in immediate proximity to the Phase I Site. Further, the prior and historic use of the Phase I Site and its surroundings has been commercial and industrial. Therefore, the proposed use is not reasonably expected to cause or increase a disproportionate burden on the community where the Phase I Site is located.

2.3.8 Federal or State Land Use Designations

No Federal or State Land Use Designations have been identified on the Phase I Site.

2.3.9 Population Growth Patterns and Projections

Syracuse is considered a major metropolitan area according to the 2000 census. Onondaga County exhibited a -3% change in population between 1990 and 2000. The Destiny project is anticipated to transform the previously underutilized Phase I Site and its surroundings into a major research, retail, entertainment, dining, hospitality, and tourism venue. This much needed project will provide the stimulus necessary to reverse the decreasing population trend identified in the 2000 census.

2.3.10 Accessibility to Existing Infrastructure

The Phase I Site currently has full access to the required utilities and transportation network. The electric, natural gas, water and sewer utilities are currently connected to and service Carousel Center, which is adjacent to the Phase I Site. Specific connections, and necessary environmentally-sensitive and beneficial upgrades, have been made and are continuing in accordance with all required laws and regulations. For example, some additional water requirements necessary for the expanded Carousel Center will be provided by the designed rain-harvest collection system.

An extensive public transportation system is in place to accommodate the additional anticipated traffic to the Phase I Site, including but not limited to I-81 and I-690.

2.3.11 Proximity to Important Cultural Resources

The Phase I Site is not wholly or partially included within an identified archeologically-sensitive area. The Phase I Site does not involve nor is it substantially contiguous to a property listed or recommended for listing on the New York State or National registers of historic places. No known heritage or native-American religious sites are located on or in close proximity to the Phase I Site.

2.3.12 Natural Resources

The Phase I Site is approximately 1400 feet from Onondaga Lake and 0.6 miles from the Onondaga Lake Park. The New York State Barge Canal is located approximately 900 feet from the Phase I Site. As discussed in the Determination of Significant Threat Assessment submitted to NYSDEC, dated April 24, 2009, there are no wetlands or critical habitats of threatened or endangered species at or adjacent to the Phase I Site. There are no wildlife refuges on or near the Phase I Site.

2.3.13 Potential Vulnerability of Groundwater

No significant migration of contaminants in groundwater is anticipated from the Phase I Site due to the existing hydraulic controls, slurry wall barrier and treatment systems that exist on and around the Phase I Site. In addition, there are no wellhead protection areas or groundwater recharge areas for potable sources on or in close proximity to the Phase I Site.

2.3.14 Proximity to Flood Plains

The FEMA Flood Insurance Rate Map indicates that an A6 flood hazard area (areas with a 1% annual chance of flooding and 26% chance of flooding over the life of a 30 year mortgage) extends onto the former Hess property. However, it should be noted that the effective date of the FEMA map is May 3, 1982. Since that time, field activities map, including the grading and construction activities at the Carousel Center have modified (i.e. increased) the grade elevation at and near the Phase I Site.

2.3.15 Geography and Geology

See sections 1 and 4 of the Phase I RIR for a detailed discussion of these topics. Figure 5 "Existing Topography" presents the existing topography of the Phase I Site.

2.3.16 Current Institutional Controls

There are no existing institutional controls applicable to the Phase I Site.

2.4 DESCRIPTION OF REMEDIAL ALTERNATIVES

2.4.1 Alternative 1 – No-Action

A "No-Action" alternative is not considered a viable option because it would not meet the RAOs of the project. Specifically it would neither reduce nor eliminate the contaminant mass or reduce the potential threat to the public health and the environment.

2.4.2 Alternative 2 – In-Situ Soil Treatment with Excavation

In-situ treatment of contaminated soils is a viable alternative if the site contaminants and conditions are conducive to the treatment process. This includes not only the contaminant response to vapor control or nutrient and/or chemical injection, but also the ability to operate, maintain and monitor the effectiveness of the treatment.

In-situ soil treatment programs can also come in the form of "one-shot" applications. As subsurface soils become exposed through excavation, soil enhancers and/or biotreatment solutions may be added on a one time basis to accelerate contaminant attenuation.

At the Phase I Site, the contaminants of concern (COCs) include volatile organic compounds (VOCs), semi-volatile organic constituents (SVOCs), PCBs, and metals. In-situ injection of nutrients/chemicals would potentially accelerate the remediation of the VOCs and some of the SVOC contaminants. This treatment approach typically demands multiple injections/applications and the injection points would have to remain available over time. Periodic sampling is also required to assess the effectiveness of the operation.

In-situ treatment of metals, PCBs and recalcitrant SVOCs is more problematic. These compounds do not readily respond to vapor Control or nutrient/chemical reaction. An in-situ flushing process could be possibly used for these types of contaminants. However, inhomogeneous soils in the subsurface could result in non-uniform contaminant removal with residuals left in place. Additionally, soil flushing agents mixed with groundwater and contaminants can form emulsions that are extremely difficult to treat when they are pumped from the ground. Without extensive field pilot studies, it is highly uncertain as to whether this alternative could achieve Track 2 Objectives.

The existing Phase I Site profile has ground elevations in the vicinity of Hiawatha Boulevard rising as high as sixteen feet above and tapering down to a final subgrade level. To bring the surrounding grade even with the existing Carousel Center floor level will result in the excavation and removal of 88,000 cubic yards of material.

2.4.3 Alternative 3 – Excavation – On/Off-Site Disposal

Excavation of the entire Phase I Site footprint (approximately 388,000 cu. yd.) down to a depth of 20 feet below the proposed building floor elevation would remove all the contaminants to a level to support an unrestricted land use designation. Worker exposure to COCs is at its highest during the excavation period. Excavation methods will have to accommodate hours of business operation to minimize public exposure. This would most likely extend the excavation period.

There are several options available for disposal of excavated material. Disposal can take place off-site at a permitted facility, stockpiled on-site within the boundaries of Oil City or a combination of both.

Disposal off-site would remove the COCs from the property and thereby eliminate any future risk of exposure to human health or the environment. Stockpiling on-site would temporarily place the material at a location on the Oil City property where exposure would be eliminated by instituting temporary engineering controls until such time as a final characterization can be made.

2.4.4 Alternative 4 – Excavation, Capping and Vapor Barrier with Vapor Control

To address the contaminated soil below the building level and mitigate any potential exposure from subsurface contamination, this alternative involves the installation of a combined capping, vapor barrier and vapor control system across the entire footprint of the Phase I Site. The system consists of a network of slotted PVC piping manifolded together and forming multiple galleries and extraction points to collect subsurface vapors. The piping network is covered by a polyethylene sheeted vapor barrier to trap subsurface vapors beneath the concrete floor slab. The concrete floor is poured over the barrier/pipe network and acts as a cap for the entire Phase I Site. The vapors are collected from several pre-constructed extraction points and, if emission levels allow, discharged to the atmosphere above the roofline. If emission levels exceed allowable levels, vapor phase treatment can be included.

This alternative also includes excavating 88,000 cubic yards of soil down to the subgrade (horizontal) level below the existing ground level of the Carousel Mall. Without this excavation, the vertical outside walls of the new building would remain in direct contact with contaminated fill that could be a potential source of vapor intrusion. By removing this "wedge" of soil, a vapor control system for the vertical outside walls, which would be difficult to construct, is not required. This approach allows Track 4 objectives to be satisfied.

2.5 GROUNDWATER PROTECTION

Groundwater contamination is addressed through the activities contained in the selected alternative (i.e. soil excavation, and capping). Soil excavation should improve groundwater quality to some extent and capping prevents infiltration of stormwater through remaining soils located underneath the Phase I Site, further reducing leaching of contaminants.

In conjunction with these activities, groundwater contaminants are currently, and will continue to be contained below the surface of the Phase I Site boundaries through various engineering control measures that restrict dermal contact, inhalation, and ingestion. Groundwater contaminants are currently being treated downgradient of the Phase I Site. These measures include the following:

a) The existing Amerada Hess groundwater collection trench located downgradient of the Phase I Site collects and treats potentially migrating contaminants before they could migrate to off-site locations (See Figure 4 "Existing Hydraulic Controls Plan");

b) The existing groundwater data collected from the down-gradient Amerada Hess collection trench shows area groundwater to be only moderately impacted with petroleum constituents;

c) The presence of the existing slurry wall around the current Carousel Center is expected to limit groundwater flow across the Phase I Site (See Figure 4 “Existing Hydraulic Controls Plan”);

d) Existing Carousel Center foundation wells continuously pump and treat Phase I Site groundwater through an on-site wastewater collection and treatment system prior to discharge through a NYSDEC issued SPDES permit. The foundation pumping system is expected to create a hydraulic gradient towards foundation well intakes further limiting any threat of offsite migration of contaminants through groundwater (See Figure 4 “Existing Hydraulic Controls Plan”); and

e) The existing collection trench, slurrywall, and Carousel Center foundation wells are controlling groundwater migration at the Phase I Site. These hydraulic control measures effectively treat and contain groundwater contamination regardless of whether it originates on the Phase I Site or elsewhere.

The groundwater protection decision making factors set forth at 375-1.8(d)(4) have already been addressed because of the effective hydraulic controls currently in existence. In addition, the community is not exposed to nor does it require any access to groundwater beneath the Phase I Site because of the existing municipal water supply system.

2.6 REMEDY SELECTION FACTORS

The alternatives described in Section 2.2 have been evaluated against the following remedy selection factors consistent with the NYSDEC BCP.

a) Conformance to Standards, Criteria and Guidance (SCGs)

These criteria evaluate the alternatives against the federal and New York State legal and engineering standards identified for the Phase I Site. This evaluation also considers the RAOs developed for the Phase I Site as identified in Section 1.6. These standards are considered a minimum performance specification for each remedial alternative under consideration, and include, but are not limited to, the Brownfields law, all applicable regulations and guidance.

b) Overall Protectiveness of Public Health and the Environment

Protection of public health and the environment is evaluated on the basis of estimated reductions in the potential for both human and environmental exposure to contaminants for each remedial alternative. The evaluation focuses on whether a specific alternative achieves adequate protection under the conditions of the site's future use and how site risks are eliminated, reduced or controlled through treatment, engineering or institutional controls. An integral part of this evaluation is an assessment of long-term residual risks to be expected post-construction of the remedy. Evaluation of the public health and environmental protection factor is generally based on the findings of the exposure assessment and other data as set forth in the Phase I RIR.

c) Short-term Effectiveness and Impacts

Evaluation of short-term effectiveness and impacts of each alternative examines health and environmental risks likely to exist during the implementation of a particular remedial alternative. Principal factors for consideration include the expediency with which a particular alternative can be completed, potential impacts on the nearby community, on-site workers and environment, and mitigation measures for short-term risks required by a given alternative during the necessary implementation period.

d) Long-Term Effectiveness and Permanence

Examination of long-term impacts and effectiveness for each alternative requires an estimation of the degree of permanence afforded by each alternative. To this end, the anticipated service life of each alternative must be estimated, together with the estimated quantity and characterization of residual contamination remaining on-site at the end of this service life. The magnitude of residual risks must also be considered in terms of the amount and concentrations of contaminants remaining following implementation of a remedial action, considering the persistence, toxicity and mobility of these contaminants, and their propensity to bioaccumulate. This evaluation also includes the adequacy and reliability of controls required for the alternative, if required.

e) Reduction in Toxicity, Mobility and/or Volume of Contamination

Reduction in toxicity, mobility and/or volume of contamination is evaluated on the basis of the estimated quantity of contamination treated or destroyed, together with the estimated quantity of waste materials produced by the treatment process itself. Furthermore, this evaluation considers whether a particular alternative would achieve the irreversible destruction of contaminants, treatment of the contaminants or merely removal of contaminants for disposal elsewhere. Reduction of the mobility of the contaminants at the site is also considered in this evaluation.

f) Implementability

Evaluation of implementability examines the difficulty associated with the installation and/or operation of each alternative on-site and the proven or perceived reliability with which an alternative can achieve performance goals. The evaluation examines the potential need for future remedial action, the level of oversight required by regulatory agencies, the availability of certain technology resources required by each alternative and community acceptance of the alternative.

g) Cost Effectiveness

Cost evaluations presented in this document estimate the capital, and operation, monitoring and maintenance (OM&M) costs associated with each remedial alternative. From these estimates, a total present worth for each option is determined.

h) Community Acceptance

Community acceptance evaluates the technical and administrative issues and concerns that the community may have regarding each of the alternatives. Community acceptance will be gauged through the 45 day statutorily required public comment period for the Phase I RWP. Public comments will be considered and incorporated into the final approved Phase I RWP, upon the completion of the public comment period.

i) Land Use

Evaluation of land use examines whether the alternative is suitable for the site, based on current and future use of the site and its surrounding factors, such as:

- zoning;
- any applicable comprehensive community master plans or land use plans;
- surrounding property uses;
- citizen participation;
- environmental justice concerns;
- land use designations;
- population growth patterns;
- accessibility to existing infrastructure;
- proximity to cultural resources;

- proximity to natural resources;
- off-site groundwater impacts;
- proximity to floodplains;
- geography and geology of the site; and
- current institutional controls.

The following sections provide a more detailed description of the remedial alternatives.

2.7 COMPARATIVE ANALYSIS OF REMEDIAL ALTERNATIVES

The following comparative analysis discusses the advantages and disadvantages of each alternative relative to each other and with respect to the nine selection factor criteria discussed above.

2.8 OVERALL PROTECTIVENESS OF PUBLIC HEALTH AND THE ENVIRONMENT

2.8.1 Alternative 1 – No-Action

A no-action alternative would provide no source removal or mitigation of the existing contamination identified in the subsurface soils. Construction and use of the Phase I expansion above these soils without implementing any mitigating measures can present a potential health risk to employees and patrons of the new facility. This risk is inconsistent with the RAOs and should not be considered a viable option.

2.8.2 Alternative 2 – In-Situ Soil Treatment with Excavation

In-situ treatment of subsurface contaminants presents an operational challenge. In-situ soil treatment systems require permeable soils and, depending on the methodology employed, could typically take months or longer to produce measurable results. In-situ treatments come in three primary forms; biological, chemical, or mechanical. Chemical/Biological treatment systems typically address organic contaminants and require the appropriate solutions be delivered so they contact all subsurface areas of contamination. It also requires the treatment system be monitored and maintained for extended periods. Effectively designed systems can protect public health and the environment, and can be implemented. Biological systems will generally take longer time periods to complete. Chemical-induced systems, (e.g., ozone, peroxide, etc.), usually entail higher initial capital cost but can be completed in a shorter time.

Mechanical systems, (e.g., soil flushing), are used to address inorganic contaminants such as metals and PCBs. Flushing systems have high upfront costs as they are usually accompanied by groundwater pump and treat systems to collect the flushed contaminant.

This alternative would be accompanied by the excavation and removal of 88,000 cubic yards of material currently above the new building's subgrade level. The material would be removed to bring the surrounding grade even with the existing building.

2.8.3 Alternative 3 – Excavation – On/Off-Site Disposal

This alternative would result in an unrestricted land use. The foundation excavation would be dug 20 feet below the final grade to remove all contaminated material. The soil would be either, disposed at a permitted landfill or stockpiled and/or treated on site in accordance with applicable legal requirements. Exposure to workers could occur during excavation but it would be short term and proper worker protection would mitigate potential impacts.

This option, while protective, is also the most costly. The approximately 450,000 sq. ft. footprint, if dug down to a depth of 20 feet, plus the removal of the surrounding grade to match the final elevations, would result in approximately 388,000 cu. yds. of material being excavated and disposed.

2.8.4 Alternative 4 – Excavation, Capping and Vapor Barrier with Vapor Control

This alternative utilizes a combination of removal and mitigation technology to protect the public health and the environment. The profile of the existing site rises to an elevation as high as sixteen (16) feet above the existing building floor level. This alternative includes removing 88,000 cubic yards of soil, down to the existing building subgrade level.

To further mitigate the potential for exposure from the subsurface contaminants, this alternative provides for the installation of a vapor barrier with an accompanying active vapor control system. The barrier prevents vapors from reaching the surface while the vapor control system collects and transports any accumulated vapors from beneath the barrier to discharge above the roof level. If vapor concentrations exceed allowable emission standards, vapor phase treatment can easily be implemented. The Phase I RWP includes covering the vapor barrier with a 15-inch concrete foundation slab.

2.9 COMPLIANCE WITH STANDARDS, CRITERIA, AND GUIDANCE (SCGS)

2.9.1 Alternative 1 – No-Action

A no-action alternative would allow existing contamination to remain in the soil. Since the levels of contamination exceed SCGs, and without any mitigating measures, this alternative is determined not to be a viable option.

2.9.2 Alternative 2 – In-Situ Soil Treatment with Excavation

SCGs can be achieved for the organic contaminants by using biological in-situ treatment, however biological treatment will have little (if any) affect on metals, PCBs and some SVOCs. To address these contaminants, a mechanical method such as in-situ flushing would have to be combined with the biological treatment. It is not certain that these technologies have the capability to achieve the SCGs.

2.9.3 Alternative 3 – Excavation – On/Off-Site Disposal

This option provides for complete removal of all contaminants in the soil to a depth of 20 feet bgs and consequently assures compliance with soil SCGs. While not directly treated, and assuming no additional contamination, groundwater quality over time may improve. Off-site disposal will be very expensive and on-site treatment is problematic and very costly.

2.9.4 Alternative 4 – Excavation, Capping and Vapor Barrier with Vapor Control

This alternative, which includes installation of a vapor barrier, and cap, achieves SCGs for soils above the building level and mitigates exposure to subsurface contaminants.

2.10 SHORT-TERM EFFECTIVENESS AND IMPACTS

2.10.1 Alternative 1 – No-Action

There is no short term effectiveness as this option allows contamination to remain. Any impact remains because no remedial action is taken.

2.10.2 Alternative 2 – In-Situ Soil Treatment with Excavation

Given that most biological in-situ treatments take anywhere from months to years, this alternative is expected to provide little short-term effectiveness. Chemical oxidation may achieve SCGs for organic contaminants over a shorter period of time and would result in a significant reduction in contaminant concentrations. Metals and PCBs would still be available and soil flushing would have to be employed to address inorganic contamination.

2.10.3 Alternative 3 – Excavation – On/Off-Site Disposal

While excavation and disposal of the contaminated area to a depth of 20 ft bgs provides short term effectiveness, open excavation of the subsurface contaminated soils exposes workers to contaminants from dust and direct contact. A complete excavation to 20 feet below grade level could impact the existing building substructure of the Carousel Center and compromise stability.

2.10.4 Alternative 4 – Excavation, Capping and Vapor Barrier with Vapor Control

Short-term exposure of workers to contaminated material is a risk created by removal of the soil. Installation of a vapor barrier and vapor control system eliminates the potential for vapor migration immediately upon construction completion. While SCGs will not be met beneath the Phase I Site, exposure to contaminants will be eliminated.

2.11 LONG-TERM EFFECTIVENESS AND PERMANENCE

2.11.1 Alternative 1 – No-Action

A no action alternative would provide no achievement of SCGs and presents the most problematic exposure opportunities over the long term.

2.11.2 Alternative 2 – In-Situ Soil Treatment with Excavation

If successful, in-situ soil biotreatment can result in an effective long-term treatment option for some organic contaminants. The metals and PCB contamination would require a different type of treatment program. In-situ treatment programs will require several applications over time to achieve compliance. Construction scheduling may be an issue. Once the floor slab required for the Phase I expansion is constructed, it is very difficult to monitor the progress of in-situ soil treatment and maintain its effectiveness.

After treatment, the concrete floor slab would serve as a physical barrier and eliminate direct exposure to patrons of the facility.

2.11.3 Alternative 3 – Excavation – On/Off-Site Disposal

Offsite disposal presents an effective long term and permanent option. Removal of contaminated soil to a permitted facility will effectively eliminate the source material to a depth of 20 ft bgs. Excavation with on site disposal would also permanently eliminate contaminants from the source area but may transfer the contaminated soil to another location.

2.11.4 Alternative 4 – Excavation, Capping and Vapor Barrier with Vapor Control

Partial excavation, in connection with a vapor control system and concrete foundation barrier provides a highly effective long term solution. A properly maintained vapor control system and cap eliminates any potential exposure and results in an effective long term solution.

2.12 REDUCTION OF TOXICITY, MOBILITY AND/OR VOLUME WITH TREATMENT

2.12.1 Alternative 1 – No-Action

Given that all the identified contaminant material would remain in place, a no-action alternative would have no impact on the reduction, volume, or mobility of the contamination present in the subsurface soil within the footprint of the Phase I expansion.

2.12.2 Alternative 2 – In-Situ Soil Treatment with Excavation

If successful, in-situ soil treatment would reduce the concentration, mobility and volume of the organic contaminants. Incorporating a physical methodology such as soil flushing to address metals and PCBs would increase the mobility of contaminants and make them available for collection and disposal.

2.12.3 Alternative 3 – Excavation – On/Off-Site Disposal

Toxicity, mobility, and contaminant volume would be reduced to the lowest level by physically removing approximately 388,000 cu. Yd. of contaminated material from the site.

2.12.4 Alternative 4 – Excavation, Capping and Vapor Barrier with Vapor Control

This alternative significantly reduces toxicity, mobility, and contaminant concentrations due to the excavation of approximately 88,000 cubic yards of material including the material above the level of the existing concrete foundation. The vapor barrier and the vapor control system increases vapor mobility under a controlled environment and provide a dedicated and controlled pathway for removal.

2.13 IMPLEMENTABILITY

2.13.1 Alternative 1 – No-Action

Not Applicable

2.13.2 Alternative 2 – In-Situ Soil Treatment with Excavation

Depending on the treatment selected, implementability can be a significant problem for in-situ treatment at this site. All of the in-situ technologies for organic and inorganic contaminants would require some form of injection of a solution to enhance removal. In addition, these solutions must reach every zone of contamination to be effective which is highly unlikely to be achieved. Given the size of the Phase I site footprint (over 450,000 sq. ft), it would be a significant task to deliver the necessary mixtures. These technologies typically require more than one application which could take approximately 12-18 months to complete. This remedial alternative is not feasible given the existing project constraints.

2.13.3 Alternative 3 – Excavation – On/Off-Site Disposal

The presence of a slurry wall around the existing Carousel Center may compromise this alternative. The slurry wall extends longitudinally through the proposed area of excavation. Assuming that breaching this wall of bentonite slurry is not acceptable, excavation without affecting the wall may not be feasible. Excavating to depths of 20 ft is also complicated by the existence of groundwater, which occurs at depths of 8-10 ft. Significant dewatering and perhaps installation of sheet pile will be required.

With approximately 388,000 cubic yards of material, the logistics of such an operation would be formidable and disposition of that amount of material may not be feasible. The material would be considered contaminated so on-site storage would have to accommodate that designation. There would also have to be available space for such a large quantity. Offsite disposal at a regulated facility may also be problematic as upwards of 19,400 truckloads would have to be carted offsite.

2.13.4 Alternative 4 – Excavation, Capping and Vapor Barrier with Vapor Control

While the same general type of disposal issues are present for this alternative as described in Alternative 3 above, this alternative requires the disposal of significantly less soil and does not require the breach of the slurry wall. Additionally, this alternative does not require excavation below the groundwater table. Installation of a cap and vapor barrier with its accompanying vapor control system is a common technology.

2.14 Cost Effectiveness

The costs presented below are considered reasonable and appropriate estimates for the selected remedies. The volume of the surrounding excavated material (88,000 cubic yards) was calculated based on the excavation plan produced by Spectra (See Figure 7 “Alternative No. 4 Excavation Plan”). The excavation of this material is necessary to support the proposed remedies.

Assumptions:

- A soil conversion rate of 1.25 tons/cu yd was used to estimate hauling and disposal cost.

- While excavated soil may be disposed on the Oil City property, for the purposes of this comparison, all soil is assumed to be hauled to an offsite permitted facility.
- In-situ soil treatment includes the cost of treatment of flushed groundwater and was applied to the entire footprint.

2.14.1 Alternative 1 – No-Action

Not Applicable

2.14.2 Alternative 2 – In-Situ Soil Treatment with Excavation

Excavation to subgrade construction level = 88,000 yd^3 x 1.25 tons/ yd^3 = 110,000 tons @ $75/ton = **$8,250,500**

In-Situ Treatment ~ = **$6,000,000**

Total Cost = <u>$14,250,000</u>

2.14.3 Alternative 3 – Excavation – On/Off-Site Disposal

<u>Offsite Disposal</u>

Cost to excavate and offsite disposal of 388,000 cu yds

(388,000 cu yds x 1.25 tons/ yd^3 = 485,000 tons)

485,000 tons @ $75/ton = **$36,375,000**

Total Cost = <u>$36,375,000</u>

2.14.4 Alternative 4 – Excavation, Capping, Vapor Barrier with Vapor Control

Cost to excavate and offsite disposal of contaminated soil above the building subgrade level = 88,000 yd^3 x 1.25 tons/ yd^3 = 110,000 tons @ $75/ton = **$8,250,000**

Vapor Barrier and Control system = ~ **$700,000**

Total Cost = **<u>$8,950,000</u>**

2.15 COMMUNITY ACCEPTANCE

Public comments will be considered and incorporated into the final approved Remedial Work Plan upon the completion of the public comment period.

2.16 LAND USE

2.16.1 Alternative 1 – No-Action

Not Applicable. See Section 2.2.

2.16.2 Alternative 2 – In-Situ Soil Treatment with Excavation

This alternative supports the intended commercial land use of the site. Consistent with the existing hydraulic controls, this alternative supports the proposed use described in Section 2.5, Remedy Selection Factors.

2.16.3 Alternative 3 – Excavation – On/Off-Site Disposal

This alternative results in the highest level of remediation and renders the site eligible for unrestricted use.

2.16.4 Alternative 4 – Partial Excavation, Capping of Expansion Parcel with Vapor Control

This alternative supports the intended commercial land use of the site. Consistent with the existing hydraulic controls, this alternative supports the proposed use described in Section 2.5, Remedy Selection Factors.

2.17 SUMMARY OF COMPARATIVE ANALYSIS

A summary of the comparative analysis is presented in the table below.

Evaluation Criteria	Meets Criteria		
	YES	**NO**	**Meets with Controls**
Overall Protection of Human Health and the Environment	Alternative 2,3,4	Alternative 1	Alternative
Compliance with Standards, Criteria, and Guidance (SCGs)	Alternative 3	Alternative 1	Alternative 2,4
Short-Term Effectiveness and Impacts	Alternative 3,4	Alternative 1,2	Alternative
Long-Term Effectiveness and Permanence	Alternative 2,3,4	Alternative 1	Alternative
Reduction of Toxicity, Mobility, or Volume with Treatment	Alternative 2,3	Alternative 1	Alternative 4
Implementability	Alternative 1,4	Alternative 2, 3	Alternative
Cost Effectiveness	Alternative 1,4	Alternative 2,3	Alternative
Community Acceptance	Alternative TBD	Alternative TBD	Alternative TBD
Land Use	Alternative 2,3,4	Alternative 1	Alternative

2.18 FINDINGS SUMMARY

The No-Action alternative (Alternative 1) does not meet any of the environmental quality and health protection criteria of the remedial action objectives (RAO) and is clearly not a viable option to be compared against.

Each of the other alternatives meets the RAOs either by direct removal, treatment, mitigation through engineering controls, or a combination of these consistent with the hierarchy of source removal and control measures set forth in 375-1.8(c). As illustrated in the previous table, Alternatives 1, 2, and 3, each do not meet one or more of the evaluation criteria.

Alternative 4 presents the most cost effective of the proposed alternatives. It is preferred because it achieves the RAOs and it eliminates public exposure to contaminants, with the added benefit of being most cost effective. *See* 6 NYCRR 375-3.8(a)(3). For these reasons, Alternative 4, Excavation and Vapor Barrier with Vapor Control and Capping, is the selected alternative. This would achieve a Track 4 cleanup level.

2.19 COST SUMMARY COMPARISON

ALTERNATIVE	TOTAL COST
1	**$0**
2	**$14,250,000**
3	**$36,375,000**
4	**$8,950,000**

3.0 SUMMARY OF SELECTED REMEDY

3.1 INTRODUCTION

The remedy selected for the Phase I Site was Alternative 4 – Excavation, Vapor Barrier with Vapor Control and capping. Spectra determined that this remedy was the most appropriate for the Phase I Site after consideration of the alternatives discussed herein.

The selected remedy meets the criteria provided by the BCP program, including the protection of public health and the environment (including groundwater, drinking water, surface water, air, indoor air and sensitive populations). The four alternatives listed below have been evaluated against the remedy selection factors set forth in the NYSDEC BCP and presented in the alternatives analysis.

Alternative 1 – No-Action

Alternative 2 –In-Situ Soil Treatment with Excavation

Alternative 3 – Excavation – On/Off-Site Disposal

Alternative 4 –Excavation**,** Capping and Vapor Barrier with Vapor Control

In addition, existing groundwater controls are currently in place at the Phase I Site and will continue to be operated consistent with the selected remedy for the Phase I Site, as long as necessary. These current measures were described in Section 2.3.

Alternative 4 – Excavation, Capping and Vapor Barrier with Vapor Control

To address the contaminated soil below the building level and to mitigate any potential exposure from subsurface contamination, this remedy consists of the installation of a combined vapor barrier and vapor control system across the entire footprint of the Phase I Site. The system consists of a network of slotted PVC piping manifolded together and forming multiple galleries and extraction points to collect subsurface vapors. The piping network is covered by a polyethylene sheeted vapor barrier to trap subsurface vapors beneath the concrete floor slab cap. The concrete floor is poured over the barrier/pipe network serving as a cap. The vapors are collected from several pre-constructed extraction points and, if emission levels allow, are discharged to the atmosphere above the roofline. The OM&M plan will monitor and manage emission levels as well as any follow up steps required.

This alternative includes the excavation of over 88,000 cubic yards of soil. (See Figure 7 “Alternative No. 4 Excavation Plan”.). It removes the primary contaminated material but does not extend to the subsurface below the Carousel Center expansion. However, any remaining soil contamination present below the vapor control system would be mitigated by this system and is otherwise in compliance with Track 4 requirements.

Alternative 4 is an acceptable solution to address the public health aspects associated with soil at the Phase I Site. Groundwater is controlled by the previously described remediation systems. Further, the Phase I Site is supported by municipal water supply from an off-site location and groundwater restrictions will also be imposed on the Phase I Site. With respect to potential ecological exposures, the Phase I Site and surrounding areas do not support significant habitat due to current commercial and prior industrial use.

4.0 REMEDIAL CONSTRUCTION ACTIVITIES/SITE MANAGEMENT PLAN

As indicated in its letters dated June 19, 2008, July 2, 2008 and July 11, 2008, the Developer notified NYSDEC of the anticipated Phase I Site activities and that, under the circumstances, it had no option but to comply with the BCP process concurrent with construction. Further, Developer has fully and timely complied with each and every requirement of the BCP and its regulations, including, but not limited to, the Phase I RIWP, Phase I CPP, and Phase I RIR. The Developer has fully complied with each and every requirement of the BCP and its regulations in light of the time constraints imposed on the developer by the decision made by NYSDEC as to its level of participation and this public improvement project.[1]

The Phase I RWP provides that remedial construction activities include pre-mobilization work such as obtaining any necessary permits, followed by mobilization to the Phase I Site, site preparation, traffic control, security, health and safety planning, air monitoring implementation, off-site transportation and disposal of waste, storm water planning, and demolition of surface structures.

A description of the remedial construction activities are as follows.

4.1 CONSTRUCTION HEALTH AND SAFETY PLAN

A site specific Health and Safety Plan (HASP) has been prepared and is attached as Appendix A. All contractors and subcontractors performing work on the Phase I Site are required to read and comply with the requirements of the HASP.

4.2 COMMUNITY HEALTH AND SAFETY

4.2.1 Community Air Monitoring

The selected remedy includes a Community Air Monitoring Plan (CAMP) providing real-time and continuous volatile organic compound (VOC) and particulate monitoring during all ground intrusive activities (including test pitting and installation of soil borings/monitoring wells, grading and excavations).

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[1] This RWP sets forth, among other things, the analysis demonstrating the appropriateness of the selected remedy; the procedure by which it was and continues to be undertaken; and provides an opportunity for the public and state and local agencies to comment in compliance with relevant statutory and regulatory requirements. A gant chart showing the interrelationship of certain construction and remedial activities, including the implementation of the selected remedy, is attached hereto as Appendix D.

Section 10 *"Soil Intrusive Activities"* of the Site HASP outlines the Community Air monitoring Program required for the Phase I Site to implement this remedy.

4.2.2 Site Access and Traffic Control

See section 4.7 "Site Security, Control and Access" and 4.8 "Traffic Control" of the HASP for information regarding site access and traffic control.

4.3 DATA QUALITY OBJECTIVES, QUALITY ASSURANCE/QUALITY CONTROL PLAN (QA/QC)

4.3.1 Data Quality Objectives

Analytical results are reviewed with respect to laboratory compliance with EPA methods and reporting, and with the NYSDEC Analytical Services Protocol. All analytical data packages will be provided to NYSDEC in Category A (as defined by ASP) deliverable format as part of the Phase I Final Engineering Report ("Phase I FER").

Data quality is reviewed to ensure that the analytical results are indicative of the quality of the media that have been sampled and the environmental conditions from the locations at which the samples were obtained.

The data quality review ensures that the evaluation of the data leads to a proper determination of the significance of the results and determination of any additional remedial measures that might be required.

Appendix B contains a complete QA/QC Plan for the remedial activities for the Phase I site.

4.3.2 Quality Assurance/Quality Control

The Phase I RWP includes post excavation soil sampling subsequent to installation of all pile caps and before placement of the concrete building slab. Such soil sampling includes approximately 21 soil borings within the Phase I Site with subsequent laboratory analysis for volatile organic compounds by EPA method 8260 Target Compound List (TCL), semi- volatile organic compounds by EPA method 8270 TCL, PCBs by EPA Method 8082, and methods applicable to the Metals Target Analyte List (TAL) to document residual soil contamination under the Carousel Center expansion at the Phase 1 Site.

4.3.2.1 General QA/QC

It is appropriate for the selected laboratory to perform all analyses in accordance with accepted EPA SW-846 methods including appropriate QA/QC samples including but not necessarily limited to blind field duplicates, matrix spike/matrix spike (MS/MSD) duplicates, and trip blanks. Laboratory analysis and procedures are generally performed by NYSDOH certified laboratories approved for performing all analysis and procedures.

4.3.2.2 Laboratory QA/QC

The Phase I RWP includes that the laboratory analyzing the collected soil and groundwater samples perform all required internal QA/QC evaluations consistent with the EPA methods performed. Any deviations from standards, discrepancies, and data qualifications must be noted.

4.3.2.3 Data Review

Analytical results are reviewed for quality with respect to practicable quantification limits and method detection limits, including an evaluation of all QA/QC samples and the laboratory QA/QC results.

4.3.2.4 QA/QC Air Monitoring

Churchill Environmental Safety Consultants of Syracuse, NY was selected to perform the quality Assurance and Quality Control for the implemented community air monitoring.

4.3.2.5 Engineering Oversight

All remedial field activities conducted for the selected remedy are subject to supervision by an on-site qualified environmental professional, whether an employee, consultant, or contractor.

4.4 STORMWATER POLLUTION PREVENTION PLAN

The Phase I RWP includes management of stormwater, soil erosion and sediment control in accordance with the stormwater pollution prevention plan ("SWPPP") , which was approved by NYSDEC on May 14, 2007.

4.5 PERMITS

The construction contractor obtains federal, state and City permits, as necessary. No permits other than those required in connection with construction have been identified.

4.6 SITE PLANS AND AS-BUILT DRAWINGS

The Phase I RWP includes a scaled site map showing the limits of the remedial program. As-built drawings will be submitted showing the results of the construction activities as part of the Phase I FER. The as-built drawings show the final limits and elevations of excavations, vapor control system component locations, limits of backfill.

4.7 SITE SECURITY, CONTROL AND ACCESS

Site security, control and access are governed by the existing HASP, attached as Appendix A.

4.8 TRAFFIC CONTROL

Traffic control is addressed in the existing HASP, attached as Appendix A.

4.9 SITE PREPARATION AND TEMPORARY FACILITIES

Site preparation and temporary facilities are addressed in the existing HASP, attached as Exhibit A.

4.10 EQUIPMENT AND MATERIAL STORAGE AND LAY DOWN AREAS

The Phase I RWP provides for storage of equipment and materials in the contractor lay down yards located at the corners of Solar Street and Hiawatha Boulevard, and at designated areas within the Phase I Site as shown on Figure 3 "Site Plan".

4.11 PPE, EQUIPMENT AND PERSONNEL DECONTAMINATION PROCEDURES

See Appendix A, Section 10.0 "Soil Intrusive Activities" for PPE levels, and equipment and Decontamination procedures.

4.12 EXCAVATION PLAN

The Phase I RWP includes soil excavation at the Phase I Site. An excavation plan showing cut and fill locations is provided as Figure 7 "Alternative No. 4 Excavation Plan".

The Phase I RWP includes monitoring and screening of excavated soils for visual or olfactory evidence of petroleum contamination, with notification to the NYSDEC in the event that petroleum contaminated soils are detected using the screening protocol, with management of such contaminated soils as directed by NYSDEC. The Mobil 24 parcel has been designated for stockpiling the remaining excavated soil. Such materials are to be disposed of or treated, following sampling to the extent required, in accordance with applicable requirements.

The stockpile will be sampled for potential reuse and/or for disposal characterization and a plan for sampling will be submitted if so required by NYSDEC.

4.13 DEMOLITION OF SURFACE AND SUBSURFACE STRUCTURES

The Phase I RWP provides that, during construction and excavation, any previously undocumented subsurface structures encountered are demolished and removed when encountered in accordance with applicable BCP regulations. Section 4.15 describes the required handling of debris generated from demolition of the surface and subsurface structures. The contingency plan outlined in section 4.17 is designed to address subsurface structures containing petroleum or hazardous materials.

4.14 Vapor, Odor and Dust Controls

Vapor, odor and dust controls are addressed in the existing HASP, attached as Appendix A. As discussed in Section 4.2, the Phase I RWP includes use of a community air monitoring plan throughout the duration of the construction work to properly control emissions.

Community air monitoring program action levels are presented in Appendix A "Destiny USA SSHASP" section 10.0.

4.15 Material Handling Procedures

4.15.1 Debris

The Phase I RIR indicates that fill material on-site potentially contains debris such as brick, wood timbers, concrete and metal. The history of the Phase I Site makes it possible that large blocks of rock and the remnants of subsurface structures exist, including brick and concrete walls and foundations. The Phase I RWP includes handling of debris consistent with the existing HASP, attached as Appendix A.

4.15.2 Groundwater

Groundwater removed during excavation is disposed of in the existing on-site water treatment system operated pursuant to SPDES Permit NY 0230 2386. See also the existing SWPPP.

4.16 Excavated Soil Stockpiling

The goal of the selected remedy is to reduce the contaminant mass through the removal of impacted soil through excavation, to be followed by installation of a vapor barrier/cap. This remedial procedure includes construction of a soil stockpile and containment area on Mobil 24 within Oil City boundaries as shown on Figure 3 "Site Plan". The Phase I RWP provides that the soil exhibiting petroleum contamination is placed in a location and managed pursuant to NYSDEC directive. Stockpiled soil will ultimately be reclaimed and reused and/or disposed of in accordance with relevant legal requirements.

4.17 CONTINGENCY PLANS

Utility Emergencies

New York State rules and regulations govern utility mark-out completion. The Phase I RWP includes notifying Dig Safe New York for utility mark out and making utility markout requests at least 72 hours prior to initiating fieldwork. In addition, this remedy includes review of existing utility maps and consultation of site management prior to any ground disturbance.

Discovery of Underground Storage Tanks or Vessels

The Phase I RWP includes the following procedure for any tanks or vessels (including conduit that contains liquids) discovered during excavation:

- Removal and disposal of contaminants in accordance with all applicable State and federal requirements within a schedule approved by the Department;
- Notification of the environmental conditions of the NYSDEC Project Manager, Project Engineer, and environmental consultant by telephone, cellular phone, and e-mail of the conditions;
- Photo-document identified conditions;
- A determination of the type, state and volume of any contained material;
- If the contents cannot be identified by physical conditions, a sample will be collected for chemical analysis. Based on analytical results the Site Health and Safety Officer will determine the need for a change of PPE;
- Removal and transport for off-site disposal by an appropriate waste hauler when the contents have been identified;
- Retention of manifests for volume of product for inclusion in the Final Engineering Report;
- Appropriate, cleaning, treatment and/or disposal of structure; and
- Spill notification to NYSDEC, if applicable.

5.0 ENGINEERING DESIGN PROCESS

This section presents the approach to design, installation, and commissioning of the vapor mitigation system at the Phase I Site.

5.1 VAPOR CONTROL SYSTEM DESIGN OBJECTIVES

The design objective for the vapor control system is to prevent soil vapors from migrating into the enclosed, occupied spaces in the Phase I expansion, and to prevent vapors from accumulating beneath the floor slab.

5.2 OVERVIEW OF SOIL VAPOR CONTROL DESIGN PROCESS

The remedy includes installation of a mitigation system providing two levels of vapor intrusion protection for occupants of the Phase I expansion buildings. The primary measure for preventing vapor migration into the occupied space is a continuous impermeable membrane that covers the full extent of the Phase I Expansion area footprint as shown on Figure 8 “Alternative No. 4 Engineering Controls Plan” and design drawing attached as Appendix C.

A properly constructed vapor barrier under the concrete floor provides adequate protection from vapor intrusion. To provide additional security and integrity to the mitigation measure, it is appropriate to include construction of a vapor control system under the membrane to establish a preferential pathway for any vapors that might accumulate under the membrane. The vapor control system consists of a network of perforated pipes below the vapor barrier maintained under a mild vacuum condition. This system is similar to the sub-slab depressurizing systems employed in radon-effected areas. Each independent section (gallery) of the sub-slab pipe network includes an axial blower on a solid pipe riser. The blowers are then vented above the building roofline. The blowers maintain a pressure in the vapor control galleries that is lower than the ambient pressure in the occupied spaces of the expansion. This ensures that vapors emanating from soil beneath the building move towards the pipe to be captured and are vented safely outside of occupied space, rather than accumulating beneath the impermeable membrane.

The system produces a vacuum in the range of 2 to 3 inches of water (“wc”). The system response curve developed for each collection gallery is used to determine the amount of air flow required to produce the target vacuum pressure at the riser of each collection gallery. The blower and system piping are sized based on the required air flow.

5.3 VAPOR CONTROL SYSTEM DESIGN SPECIFICATIONS

The following specification applies to construction of the following elements:

- Continuous vapor barrier under the concrete floor slab;
- Sub-floor pipe network under the vapor barrier;
- Riser Stubs connecting the pipe network to the depressurization system; and
- Blowers and exhaust piping.

5.3.1 Vapor Barrier Specifications

The Phase I RWP includes installation of a 15 Mil (0.015 inch) thick polyethylene membrane sheet vapor barrier installed beneath the concrete slab throughout the entire Phase I expansion area to establish a continuous impermeable membrane. The remedy provides that the vapor barrier meet and/or exceed ASTM E-1745 Class B Performance standards.

5.3.2 Soil Vapor Control Piping Specifications

The vapor control pipe network utilizes a minimum 2 inch diameter slotted schedule 40 pvc pipe. Perforations are 0.020 inch wide circumferential slots, four slots per row (standard 2 inch 20 slot pvc well screen is acceptable). Slotted pipe is placed on one layer of filter fabric or pipe is wrapped with filter fabric. Parallel laterals are laid no more than 40 feet apart on center. All ends are capped. All piping connections and end caps are glued with pvc cement to prevent separation.

The Phase I RWP provides that riser stubs are located by an architect within the building footprint, compatible with architectural details. Each riser stub is located in areas with no public access (for example, utility rooms, utility shafts, elevator shafts or plumbing races).

5.3.3 Soil Vapor Control Blower Specifications

The Phase I RWP requires that the blowers are inline duct fans capable of producing a vacuum in the range of 2 to 3 inches of water at the riser at the air flow rates determined during design testing. Fans are required to have the capability for speed variation and be capable of vertical or horizontal mounting.

5.4 SYSTEM INSTALLATION

The vapor control system installation is shown on Figure 8 “Alternative No. 4 Engineering Controls Plan”. The vapor control system construction drawing set is attached as Appendix C.

The remedy provides conducting design testing to develop a system response curve for each collection gallery. The system response curve allows proper sizing of the blowers and exhaust stack. Air sampling will be conducted as required.

6.0 IMPLEMENTATION OF ENGINEERING AND INSTITUTIONAL CONTROLS

6.1 ENGINEERING CONTROLS

The chosen remedy includes use of engineering (vapor barrier, vapor control system consisting of subsurface piping and surface vacuum blowers, and concrete building foundation slab) and institutional (environmental easement conforming to Article 71 Title 36 of ECL) controls. These engineering controls prevent exposure to any potential contaminants as discussed in detail below. The engineering control will be maintained pursuant to the Operations, Maintenance and Monitoring Plan ("OM&M Plan") developed pursuant to the BCP requirements.

6.1.1 Vapor Control Piping Installation

Vapor control piping network installation requires inspection prior to each scheduled concrete pour for the buildings ground floor. A minimum 6 inch length of riser above the finished floor level is required. The riser stubs are then connected to the vapor control pipe network with schedule 40 tee fittings. Riser stubs are constructed with schedule 40 solid pipe.

The remedy provides that vapor barrier material is used to create an apron (min 24 inch wide) around each riser stub and that each riser stub is sealed to the apron and to the ground sheet with butyl mastic tape in concentric rings around the riser pipe. The remedy provides that a minimum 4 inch wide air tight seal is created.

It is necessary that the installation contractor ensure that finished riser stubs are perpendicular to the finished floor. The installation contractor must also protect completed riser stubs from damage during subsequent construction activity**.** The riser stubs locations are provided on the vapor control system construction drawings attached as Appendix C and Figure 8 "Alternative No. 4 Engineering Controls Plan".

6.1.2 Vapor Barrier Installation

The remedy includes a vapor barrier that extends from the façade of the existing building to the perimeter of the Phase I Expansion area to establish a continuous sealed vapor barrier beneath the concrete slab floor as shown on Figure 8 "Alternative No. 4 Engineering Controls Plan".

Remedial construction practices pursuant to this RWP require that the ground surface is cleared of all penetration hazards that could compromise the impermeable membrane (i.e. debris, sharp objects) prior to placement of the barrier. The Phase I RWP provides that suitable fill is placed under the vapor barrier for ground preparation. Suitable fill is any material that allows construction of the floor slab to be completed without compromising the integrity of the vapor barrier.

The remedy provides that vapor barrier sheet material is transported, stored, handled and installed in a manner that prevents damage to the material.

It is appropriate to overlap adjacent sheets of vapor barrier material by a minimum of 18 inches and to seal it with a continuous strip of butyl mastic double sided tape, with a minimum 4 inch wide seal to create an air tight joint. Two parallel strips of narrower tape may be substituted however; a minimum 4 inch seal width must be maintained.

The Phase I RWP provides that all punctures, tears and penetrations are patched before pouring concrete. Construct all patches according to lap seal requirements for sheets.

Plans for the vapor barrier require that it extend no less than 12 inches onto the top of each concrete pile cap or grade beam. The vapor barrier is then adhered to concrete with butyl mastic double sided tape, a minimum 4 inch wide air tight seal will be completed.

Where conduit bundles extend through the concrete slab, they are wrapped together, and the vapor barrier extends a minimum of 4 inches above top of concrete slab. The open portion of the vapor barrier is sealed with foam or silicon joint compound to create an air tight plug.

The Phase I RWP provides that the vapor barrier is loosely laid between pile caps to prevent membrane tension. The vapor barrier is required to contain a minimum 18 inch wide tension relief fold between the pile caps. The longitudinal lap seal between side-by-side sheets may not fall within the Tension relief fold. The tension relief fold may cross lap seal at ends of sheets.

This procedure provides that, prior to pouring the floor slab, the vapor barrier is inspected for the integrity of joints and membrane material, and for proper tension relief construction. Membrane tension shall be relieved by splicing additional sheet material, using the lap seal requirements above.

6.1.3 Quality Control

The remedy provides that the following quality control measures are implemented to ensure that the engineering controls are installed according to engineering specifications.

a) Prior to Laying Vapor Barrier

The area must be inspected to verify that all penetration hazards (debris, sharp objects, and angular stone) have been removed, or that a continuous layer of suitable vapor barrier supporting material is in place.

Where vapor barrier crosses abrupt ground changes, gaps or concrete edges, the inspectors must verify that fill is placed to fill gaps and support the vapor barrier to prevent tearing while concrete is poured.

b) Before Concrete Pour

The remedy provides that the vapor barrier is inspected for punctures, tears, burns and any other damage that would compromise the permeability requirement of the material, and for gaps in sealed joints and that any punctures, tears and penetrations are patched before pouring concrete. Patches must be constructed according to lap seal requirements for sheets. Re-seal any incomplete joints by use of butyl mastic tape. The engineer is required to inspect the liner for tension in the membrane between pile caps. Membrane tension is to be relieved by splicing additional liner material, using the lap seal requirements above.

This Phase I RWP provides inspection of all riser stubs and utility conduits for proper seal around the pipe and at the ground sheet, as well as to ensure that riser stubs are perpendicular to the floor.

c) Following Concrete Pour

Sound engineering practice provides that conduit bundles are inspected for airtight plug installation to ensure proper protection and capping for all riser stubs.

d) Vapor Barrier Engineering Certifications

Quality control inspections must be certified by contractor or contractor's representative for each pour. The Phase I RWP provides that certifications are maintained in a central location upon completion.

6.1.4 Vapor Control System Commissioning

The Phase I RWP provides that, upon installation, each vapor control gallery is commissioned to document that it was installed properly, is achieving the design criteria, and is performing in accordance with the defined performance specifications discussed in this subsection. Results of the commissioning will be recorded in the Phase I FER. An as-built drawing will be prepared (modification of the design drawing) for each commissioned gallery, showing locations of risers and laterals on a plan view of the expansion area floor. The location of gallery fans, control panels and roof vents will be shown on architectural as-built drawings.

The Phase I FER will also include this checklist and drawing, along with a certification by a professional engineer licensed in New York that the system has been commissioned to effectively address vapor intrusion. The Phase I RWP provides that each gallery is designed and commissioned to achieve a measurable differential pressure in the range of 2 to 3 inches of water at the riser of each of the six galleries.

6.2 SITE RESTORATION

Restoration of Phase I Site includes asphalt paving, planting of grass, shrubs and trees. Phase I Site Restoration plans are illustrated on Figures 6, “Final Grading Plan” and 9, “Alternative No. 4 Site Restoration Plan”.

6.3 INSTITUTIONAL CONTROLS

As discussed in Section 2.0, the Phase I RWP provides implementation of institutional controls for the Phase I Site. The institutional controls will provide the necessary non-physical protections and provide notice to properly limit potential human or environmental exposure to contaminants. The institutional controls for the Phase I Site include establishment of an environmental easement that will:

- ensure that use of the Phase I Site is restricted to commercial use (as defined in the BCP) and that the engineering controls, as described herein, remain in place;
- ensure appropriate future use and that future property owners are aware of the existing conditions on the Phase I Site;
- include a restriction prohibiting use of groundwater on the Phase I Site;
- include required notifications prior to commencement of any ground-intrusive activities that may encounter contaminated materials. Notification of NYSDEC and any on-site workers will be required prior to excavating soil;
- include notice of and information relating to a soil management plan, identifying requirements in the event of excavation, which will be included as part of the operations and maintenance monitoring plan (OM&M);
- include notice of and information relating to a health and safety plan and community air monitoring plan for use during future ground-intrusive activities, which will be described in the OM&M Plan;
- providing notice of continued periodic soil vapor intrusion monitoring on the Phase I Site, which will be described in the OM&M Plan;
- include notice of the annual inspection program to ensure appropriate use of the Phase I Site and minimize potential for exposures, which will be described in the OM&M Plan; and

- include notice of the annual certification program requiring the owner to certify that the institutional and/or engineering controls are in place, have not been altered and are still effective, which will be described in the OM&M Plan.

In addition to the above institutional controls, as discussed above, the remedy contemplates that the vapor barrier, vapor control system and concrete slab installed as part of building construction serve as the engineering control for the Phase I Site. Careful attention will be given to any indications that this engineering control has been compromised as part of the annual inspection discussed above, and appropriate investigations and corrective actions will be taken when necessary.

7.0 REPORTING AND DOCUMENTATION

The Phase I RWP involves periodic progress reporting and maintenance of project records during remedial construction to enable involved parties (e.g., overseeing engineer and project managers) to track the project with respect to schedule and the requirements of the RWP. Additionally, after completion of remedial construction, an FER, including a comprehensive report of remedial action, will be prepared as described below.

7.1 MONTHLY PROGRESS REPORT

The Brownfield Cleanup Agreement provides that monthly Progress Reports are prepared and submitted after approval of the first work plan.

7.2 ON-SITE RECORD KEEPING/DOCUMENTATION OF ACTIVITIES

The Phase I RWP provides that, throughout implementation of the remedial action, records are maintained by the construction contractor and/or engineer performing construction inspections to document activities completed at the Phase I Site.

7.3 PHASE I FINAL ENGINEERING REPORT

The remedial activities completed pursuant to this Phase I RWP will be documented in the Phase I FER in accordance with BCP requirements. This reporting will include the following

1. Description of remedial actions performed;
2. Deviations from the Phase I RWP, if any;
3. Copies of records maintained during the remediation;
4. Problems encountered during construction and their resolution;
5. A discussion on the quantification and listing of waste/contaminants treated or removed from the site;
6. Detailed "as-built" drawings showing the surveyed limits of the excavation, the locations of documentation samples, construction details;
7. Copies of all records documenting off-site disposal of waste material;
8. Documentation of sampling results;
9. A summary of visual soil screening results;
10. An estimate of the volume of excavated soil which exceeded the headspace soil screening criteria;

11. A summary of laboratory analytical results of soil stockpile sampling and a compilation of laboratory analytical data reports;
12. Documentation including photographs that clearly identify the location of the stockpiles and demonstrates the effective containment of the excavated soils; and
13. The Phase I FER will include a certification by a Professional Engineer registered in New York State, stating that the work was implemented and construction activities were completed in substantial conformance with this RWP and that the engineering and institutional controls are implemented according to state and local codes and regulations.

Additionally, the Phase I FER will document that the remedial objectives of the Phase I remedial program have been or will be achieved.

7.4 OPERATION, MAINTENANCE AND MONITORING (OM&M) PLAN

The Phase I Site is also adjacent to several ongoing groundwater management and monitoring programs. Currently, groundwater is managed and monitored from a series of wells on the former Hess property, located immediately adjacent to the Phase I Site. These wells are hydraulically downgradient to the Phase I Site. In addition, groundwater downgradient of the Phase I Site is also monitored in the foundation wells for Carousel Center and the monitoring well network that surrounds the VOC containment cell.

A O&M Plan will be developed for the Phase I Site and included in the Phase I FER to provide a detailed description of the procedures to be followed in order to properly manage any residual contamination left in place following completion of the remedial action, including operation and maintenance of the implemented engineering controls, institutional controls, monitoring of ongoing environmental conditions (soil vapor and groundwater), and compliance with applicable state regulations.

Costs Associated With Engineering Control Monitoring and Maintenance

An estimate of the long-term costs (in current dollars) associated with implementation of this OM&M Plan is presented below. The Developer will implement the OM&M plan as part of the maintenance and operation of the project. No financial assurances are warranted.

ITEM	ESTIMATED QUANTITY	UNITS	ESTIMATED UNIT COSTS	ESTIMATED TOTAL
ANNUAL OPERATING, MONITORING AND MAINTENACE (OM&M) COSTS				
ANNUAL INSPECTIONS/CERTIFICATIONS				
INSPECTION	1	MANDAYS	$1,200	$1,200
ANNUAL CERTIFICATION	2	MANDAYS	$1,200	$2,400
ESTIMATED ANNUAL COSTS				$3,600
COST OF ANNUAL INSPECTIONS OVER 30 YRS				**$108,000**
VAPOR CONTROL SYSTEM SAMPLING AND MAINTENANCE (COST per yr)				
SAMPLE ANALYSIS	6 (samples annually)	SAMPLES	$400	$2,400
EQUIPMENT, MATERIALS AND SUPPLIES	1	LS	$1,500	$1,500
REPORTING	3	MANDAYS	$1,800	$5,400
ESTIMATED PER EVENT MONITORING COSTS				$9,300
COST OF ANNUAL MONITORING OVER 30 YRS				**$279,000**
TOTAL ESTIMATED OM&M COST				**$387,000**

8.0 PROJECT MANAGEMENT

8.1 KEY PARTICIPANTS AND RESPONSIBILITIES

Key participants involved in the remediation and development of the Phase I Site under the Brownfield Cleanup Program include the following:

Key Participants	**Primary Responsibilities**
Contractor: Cianbro Corporation Inc.	Oversee implementation and reporting for remediation and construction in accordance with development plans. Construction inspection, record keeping, Reporting.
Developers: Destiny USA Development LLC, Pyramid Company of Onondaga, or its affiliates	Procure and direct contractors and consultants for design, remedial construction and site development in accordance with approved construction documents.
Regulatory Agencies: New York State Department of Environmental Conservation and New York State Department of Health	Regulatory oversight.
Remediation/Construction Contractor: Various	Furnish labor, material, supplies, etc. for remedial construction and site development in accordance with approved plans.
Environmental Consultant: O'Brien & Gere Engineers, Inc.	 Provide environmental engineering planning and field oversight with respect to mass excavation and associated soil management activities.
Spectra, Engineering, Architecture and Surveying, P.C.	Reporting, construction inspection, and record keeping, related to construction of the vapor barrier and vapor control system, and preparing the Final Engineering Report.

8.2 PROJECT COMMUNICATION AND MANAGEMENT

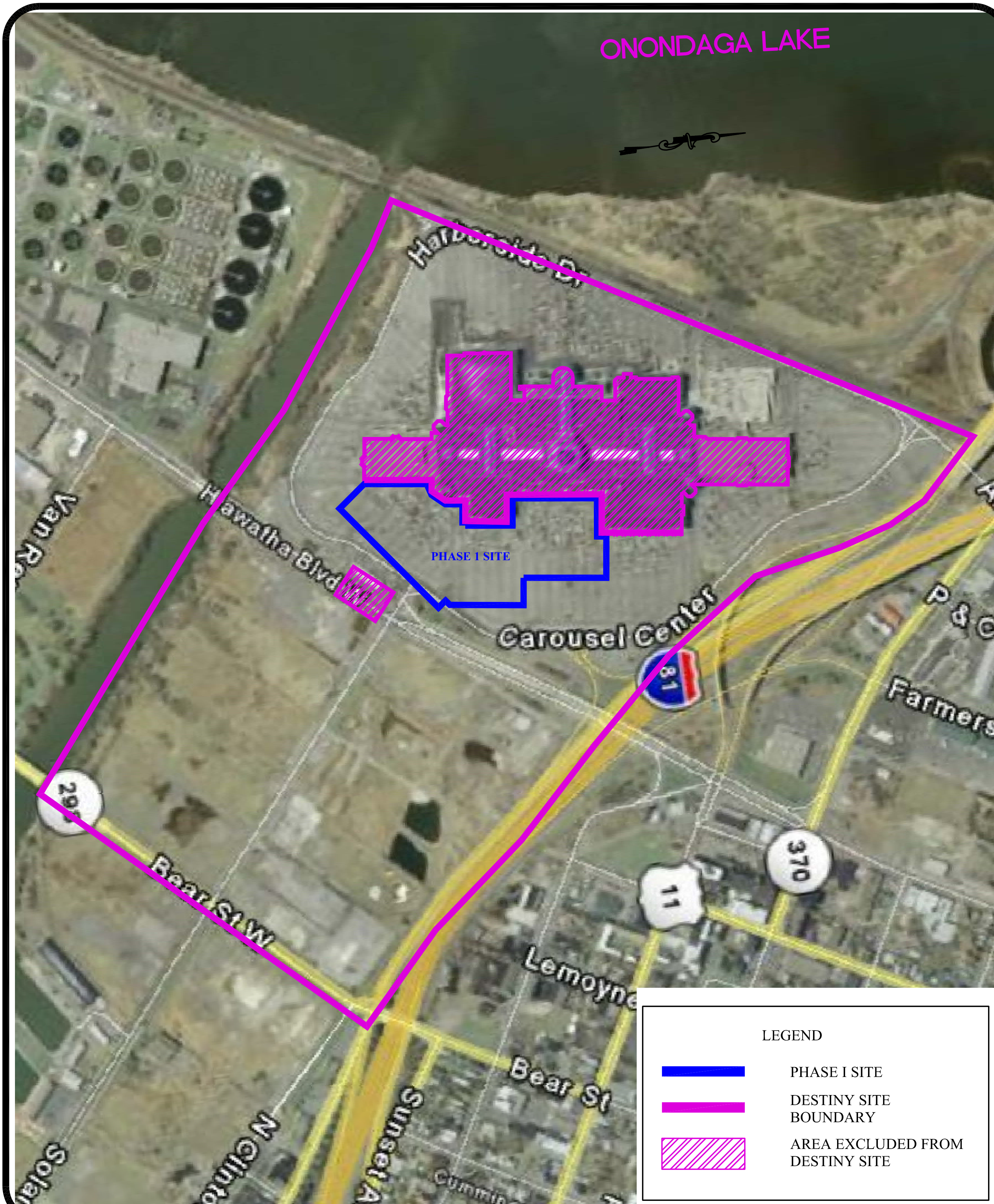
This Phase I RWP provides that project meetings occur throughout the Phase I BCP Project to discuss work progress, plan upcoming activities for the work and discuss any unanticipated site conditions encountered. The construction contractor's superintendent is required to attend project meetings, as well as the construction contractor's Health and Safety Officer and QA/QC Officer, when discussion of issues related to their responsibilities is required.

The Phase I RWP provides that, during remedial construction, records are maintained and reports are prepared as described in Section 7.0.

9.0 PROJECT SCHEDULE AND KEY MILESTONES

A Gant chart providing the project schedule and key milestones is attached as Appendix D.

FIGURES

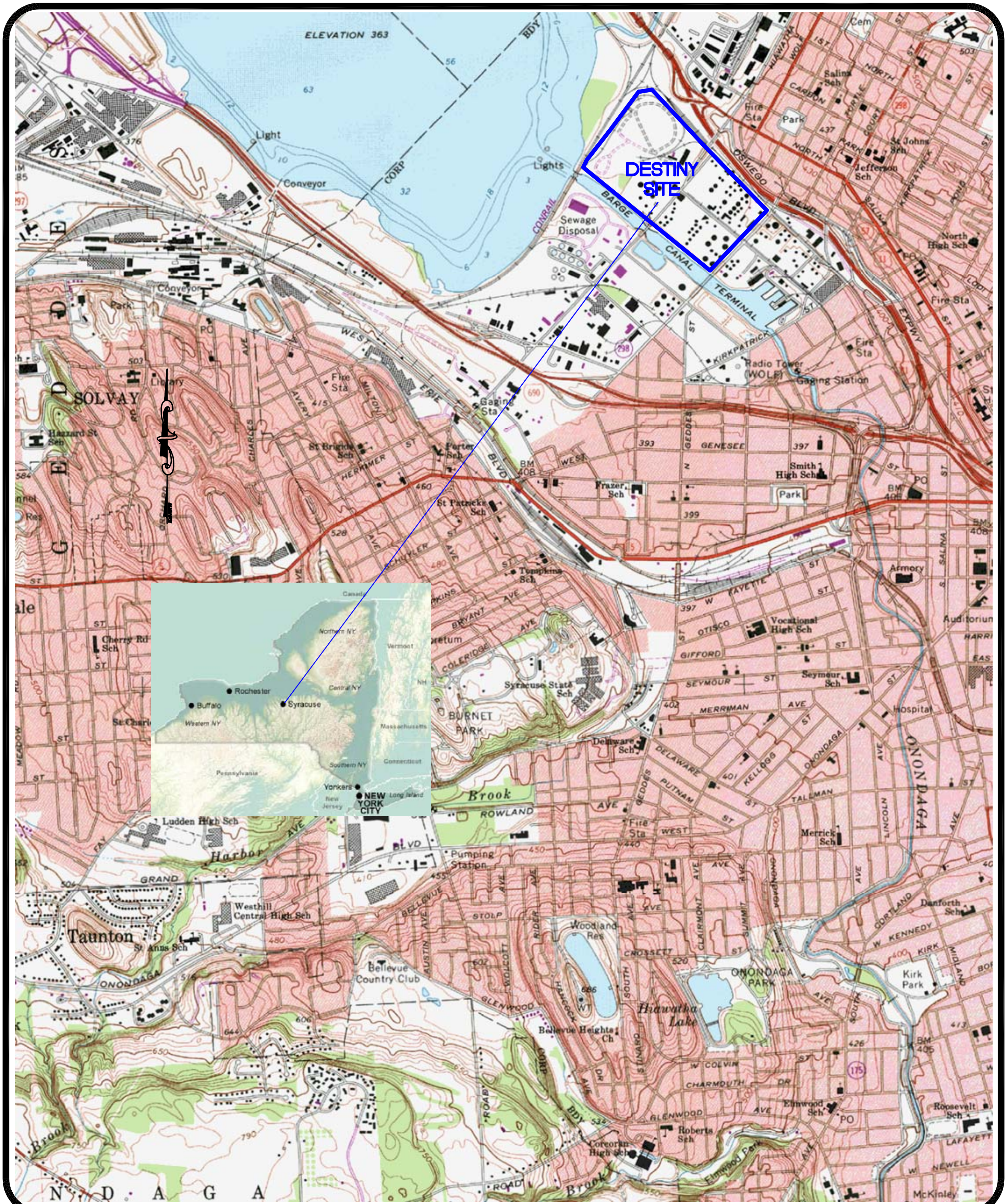


SPECTRA ENVIRONMENTAL GROUP, INC.
19 British American Blvd
Latham, NEW YORK 13202

2008 AERIAL PHOTOGRAPH SHOWING DESTINY SITE

ONONDAGA COUNTY — NEW YORK

PROJ. No.: 06448	DATE: 09/09/2008	SCALE: NOT TO SCALE	DWG. NO. 06448SLMAP.DWG	FIGURE 1

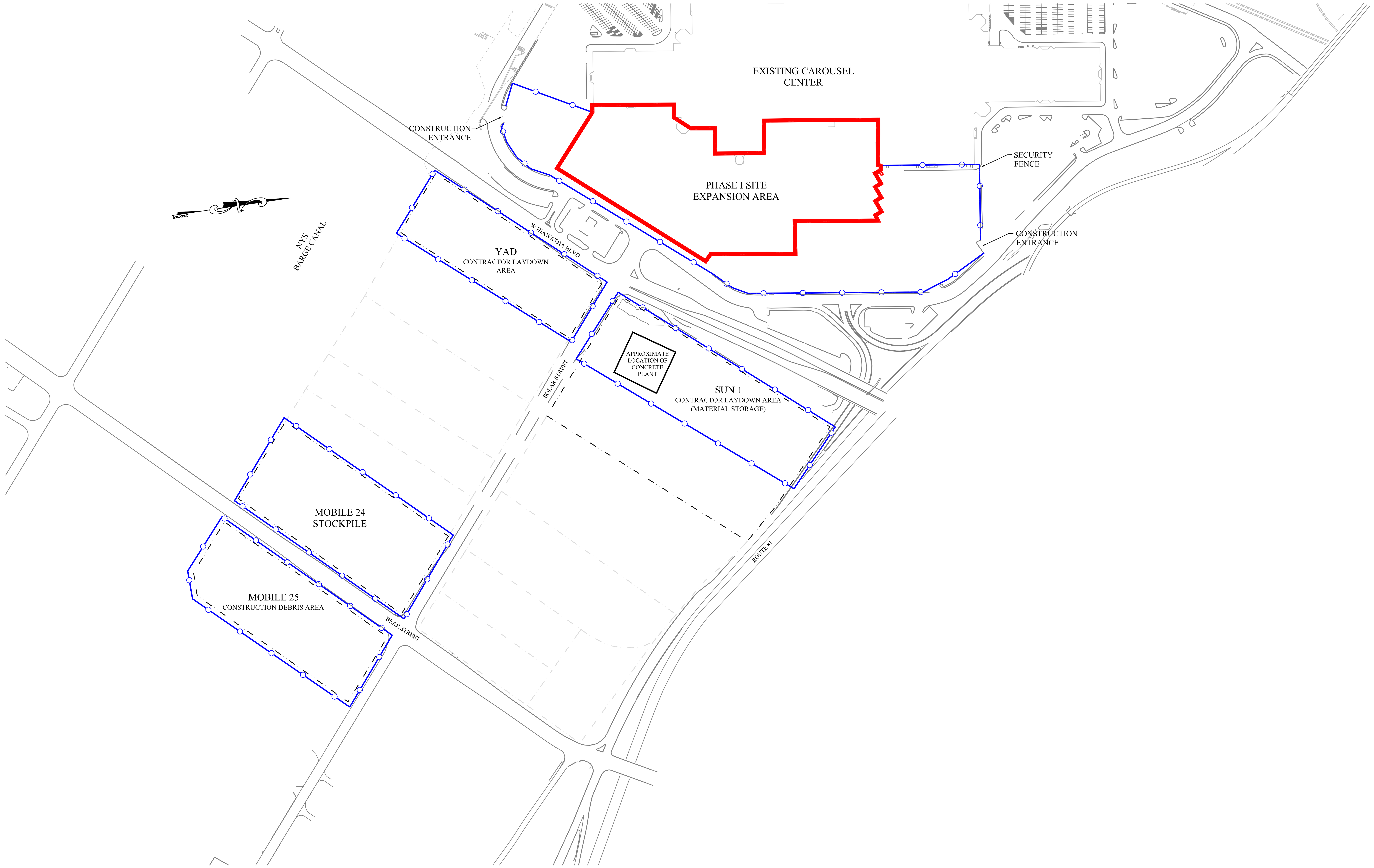


SPECTRA ENVIRONMENTAL GROUP, INC.
19 British American Blvd
Latham, NEW YORK 13202

DESTINY SITE LOCATION MAP

ONONDAGA COUNTY | NEW YORK

PROJ. No.: 06448	DATE: 09/09/2008	SCALE: NOT TO SCALE	DWG. NO.06448SLMAP.DWG	FIGURE 2



LEGEND

PARCEL BOUNDARIES

PHASE I SITE BOUNDARY

SECURITY FENCE

NOTE: MAP BASED ON DRAWINGS FROM O'BRIEN AND GERE ENGINEERS, INC. ISSUED FOR CONSTRUCTION 06/06/2007

UNAUTHORIZED ALTERATION OR ADDITION TO THIS DRAWING IS A VIOLATION OF SECTION 7209, SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW.

NO.	DATE	REVISIONS	DRN	CKD	APPR

PROJECT

PROJ. ENGR.:
PROJ. NO.: 06448
DESIGNED BY: MGR
DRAWN BY: REW
CHECKED BY:
APPROVED BY:
DATUM: CITY OF SYRACUSE
CONTOUR INTERVAL = NA

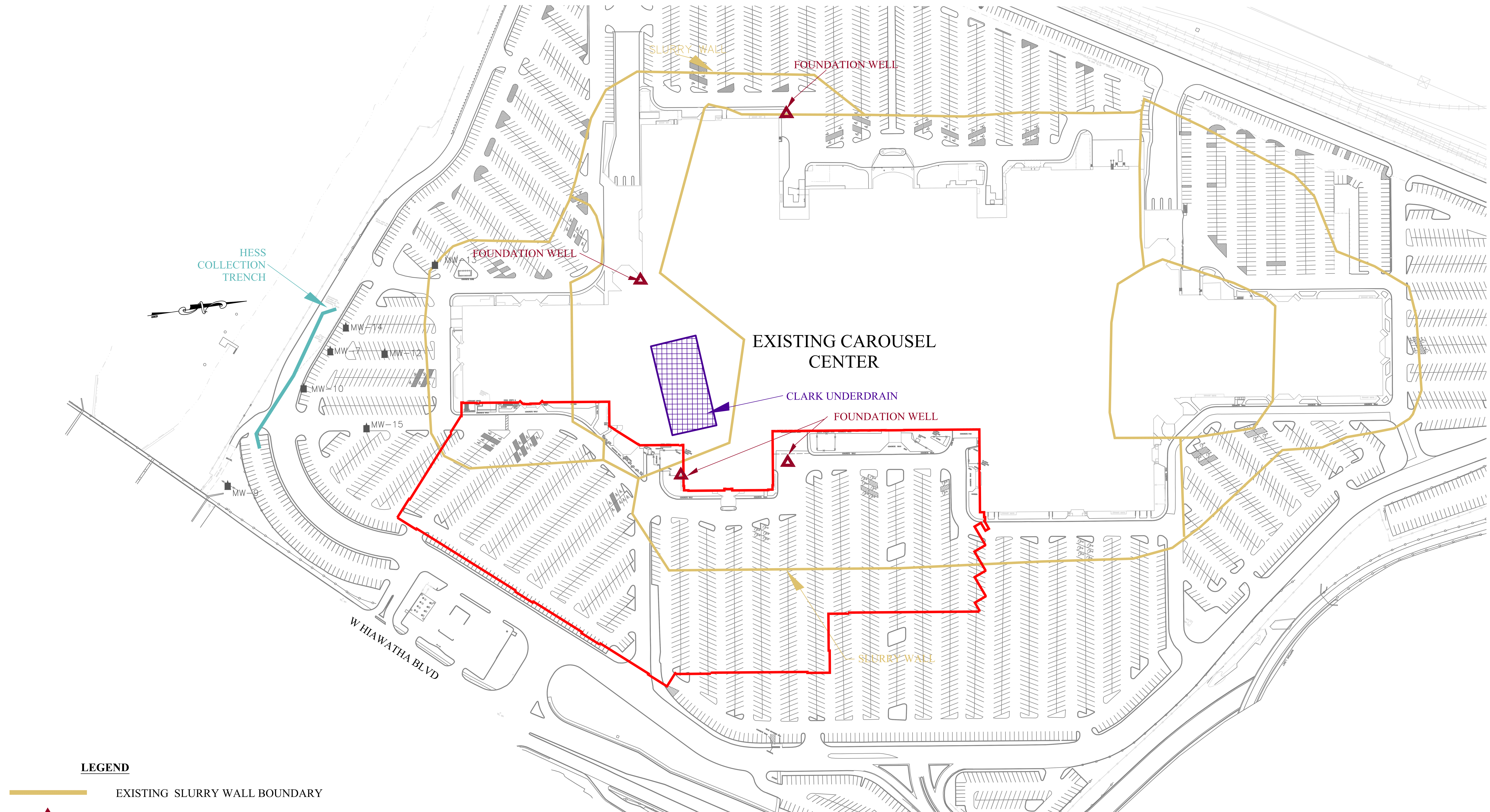
0 100' 200' 400'
1" = 200'

SITE PLAN
PHASE I SITE

CITY OF SYRACUSE, NEW YORK **ONONDAGA COUNTY**

SPECTRA ENVIRONMENTAL GROUP, INC.
19 British American Boulevard
Latham, New York 12110
TEL (518) 782 0882 FAX (518) 782 0973

DATE: 05/08/09 SCALE: 1" = 200' DWG. NO. 06448 FIGURE 3



LEGEND

- EXISTING SLURRY WALL BOUNDARY
- EXISTING FOUNDATION WELLS
- EXISTING CLARK UNDERDRAIN
- EXISTING HESS TRENCH
- MW-7 EXISTING MONITORING WELLS
- PHASE I SITE BOUNDARY

NOTE: MAP BASED ON DRAWINGS FROM O'BRIEN AND GERE ENGINEERS, INC. ISSUED FOR CONSTRUCTION 06/06/2007

NO.	DATE	REVISIONS	DRN	CKD	APPR

PROJECT	
PROJ. ENGR.:	
PROJ. NO.:	06448
DESIGNED BY:	MGR
DRAWN BY:	REW
CHECKED BY:	
APPROVED BY:	
DATUM:	CITY OF SYRACUSE
CONTOUR INTERVAL =	NA

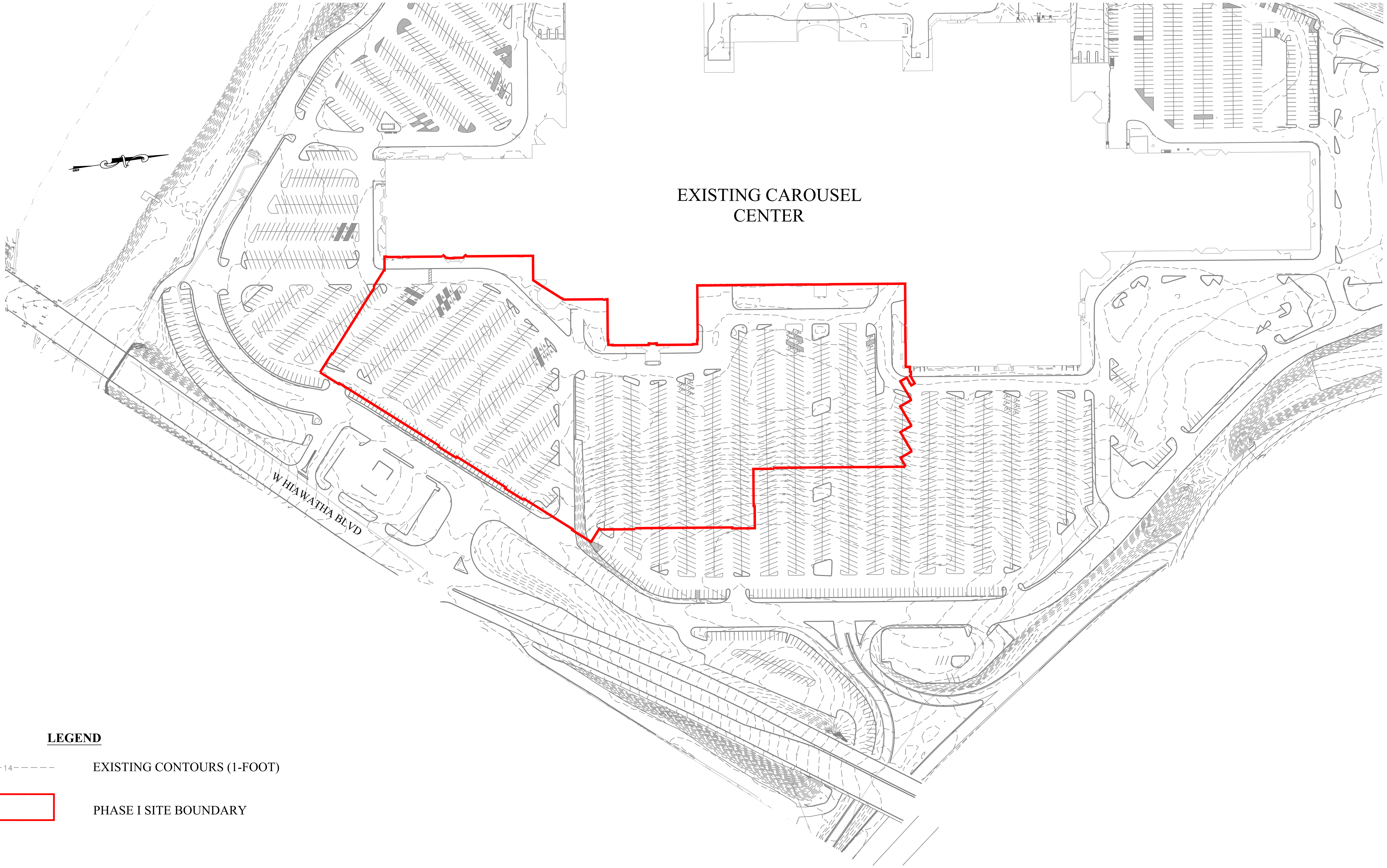
0 50' 100' 200'
1" = 100'

EXISTING HYDRAULIC CONTROLS PLAN PHASE I SITE

CITY OF SYRACUSE, NEW YORK ONONDAGA COUNTY

SPECTRA ENVIRONMENTAL GROUP, INC.
19 British American Boulevard
Latham, New York 12110
TEL (518) 782 0882 FAX (518) 782 0973

DATE: 05/08/09 | SCALE: 1" = 100' | DWG. NO. 06448 | FIGURE 4



LEGEND

14 EXISTING CONTOURS (1-FOOT)

PHASE I SITE BOUNDARY

NOTE: MAP BASED ON DRAWINGS FROM O'BRIEN AND GERE ENGINEERS, INC. ISSUED FOR CONSTRUCTION 06/06/2007

UNAUTHORIZED ALTERATION OR ADDITION TO THIS DRAWING IS A VIOLATION OF SECTION 7209, SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW.

NO.	DATE	REVISIONS	DRN	CKD	APPR

PROJECT	
PROJ. ENGR.:	
PROJ. NO.:	06448
DESIGNED BY:	MGR
DRAWN BY:	REW
CHECKED BY:	
APPROVED BY:	
DATUM:	CITY OF SYRACUSE
CONTOUR INTERVAL =	NA

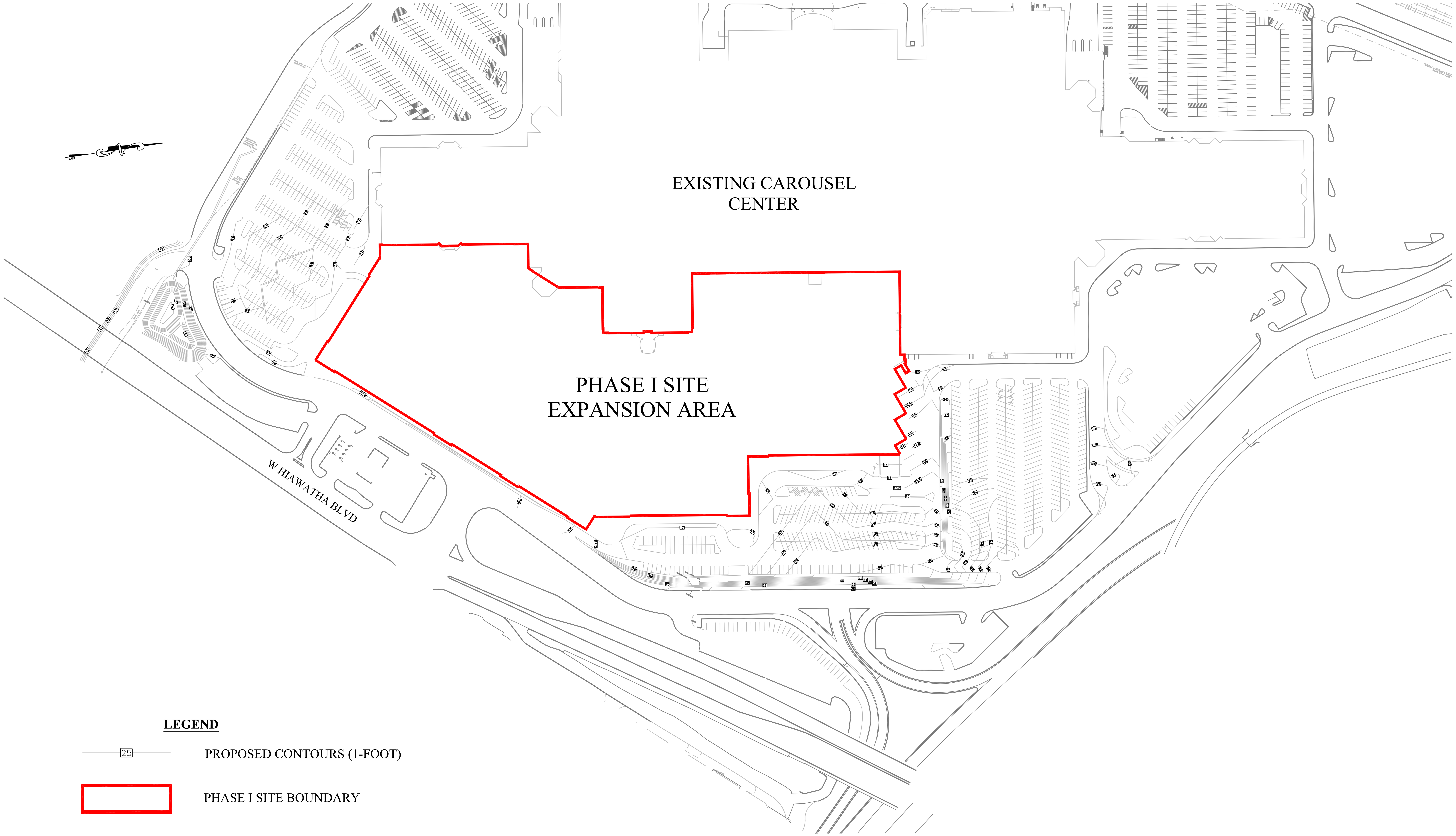
0 50' 100' 200'
1" = 100'

EXISTING TOPOGRAPHY PHASE I SITE

CITY OF SYRACUSE, NEW YORK **ONONDAGA COUNTY**

SPECTRA ENVIRONMENTAL GROUP, INC.
19 British American Boulevard
Latham, New York 12110
TEL (518) 782 0882 FAX (518) 782 0973

DATE: 05/08/09 | SCALE: 1" = 100' | DWG. NO. 06448 | FIGURE 5



LEGEND

25 PROPOSED CONTOURS (1-FOOT)

PHASE I SITE BOUNDARY

NOTE: MAP BASED ON DRAWINGS FROM O'BRIEN AND GERE ENGINEERS, INC. ISSUED FOR CONSTRUCTION 06/06/2007

UNAUTHORIZED ALTERATION OR ADDITION TO THIS DRAWING IS A VIOLATION OF SECTION 7209, SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW.

NO.	DATE	REVISIONS	DRN	CKD	APPR

PROJECT	
PROJ. ENGR.:	
PROJ. NO.:	06448
DESIGNED BY:	MGR
DRAWN BY:	REW
CHECKED BY:	
APPROVED BY:	
DATUM:	CITY OF SYRACUSE
CONTOUR INTERVAL =	NA

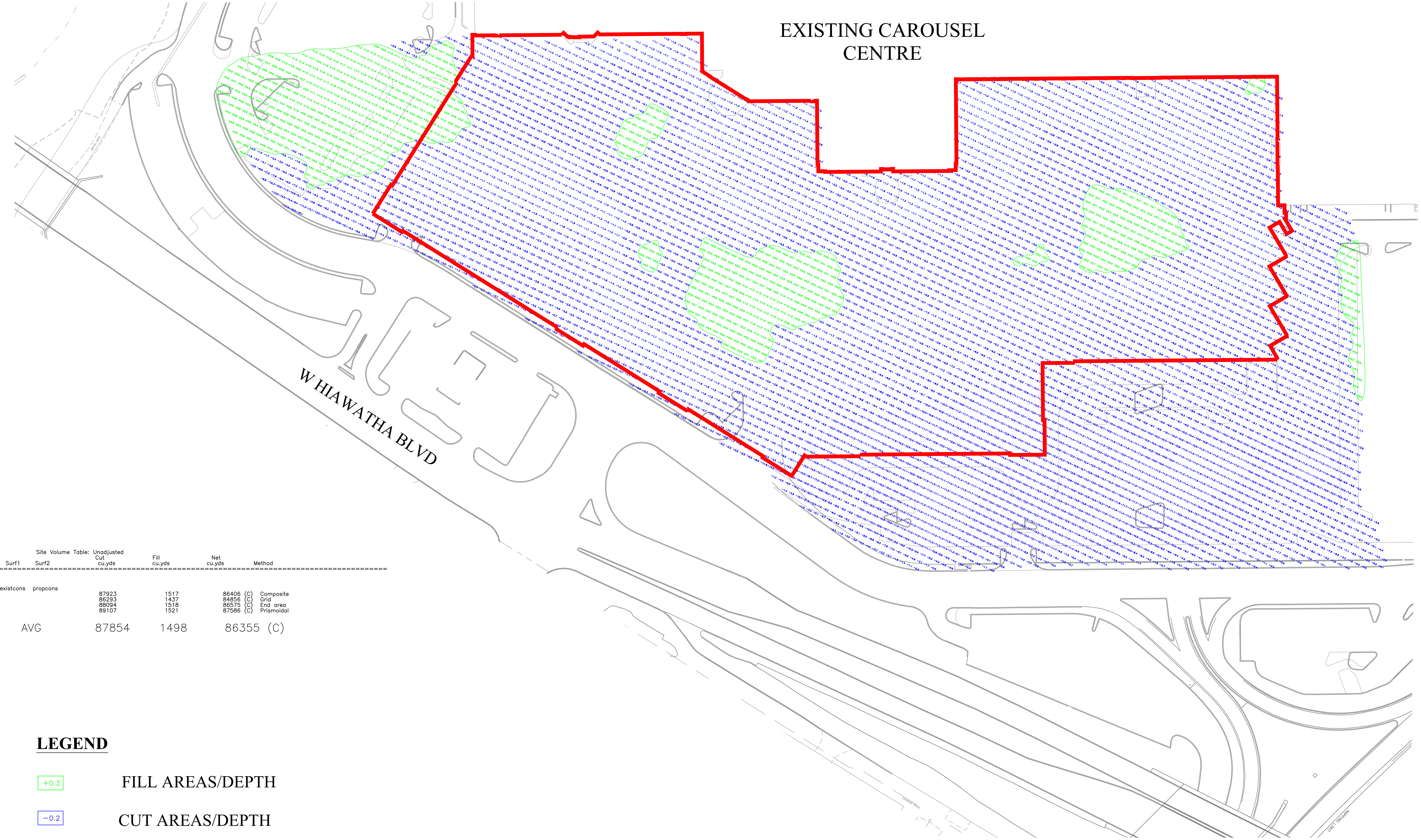
0 50' 100' 200'
1" = 100'

FINAL GRADING PLAN
PHASE I SITE

CITY OF SYRACUSE, NEW YORK **ONONDAGA COUNTY**

SPECTRA ENVIRONMENTAL GROUP, INC.
19 British American Boulevard
Latham, New York 12110
TEL (518) 782 0882 FAX (518) 782 0973

DATE: 05/08/09 | SCALE: 1" = 100' | DWG. NO. 06448 | FIGURE 6



Site Volume Table: Unadjusted

Site	Stratum	Surf1	Surf2	Cut cu.yds	Fill cu.yds	Net cu.yds	Method
DestiNY							
contour	volumes	existcons	propcons	87923	1517	86406 (C)	Composite
				86293	1437	84856 (C)	Grid
				88094	1518	86575 (C)	End area
				89107	1521	87586 (C)	Prismoidal
			AVG	87854	1498	86355 (C)	

LEGEND

+0.3 FILL AREAS/DEPTH

−0.2 CUT AREAS/DEPTH

PHASE I SITE BOUNDARY

NOTE: MAP BASED ON DRAWINGS FROM O'BRIEN AND GERE ENGINEERS, INC. ISSUED FOR CONSTRUCTION 06/06/2007

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NO.	DATE	REVISIONS	DRN	CKD	APPR

PROJECT

PROJ. ENGR.:
PROJ. NO.: 06448
DESIGNED BY: MGR
DRAWN BY: REW
CHECKED BY:
APPROVED BY:
DATUM: CITY OF SYRACUSE
CONTOUR INTERVAL = NA

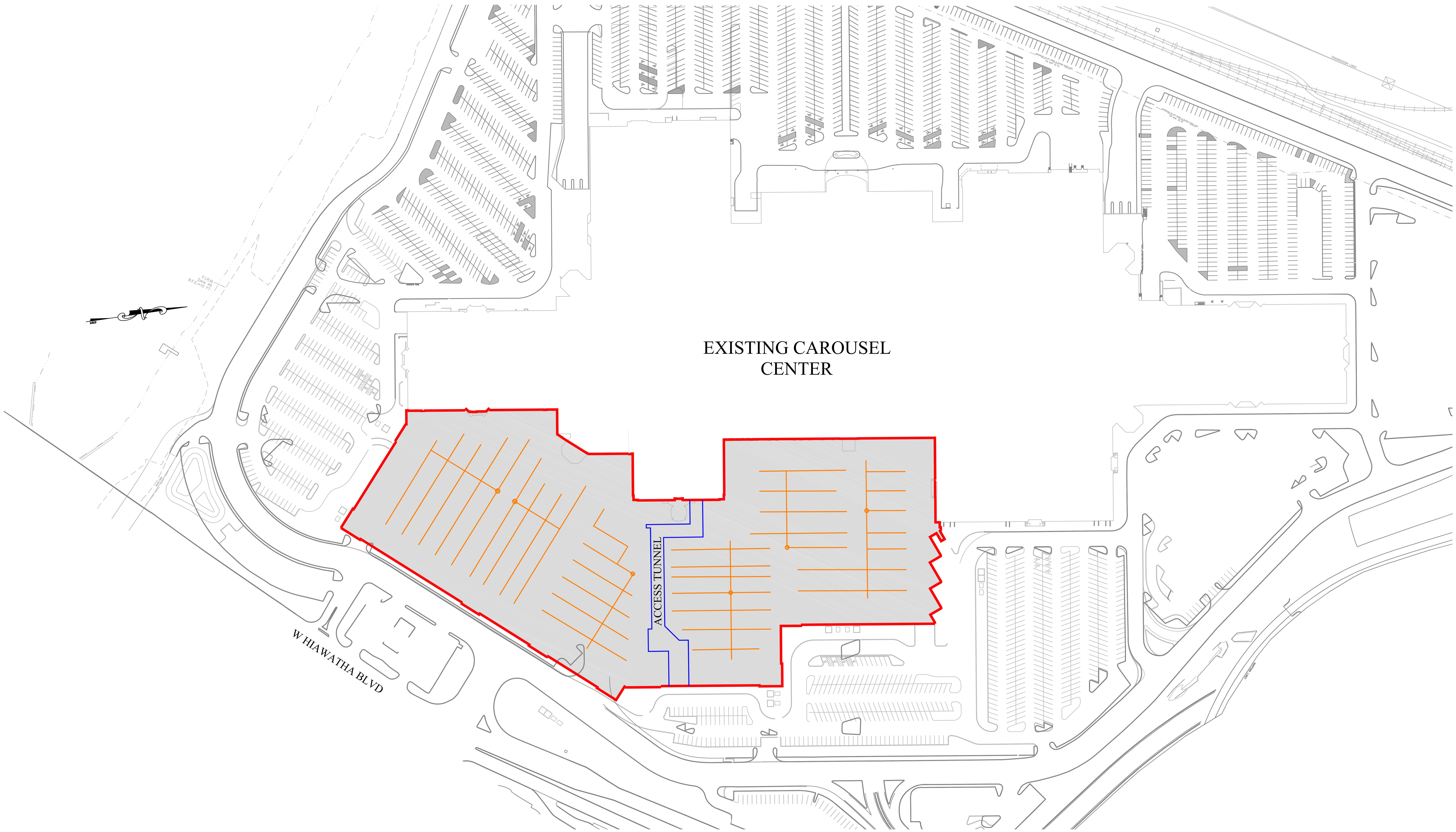
0 30' 60' 120'
1" = 60'

ALTERNATIVE NO. 4 EXCAVATION PLAN PHASE I SITE

CITY OF SYRACUSE, NEW YORK ONONDAGA COUNTY

SPECTRA ENVIRONMENTAL GROUP, INC.
19 British American Boulevard
Latham, New York 12110
TEL (518) 782 0882 FAX (518) 782 0973

DATE: 05/08/09 | SCALE: 1" = 60' | DWG. NO. 06448 | FIGURE 7



LEGEND

PHASE I SITE BOUNDARY

LIMITS OF VAPOR BARRIER

VAPOR CONTROL PIPE LATERAL

VAPOR CONTROL SYSTEM RISER AND BLOWER LOCATION

NOTE: MAP BASED ON DRAWINGS FROM O'BRIEN AND GERE ENGINEERS, INC. ISSUED FOR CONSTRUCTION 06/06/2007

NO.	DATE	REVISIONS	DRN	CKD	APPR

PROJECT

PROJ. ENGR.:
PROJ. NO.: 06448
DESIGNED BY: MGR
DRAWN BY: REW
CHECKED BY:
APPROVED BY:
DATUM: CITY OF SYRACUSE
CONTOUR INTERVAL = NA

0 50' 100' 200'
1" = 100'

ALTERNATIVE NO. 4 ENGINEERING CONTROLS PLAN PHASE I SITE

CITY OF SYRACUSE, NEW YORK ONONDAGA COUNTY

SPECTRA ENVIRONMENTAL GROUP, INC.
19 British American Boulevard
Latham, New York 12110
TEL (518) 782 0882 FAX (518) 782 0973

DATE: 05/08/09 | SCALE: 1" = 100' | DWG. NO. 06448 | FIGURE 8

PLANT LIST

KEY	COMMON NAME	SCIENTIFIC NAME	SIZE	ROOT	QUANTITY
AP	AUSTRIAN PINE	PINUS NIGRA	8'–9' HT	BB	9
CP	CALLERY PEAR	PYRUS CALLERYANA ARISTOCRAT	2 1/2"–3" CAL	BB	15
RM	RED MAPLE	ACER RUBRUM	2 1/2"–3" CAL	BB	6
JF	JAPANESE FLOWERING CRAB	MALUS FLORIBUNDA	2 1/2"–3" CAL	BB	15
LL	LITTLELEAF LINDEN	TILIA CORDATA GREENSPIRE	2 1/2"–3" CAL	BB	6
TH	THORNLESS HONEYLOCUST	GLEDITSIA TRIACANTHOS INERMIS	2 1/2"–3" CAL	BB	6
GA	SUMMIT GREEN ASH	FRAXINUS PENNSYLVANIA SUMMIT	2 1/2"–3" CAL	BB	8
CS	COLORADO BLUE SPRUCE	PICEA PUNGENS GLAUCA	8'–9' HT	BB	12
SA	SHRUB ALTHEA	HIBISCUS SYRIACUS	5'–6' HT	BB	17
FS	FRAGRANT SUMAC GRO–LOW	RHUS AROMATICA GRO–LOW	18"–24" SP	CG	310
JS	JAPANESE SPIREA LITTLE PRINCESS	SPIRAEA JAPONICA LITTLE PRINCESS	18"–24" SP	CG	45
PA	SHRUBBY POTENTILLA ABBOTSWOOD	POTENTILLA FRUTICOSA ABBOTSWOOD	18"–24" SP	CG	25
SJ	SEA GREEN JUNIPER	JUNIPERUS CHINENSIS SEA GREEN	18"–24" SP	CG	61
SI	CUTLEAF STEPHANANDRA	STEPHANANDRA INCISA CRISPA	18"–24" SP	CG	280
HS	HUMMINGBIRD SUMMERSWEET	CLETHRA ALNIFOLIA HUMMINGBIRD	18"–24" SP	CG	110

LANDSCAPE NOTES:

1. ALL DISTURBED AREAS NOT UNDER BUILDINGS, PAVEMENT & PLANTINGS SHALL BE TOPSOILED, GRADED & SEEDED.
2. EXISTING TREES SCHEDULES FOR REMOVAL DEEMED SUITABLE FOR TRANSPLANTING SHALL BE RELOCATED WHERE DIRECTED BY OWNER.
3. ALTERNATE SLOPE PLANTING: SEED BUFFALO GRASS (BUCHLOE DACTYLOIDES) AT RATE OF 1–2 LB PER 1,000 SQ. FT., PROTECT SLOPE AGAINST EROSION WITH BIODEGRADABLE EROSION CONTROL BLANKETS.

LEGEND

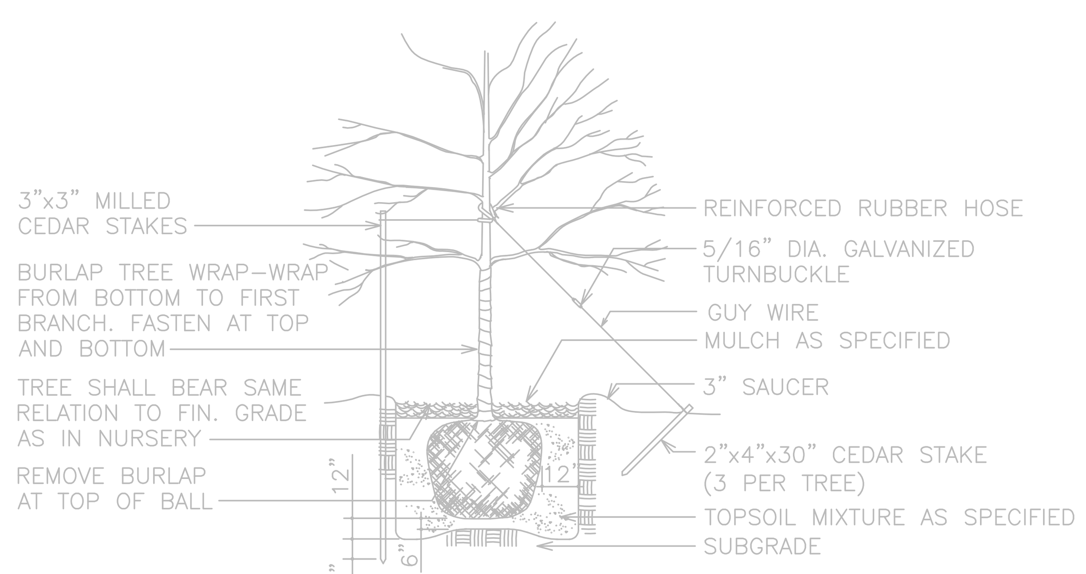
– PROPOSED SHRUB

– PROPOSED EVERGREEN TREE

– PROPOSED DECIDUOUS TREE

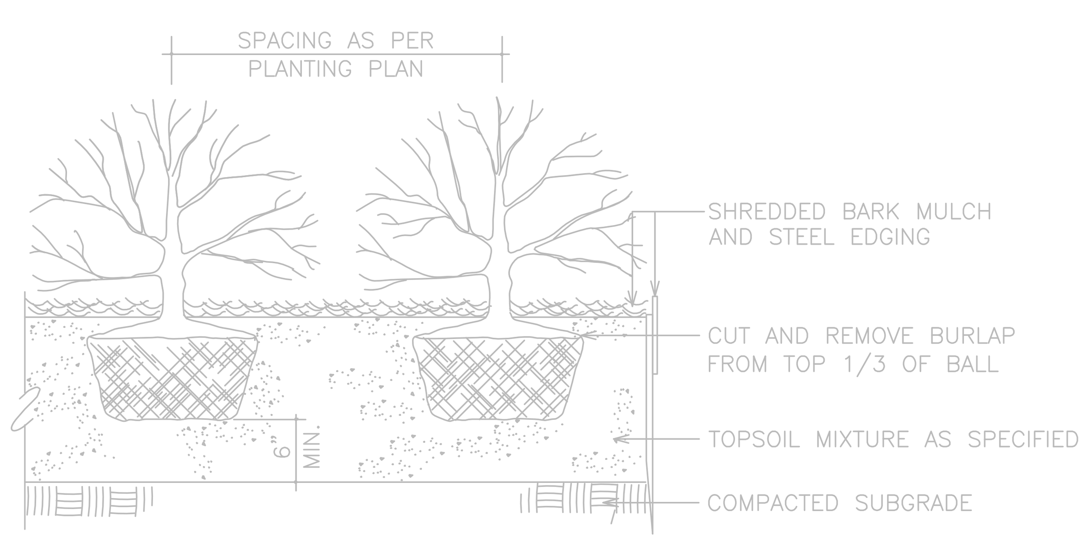
WS 4 QUANTITY

PLANT TYPE



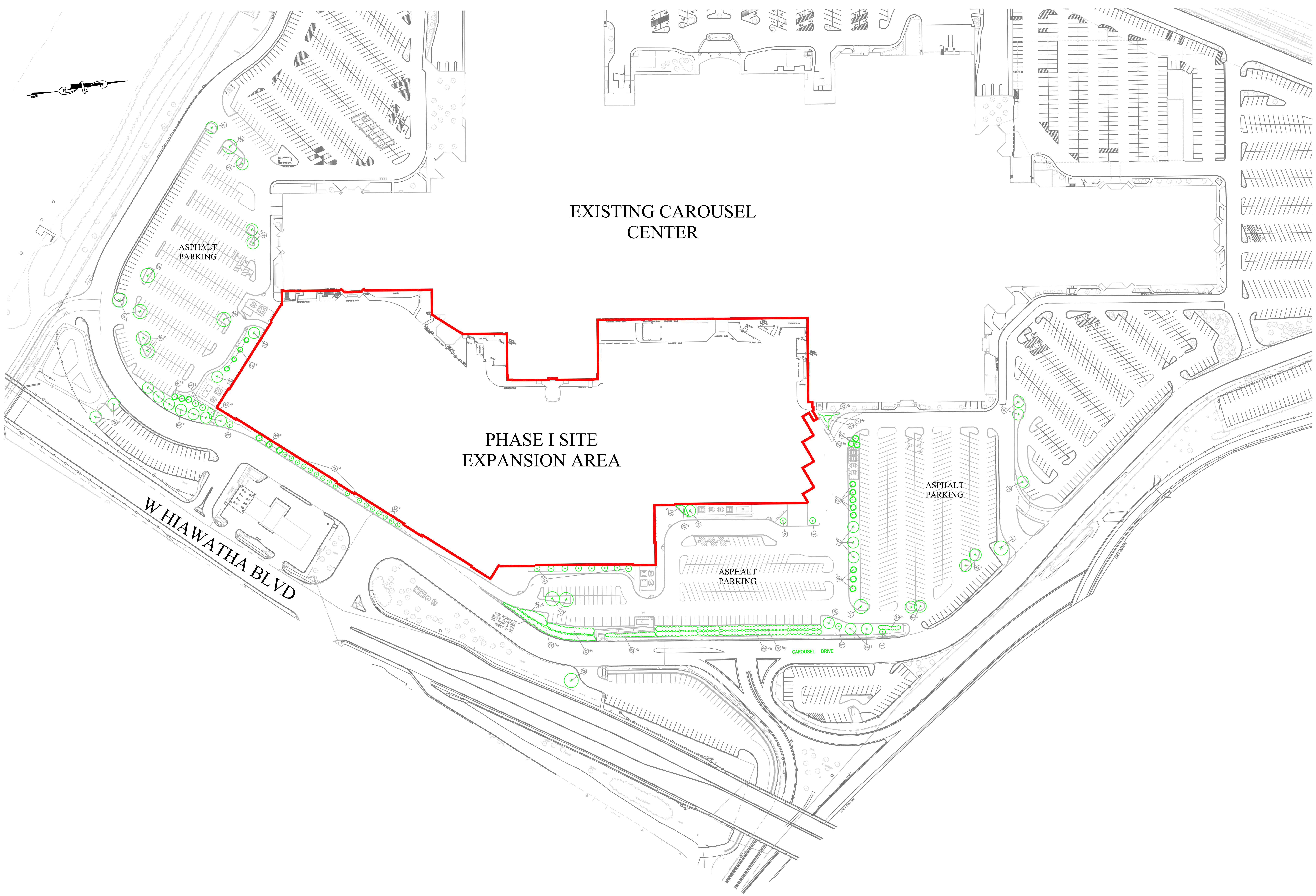
NOTE:
FOR EVERGREEN TREES, OMIT TREE WRAP

TREE PLANTING
NOT TO SCALE



NOTE:
SHRUBS TO BE PLACED ALONG TOP OF BERM AT THE DIRECTION OF THE OWNER.

SHRUB PLANTING
NOT TO SCALE



NOTE: MAP BASED ON DRAWINGS FROM O'BRIEN AND GERE ENGINEERS, INC. ISSUED FOR CONSTRUCTION 06/06/2007

NO.	DATE	REVISIONS	DRN	CKD	APPR

PROJECT	
PROJ. ENGR.:	
PROJ. NO.:	06448
DESIGNED BY:	MGR
DRAWN BY:	REW
CHECKED BY:	
APPROVED BY:	
DATUM:	CITY OF SYRACUSE
CONTOUR INTERVAL =	NA

0 50' 100' 200'
1" = 100'

ALTERNATIVE NO. 4 SITE RESTORATION PLAN PHASE I SITE

CITY OF SYRACUSE, NEW YORK — ONONDAGA COUNTY

SPECTRA ENVIRONMENTAL GROUP, INC.
19 British American Boulevard
Latham, New York 12110
TEL (518) 782 0882 FAX (518) 782 0973

DATE: 05/08/09 | SCALE: 1" = 100' | DWG. NO. 06448 | FIGURE 9

APPENDIX A

DESTINY USA SITE HEALTH AND SAFETY PLAN (SHASP)

destiny usa

Site-Specific Safety and Health Manual

CIANBRO

Final May 7, 2009

TABLE OF CONTENTS

INTRO I. SITE SPECIFIC PROGRAM REQUIREMENTS CHECKLIST

Contractor Name: __________________ **Date**: _____________

YES NO

1. Upon notice of bid award and prior to beginning the work, each contractor shall submit a site-specific plan for their contract work that has, at a minimum, the requirements listed herein.

2. Each contractor shall have on site safety and health representative.

3. Each contractor shall submit a weekly site safety audit using the form contained in this plan or similar.

4. All visitors and contractors personnel shall have a site specific orientation before being allowed on site.

5. All incidents shall be investigated to determine root cause and corrective action.

6. Each Contractor shall include an effective discipline section of their site specific plan which includes consequences for violation of safety and wrap up program elements, up to and including removal from site to termination.

7. A hot work permit and fire watch shall be required prior to welding, or any other hazardous work where flammables or combustible materials cannot be removed.

8. Each Contractor shall provide appropriate fire extinguishers in the immediate area of the hot work, and throughout the site as required by OSHA.

9. Each contractor shall monitor noise levels during construction activities and team members shall be provided with hearing protection appropriate for the exposures as needed.

10. Excavation permits shall be required whenever a powered tool or piece of equipment is used to create a trench at a depth of five feet or deeper.

11. All aerial, roof or walking surface area over 6 feet in height shall have a means of conventional fall protection (PFAS, guardrails, or), aerial lifts or properly erected scaffold. (A permit is required for any non-conventional fall protection method).

12. A Job Hazard Analysis shall be completed prior to over 6 feet work and the contractor shall maintain a written fall protection plan.

15. Unprotected onlookers of the public will be protected by a plan coordinated by the Construction Manager and the Owner.

16. Each Contractor conducting "soil intrusive" activities only; shall have their exposed field personnel complete a 40-hour required Safety & Health training session dealing with Hazwoper as designated by OSHA.

17. Each contractor shall adhere to a no drug – no alcohol policy on site.

18. Each contractor shall have a vehicle safety program.

INTRO II. TEAM MEMBER ACKNOWLEDGEMENT FORM

ORIENTATION SIGN OFF SHEET

Indicate below at which job site you performed the orientation and check the topics that were covered. If you covered additional topics, please list them

Jobsite:			
Safety Program		Eye Protection	☐
Fire Emergency Plan	☐	Bloodborne Pathogens	☐
Emergency Phone Numbers and Locations	☐	Accountability Program	☐
Hard Hat Instruction	☐	Lead Awareness	☐
		Silica Awareness	☐
Confined Space	☐	Scaffold User	☐
Safety Policy	☐	Stretches	☐
General Work Rules		Excavations	☐
Wellness Program	☐	**Project Work Rules**	
Harassment Policies	☐	Job Site Specific Safety Considerations	☐
EEO Policy	☐	Scaffold User	☐
Team Member Counseling and Reprimand Procedure	☐	Work Area Barricade Protection	☐
Labor Relations Plan	☐	Activity Plans (Safe Work Plans)	☐
Open shop/merit	☐	Project Safety Plan	☐
PPE Requirements	☐	Competent Person List	☐
Project Safety Plan	☐	Personal Property/Cell phone use	☐
Fall Protection Program	☐	Traffic Control and Protection	☐
Respiratory Program	☐		
Hearing Conservation Program	☐	**Project Environmental**	
Hazard Communication Program	☐	Spill Prevention and Control Plan	☐
Safe Rigging Operations	☐	Site Contingency Plan	☐
Lockout/Tag-out	☐	Site Specific Environmental Concerns	☐
Electrical Safety	☐	Substance Free Workplace Policy/Tobacco Policy	☐
Hand Finger Protection	☐		
Project Specific Training	☐		
Project Description (Site Plan, and Organization Chart)	☐		
Other topics covered			
1. –Excavation Permits		4. -	
2. –Hot Work Permits		5. -	
3. –Drug and Alcohol testing		6. -	
Additional Comments:			

1.0 POLICY STATEMENT

Team members deserve a work environment that is free from injuries, illnesses, and at-risk behaviors. Therefore, all managers must dedicate themselves to providing an injury and illness free workplace for all team members on this project. Everyone's top priority is to take responsibility for eliminating or controlling workplace hazards, for eliminating at-risk behaviors and for reporting and managing all team member injuries. Team leaders must hold all team members accountable to acceptable performance standards. Our solid leadership will ensure attainment of our goals – eliminating at-risk behaviors and achieving zero injuries. We believe that the management skills, commitment, and teamwork required to achieve a safe workplace are identical to those required to build an organizationally strong, legally sound, morally right, and financially secure company.

2.0 PROGRAM OBJECTIVES

The goal of this Safety and Health Manual is to establish and maintain a safe working environment for contractors performing work, visitors, and the public who may have access to our project sites. It is the responsibility of everyone involved to strive for an incident-free project and to minimize the potential loss of life, injury, property damage, or lost time that can occur in an unsafe environment.

While this program is not intended to limit the legal or contractual obligations of individual contractors and /or sub-contractors working on the site, the following objectives must be accomplished to achieve a safe project for team members and visitors:

- A safe system of work that includes preplanning must be implemented. Daily activity planning and job hazard analyses will be required on this site for all work activities.
- A system must be established and maintained to promptly identify and correct unsafe practices or conditions. Written safety audits will be required weekly.
- To increase safety awareness, a team member Safety Training Program must be established and maintained for all contractor and/or sub-contractor team members, including new team member orientation, site-specific orientation for everyone coming on site, regular safety meetings, and use and care of protective equipment.
- Emergency procedures and communications with local authorities will be established as part of the site contingency plan in order to minimize fire, police, or ambulance response time in the event of an occurrence.
- Access to the site must be secure, and work in the project area must be planned and controlled to minimize hazards to the general public.
- Destiny USA requirements, requirements of the Occupational Safety and Health Act, all other ordinances and laws promulgated by Federal, State or Local agencies, as well as environmental laws and the requirements of Clients must be complied with.

The safety of our work environment depends directly upon individual effort and commitment to the objectives of this program. We must all do our part and encourage and demand others to do theirs.

OUR GOAL IS ZERO INCIDENTS.

3.0 CONSTRUCTION ORGANIZATION

The responsibility for safety and loss prevention on a construction site lies with every person involved on the project. The following is a general outline of the function and related responsibility of various individuals or groups involved in the safety and loss prevention initiative on the project. When, or if, the organization of the project team varies in response to the needs or status of the project, the responsibilities indicated below shall be assigned to the appropriate team members by the senior representative on the project site.

3.1 Project and Construction Manager

The Construction Manager is fully responsible for the overall performance of the project contractors, including the development, enforcement, and administration of the project site-specific Safety and Health program. These responsibilities include managing the Project Accountability Program.
Project Manager: Brian Watson
Construction Manager: Scott Tierney

3.2 Project Superintendent

The Project Superintendent will work with the Safety Manager and Construction Manager to develop the project safety program and be directly responsible for implementation and enforcement. Responsibilities of the Project Superintendent include:

- Ensure that regular job site inspections are completed
- Do a safety walk around with the Safety Specialist at least once per week

3.3 Project Safety Manager

The Project Safety Manager will work with the Project Manager, Project Superintendents, and the Client to develop and implement the project's safety program. He/she will serve as a focal point for administration of the project's safety program. He/she will also review all audits, incident investigations, training programs, and contractor plans.
Safety Manager: Kris Ballard

Responsibilities of the Project Safety Manager include:

- Approve any changes to this Site Safety and Health Plan.
- Attend pre-bid and pre-construction meetings to review pertinent safety and health requirements.

- Ensure a copy of this site specific Safety & Health Program is made available to all contractors and/or sub-contractors.

- Obtain a copy of each contractors and/or sub-contractor's Hazard Communication Program and Safety Program which describe safety steps to be taken to minimize hazards particular to that contractor's and/or sub-contractor's work. Verify that each contractor and/or sub-contractor designates a Safety Representative to implement his or her own program.

- Monitoring safety program compliance through daily safety inspections, identification, documentation of unsafe conditions and remedial action.

- Administer the Construction Manager/Clients site-specific safety orientation for all contractor and/or sub-contractor personnel and visitors.

- Reviewing the safety program requirements of various contractors and/or sub-contractors and monitoring program implementation.

- Organize and instruct project staff in safety and training meetings.

- Conduct regular jobsite inspections with the Contractor's Safety Representative and/or Project Superintendents to evaluate safety program implementation.

- Attend the site Safety Committee meetings.

- Make recommendations that will best correct hazardous conditions or will prevent hazardous situations from occurring.

- Verify that proper signage and portable fire fighting equipment is provided and is in place.

- Lead investigation of all accidents or safety incidents for corrective actions and preparation of incident reports.

- Develop and maintain project safety files.

3.4 Specialty Contractor Responsibilities

All contractors or subcontractors performing construction or construction-related activities on the project, whether under contract with the Client or contractor, are responsible to comply with and diligently enforce, the Occupational Safety and Health Act and all other ordinances and laws promulgated by Federal, State or Local agencies, Environmental laws and the requirements of the Client. General responsibilities include:

- Each contractor and/or sub-contractor will provide a written job hazard analysis to Destiny's Construction Contractor Cianbro Corp highlighting the particular hazards to their trade. This job hazard analysis must be submitted before any work over 6 feet in height or other "critical" work is performed on the jobsite and include provisions for implementation on the project, including the safety of any subcontractors or lower tier subcontractors. The Project Manager and Safety Manager will need at least a week before the work starts to review the plans.

- Each contractor and/or sub-contractor shall designate a jobsite Safety Representative to be responsible for implementation of this Safety Program.

- Each contractor and/or sub-contractor shall conduct weekly safety meetings and "Toolbox Talks" for all their team members on the jobsite and submit records of all such meetings to Destiny USA.

- Each contractor and/or sub-contractor shall conduct a documented weekly audit of his or her work area. Provide documentation of the items found and corrective actions to the Destiny USA Safety Manager.

- No contractor and/or sub-contractor shall use another trade's equipment without written permission from the owner of the equipment. All equipment shall be checked daily and before each use for safety compliance. No equipment shall be left at any time in an unsafe condition and shall be removed or tagged out immediately if not to be used again.

- Each contractor and/or sub-contractor will provide a written Hazard Communication Program. The contractor and/or sub-contractor shall submit Material Safety Data Sheets for all potentially hazardous materials being used on site. The contractor and/or sub-contactor shall make available his MSDS to all his team members. All contractor and/or sub-contractor team members shall be trained in the safe handling, use, storage, and disposal of any hazardous material he is in contact with. Documentation of each training session shall be made available upon request.

- At all times, each contractor and/or sub-contractor shall provide and enforce the use of personal protective equipment required by this Site Safety Plan, the Occupational Safety and Health Act, all other ordinances and laws promulgated by Federal, State or Local agencies, and Client requirements.

- Contractors and/or sub-contractors shall ensure that suitable tools are used for each task and maintained in safe operating condition. Verify that all team members are fully trained and have read and fully understand operating procedures before machinery or equipment is used.

- Contractors and/or sub-contractors shall continuously check for and correct any unsafe practices or conditions that exist in the performance of their work. Report to the Destiny USA and/or the client any unsafe conditions created by others.

- Contractors and/or sub-contractors shall make a complete investigation of incidents including near misses to determine the cause so that corrective action can be taken. In addition, report all incidents and injuries to Destiny's construction manager Cianbro Corporation.

- Each contractor and/or sub-contractor shall adhere to the site security requirements.

- Each contractor and/or sub-contractor shall implement a formal Return to Work Program, including use of an off-site occupational medical facility for non-emergencies.

- Each contractor and/or sub-contractor shall be responsible for its own Vehicle Control Program including maintenance of vehicles used on-site.

- Permit requests are to be submitted to the Construction Manager for all hot work and excavations deeper than 4 feet

4.0 WRITTEN HASP OVERVIEW

Site Description and Site Characterization

Destiny USA 800K is a project which will attach to the existing 0.8 million SF existing Carousel Center and will add over 800,000 square feet of mixed-use space to the existing Carousel Center. This project is located in the City of Syracuse and is owned by SIDA and The Pyramid Companies.

The site is located in an industrial/commercial area on the southeast end of Onondaga Lake. Access to the site will be restricted by chain link fences, which surround the perimeter of the expansion only. The existing Carousel Center will be operational and open to the public.

Scope of Work:

This site-specific plan includes the following contract work items:

1. Mobilization of Construction related activities
2. Site work
3. Excavation, disposal of impacted soils and back fill with granular material to final grades
4. Utility relocation
5. Sheeting, bracing, and pile driving
6. Formwork
7. Cast in place concrete
8. Structural steel

9. Pre-cast concrete.
10. Carpentry/ frame work
11. Interior finishes
12. Mechanical
13. Electrical

Construction Organization:

Destiny USA will oversee multiple specialty trade contractors. Each approved contractor will be required to adhere to this site-specific program.

General:

All contractors and sub-contractors working on the Destiny USA site must comply with all Destiny USA, Federal, State, Local, and owner required safety and environmental standards and procedures.

Safety Personnel:

Each contractor and/or sub-contractor must have an on site safety and health representative at all times. This person must have the training, education, and experience needed to identify hazards and correct them on the site. This person may have other duties in addition to health and safety until the contractor reaches 20 or more workers on site, as stated in the OSHA Agreement on page 4 (3.2) Strategies of this Partnership Include section vi the person responsible for safety will be trained in the 30 Hour OSHA Outreach.). Each task must also have a competent person on site as required by OSHA (i.e. scaffold, excavation etc).

Changes to This Site Safety and Health Plan:

All changes and/or amendments to this Plan must be approved by the Project Safety Manager these changes will be communicated to all affected personnel before they go into affect.

Inspections:

Each contractor and/or sub-contractor will be required to submit a written weekly site safety audit. Any deficiencies noted during any audit must be promptly corrected. Outside third parties may also fulfill this requirement. If at any time, a contractor and/or sub-contractor recognize an unsafe condition or act of another contractor, this must be brought to the attention of the onsite safety director.

Site Access:

All visitors, contractors, and/or sub-contractors must go through a site-specific orientation before being allowed on site. All visitors must be escorted throughout the site.

Personnel and vehicle access is restricted and should be coordinated in advance with the on site Logistics Manager Brian Larsen. This coordination includes access that is required outside of normal working hours.

Every person has a right to choose to work. Should picketing occur that creates a risk, contact the Construction Manager for guidance.

Post Injury Management:

All contractors and/or sub-contractors must adhere to post injury requirements that include:

1. A formal return to work program
2. Consult with an off site PPO or Occupational medical facility for non emergencies
3. An injured worker escort program to the clinic or hospital.
4. Regular contact with injured workers out on lost time.

Meetings:

Each contractor must hold or attend a safety meeting at least weekly. Contractor and/or sub-contractor representative may be required to attend at a minimum weekly site safety meetings held by the Site Safety Director and located at his/her facility. All other required meetings will be attended as notified.

Incident Reporting and Investigation:

All incidents must be properly investigated to determine root cause and corrective action. All reports shall be completed ASAP but no later than 24 hours from the incident and a copy must be submitted to the Construction Manger for Destiny USA Cianbro Corp. within this same timeframe.

Accountability:

Each contractor and/or sub-contractor shall include an effective discipline section of their plan that includes consequences for safety violations, up to and including removal from site or termination.

- **Fall protection violation see Section 15 any violation of the policy will be 3 days off from the site, the second offense will be termination from the project.**
- **LOTO Lock out tag out and violation of plan will be 3 days for first violation and termination for second. If you by pass a Lock out you will be terminated immediately from the site. This is in Section 7.8**
- **Confined space violation working without permit or plan you will not be able to work on site for 3 days the second time will be termination.**
- **Red barricade tape must not be crossed without permission from the crew who's name is on the tag or sign, if you do cross you will be given 3 days off from the site and second offense is termination.**
- **If any employee crosses the swing radius barricade while the crane is in motion walking or swinging, they will be sent home for 24 work hours for the first offense and terminated for second.**
-
- **Smoking or tobacco use is prohibited if you are caught you will be asked to leave for 1 full day.**
- **Any other violation will be dealt with by each individual contractor or Cianbro with a warning, written warning and then time off. If it is a grievous violation you may be asked to leave or be fired.**

Drug and Alcohol Policy:

The possession and or consumption of alcohol or the sale, distribution, purchase, possession, dispensing or use of drugs at this site is ***prohibited.*** **All accidents will require a drug and alcohol and substance abuse test. If you fail a drug or alcohol test you will not be able to work at Destiny.**

Other:

Hazard Communication: See Hazard Communication Program Safety Bulletin

Confined Space: A permit is required for Permit and Non Permit Confined Spaces and prior approval from the site safety director prior to entry. (See section 7.4)
Lock Out/Tag Out: (see section 7.8)

Temporary Electric: (see section 31.0)

A Hot Work Permit and fire watch will be required prior to welding or any other hazardous work where flammables or combustible materials cannot be removed. Appropriate fire extinguishers must be in the immediate area of the hot work, and throughout the site as required by OSHA.

Physical Hazards:

Physical Hazards could include the following:

Contact with overhead power lines or underground utilities when excavation activities are taking place. The exact location of all active utilities must be verified prior to commencing excavation. The contractor's normal procedures are to call UFPO/Dig Safely New York for located buried utility lines prior to excavation. Electrical and Lockout/tag out procedures are identified herein.

Construction work in outdoor environments during the summer can create concerns of heat stress for team members. These concerns will be exacerbated if personal protective equipment needs to be upgraded to Level C. When working in hot environments or wearing constrictive clothing, i.e., suit and/or respirator, team members need to acclimate themselves first to the new environment, drink plenty of cool water throughout the entire day, take breaks in a shaded area or in the air conditioned job trailer, and know the signs and symptoms of heat exhaustion or heat stroke. Heat stroke can occur when the body's temperature reaches above 98 degrees. The skin may be pale, sweating stops, and the team member may feel disoriented and confused. The team member must be cooled down immediately and proper medical care given.

During the winter months, each contractor shall be responsible for removing ice and snow from their own work areas.

Construction equipment and activities can at times create a noisy environment. Each site contractor shall monitor noise levels during construction activities and team members shall be provided with hearing protections appropriate for the exposure. Workers shall be protected in accordance with OSHA requirements.

Excavation:

Cave-ins during trench work could trap team members and lead to serious injury. Safety procedures are outlined herein for trenching and excavation activities. Excavation permits are required whenever a powered tool or piece of equipment is used to create a trench at a depth of 4 feet or deeper.

For this site-specific plan, each excavation team will have a calibrated four-gas monitor to provide continuous monitoring in the excavation. Also for the purpose of this site-specific plan, the competent person shall require shoring or slope back to a 1 ½ to 1 angle of repose, i.e., a Class C soil slope. Safe access shall be provided with ladders or an earth embankment every 25 ft.

Fall Protection:

This is a 100% fall protection site. All aerial, roof, or walking surface area beyond 6 feet in height must have a means of conventional fall protection (PFAS or guardrails), aerial lifts, or properly erected scaffold. Any roof work with an unguarded leading edge or opening requires fall protection. Non-conventional fall protection (safety monitor, controlled access zone, controlled decking zone) cannot be used without prior approval by the site safety director.

Each contractor and/or sub-contractor shall perform a Job Hazard Analysis prior to work above 6' and shall maintain a written fall protection plan.

Stepladders will not be used as extension ladders. Ladders shall be in good condition, inspected, and team members trained on safe ladder use. Any ladder used over 24 feet must have some form of fall protection. Metal ladders are not allowed on this site.

Fire:

Fire hazards may also be encountered at the job site. Contact will be maintained with the Syracuse Fire Department (Captain Tom Erwin). All personnel expected to use fire extinguishers must receive training. There are fire extinguishers located every 3000 sf within the building and they are not to be used for hot work. A site evacuation plan will be developed by the Construction Manager and coordinated with the Contractor / Owner.

Personal Protective Equipment (PPE):

All site personnel must dress appropriately including long pants and shirts with short or long sleeves (no tank tops).

The minimum PPE in all construction and remediation areas is hardhat, safety shoes at least 6" high, safety glasses with rigid side shields, and cut resistance gloves appropriate for the types of tasks being performed. When you come thru the gates to the project you must have these on, if you have to cross the road to come into the site you must wear a traffic vest or equivalent.

Noise: Hearing protection must be worn when operating heavy equipment, pile driving, using loud power tools, and in any area where workers must raise their voice to talk to persons standing within 3 feet.

Eye Protection: Face shields or other double eye protection is required when using any power tool.

Contractors are required to specify and provide additional PPE for specialized tasks. Site personnel must be trained to properly use the PPE provided and in some cases (such as respirators) must also be medically qualified. These tasks may include, but not necessarily be limited to, the following:

- Welding PPE
- Chemical protective clothing (including hazardous waste work)

- Respirators
- Electrical protective clothing
- Arc flash protection
- Fall protection (harness, lanyards, carabiners, retractables, D-straps, etc.)

Emergency Response (Contingency) Plan:

In the event of an emergency, all members of the contractor's crew will be instructed by three blows of a hand-held horn by the site safety director or representative to exit the area and meet at the rally point identified in the emergency (contingency) plan.

An emergency consists of any serious accident or any conditions discovered by the onsite safety & health individual that would suggest the presence of a hazardous situation, fire, or chemical exposure. Please see the contingency plan emergency contact numbers as well as the nearest emergency facility, i.e., St. Joseph's Hospital. The owner's representative has communicated with St Joseph's hospital to advise them as to the potential hazards and the contents of this health and safety plan.

5.0 TRAINING

A Safety Training Program is necessary to continually enhance safety awareness to make sure the jobsite is safe and to ensure team members understand the potential hazards associated with their work and employ proper safety techniques. Awareness and early identification of hazardous situations that can lead to incidents will enable corrective action to be implemented, minimize accidents, personal injuries, and property damage.

5.1 Site-Specific Orientation

All persons coming onto this site will go through a site-specific orientation including:

- Parking
- Work Hours / Security
- Reporting All Incidents and Near Misses
- Site Visitors and Deliveries
- Safety Warnings and Disciplinary Actions
- Location of First Aid Supplies and Telephones
- Project Emergency Evacuation Procedures
- Site Specific Hazards
- General Safety Rules / PPE Required
- Lock Out / Tag Out Requirements
- Work Permit Requirements
- Smoking Restrictions
- Fall Protection Requirements

Date of orientation, project name, attendees' signature and employer, instructor's signature and the topics discussed will be documented and filed.

5.2New Team Member Orientation

When a new team member is hired, he/she is excited about gaining employment and wants to do a great job for their new employer. In doing so, they may work harder and faster than ever before. Many of these team members may have never been on a construction site before. Without effective new team member orientation, this team member is at a higher risk to injury than one who understands the hazards and potential hazards of the job and takes the necessary time to work safely with them.

In addition to the site-specific orientation, all new team members should have completed an orientation addressing the following:

Yes	No	
☐	☐	Your operation's Safety & Health Program
☐	☐	Existing Safety Rules (General and Workplace Specific)
☐	☐	Disciplinary program in place
☐	☐	Employer and team member responsibilities
☐	☐	Injury/loss prevention procedures and importance
☐	☐	Specific job training
☐	☐	Use of personal protective equipment (PPE)
☐	☐	Team member right-to-know (Hazard Communication)
☐	☐	Emergency Preparedness Procedures / Security
☐	☐	The importance of reporting all incidents and injuries immediately
☐	☐	Top management commitment toward safety
☐	☐	Importance of team member involvement in the Safety Program
☐	☐	Importance of open communications at all times

Comments: For all items checked **NO…**complete the action plan below:

Observation Made	Action Needed	By Whom	Date

5.3 Contractor Tool Box Meetings

Each contractor shall be required to conduct weekly “Tool Box” safety meetings for their entire workforce. The contractor shall prepare an agenda for these meetings using pertinent safety material. Minutes of these meetings, along with signed attendance sheets, must be submitted to the Destiny USA Safety Manager each week.

5.4 Site Safety Meetings

Safety meetings will be held weekly. All personnel on site are required to attend. When the size of the job requires it, multiple meetings will be held.

5.5 Project Coordination Meetings

Safety will be a priority topic at the beginning of each Project Coordination Meeting.
The Project Safety Manager or Superintendent will review potential hazards associated with current and upcoming activities.

5.6 Contractor Training

It is the responsibility of each contractor to develop and implement a Safety Training Program for their supervisors and workers. Training sessions will occur on a regular basis during the course of the project. In addition, the contractor must provide task-specific training whenever a team member will be performing new and/or unfamiliar work assignments.

5.7 Bulletin Board

The Construction Manager will provide a bulletin board in a conspicuous area accessible to team members. The bulletin board shall be utilized for the required posting of OSHA information, safety information, and posters. Signs, bulletin boards, and posters shall be legible and maintained in a clean, orderly manner by the Construction Manager, Superintendent, or Project Safety Manager.

5.8 Task Hazard Analysis

The purpose of preparing a task hazard analysis is to identify and anticipate hazards associated with a particular activity and to enable the contractor(s) performing the work to develop a plan to prevent them from causing accidents.

A task hazard analysis will be developed as part of the activity planning process prior to starting a new activity. A written task hazard analysis will be developed by each contractor. The task hazard analysis will be reviewed as part of the activity plan with personnel that will be performing the work by the appropriate contractor supervisor. The plan shall be reviewed and updated periodically to reflect changes in the hazards or job conditions.

6.0 SAFETY CONTROLS

Safety controls are necessary to establish and maintain a safe and healthy work environment. The process of selecting safe contractors, performing frequent comprehensive safety inspections/audits, planning for safety and disciplining contractors will reaffirm the basic responsibility of contractors to provide a hazard-free work environment for their team members and the public. Disciplining team members will reaffirm their responsibility to comply with established safety requirements.

6.1 Contractor Qualification

The Owner is committed to working with safe contractors. Toward that end, the Contractor Safety Questionnaire shown in Section 38.0 must be completed by any contractor seeking to work on this project. The Construction Manager will review the information provided by the contractor and determine if the contractor qualifies to work on this project.

The Contractor's Workers' Compensation Insurance Experience Modification Rate (EMR) shall serve as a primary criteria in determining a Contractor's Safety qualification. A contractor will meet the EMR criteria if their current EMR is less than 1.00. A contractor whose current EMR is greater than 1.00 may be deemed qualified pending an investigation into the reason for the high EMR.

Review of the contractor's safety program and OSHA 300 logs for the past calendar year will also play an important role in determining a contractor's safety qualifications and must be submitted to the Construction Manager.

If a contractor cannot provide a true EMR because they are too new, too small or self-insured, they may be deemed qualified if their OSHA Incident Rates are in line with national averages as published by the Bureau of Labor Statistics.

6.2 Contractor Pre-Bid Meeting

During contractor pre-bid meetings the Construction Manager will review specific safety procedures and equipment that will be required; pertinent Client Safety and Industrial Hygiene Standards; applicable work permit requirements (confined space, welders, etc.); security and the Construction Manager / Client orientation requirements. Logistics issues should also be reviewed with prospective bidders during a walk through of the site.

Client representatives should be given advance notification of these meetings and are invited to attend.

6.3 Contractor Pre-Construction Meeting

The Project Manager will conduct Contractor pre-construction meetings for reviewing general project requirements for safety, health, security, and logistics. Specific safety requirements for the Contractor's scope of work will also be reviewed, i.e., fall protection for structural steel erectors, excavation requirements for underground utilities, steel erection plans, control access areas, etc. The contractor representative that will be onsite during the actual work is required to attend.

Client representatives will be given advance notification of these meetings and are invited to attend these meetings.

6.4 Safety Inspections

Systematic and random informal daily monitoring combined with documented formal weekly safety inspections will be conducted by the Safety Manager to ensure contractor compliance with the Project Safety Program. The Safety Inspection Report shown in Section 38.0 can be used for weekly documented inspections. Contractors will be notified in writing of unsafe conditions and/or practices observed. The Construction Manager will monitor the contractor's response and verify appropriate corrective action has been taken with regard to unsafe conditions and/or practices observed.

The Construction Manager will take appropriate enforcement measures if required.

6.5 Contractor Surveys

Each contractor is required to conduct daily surveys of their work area(s) to insure continual compliance with the Project Safety Program. Contractors are responsible for immediately correcting any deviations noted during these surveys.

Daily surveys shall include, but not be limited to, any of the following items applicable to the contractor's work:

- Checking excavation operations and related equipment.

- Housekeeping will be checked for storage of new and waste materials. Keep walkway and traffic areas clear. The contractor shall be fully responsible for ensuring their work area is free from accumulations of all waste materials, rubbish, debris, broken concrete, and other scrap resulting from the performance of the work.

- Inspect ladders, stairs, handrails, fences, and barricades.

- Inspection of scaffolding and platforms.

- Hand tools will be checked for burrs, dull points, heads properly fitted on handles and generally safe working order.

- Hoists hoisting equipment, cranes and derricks will be inspected by a competent person daily, monthly, and annually. Team member will not ride rigging or loads.

- Shoring for excavations, trenches, tunnels, and adjacent buildings will be inspected by a competent person for proper shoring and/or slope. All excavations will meet the requirements of OSHA 29CFR 1926.652 Subpart P.

- Electrical equipment will be checked for condition of insulation on conductors and guarding of live circuits. Ground fault circuit interrupters will be inspected for proper operability.

- Machines will be checked for guarding of gears belts, pulleys, shafting, and method of lubrication.

- Welding and burning operations require Hot Work Permits. Welders and helpers wear proper personal protective equipment and that welding machines are properly maintained. Check storage, grounding, and transportation of acetylene and oxygen tanks. Provide welding shield when other personnel are working in the area.

- Floors will be checked for proper protection of open-sided shafts, floor holes and openings and perimeter protection.

- Flammable and combustible materials will be inspected in the work areas for proper placement or storage. Burning, welding, or other fire-generating work shall be performed only after inspections are made to assure that no fire hazard is present.

- Properly fitted earplugs and/or muffs must be worn when a team member is exposed to noise levels greater than 85-dBA time weighted average (TWA). See Hearing Conservation Section 35.

- Vehicle equipment will be checked for condition and state of maintenance. Seat belts are required and must be used by each passenger and/or operator.
- Assure that personal protective equipment and clothing is used as required. Check for proper lighting at all points. See that nails are removed in old forms and lumber and other physical hazards are controlled.

- Check for proper ventilation and dust control.

6.6 Activity Planning

Many safety and health issues can be avoided through proper planning. Accordingly, contractor construction operations shall be planned to include safety and health requirements. Major and daily activity plans or similar will be completed and turned into the site safety manager. Contractors shall also consider potential safety and health impacts on personnel of other contractors and the means and methods to mitigate such impacts.

Activity Planning is, as the name implies, a **planning tool**. Planning the work includes hazard identification, elimination, and control. It also identifies the resources needed – (equipment, tooling, materials, engineering controls, training, PPE, etc.) to safely and productively accomplish the task. The goal is to involve every team member in planning each work activity. Thorough activity planning covers the scope of work and assesses the specific needs for safety, people, materials, and equipment. Activity planning **creates an environment that improves both product quality and productivity.**

Review the completed plan with the crew (on location if possible), monitor the progress of the work, coach team members for success as required, and at the end review the work with the crew for improvements.

- Major activity plans/job hazard analysis/work packages

Major activity plans are typically required for activities that take more than one day, require more than typical crew size involve more than minimal interaction or coordination between crews or with outsiders, present high potential risk for injury, damage or spill, the cost of failure is high, the work is complicated, difficult to do or is unusual to perform.

- Daily activity plans/task hazard analysis

Daily plans are used as daily a supplement to Major plans or are done when they will be sufficient for supervisor and crew to “get their arms around the work”. Daily plans are used to plan the portion of the work that will be done by a crew in a day or less, the task(s) are relatively straightforward, the hazards are relatively predictable and hazard control is routine. When in doubt, remember it is not the form that is used or number of pages that are filled out that is important, it is the adequacy of the plan.

6.7 Audits

In addition to site safety inspections/audits, periodic safety inspections/audits (Corporate X-Rays) shall be conducted.

7.0 GENERAL SAFETY AND HEALTH GUIDELINES

The following guidelines have been developed to assist contractors in reducing jobsite hazards, and minimizing accidents, injuries and property damage. These guidelines are not intended to revise or limit compliance with the Occupational Safety and Health Act or any other ordinance, law or regulation promulgated by federal, state, or local agencies. If any of the following safety requirements conflicts with or is in disagreement with any law or regulation of any government agency or any other contract document, the requirement offering the greatest protection to team members will be adhered to.

7.1 Asbestos Abatement

Asbestos abatement work shall only be performed by licensed asbestos abatement contractors employing trained and certified team members. Asbestos abatement shall be done in strict compliance with the requirements of New York State Code Rule 56 and all other federal, state, and local laws and requirements.

Prior to beginning asbestos abatement, the contractor shall submit a written Asbestos Abatement Plan to the Construction Manager. This Plan shall address, but not be limited to, the following items:

- Description of the work area;
- Description and quantities of material to be removed;
- Copies of all required notifications;
- Schedule for turning off and sealing any existing ventilation system(s);
- Hygiene procedures for personnel;
- Signage, labeling and packaging procedures;
- Personal protective equipment and clothing to be used by team members;
- Respiratory protection program, including training, medical, and fit test documentation;
- Description and specifications of the local exhaust ventilation system(s) including a discussion of the testing procedures used to ensure proper operation of the equipment;
- Team member work practices, including emergency procedures;
- Procedures to be used to abate asbestos;
- Product information and Material Safety Data Sheets (MSDSs) for any wetting and/or encapsulating agents to be used;
- Air monitoring plan including the name of the analytical laboratory;
- Name of the transporter, method of transport and copies of any required permits;
- Name of the disposal facility and a copy of the facility permit;
- The name of the individual designated as the supervisor; and
- Copies of current training certificates for supervisors and workers.

7.2 Blasting

1. Prior to any blasting or use of explosives on site, a written procedure shall be developed and submitted to the Contractor Manager for review. The procedure must be specific to the scheduled blasting operation and shall comply with OSHA 29CFR, Subpart U, 1926.900 all inclusive and should at minimum include the following:

   - Identification of the person designated as the "Competent Person" and verification of that person's qualifications.
   - Identification of the precise blasting locations.
   - A plan for securing the area that includes locations, methods, and types of security equipment and identifying all locations that will require warning/danger signs/notification.
   - A fire prevention, protection, and response plan.
   - A procedure for accounting for all explosives at all times including an inventory and use record maintained current.
   - The required procedures for use, detonation, and misfire of the specific type(s) of explosives to be used in the scheduled operations.
   - The requirements for transportation and storage of explosives.

2. The Contractor Manager's UTILITY SAFETY CHECKLIST MUST BE COMPLETED to assure that all known underground adjacent and overhead utilities have been located and verified by the responsible parties.

3. The person designated as the "Competent Person" shall be onsite and at hand to supervise all blasting operations and assure compliance with applicable requirements.

7.3 Concrete and Masonry Construction

General requirements for concrete and masonry construction are provided below. Refer to 29 CFR 1926 Subpart Q, Concrete and Masonry Construction for additional requirements.

General

All protruding reinforcing steel, onto and into which team members could fall, shall be guarded to eliminate the hazard of impalement.

Team members shall not be permitted to work under concrete buckets while buckets are being elevated or lowered into position.

Concrete buggy handles shall not extend beyond the wheels on either side of the buggy.

Concrete buckets equipped with hydraulic or pneumatic gates shall have positive safety latches or similar safety devices installed to prevent premature or accidental dumping.

Rigging of concrete buckets shall be done by a qualified rigger. Rigging shall be inspected by a qualified rigger prior to each shift and as necessary to ensure that it is safe. Tag lines shall be used to control the concrete bucket.

Masonry saws shall be guarded with a semicircular enclosure over the blade.

If equipment needs to be worked on, it shall be locked and tagged out. See the Zero Energy Safety Bulletin.

Material Safety Data Sheets (MSDSs) for products to be used on site shall be provided to the Construction Manager prior to commencement of construction activities.

Personnel Protective Equipment

To prevent skin contact, team members working with fresh concrete shall wear appropriate gloves and rubber boots. Face shields are required if there is any risk of splashing.

Team members working in areas where they may be exposed to blowing dust (concrete, mortar, and cementious fireproofing) shall wear safety goggles and appropriate respiratory protection. Personnel required to use respirators, including filtering face pieces, shall be trained in there use, maintenance, and limitations. A copy of the contractor's respiratory protection program, including training, medical, and fit test documentation shall be submitted to the Construction Manager.

Finishers shall wear waterproof kneepads while hand finishing concrete.

Formwork

Each team member on the face of formwork or reinforcing steel shall be protected from falling 6 feet or more to lower levels by personal fall arrest systems.

Formwork shall be designed, fabricated, erected, supported, braced and maintained so that it will be capable of supporting without failure all vertical and lateral loads that may reasonably be anticipated to be applied to the formwork.

Drawings or plans, including all revisions, for the jack layout, formwork (including shoring equipment), working decks, and scaffolds, shall be available at the jobsite.

Erected shoring equipment shall be inspected by a competent person immediately prior to, during, and immediately after concrete placement.

The design of the shoring shall be prepared by a qualified designer and the erected shoring shall be inspected by an engineer qualified in structural design.

All vertical slip forms shall be provided with scaffolds or work platforms where team members are required to work or pass.

Reinforcing steel for walls, piers, columns, and similar vertical structures shall be adequately supported to prevent overturning and collapse.

Uncoiled wire mesh shall be adequately secured to prevent recoiling.

Forms and shores (except those used for slabs on grade and slip forms) shall not be removed until the contractor determines that the concrete has gained sufficient strength to support its weight and superimposed loads.

Precast Concrete

Each team member engaged in the erection of precast concrete members (including, but not limited to the erection of wall panels, columns, beams, and floor and roof "tees") and related operations such as grouting of precast concrete members, who is 6 feet or more above lower levels shall be protected from falling by guardrail systems or personal fall arrest systems. The use of “non-conventional” fall protection requires the prior approval of the Construction Manager.

Precast concrete wall units, structural framing, and tilt-up wall panels shall be adequately supported to prevent overturning and to prevent collapse until permanent connections are completed.

No team member shall be permitted under precast concrete members being lifted or tilted into position except those team members required for the erection of those members.

Rigging of precast concrete members shall be done by a qualified rigger. Rigging shall be inspected by a qualified rigger prior to each shift and as necessary to ensure that it is safe.

Masonry Construction

A limited access zone shall be established prior to the start of construction whenever a masonry wall is being constructed. The limited access zone shall be equal to the height of the wall to be constructed plus 4 feet, and be established on the side of the wall that will be unscaffolded and run the entire length of the wall. Entry into the limited access zone shall be restricted to team members actively engaged in constructing the wall The limited access zone shall be kept in place until the wall is adequately supported and braced to prevent overturning and collapse. The bracing must remain in place until permanent supporting elements of the structure are in place.

Silica

Identifying Silica Hazards
Crystalline silica is a natural constituent of the earth's crust and is a basic component of sand, concrete, brick, asphalt, granite, some blasting grit, and wall spackling materials. People may be exposed to crystalline silica hazards when working in or near activities like:

- Abrasive blasting
- Jack hammering
- Concrete crushing
- Hoe ramming
- Rock drilling
- Mixing of concrete or grout
- Concrete drilling
- Sawing concrete, concrete blocks, or bricks
- Chipping or scarifying concrete
- Rock crushing
- Moving or dumping piles of concrete, rock, or sand
- Housekeeping activities (shoveling, sweeping, vacuuming, etc.)
- If you have to do demolition involving any of these materials listed above, using coatings containing crystalline silica or removing coatings containing crystalline silica.

Before any activity begins, project personnel must assess the work and identify possible exposures. Remember that concrete contains Portland Cement with silica and rock that contains silica. Quartz is the most common form of crystalline silica and is one of the most common minerals in the earth's crust. Also, whenever available consult the MSDS(s) for the materials with which you are dealing. Even materials containing small amounts of crystalline silica may be hazardous if they are used in ways that produce high dust concentrations.

Planning For Silica Exposure
In order to manage the silica hazard, project personnel must plan for potential team member health and environmental impacts **before** the work begins.
Each activity with the potential for silica exposure must be addressed in a job specific activity plan (see Appendix B) that focuses on eliminating or minimizing silica exposure through substitution, engineering controls, work practices and methods, air monitoring, effective hygiene practices, PPE, training, environmental controls, and waste disposal. Section 4.3 sets forth the requirements of job specific silica plan.
Establishing a Job Specific Silica Protection Plan/Training
Documented training will include:
• Information about the potential health effects and symptoms of exposure to respirable crystalline silica. See Appendix C.
• Material safety data sheets for silica, quartz, and applicable products containing silica.
• Purpose and set up of regulated areas marking the boundaries of work areas containing silica dust.

• Discussion of the importance of substitution, engineering controls, work practices, good housekeeping, and personal hygiene in reducing crystalline silica exposure.
• Use and care of appropriate PPE including respirators.
• Expected exposures, controls in place to minimize exposure, and how to set up, use, maintain, etc. the controls to be used.
• Hygiene.
• Availability of air monitoring and medical surveillance results.

Substitution, Engineering Controls, and Work Practices

In order to control the hazards of crystalline silica, you must first look at alternate methods of doing the work, substitution of less hazardous materials, engineering controls, and work practice controls to reduce the exposure to crystalline silica to below the OSHA permissible exposure limit (PEL). The job specific plan will contain information on what methods, substitution, engineering and work controls were considered, why or why not they are feasible, and which controls the job is going to use. 29 CFR 1926.55 requires us to use **feasible** engineering or work practice controls to reduce team members' exposure to below the PEL.
Some possible substitution or engineering controls:
• Substituting non-silica containing materials for use while abrasive blasting
• Alternative methods (i.e. ordering grout from a concrete plant rather than mixing it onsite)
• Local exhaust (follow requirements of 1926.57)
• General ventilation (follow requirements of 1926.57)
• Vacuum methods with HEPA filters (vacuum shrouded tools like grinders, needle guns or saws)
• Distance (using a long handled grinder to allow standing up while grinding a floor or using a remote controlled unit like -a scabbler, etc.)
• Dust control products for use on dusty roads or piles of material
• Containment
• Equipment with pressurized cabs and filter systems
• Use of water hoses, spray booms, etc.
• Use of tools with dust control systems (water on saws or drill bits, etc.)
• Diamond rope saw to cut concrete
• "Chinese dynamite" e.g. slow expanding materials designed to break up concrete
Some possible work practice (administrative) controls:
• Working during hours other crews are not
• Restricting access to the work areas
• Good housekeeping practices (not allowing dust to build up, etc.)
• Specific standard operating procedures that minimizes dust produced by a task
• Green cutting with a hydroblaster before concrete sets up
These are only some suggestions; there are other controls we can use.
Some combination of these or other controls will allow us to reduce the exposure to below the PEL.
The object is to keep the dust out of the air.
Be creative and share what you learn. Remember that you must use feasible controls even if they do not completely reduce the exposure to below the PEL

- Engineering and administrative controls will be explored and implemented prior to the concrete placing operation or before any demolition operations are started.

- Initial monitoring will be performed during the drilling and saw cutting operation, and during the demolition.
- In the event that a hazard can not be eliminated, other plans will be developed to protect the team members the hazard may be controlled by administrative or engineering controls such as but not limited to
    - Wet methods
    - Direct ventilation by copus type blowers or fans

The limited access zone shall be restricted to entry by team members actively engaged in constructing the wall. No other team members shall be permitted to enter the zone.

7.4Confined Space Entry

To protect team member safety and health, all confined space entry activities on the project, whether the confined space meets the definition of permit-required or not, will require the use of a fully completed entry permit.

The contractor shall submit their written Confined Space Entry Program and a Job Hazard Analysis (JHA) that outlines hazards and control procedures for each confined space entry to the Safety Manager.

Contractor's written Confined Space Entry Programs shall comply with the following requirements and 29 CFR 1910.146.

Any individual who violates the requirements of this Confined Space Entry Program will be permanently discharged from this site.

General – Refer to the Confined Space Safety Bulletin in Appendix A for additional details.

Ten Basic Rules Applying to Confined Space Entry Work:

1. **Competent Person** - A competent person shall be assigned to each confined space activity and is capable of anticipating, recognizing, and evaluating employee exposure to hazardous substances or conditions and understands the appropriate emergency procedures. A competent person also has authority to cease operations that pose a threat to workers.

2. **Emergency Planning** – Prior to entry, plans **must** be established which provide for employee rescue/retrieval from a confined space and the quickest possible medical treatment. Whenever possible, retrieval equipment should be used for rescue to eliminate the need to enter the space during rescue. Rescue by entry is the last resort and requires the following:

    a. A minimum of two SCBA trained individuals available to respond in an emergency within 4 minutes.

b. Refer to the Confined Space Rescue Bulletin

3. **Testing of Atmosphere** - Testing must be accomplished for existing or potential atmospheric hazards. OSHA permissible exposure levels (PEL) shall be followed (see limits listed on permits in Appendices 1 and 2). Continuous or frequent monitoring shall be conducted and results documented. Monitoring shall continue at some frequency and be stopped only if the competent person in charge determines it safe to stop. Permits must identify frequency of testing. As a minimum, no less than one (1) air test shall be conducted each day during which any Destiny USA employee is working in the confined space. Oxygen must always be checked first because low oxygen levels affect the combustible gas indicator (LEL meter).

   a. Oxygen deficient or enriched atmosphere (Must be between 19.5 and 23.0%, (19.5 and 22.0% for marine work))
   b. Flammable or explosive atmosphere (LEL)
   c. Toxic atmosphere (H2S, SO_2, CLO, CO, etc.)
   d. Other special conditions

Note: For every 0.1% that the oxygen reading is below the normal reading of 20.9%, something has replaced 1000 PPM of the oxygen. For oxygen readings of 20.5 or below you should investigate what is replacing the oxygen.

4. **Lock Out/Tag Out** - All electrical and/or mechanical components associated with the confined space must be positively secured. (Pipes blind flanged, breakers padlocked, valves chain locked, etc.)

   Note: Since OSHA allows the use of a Tag Out system for general industry, some companies, especially electrical generating facilities, have selected the Tag Out for their program. So long as we are assured positive controls are in place, and a coordinated program with the host is established, "Tag Out" method can be used.

5. **Confined Area Entry Permit** - Destiny USA's Confined Space Entry Permit must be completed and posted at the access entry of the confined space. The permit must identify the time duration it is good for. In most cases, the permit will only be good for one shift. Some Non-Permit spaces may only require an initial (one-time) permit that is checked off, good for the duration of work.

   a. For "permit required" confined spaces in general industry, OSHA 1910 Standards must be followed, and a sign reading "Danger, Permit Required Confined Space - Do Not Enter" needs to be posted at each access point. Unless the host has additional requirements, inclusion of all Ten Basic Rules listed in this section will adequately satisfy OSHA'S Requirement for Confined Space Work in General Industry.

b. "Permit required" confined spaces includes the need to log workers in and out of a confined space. Use the log provided on the back of the permit form. Log is optional for non-permit spaces unless need is determined by client or competent person.

6. **Hole/Stand-by Watch** - A minimum of one person will be assigned sole responsibility for monitoring team members in a permit required confined space to support activities and initiate any emergency actions necessary. This person must be trained and have it documented. Training must include as a minimum those duties listed under Section V of the Confined Space Safety Bulletin. New construction like excavations **may not** require hole/stand-by watch.

7. **Ventilation** - Continuous air ventilation/flow must be adequate. Mechanical ventilation <u>must</u> be used any time welding, burning, or cutting operations are being performed in a confined space. Minimize bends, kinks, or turns in hoses as this greatly reduces airflow.

8. **Tools/Equipment/PPE** - Provide for appropriate Personal Protection Equipment for the activity. Explosion proof equipment may be required (GFCI, 12 Volt lights, etc.).

9. **Training** – Only trained and authorized personnel shall enter a confined space, supervise confined space entry, or conduct confined space rescue. Copies of training documentation shall be provided to the Construction Manager upon request.

<u>Confined Space Training</u>
Complete on those prior to entering a confined space (As needed).

<u>Hole Watch Training</u>
Completed on those who are going work as a hole watch (As needed).

<u>Confined Space Rescue Team Training</u>
Complete 24hr. Confined Space Rescue Training. -One time training
Complete refresher competency rescue training. Training must contain a mock rescue. -Annually
Complete medical questionnaire for specific SCBA approval from our medical director. -Annually
Current Pulmonary Function Test (PFT). – Every three years
Current FIT test specific for SCBA - Annually
Advanced First Aid. -Annually

Conduct training with all team members involved in the confined space work activity prior to starting work and as conditions change. A written activity plan must be developed and reviewed with team members and all aspects/hazards discussed. Team members must sign off on the activity plan to document training was conducted. Team members must be proficient in duties expected of them including how to do non-entry rescue if required. Any changes in the original confined space activity plan must be reviewed with team members.

10. **Recordkeeping** - Records must be maintained during the activity and filed following the work at the job site. Records should include at minimum:
    a. Activity plan
    b. Permits
    c. Training conducted
    d. Air testing results
    e. Emergency Action Plan
    f. Special tests conducted
    g. Employee signatures of training received
    h. Log of team members into and out of confined space for "Permit Required" Spaces

NOTE: All confined space entry activities on the project, whether the confined space meets the definition of permit-required or not, will require the use of a fully completed entry permit

All other provisions of the Occupational Safety and Health Act, such as fall protection, ladders, hand and power tool safety, scaffolding, etc. shall apply during confined space entry.

Rescue and Emergency Services

Rescue arrangements shall be in place prior to entry into a confined space. The name of the rescue agency and the means to contact them shall be identified on the permit.

- To facilitate non-entry rescue, retrieval systems or methods shall be used whenever an authorized entrant enters a permit space, unless the retrieval equipment would increase the overall risk of entry or would not contribute to the rescue of the entrant. All personnel expected to provide non-entry rescue shall be trained.
- Any violation of this policy will not be tolerated and the person (s) will be sent home for 3 days for first violation and terminated if there is a second.

7.5 Spray-Applied Fireproofing Operations

General

Spray-applied fireproofing operations may present many serious physical and health hazards to personnel conducting the activities and other personnel working in the area. Fireproofing operations are not covered specifically in any one OSHA regulation, but numerous OSHA standards apply to fireproofing operations. The following are pertinent OSHA requirements that may apply to fireproofing operations. Contractors are required to address all safety hazards associated with their activities and to ensure that all safety precautions have been taken.

Contractors shall provide copies of Material Safety Data Sheets (MSDSs) to the Construction Manager for all products used during fireproofing operations. This includes, but is not limited to fireproofing material, binders, primers, and lockdown agents.
Fireproofing contractors shall notify other contractors in the work area prior to commencing fireproofing operations so that those affected contractors may take the necessary steps to protect any potentially exposed team members and to allow those affected team members to review the MSDSs for the products to be used.

Fireproofing operations shall not commence until a written notice to proceed has been received from the Construction Manager.

The contractor shall review the location of staging and material storage areas with the Construction Manager prior to mobilizing equipment and materials to the site. For cementious fireproofing, the contractor shall also comply with all applicable environmental regulations governing the disposal of waste water/material generated during line charging and flush-out/cleanup activities.

Personal Protective Equipment

Personnel involved in fireproofing operations shall wear all required personal protective equipment (PPE) as recommended by the manufacturer or the MSDS. Additional PPE may include, but is not limited to the following;

- Overalls;
- Face shield or safety goggles;
- Gloves; and
- Respiratory protection.

Personnel required to use respirators, including filtering face pieces, shall be trained in there use, maintenance, and limitations. A copy of the contractor's written respiratory protection program, including training, medical, and fit test documentation shall be submitted to the Safety Manager.

Equipment
Internal combustion engine-powered equipment shall not be setup inside the building structure unless it is exhausted outside. Temporary structures used to house fuel powered fireproofing equipment shall be constructed to meet any applicable code requirements for such structures.

A fire extinguisher, rated not less than 10 ABC, shall be provided within 50 feet of fuel-powered equipment.

Electrical shock hazards shall be minimized by use of ground fault circuit interrupters (GFCIs) for all 110-volt metering devices, water pumps and other auxiliary devices.

Prior to conducting maintenance or repairs on fireproofing equipment, the equipment shall be locked-out or disconnected from the power source and any hose pressure relieved as required by 29 CFR 1910.147.

All pumping equipment shall be equipped with required pressure relief and overpressure devices. Pressure relief and overpressure devices shall be inspected and maintained as per the manufacturer's recommendations.

All material hoses used for the placement of material shall be of the proper type and able to withstand the expected working pressures of the equipment in use. All hose connections shall be made with the required couplings.

Hoses and couplings shall be inspected on a daily basis and shall be free of cuts, abrasions, or any other damage that may affect the safety of the equipment.

All guards and safety devices shall be in place and operational. Equipment with missing or defective safety guards or devices shall be removed from service until repairs have been made to restore those devices to proper working order.

Fall Protection and Scaffolding

Each team member engaged in the application of fireproofing, who is 6 feet or more above lower levels shall be protected from falling by guardrail systems or personal fall arrest systems. Team members required to lean over guardrails in order to spray the outside surfaces of perimeter steel shall also wear a personal fall arrest system or fall restraint system meeting the requirements of 29 CFR 1926 Subpart M, Fall Protection.

Work platforms constructed around mixers and other equipment shall be secure, stable, fully decked, be provided with an anti-slip surface, and a means of access, if necessary. Platforms shall be maintained and cleaned as often as necessary to prevent accumulations of fireproofing material.

Scaffolding used during the application of fireproofing shall meet the requirements of 29 CFR 1926 Subpart L, Scaffolds.

Mobile scaffolds used during the application of fireproofing shall meet the requirements of 29 CFR 1926.452(w). Mobile scaffolds in use within 10 feet of a guardrail system or an unprotected side or edge, shall be equipped with guardrails regardless of the scaffold platform height. Mobile scaffolds shall not be used within 3 feet from an edge of an elevated walking/working surface unless precautions are in place to prevent the scaffold's castors from rolling off the elevated surface.

7.6 Hot Work Program

Contractors shall obtain a Hot Work Permit from the Safety Manager before starting any welding (electric, gas, arc), burning, cutting, soldering, brazing or other flame/spark-producing operations. The requirements established below must be met before a Hot Work Permit will be issued:

General

The contractor shall provide an adequate fire extinguisher and other fire protection equipment that may be necessary, i.e., fire blankets.

A trained fire watch must be provided by the contractor for each hot work operation when combustibles cannot be completely removed from the area or you are within 40 feet of the existing mall.

The area must be continuously maintained in safe condition throughout the time period that work is performed.

When air monitoring is required, the Lower Explosive Limit must be non-detectable prior to any type of burning, welding, or hot work being conducted by the contractor. (Air monitoring will be required around or near any areas that may pose a potential fire or explosion threat from flammable or combustible vapors and for any work in a confined space. The contractor is responsible for providing and operating any required air-monitoring equipment).

If explosive dust is present, then the contractor must wet down all explosive dust from visible suspension and sweep the debris away from the hot work area.

All workers involved in welding and burning operations shall wear proper eye, face and body protection and possibly respiratory protection, suitable for the type of operation being performed.

7.7 Arc Welding and Cutting

Welding current return circuits or grounds must carry their current without hot or sparking contacts and without passage of current through equipment or structures. Specifically, welding current must not be allowed to pass through any of the following materials:

- Acetylene, fuel gas, oxygen or other compressed gas cylinders.
- Tanks or containers used for gasoline, oil or other flammable or combustible material.
- Pipes carrying compressed air, steam, gases or flammable or combustible liquids.

- Conduits carrying electrical conductors.
- Chains, wire ropes, metal hand railings or ladders, machines, shafts, bearings, or weighing scales.

Whenever practical, all arc welding and cutting operations shall be shielded by non-combustible or flameproof screens.

The ground for the welding circuit shall be mechanically strong and electrically adequate for the service required and should be attached directly to the work piece.

When possible, electrode and ground cables shall be supported to prevent obstructions interfering with the safe passage of workers.

Cables with worn insulation shall not be used.

Gas Welding, Cutting and Soldering

Suitable cylinder cart, chain or other secure non-flammable fastening shall be used to keep cylinders from being knocked over while in use.

Cylinders of oxygen shall not be stored next to cylinder of acetylene or other fuel gas. They shall be separated by 20 feet or by a non-combustible barrier, with a ½-hour fire rating. Oxygen cylinders, cylinder valves, couplings, regulators, hose, and apparatus shall be kept free of and away from oil and/or grease. Oil or grease in the presence of oxygen under pressure may ignite violently. Oxygen accessories and fittings shall be stored in plastic or on a clean shelf designated for oxygen accessories only.
Empty cylinders shall have their valves closed. Valve protection caps shall always be in place except where cylinders are in use or connected for use.

When moving cylinders by a crane or derrick, a cradle, boat or suitable platform shall be used. Slings, hooks, or electric magnets shall not be used. Valve protection caps shall always be in place.

Compressed gas cylinders, empty or full, shall be secured in an upright position at all times except, if necessary, for short periods of time while cylinders are actually being moved. Empty cylinders should be marked EMPTY or MT for identification.

Regulators and hoses shall be frequently inspected for leaks, worn places, and loose connections. Regulators shall also be checked for operable gauges.

Approved flash arrestors shall be provided in both oxygen and acetylene hoses

Oxygen equipment and accessories shall be stored away from grease and oils.

7.8Lock Out / Tag Out

The requirements and procedures established in the attached Lockout/Tagout program shall be adhered to by all contractors and/or sub-contractors. Refer to the Zero Energy State Safety Bulletin # 16 for more details.

General

- All tags will be dated, signed, identify contractor and/or sub-contractor and attached securely.
- No device shall be operated with tag or lock attached regardless of circumstances.
- No person shall remove another's tag or lock unless the owner is off the site; then the Construction Manager with the safety manager may remove the tag or authorize its removal after ensuring the team member is off site and equipment is checked out to insure a safe working condition.
- It is the contractor Superintendent's responsibility to ensure that no work is performed beyond the protection of locks and tags installed.
- Locks and tags are not a substitute for the contractor's and/or sub-contractor's responsibility for breaking flanges, placing blanks, draining and otherwise decontaminating equipment or systems.
- Lines containing acid, volatile liquids, high-pressure steam, compressed air, and all electrical services require LOCK as well as tag.
- Locks required beyond one shift must be replaced by the oncoming shift or by the contractor's Superintendent if no work is scheduled and the system remains shut down.
- PPE used while energizing, de-energizing, or verifying shall meet the guidelines set forth in NFPA 70E.
- Any equipment or circuits exceeding 600 volts shall be locked and tagged by qualified electrician trained in high voltage work.

LOCKS

- Only individually keyed locks will be used; the key will remain in possession of the person placing the locks.

ACCOUNTABILITY

- For any violation of any of the Lock out/Tag out policy will be suspended 24 work hours from the project for first offense or if their company policy is more stringent it will be followed and the second is termination from the project.

- Any person who operates a valve switch or device to which "Danger" tags are attached or remove a tag without authorization will be subject to immediate removal from the site.

7.9 Traffic Safety

- Any work done in public roadways will require a site specific traffic plan and submitted to safety manager

- Traffic vests are required

- Work will be done behind solid barricades or blocker/ attenuator vehicles.

- Anyone who is doing flagging must be trained and certified. Stop and Slow paddles will be used.

7.10 Work Area Barricades

- The work area perimeter will be barricaded with fence and sometimes jersey barriers.
- For requirements for barricading exclusion zones and contamination reduction zones, refer to Section 10.0 Soil Intrusive Activities.
- If red or yellow tape is used to barricade areas, tags must be used to identify who, what, when, and why.
- Yellow tape can be crossed after reading the tag to understand the hazard and determining that it is safe to cross.
- Red tape cannot be crossed without permission of the person(s) listed on the tag. <u>Crossing red tape will mean immediate removal from the site.</u>
- <u>All barricade tape will be removed when the operation is finished or danger is removed.</u>
- Refer to the Work Area Barricade Protection safety bulletin in Appendix A.

8.0 CRANES AND RIGGING

This section covers all cranes operating on the site.

- All cranes will have a current annual and monthly crane inspection certificate in the operator cab. A daily crane inspection checklist will be filled out by a competent person authorized and licensed to operate each crane.

- All cranes will be maintained in accordance with manufacturer's specifications. Each contractor shall maintain an up-to-date maintenance record at their site office for each crane on site.

- Each contractor shall designate in writing the specific personnel authorized and licensed to operate each crane. Operators must be NY licensed.

- Crane swing radius protection shall be properly installed and maintained by the contractor.
  - If any employee crosses the swing radius barricade while the crane is in motion walking or swinging, they will be sent home for 24 work hours for the first offense and terminated for second.

- The crane and all rigging equipment shall be inspected by a competent individual(s) at the start of each shift. Any damaged equipment shall be removed from service and repaired or destroyed. All tires shall be property inflated. Outriggers shall be used as needed.

- All hooks and rigging cables shall be in good condition; be of an appropriate capacity for the rigging load; and have all required safety devices in place and operational.

- Tag lines shall be used to control and secure loads.

- OSHA regulations shall be followed when operating near energized electric lines.

- It should be determined whether any crane on the project will require aircraft warning lights. Operators certification is required when operating cranes using booms of 100' in length or greater. A copy of the certification must be provided to the Construction Manager.

- A review of weights and determination or radius shall be established to assure all lifts are within the limits of the rated load chart specific to the equipment being used. All lifts at 75% of chart capacity or greater will require a pre-lift checklist to be completed and provided to the construction manager.

All critical lifts require thorough planning to ensure no mistakes are made. For each critical lift, a pre-lift checklist will be required. Refer to the definition below. A copy of the pre-lift checklist is available in the Crane Safety Bulletin in Appendix A.

- **<u>Critical lift definition</u>**:
  A non-routine crane lift, requiring detail planning and additional or unusual safety precautions. Critical lifts include lifts made when the load weight is 75% of the rated load chart capacity of the crane; Lifts which require the load to be lifted, swung or placed out of the operators view; or lifts made with more than one crane; lifts involving non-routine or technically difficult rigging arrangement; hoisting personnel

with a crane or derrick; or any lift which the lift or crane operator believes should be considered critical.

9.0 DRILLING OPERATIONS

- Prior to the start of operations, the Construction Manager's UTILITY SAFETY CHECKLIST must be completed to assure that all known underground, adjacent, and overhead utilities have been located and verified by the responsible parties.

- The drilling area shall be inspected for hazards before starting the drilling operation.

- Drill crews and other team members shall be directed to stay clear of augers or drills streams that are in motion.

- When drill helpers assist the drill operator during installation or operation of a drilling rig, the helpers shall be in sight of or in communication with their operator at all times.

- While in operation, drilling rigs shall be attended at all times.

- Drill steel, spare parts, and tools shall be safely stored in racks or receptacles on the drill rigs when not in use.

- Drilling equipment shall be inspected at the start of each shift by the person designated as the Competent Person and any defects noted shall be corrected before the equipment is used.

- Before each drilling cycle is started, warnings shall be given to workers in the area around the drilling operation.

- The person designated as the Competent Person shall be on site and plan to supervise the operation.

10.0 SOIL INTRUSIVE ACTIVITIES

This section covers the excavation and handling of contaminated or potentially contaminated soil, water, or equipment. Activities covered in this section will be conducted to meet the requirements of 29 CFR 1926.65 Hazardous Waste Operations and Emergency Response.

Site Description and Characterization

Intrusive work is necessary to support the construction of the Destiny USA 800K expansion to the Carousel Center. Intrusive work locations are generally classified into three areas:

- Destiny Work Area (near Carousel Center),
- Solar Street Property, and
- Bear Street Staging Area.

Intrusive work activities in the Destiny Work Area will include excavations, grading, pile installation, hauling contaminated materials, relocation of subsurface utilities, and any other activities conducted inside a designated Exclusion Zone. This work area is adjacent to the Carousel Center where the public is potentially in close proximity to site activities. Therefore, the control of dusts, odors, and noise is essential to ensure public safety and minimize complaints and public concerns. One of the wastes anticipated at this location is commonly referred to as “Allied waste” and is a whitish, alkaline material. Historically, this material has not been especially odorous or dusty. The Destiny Work Area may also include low levels of heavy metals, PCBs, and petroleum contamination.

The **Solar Street Property** is located in an area formerly occupied by petroleum storage tanks. Intrusive work tasks primarily include surface grading and preparation. Although this property has been undergoing remediation, contractors should anticipate residual petroleum contamination and be prepared to implement dust and odor control measures.

The **Bear Street Staging Area** is located near Solar St. and Bear St. on the north side of Solar St. Contractors will stage contaminated or potentially contaminated materials in this area that are hauled from other intrusive work areas. Dust and odor control will be a priority while loading, unloading, and handling contaminated materials in this area.

Key Definitions

- *Remedation Work Zone (RWZ)* - The work area(s) where intrusive tasks or work activities will be conducted, any areas where contamination may be present and contact workers, and any areas subject to dust, vapor, and odors created as a result of intrusive tasks. RWZs will include areas designated as Exclusion Zones, Contamination Reduction Zones, and any other work areas where access is limited to personnel with Hazardous Waste Operations training.

- *Contact Visitor* - A visitor, who may have contact with potential or known contamination within a RWZ, but is not a team member of a contractor or subcontractor.

- *Non-Contact Visitor* - A visitor who is not expected to come into contact with contamination and is restricted to designated areas including Non-Intrusive Work Zones. Examples would include delivery personnel, sales reps, etc.

- *Non-Intrusive Tasks* - Non-intrusive tasks are those that do NOT have the potential to jeopardize the health and safety of site workers, the public, or the environment with respect to site contaminants. Hazardous waste operations training per 29CFR1926.65 are NOT required. However, all other applicable health and safety regulations, site owner requirements, and HASP requirements must be followed.

- *Non-Intrusive Work Zone* - The work area(s) where non-intrusive tasks or work activities will be conducted. These may include activities like office work, surveying, non-intrusive construction work, and non-intrusive maintenance, etc.

- *Intrusive Tasks* - Intrusive activities are those that have the potential to cause health and safety concerns to site workers, the public, or the environment. Intrusive tasks typically have the potential to create exposures to site contaminants above HASP action levels, regulatory limits, or published guidelines or may result in direct contact with contaminated materials. These activities and any non-intrusive activities conducted within an Exclusion Zone require training per 29CFR1926.65.

Health and Safety Plan (HASP)

The contractor shall prepare a HASP for intrusive work activities. The HASP should be submitted to the Destiny USA Safety Manager within 10 business days of contract award. The contractor's HASP should meet the following criteria:

- Comply with 29CFR1926.65
- Be consistent with requirements in the Destiny USA Safety and Health Program. However, the contractor's HASP does not need to repeat the same information and may include relevant sections of the Destiny USA Safety and Health Program by reference.
- Include Job Safety Analysis (JSA) as required by the Destiny USA Safety and Health Program
- Be specific to the contractor's work methods and equipment.

Site Control

The elements of site control include restricting access to Exclusion Zones and Contamination Reduction Zones to persons who have the proper safety training and have received a site safety orientation that reviews the information in this HASP at a minimum. Contractors will maintain site security and control including:

- Limiting access to Exclusion and Contamination Reduction Zones to those authorized persons who have appropriate training, medical documentation, safety equipment, and site orientations.
- All personnel must review the contractor's HASP
- All site personnel entering Exclusion zones must complete an entry/exit log that shows the time the entered, time they left, company name, and reason for entering.

As part of Site Control, contractors must establish Exclusion Zones and Contamination Reduction Zones to prevent unauthorized persons from work areas where contaminated materials will be disturbed.

Exclusion Zone

The Exclusion Zone is the area where contaminated or potentially contaminated materials exist and will be disturbed by intrusive work activities such as excavating, grading, and pile driving. Personnel entering the Exclusion Zone must be wearing the proper personal protection and comply medical surveillance and training requirements outlined in this Safety & Health Program.

The visible delineation of exclusion zones is required to prevent unauthorized persons from entering. Physical markings of the perimeter of exclusion zones must be accomplished using fencing, wood barricades, rope, barricade tape, etc. Existing structures may also be utilized where appropriate. **Signs shall be posted identifying the Exclusion Zone boundary.**

Vehicles, tools, equipment, and personnel must be decontaminated prior to leaving the Exclusion Zone.

Contamination Reduction Zone

The Contamination Reduction Zone (CRZ) is the transition area between the Exclusion Zone and the Support Zone. Equipment and personnel decontamination is also conducted in the CRZ. The CRZ perimeter must be marked to prevent unauthorized persons from entering. Contractors are responsible for setting up the CRZ to provide sufficient distance from Exclusion Zone activities such that the public is not exposed to dust and volatile organic vapors (VOCs) above site action limits, and exposure to nuisance dusts and odors is minimized to the extent feasible. The perimeter of the CRZ must be secured with 6' chain link fence (or equivalent) unless the CRZ is located fully within a project work area that is already secured by a 6' chain link fence (or equivalent). In the latter case, the CRZ may use similar perimeter markings to those outlined for the Exclusion Zone. Signs shall be posted identifying the CRZ boundary.

Support Zone

The field offices and sanitary facilities are located within the **Support Zone**. Emergency telephone numbers will be posted in this area. Eyewash stations, first aid kits, and fire extinguishers will also be located in this area. General construction (Non-Intrusive work activities) may also be conducted in the Support Zone.

Training Requirements

Training documentation must be on site and available for inspection by Destiny USA representatives.

- NON-CONTACT VISITORS - No OSHA 24/40 Hour for Non-Contact Visitors, including delivery personnel, utility workers, vendor reps, inspectors, and anyone working solely in the Support Zone.

- CONTACT VISITORS & SUBCONTRACTORS - OSHA 24-hour training - Contact visitors, surveyors, masons, ironworkers (rebar), carpenters (forms), electricians (conduit), operators, etc. These are individuals who would have minimal contact with contaminated materials and would not enter areas requiring Level C PPE.

- REMEDIATION WORKERS - OSHA 40-hour training - Contact visitors and subcontractors who must enter Remediation Work Zones (RWZs) during intrusive activities and all Full Modified Level D and Level C work.

Medical Surveillance

Project personnel who perform intrusive work activities must participate in a Hazardous Waste Operations medical surveillance program in compliance with 29CFR1926.65. Medical exams must be completed within the last 12 months and must indicate that individuals are suitable for hazardous waste site work and respirator use. Medical surveillance documentation must be on site and available for inspection by Destiny USA representatives.

Personal Protective Equipment (PPE)

Contractors shall specify what type of PPE is required for each work task or area. This information must be clearly outlined in the Contractor's HASP and be communicated to all site personnel. PPE levels of protection are outlined below:

Level D PPE **- Safety glasses with side shields, hardhat, safety shoes, and hearing protection. Long pants and shirts with sleeves (no tank tops) must be worn on site. Work gloves must be worn when handling materials with sharp edges.**

Modified Level D PPE – Modified Level D PPE must be used when it is necessary to prevent contact with contaminated materials for purposes of worker safety and/or environmental protection.

Full Modified Level D PPE consists of Level D PPE plus coveralls, nitrile gloves (or equivalent), and boots or shoe covers. Full Modified Level D PPE is necessary when extensive contact with contaminated materials is anticipated, such as the manual-excavation of contaminated soils. Full Modified Level D PPE is also required when handling corrosive chemicals like caustic and acids.
Lightweight Modified Level D PPE consists of nitrile gloves (or equivalent) and boots or boot covers. Lightweight Modified level D is necessary when minimal contact with contaminated materials in anticipated and contamination control must be maintained. The contractor shall determine which are appropriate based onsite conditions and work methods.

- *Coveralls*: Uncoated Tyvek® when exposed to dirt / dusts, poly-coated Tyvek® when exposed to light or moderate amounts of over spray or contamination, and Saranex®-coated Tyvek if over spray exposure or contamination is heavy. The use of coated coveralls (poly-coat/Saranex) may also be referred to as Modified Level C PPE. Site safety manager will select based on site conditions.
- *Outer Gloves*: Nitrile Type or equivalent.
- *Inner Gloves*: Surgical Type (nitrile preferred)
- *Face Shield*: For decontamination activities with pressure washing. Must wear safety glasses with face shield. Chemical goggles are required with a face shield when there is a potential for splashes from corrosives.

Level C PPE – Level C PPE consists of Modified Level D PPE plus an air-purifying respirator. Half-face or full-face respirators with organic vapor/P100 combination cartridges should be used in accordance with air monitoring action levels.

Level B PPE - Level B PPE is not anticipated, but if required the following guidelines will apply. Modified Level D PPE plus self-contained breathing apparatus (SCBA) or supplied-air respirator. Positive pressure, full-facepiece SCBA or positive pressure, supplied-air respirator with escape SCBA are the only approved respirators for Immediately Dangerous to Life and Health (IDLH) or oxygen deficient atmospheres.

General Safety Rules

Workers must follow established safety practices for their respective tasks. The need to exercise caution in the performance of work is made more acute due to increased heat stress, restrictions in mobility, reduced peripheral vision, and obstructed communication caused by the use of personal protective equipment. To enhance site safety, the following general safety rules have been established:

- **No smoking on the work site.**
- Eating, drinking, chewing gum, chewing tobacco and application of cosmetics in work area are prohibited, except in specifically designated areas.
- Minimize contact with contaminated materials.
- Stay upwind of the containment source if possible.
- Do not expose skin to water, chemicals, or soil. If one becomes dirty or wet with contaminated fluids, clean up immediately using plenty of water.
- Hands must be washed before eating, drinking, and before using toilets.
- Plan work breaks to prevent heat and cold stress-related accidents or fatigue.
- No jewelry except medical alert ID's may be worn. Watches should be carried in a pocket. This requirement may be modified at the discretion of the SSHC.
- Maintain PPE. Check it daily to ensure that it is clean and in good working order.

Dust and Odor Control

The contractor shall implement one or more of the following dust control measures if dusty conditions or odors are observed and the Exclusion Zone perimeter. Only potable-grade water shall be used.

DUST

- Wetting excavation area, building surfaces and / or debris;
- Covering spoils piles with tarps;
- Spraying water on buckets when excavating and dumping contaminated soil or debris;
- Hauling materials in properly tarped or watertight container;
- Modifying work practices, such as reducing the size and / or number of demolition activities;
- Restricting vehicle speeds to 10 mph; and
- Applying water to haul roads.

ODORS

- Use water spray to suppress odors.
- If water spray is not effective, use a foam odor suppressant.
- Reduce the area of open excavations

Air Monitoring

The purpose of air monitoring is to support worker and public safety. **Work area** air monitoring will be used within the Exclusion Zone to investigate odors, evaluate air quality in excavations, and verify that workers are using appropriate PPE. The **Community Air Monitoring Program (CAMP)** will be conducted continuously to evaluate the effectiveness of dust control measures and monitor volatile organic compound (VOC) levels in case odors are observed at the CRZ perimeter, in the Support Zone, or in public areas.

Equipment

Contaminant	Meter/Equipment	Setup
Volatile Organic Compounds (VOCs)	Photoionization Detector (PID) with 10.6 eV lamp PID must have data logging capability and calculating running 15-minute time-weighted averages (TWAs). 15 minute TWAs must be data logged at least every 5 minutes.	**Work Area** – 1 "roving" PID used to periodically investigate work area VOCs and odors. It may also be used as a backup for any community PID that fails. **Community** – 2 PIDs located at each Exclusion Zone perimeter with 1 located upwind and 1 downwind for all intrusive work locations (DestiNY, Solar St, and Bear St.). PIDs may be moved during the day to maintain upwind and downwind locations.
Dust	Aerosol monitor capable of data logging, PM-10 size selection, and running 15 minute time-weighted averages (TWAs). 15 minute TWAs must be data logged at least every 5 minutes. Aerosol monitors may include MIE RAM, TSI DustTrak, or equivalent. DustTraks must be used with the weather enclosure.	**Work Area** – 1 aerosol monitor may be used to periodically monitor Exclusion Zone dust and may be used as a backup for any community aerosol monitor that fails. **Community** – 4 aerosol monitors with 1 located at "compass point" around the CRZ or Support Zone perimeter for all intrusive work locations (DestiNY, Solar St, and Bear St.)
Lead, PCBs, other heavy metals	Any IH pump properly calibrated	Work Area – Personal air sampling each shift to start. Reduce to once per week if levels remain at the action level or below.
Oxygen & Flammable vapors	Gas Meter – Industrial Scientific TMX 412 or equivalent	One (1) gas meter to evaluate confined spaces as necessary.

Work Area Monitoring

The following describes the methods and parameters to be used for PPE upgrades and work cessation. Work area monitoring should be conducted with a "roving" PID or aerosol monitor in accordance with the following guidelines. Monitoring results must be recorded along with a date, time, location, wind direction (upwind/downwind), and description of activities being monitored. Work Area monitoring data will be retained on site for review by Destiny representatives.

Periodic/Roving Monitoring - The contractor will conduct air monitoring when:

- Odors are encountered
- Work begins on a different portion of the site
- Different contaminants are being handled
- A new or different type of operation is conducted
- Weather conditions change and may increase airborne hazards (e.g., wind increases dust exposure).

<u>*Confined Space Entry -*</u> A combustible gas / oxygen meter will be required for entry into confined spaces, including excavations greater than four (4) feet deep. Refer to the "Confined Space Entry" section of this HASP.

<u>*Hot Work -*</u> A combustible gas / oxygen meter will be required to monitoring areas where flammable vapors may accumulate prior to conducting hot work.

Work Area action levels for dust and VOCs will be based on running 15 minute TWAs to be consistent with Community Air Monitoring action levels.

WORK AREA ACTION LEVELS			
Contaminant	**Frequency**	**Action Level**	**SSHC Action/Response**
VOLATILE ORGANIC VAPORS (VOCs)	1. Periodically during intrusive work activities 2. When odors are encountered or changing site conditions affect hazards. 3. Prior to and continuous during confined space entry (i.e., excavations >4 ft. and tanks).	5 ppm	1. Increase to Level C PPE (half or full- face respirator with qualitative or quantitative fit test) or use controls to reduce VOC concentrations below 5 ppm. 2. Observe VOC results on PID located downwind of the Exclusion Zone and implement Community Air Monitoring Program (CAMP) Response Actions if CAMP action levels are exceeded. Continue to observe downwind VOC levels until work area levels are <5 ppm.
		50 ppm	1. Increase to Level B PPE or Level C PPE (full-face respirator with quantitative fit test) or 2. Implement additional controls to reduce VOC concentrations below 50 ppm. 3. Continue to observe VOC results on PID located downwind of the Exclusion Zone and implement Community Air Monitoring Program (CAMP) Response Actions if CAMP action levels are exceeded. Continue to observe downwind VOC levels until work area levels are <5 ppm.
		250 ppm	1. **STOP** work and use ventilation, covers, vapor suppressants or other controls to reduce VOC levels. 2. Continue to observe VOC results on PID located downwind of the Exclusion Zone and implement Community Air Monitoring Program (CAMP) Response Actions if CAMP action levels are exceeded. Continue to observe downwind VOC levels until work area levels are <5 ppm. 3. Immediately notify the DestiNY representative.
DUST (SSHC Observations & Aerosol Meter)	1. Periodically during intrusive work activities. (drilling and excavating)	<1 mg/m^3	1. Continue to implement dust controls to prevent visible dust from leaving the Exclusion Zone.
		1 mg/m^3	1. Increase to Level C PPE (half or full-face) or reduce dust levels below 1mg/m^3. 2. Evaluate dust control options and implement additional dust control measures.
		2.5 mg/m^3	1. **STOP** Work. 2. Review, evaluate, and implement additional techniques or controls or slow work production to reduce work area nuisance dust levels below 1 mg/m^3. *3.* Notify a DestiNY representative.
COMBUSTIBLE VAPORS (Gas Meter)	1. .Prior to and continuous during confined space entry (i.e., excavations >4 ft. and tanks). ***NOTE:*** *a trench or pit over 4' deep and with limited access may be considered a confined space.*	10% LEL	1. **STOP** work. 2. Use ventilation or other controls to reduce combustible vapors. to keep combustible vapors <10% LEL.

WORK AREA ACTION LEVELS			
Contaminant	**Frequency**	**Action Level**	**SSHC Action/Response**
OXYGEN (Gas Meter)	1. Prior to and continuous during confined space entry (i.e., excavations >4 ft. and tanks). ***NOTE****: a trench or pit over 4 ft deep and with limited access may be considered a confined space. Note: Oxygen measurements must always be taken with comb. gas measurements.*	<19.5% O_2 and >23.5% O_2 *Note: Air is normally 20.8%*	1. Restore acceptable oxygen levels OR use Level B PPE. 3. Notify the **STOP** work. 2. Use ventilation **prior** to confined space entry under oxygen deficient conditions.
Lead	Once per shift to start, reduce to once per week if results below action level.	<25 ug/M3 >25 but < 50 ug/M3 > 50 ug/M3	1. Reduce monitoring to once per week 1. Continue monitoring each shift 1. Upgrade to Level C PPE 2. Continue monitoring each shift
* Dust and VOC action levels are based on running 15 minute Time-Weighted Averages (TWAs) above background. Background readings are taken at upwind locations relative to Work Areas.			

Community Air Monitoring Program (CAMP)

CAMP requirements are based on guidance from the New York State Department of Health (NYSDOH) Generic Community Air Monitoring Plan and New York State Department of Environmental Conservation (NYSDEC) Technical and Administrative Guidance Memorandum #4031.

CAMP monitoring is required continuously during intrusive work activities conducted at each of three major work locations that are designated as Destiny (near Carousel Center), Solar St. (former petroleum storage area), and Bear St. (staging area). CAMP monitoring is not required at the Bear St staging area as long as materials are not being loaded or unloaded and staged soils are covered by tarps. Regardless of instrument measurements, observations of dust leaving the site or odors at the perimeter will require modification of work practices or implementation of controls to protect the public. For this project, the "public" primarily refers to residents, businesses, and pedestrians occupying or visiting off-site areas. Aerosol monitors and PIDs used for CAMP must be placed on a sturdy platform 4'-5' above ground level. Contractors must check CAMP aerosol monitors and PIDs at mid-morning, noon, and mid-afternoon.

Air monitoring data must be downloaded at the end of each day and reviewed by the contractor for any results above CAMP action levels that may have been missed when the equipment was checked during the day. CAMP results will be retained on site for review by Destiny. Destiny shall be immediately notified of any results above CAMP action levels and any odors that may affect public areas.

CAMP - VOCs
CAMP for VOCs will include 1 upwind and 1 downwind PID located at the Exclusion Zone perimeter. Multiple small Exclusion Zones may be covered by the same downwind and upwind PIDs upon approval by Destiny and when outlined in the Contractor's HASP. PIDs may be moved around the Exclusion Zone perimeter during the day if necessary to maintain their upwind and downwind positions.

CAMP - DUST
Dust monitoring will require establishing four (4) monitoring locations around the Exclusion Zone perimeter. These locations are fixed and one aerosol meter will be placed at each location. Similar to CAMP VOC monitoring, multiple small Exclusion Zones may be covered by the same four (4) aerosol monitors upon approval by Destiny and when outlined in the Contractor's HASP.

CAMP ACTION LEVELS			
Contaminant	**Frequency**	**Action Level**	**SSHC Action/Response**
VOLATILE ORGANIC COMPOUNDS (VOCs)	1. Continuous during intrusive activities 2. When odors are detected at the fence line.	*5 ppm	1. Temporarily stop work and observe VOC levels. If VOC levels drop quickly below 5 ppm then work may continue as long as DOWNIND VOCs are acceptable as outlined below. 2. Use a "roving" PID to check VOC levels 200' downwind or half the distance to nearest public area, whichever is less. 2.1 If DOWNWIND VOCs ≤5 ppm, then work may continue 2.2 If DOWNWIND VOCs >5 ppm, then work must STOP
		*25 ppm	1. **STOP** work and continue to monitor. 2. Notify a Destiny representative.
DUST SSHC Observations Dust Meter	1. Continuous during intrusive activities	*<0.1 mg/m^3	1. If dust is observed leaving the site perimeter or fence line and into public areas, then dust controls must be implemented. 2. If dust controls fail to prevent visible dust emissions from leaving the site, then notify the Destiny representative.
		*0.1 mg/m^3 - 0.15 mg/m^3	1. Dust suppression and control is mandatory. 2. f dust controls fail to prevent visible dust emissions from leaving the site, and then notify the Destiny representative.
		*>0.15 mg/m^3	1. **STOP** Work 2. Review, evaluate, and implement additional techniques or controls. 3. Notify the Destiny representative. 4. Re-start work when additional dust control measures have been implemented.
* VOC and DUST action levels are based on running 15 minute Time-Weighted Averages (TWAs) above background at the Exclusion Zone perimeter. Background readings are taken at upwind locations relative to Work Areas.			

Decontamination & Contamination Reduction

Personnel and equipment in the Exclusion Zone will be required to enter and exit the Exclusion Zone through the decontamination area (i.e., Contamination Reduction Zone). Following decontamination, disposable items are to be disposed of in dry, impermeable containers. Contractors are responsible to ensure that decontamination pads are properly equipped and are provided sufficient clean water. Overspray and run-off from decontamination activities must be controlled and containerized.

Personnel engaged in vehicle decontamination will wear protective equipment including appropriate personal protective equipment (PPE) and will also decontaminate prior to leaving the decontamination area/pad. Face shields are required for any decon activities that use pressurized water, air, or steam.

Personnel decontamination shall at a minimum consist of removing PPE such that underlying clothes are not contaminated. Hand and face washing with soap and potable water will follow PPE disposal.

Heavy equipment and tools will first undergo gross decontamination by dry removal of visible debris with shovels or brushes. Gross decontamination will be followed by pressurized water so that all visible contamination is removed. The tracks, tires, and undercarriage of heavy equipment must be thoroughly decontaminated prior to leaving the site.

The contractor’s HASP shall identify the location of personnel and equipment decontamination facilities and shall clearly outline the equipment and materials used for decontamination.

11.0 EXCAVATIONS

Prior to starting work, each contractor shall designate in writing its Competent Person using the form located in Appendix A. For the purposes of this section, a Competent Person is one who has specific training in soil analysis and the use of protective systems; knows the requirements of OSHA 29 CFR 1926, Subpart P; can identify and predict hazards or working conditions that are unsanitary, hazardous or dangerous to team members and is authorized to take prompt, corrective measures to correct them.

The **UTILITY SAFETY CHECKLIST MUST BE COMPLETE** to assure that all known underground, adjacent, and overhead utilities have been located and verified by the responsible parties.

Protective systems are required for all excavations over 5 feet deep unless the excavation is in stable rock. Protective systems include support systems, sloping, benching, shield systems, and other systems that provide the necessary protection. The contractor’s

Competent Person is responsible for determining the type of protective system that will be used. Protective systems for excavations deeper than 20 feet must be designed by a registered professional engineer.

Personnel will not be allowed to work in excavations where water has accumulated or is accumulating unless the Competent Person has determined adequate precautions have been taken to protect team members against the hazards posed by water accumulation.

All excavations and trenches shall be covered, barricaded, and/or properly marked. If excavations will remain open overnight, substantial barricades and warning lights shall be required. If the excavation is located in an area utilized by Client team members, the public or subject to vehicular traffic.

Documented inspections of excavations and protective systems shall be done daily by a Competent Person. Inspections are also required after rainstorms or any other change in soil conditions that can increase the possibility of a cave-in or slide. If any ground movements are apparent, such as subsidence or tension cracks, all work in the excavation shall be stopped until the problem has been corrected.

Where oxygen deficiency or a hazardous atmosphere exists or could reasonably be expected to exist, such as in excavations in landfill areas or excavations in areas where hazardous substances are stored nearby, the atmosphere in the excavation shall be tested by the contractor before team members enter excavations covered in this section.

Refer to the Excavation Safety safety bulletin in Appendix A.

12.0 ENVIRONMENTAL

Groundwater and stormwater have to be kept separate. Follow stormwater plan for site.

All soil must stay on site.

- Potential contamination includes PCBs, lead and metals, petroleum related contamination, and whitish solvay waste (mostly calcium carbonate)

Runoff from excavated soils and areas disturbed by surface grading is addressed in the site Erosion Control Plan.

To prevent excavated soil from running off into storm sewers, contractors shall:

- Cover stockpiled soil with plastic or surround the stockpile with bales of hay or silt fence.
- Block off storm sewers with filter fabric held in place by bales of hay or stone.
- Sweep roadways daily. Minimize dust release

13.0 DISCOVERING HAZARDOUS SUBSTANCES

A PID is required during all soil disturbance activities per the Community Air Monitoring Plan (CAMP). See Section 10.0 Soil Intrusive Activities.

If a suspected hazardous substance is found during performance of construction or demolition activities (through visual observation, odor, or testing), the following procedures shall be followed:

- All work shall be stopped in the area of the suspected hazardous substance and the Construction Manager shall be notified immediately.

The contractor shall cordon off the entire suspected area and post signs reading "KEEP OUT". Include the date and a contact name.

The Construction Manager shall immediately contact the Client. The Construction Manager, contractor(s) involved and Client shall analyze the situation and develop a plan for further action.

14.0 FALL PREVENTION / PROTECTION

Any individual exposed to a potential fall in excess of six (6) feet while working from a walkway, platform, or other surface shall be protected from falling by a personal fall arrest system or standard guardrails. The Safety Manager has to approve non-conventional fall protection methods.

A personal fall arrest system (PFAS) means a system used to arrest a team member in a fall from a working level. It consists of an anchorage, connectors, a body belt or body harness and may include a lanyard, deceleration device, lifeline, or suitable combinations of these. A permit is required for any "non-conventional" fall protection use.

100% tie off shall be maintained at all times when using a PFAS.

ACCOUNTABILITY

For any violation of fall protection policies for this project the individual will be removed from the project for 24 working hours before return and the person will have to be retrained in fall protection. If the same person violates the policy again before the end of the project they will be removed from the project permanently. (This also goes for working in lifts, scaffolds ect.)

Follow the requirements in the Fall Protection Program safety bulletin in Appendix A.

15.0 FIRE PROTECTION

During construction, the potential for loss due to fire can be significant if proper fire protection and prevention practices are not followed. The Construction Manager and Safety Manager shall familiarize themselves with fire protection standards referenced within the OSHA standards, Client requirements, and the following general requirements:

- The Syracuse Fire Department has been contacted (and will be re-contacted periodically) and invited to visit the project at any time so they are familiar with changing conditions. They plan to have a full time representative stationed at or near the work site.

- Housekeeping shall be controlled on a daily basis to eliminate the accumulation of combustible materials.

- One (1) multipurpose fire extinguisher rated at least 10 ABC shall be provided for every 3,000 square feet of building space. Travel distance to the nearest extinguisher shall not exceed 100 feet. These are not to be used for hot work only incase of an emergency.

- In addition to the above general requirements, there are specific requirements for providing fire extinguishers. The following list is not intended to be all-inclusive but to identify the more common situations where fire extinguishers are required:
  - Each arc welding operation
  - Any use of a torch, including soldering operation
  - Each piece of construction equipment powered by an internal combustion engine
  - Tar kettles
  - Temporary heating
  - Office and storage trailers
  - Outside any room used to store flammable or combustible liquids, including paint
  - Within 25 feet of outside fuel (gasoline or diesel) storage areas.

- The contractor's Safety Representative shall inspect their extinguishers on a monthly basis. Extinguishers shall have tags showing inspection dates.

- Open fires are not permitted.

- Unobstructed access to fire-fighting equipment and emergency escape routes shall be maintained at all times. In addition, the building(s) shall be accessible to emergency vehicles at all times.

- Storage of oxygen, acetylene, LP gas or other flammable gases is not permitted within buildings.

16.0 GUARDING FLOOR AND WALL OPENINGS

Floor openings shall be guarded by OSHA standard guardrail and toeboards or covers that are secured against accidental displacement. Floor opening covers shall have a sign with the following warning: **DANGER! HOLE COVER** and shall be adequate for intended load.

Open manholes shall be protected by an OSHA standard guardrail.

Wall openings, from which there is a drop of more than 6 feet, shall be protected by OSHA standard guardrails.

Stairways and runways shall be guarded by a standard railing or the equivalent on all open sides 6 feet or more above floor or ground level.

Regardless of height, open-side floors, walkways, platforms or runways above or adjacent to dangerous equipment and similar hazards shall be guarded with a standard railing and toeboard.

17.0 HAND TOOLS

Team members shall not be issued or allowed to use defective or unsafe tools.

Impact tools shall be kept free of mushroomed heads. The wooden handles of tools shall be kept tight in the tool and free of splinters. Tools with cracked wooden handles shall be taken out of service until a new handle is provided.

Electrical, air or any type of hand tool shall not be used if safety equipment such as shields, tool rests, hoods, and/or guards have been removed or otherwise rendered inoperative. Grinders will not be used without the second handle in place.

Team members using tools under conditions that expose them to the hazards of flying objects or harmful dusts shall be provided with the required personal protective equipment including double eye protection when using any power tool.

All electrically powered tools shall be properly grounded. Tools, cords, and outlets using 110-volt electrical power shall be protected by ground fault circuit interrupters (GFCI). The GFCI shall be checked each time it is used by pushing the test button and seeing if it trips.

Portable grinders shall be provided with hood-type guards with side enclosures that cover the spindle and at least 50% of the wheel. All wheels shall be inspected regularly for signs of fracture. Portable grinders shall not be operated without both handles in place.

Hoses supplying pneumatic tools shall have couplings pinned or wired to prevent accidental disconnection.

Air supply lines shall be protected from damage, inspected regularly, and maintained in good condition.

Air source supply hoses shall be protected by excess flow valves, sometimes called OSHA check valves, to prevent "whipping" in the event of hose separation or failure.

18.0 HOUSEKEEPING

Site cleanliness and good housekeeping are key elements in maintaining a productive and safe project. Team member conduct and work practices are equally important factors. The following shall apply to all contractors' personnel on the project:

- Work areas shall be cleaned up daily and debris hauled and legally disposed off site at least once a week or as required.
- Oily rags, waste or other combustible debris shall be kept in properly identified metal containers provided for the purpose.
- Team member facilities such as eating, changing and toilet facilities and parking lots shall be kept in a clean and sanitary condition. All contractors shall be required to maintain the cleanliness of the team member parking lot and office facility area.
- Deposit trash, refuse, debris, lunch papers, and other waste in the proper refuse containers.
- Each contractor shall remove snow/ice from their work area.
- Protruding nails, screws or other metal-in-form lumber, boards, etc. must be immediately removed to prevent puncture injuries.
- The construction site, especially roadways, access ways, aisles, stairways, scaffolds, and ladders shall be kept clear of hoses, extension cords, welding leads and other obstructions which may cause tripping or other accident hazards. When possible, these items shall be strung 7 feet (minimum) overhead or taped down.
- Debris or material shall not be thrown or dropped from upper levels during cleanup or demolition activities unless an acceptable trash chute or other method is provided by the Contractor.

- Site roadways shall be kept clean and clear of trash, debris, spoil, and materials of construction.

- Eliminate slipping hazards by cleaning up items such as grease, oil, water, ice, snow or other liquids on walkways, ladders, stairways, scaffolds or other access ways or working areas.

- Specialty trade contractors who do not maintain the housekeeping in their areas will be back charged the cost of cleaning up behind them.

19.0 LADDERS

Team members shall be instructed and required to face ladders and maintain three points of contact when ascending/descending. Materials shall be raised or lowered with a line or hoisting equipment and not carried in one hand while ascending or descending.

Wood ladders shall not be painted as this may cover up defects and deterioration.

The side rails and cleats or rungs on ladders must be kept clean and free of lines, hoses, cables, wires, oil, grease, and debris.

Portable ladders shall be placed so the horizontal distance at the bottom of the ladder is not less than one quarter (1/4) of the vertical distance to the top support. In case of necessity, where a ladder is placed more vertical, it shall be fastened to prevent tipping.

Portable ladders shall be placed so that the side rails have a secure footing. The top of the ladder shall be clamped, tied off, or otherwise securely fastened, to prevent movement.

Ladders are to be inspected daily. Ladders with broken or missing rungs and steps broken or split side rails or other faulty and defective construction shall not be used and be promptly removed from the site.

Straight ladders must not be longer than 30 feet; extension ladders must not be longer than 60 feet. If greater heights are to be reached, separate ladders shall be used with intermediate landing platforms provided. Portable ladders, used on smooth floor or other smooth surfaces, shall be equipped with non-slip bases or otherwise secured to prevent displacement.

Ladders shall be of sufficient length to project not less than three feet (36”) above the top landing. When this is not practical, grab rails, which provide a secure grip for a team member moving to or form the point of access, shall be installed.

Stepladders shall be set level on all four feet, with spreader bars locked in place. Do not use a stepladder as a straight ladder. Persons shall not work off the top two steps of a stepladder.

Metal ladders are not allowed on site.

Each contractor shall provide training for each team member using ladders and stairways. Training shall meet the requirements of OSHA Safety and Health Standards, 29 CFR 1926.1060.

20.0 LEAD

Any contractor performing lead abatement shall demonstrate that he possesses the experience and technical competence required by Codes, Regulations, and Laws necessary to perform the contract work satisfactorily and safely. Prior to beginning lead abatement, the contractor shall submit a written Lead Abatement Plan. This plan will address, but not be limited to, the following items:

- Description of work area
- Hazard determination
- Exposure assessment
- Engineering and work practice controls
- Respiratory protection
- Housekeeping
- Hygiene facilities and practices
- Medical surveillance and provisions for medical removal
- Training
- Posting of signs
- Record keeping
- The name of the individual(s) designated as the Competent Person for each operation required by OSHA.

Follow the requirements in the Workplace Lead and Other Heavy Metals Program safety bulletin in Appendix A.

21.0 MATERIAL HANDLING AND STORAGE

21.1 General

Heavy loads shall not be lifted without assistance. Team members shall be shown how to lift properly and avoid strain by lifting with his/her legs and arms, not his/her back.

Materials and supplies shall be neatly and securely stacked, blocked, interlocked, and limited in height so as to be stable and in no danger of collapsing, sliding, or falling over.

Materials stored inside buildings shall not be placed within 6 feet of hoistways or floor openings.

Materials shall not be placed within 10 feet of exterior walls that do not extend above the top of the material.

Adequate access ways shall be left when storing materials. Do not block aisles or exits with stored materials, packing, or trash.

When loading materials into building at loading areas a spotter must be used when loading floors with lifting equipment so people do not walk out of building and under a load.

21.2 Hazardous Material

Contractors are required to store all chemicals, including but not limited to machine lubricants, fuels, cutting oils, cleaning solutions, etc., in an appropriate and approved enclosed storage area, shed, cabinet or the like. Storage shall conform to all applicable federal, state, and local safety, fire, and environmental standards.

Non-compatible materials shall be segregated.

Flammable and toxic or other harmful materials shall be stored in properly designated, well-ventilated areas. Observe and abide by a NO SMOKING and other warning signs.

21.3 Waste

The disposal of chemicals, paints, or solvents to any sewer is prohibited.

No wastewater or liquids of any kind may be discharged to streams, any storm sewers, plant roads, roofs, parking lots or to any open area.

Concrete washout areas shall be constructed and used.

Contractors must dispose of all waste materials they generate in accordance with all applicable Federal, State, Local, and Client regulations. Materials are to be placed for disposal in designated areas only and all waste must be properly containerized; loose piles of waste are not permitted. Destiny USA approved hazardous waste haulers shall be used by Destiny USA.

22.0 PERSONAL PROTECTIVE EQUIPMENT

Each employer is responsible to provide and maintain proper personal protective equipment and thorough instructions for its use to all their team members. The following requirements apply to all personnel on this project:

- All personnel on the jobsite shall wear approved hard hats at all times throughout the project duration with the bill forward except while wearing a welding hood.
- Work attire shall consist of long pants, sleeved shirts, and safety boots at least 6” high.
- Hearing protection shall be used in areas that are determined to have high noise exposure levels (See Hearing Conservation Section).
- Gloves shall be worn when handling material that may cut, burn or contaminate the skin.
- Respiratory protection shall be worn by personnel who may be exposed to a hazardous concentration of gases, vapor, smoke, fumes, mists, or dust. Any contractor whose team members will be required to wear respirators shall submit to the Safety Manager a copy of their written Respiratory Protection Program and identify the name of the individual who will be designated as the Competent Person (program administrator)
- Flagging vests shall be worn by personnel required to work within 10 feet of active roadways and by personnel who direct public traffic and/or construction equipment.
- Safety glasses with rigid sideshields are required in all work areas. Double eye protection is required when using any power tool and whenever operations present the hazard of flying objects, glare, liquids, injurious radiation, or a combination of these hazards.

23.0 MOTOR VEHICLES & HEAVY EQUIPMENT

The contractor shall enforce the following:

All pedestrians shall have the right of way.

All vehicles and equipment shall comply with designated traffic speeds.

Parking is permitted in designated areas only. Do not block walkways, entrance ramps, or loading docks.

All vehicles operated within project limits shall be inspected, tested, and certified to be in safe operating condition.

Only licensed drivers shall be permitted to operate motor vehicles.

Seat belts shall be used in all vehicles and equipment as required by OSHA 29 CFR 1926.600.

Rollover protection (ROPS) as specified in OSHA 29 CFR 1926.602 is required before applicable equipment can be operated on the project site.

All applicable vehicles and equipment shall be equipped with motion alarms that are audible above the surrounding noise levels.

All vehicles and equipment shall be inspected prior to use each day to assure it is in safe operating condition, all systems are functioning, and there is no evidence of damage which may cause failure while in use.

The contractor is responsible to assure the stability of any material being hauled.

Operating internal combustion vehicles and equipment within buildings is not permitted without permission of the construction manager and being vented outside.

A thorough, annual inspection of the hoisting machinery shall be made by a Competent Person. A record of the dates and results of inspections for each hoisting machine and piece of equipment shall be maintained and a copy provided to Construction Manager prior to operating equipment on project.

Spotters shall be used to guide equipment and vehicles through work areas that are congested.

24.0 PORTABLE HEATERS

A task hazard analysis shall be completed prior to bringing any portable heaters on site.

All heaters brought on site shall be Underwriters Laboratory approved and comply with and operated in accordance to manufacturer's specification.

1. Storage and use of propane gas cylinders shall conform with OSHA's Construction Standard 29 CFR 1926.153 Liquidified Petroleum Gas. Some important provisions of this standard are:

   - Hoses shall have a minimum working pressure of 250 psig and minimum burst pressure of 1,250 psig. Aluminum piping or tubing shall not be used.
   - Heaters shall be located at least 6 feet away form LP gas containers.
   - Heaters shall be located at least 20 feet from each other and be equipped with approved automatic device to shut off the flow of gas to the main burner in the event of flame failure. They shall be located at least 10 feet from tarpaulins, canvas, or other coverings.

- Outside storage areas shall be at least 10 feet from the nearest building and contain no more than 50 – 100 lb. cylinders. You may not store propane tanks inside or building An approved fire extinguisher with a minimum rate of 20BC shall be placed at each storage location.
- Heating devices shall be installed to provide clearance to combustible material of not less than 3 feet..

2. A fire watch consisting of two contractor team members shall be provided during off-shift hours. They shall be provided with phone or two-way radio communication to call in an emergency. All contractor team members serving as fire watch shall receive training in emergency procedures.

3. The amount of propane gas cylinders on hand at any one time must be kept to an absolute minimum.

4. Daily monitoring for carbon monoxide shall be required about one hour after starting each shift and at least four hours later. Levels of carbon monoxide shall be kept below 25 ppm. Levels of oxygen shall also be checked at the same time.

25.0 POWDER-ACTUATED TOOLS

The contractor shall use only indirect-acting, low-velocity tools. An indirect-acting tool is defined as a powder-actuated fastening tool that uses the expanding gas of the powder cartridge to trigger a captive piston that drives the fastener into the material. The fastener is driven by piston inertia. Once free of the piston, the fastener alone has insufficient inertia to produce free flight. A low-velocity tool is a powder-actuated fastening tool in which the velocity of the fastener is less than 328 feet (100 meters) per second at 6.5 feet (2 meters) from the muzzle.

Operators shall be thoroughly trained in operating, maintaining, and selecting fasteners for powder-actuated fastening tools.

When operating the tools, operators shall carry a card or license stating that they have successfully completed the training course. The card or license shall specify the model(s) they are qualified to operate.

Use fasteners and cartridges only in the powder-actuated fastening tools for which they are manufactured. Use all tools with the correct shield, guard, or attachments recommended by the manufacturer. The operator and workers nearby shall wear safety glasses with side shields. In addition to safety glasses, full-face shields shall be worn. Hearing protection shall also be required.

Do not use powder-actuated fastening tools to drive fasteners into surface-hardened steel, cast iron, glazed brick, hollow tile, cinder block, marble, granite, live rock, or similar extra-hard, brittle, or fragile materials. Do not use powder-actuated fastening tools around explosive or flammable materials or in a hazardous electrical area (Class I, II, or III) without a suitable Hazardous Work Permit.

Do not load powder-actuated fastening tools until just prior to the intended firing time. Never leave loaded tools and powder cartridges unattended. Never point powder-actuated fastening tools at anyone.

Post a warning barricade with appropriate signs in plain sight wherever workers might come into the line of fire or when other workers are not wearing protective equipment. Signs shall be worded similar to the following: **POWDER-ACTUATED TOOL IN USE.**

Operators shall know what is on the other side of the material being fastened, particularly if they are driving fasteners near holes or if they might miss the target. Operators shall post warning signs on the opposite side of the material.

In accordance with the manufacturer's recommended procedure, test the tools each day prior to use to see that the safety devices are in proper working condition. Follow the manufacturer recommendations concerning maintaining and inspecting powder-actuated fastening tools, including how to replace parts.

When not in use, lock powder-actuated fastening tools and cartridges in a labeled metal container. Store tools in a safe place, away from flame or heat and where they are accessible only authorized personnel. Keep cartridges of different power levels in separate compartments or containers.

You must pick up empty or partially used cartridges and dispose of properly, in bucket with water.

26.0 SANITATION

The contractor shall provide an adequate number of toilets. Minimum requirements are one toilet and one urinal for every 40 workers with a way to wash or sanitize user's hands.

Each contractor shall be responsible for providing an adequate amount of potable drinking water for their team members. Portable containers (if used) shall be clearly marked, equipped with a tap and be capable of being tightly sealed. The contractor shall provide single-service cups for each container. Cups shall be kept in a sanitary dispenser and a receptacle for disposing of used cups shall be provided at each location. If bottled water is used, provisions must be made for collecting and disposing of the empty bottles.

The use of a common drinking cup is prohibited.

27.0 SCAFFOLDS AND WORK PLATFORMS

All scaffold systems shall be designed and erected by qualified individuals under the direction of a competent person. The contractor shall provide in writing the name of person designated as the Competent Person specific to project scaffold requirements using the form in section 38.0. All scaffolds shall be plumb and supported on a firm level base.

Any platform over six (6) feet in height shall have guardrails and toeboards installed around open sides and ends.

All scaffolds shall be inspected on a daily basis by the designated Competent Person. Scaffold tags will be placed at all access points. Do not access scaffolds with a Red tag unless you are erecting or dismantling. Red tags are the same as RED Barricade tape.

All manufacturers' specifications shall be complied with when requirements are more stringent than OSHA's.

Follow the requirements contained in the Scaffold Safety is Everyone's Responsibility safety bulletin in Appendix A.

28.0 SKYLIGHTS

Openings for new or removed skylights shall be protected by standard guardrails and toeboards or covers secured in place. Covers shall be capable of supporting any anticipated load that may be placed on the cover.

The contractor responsible for installing or removing skylights shall submit a Fall Protection Plan for review prior to beginning work. This Plan shall describe how workers will be protected from falls while installing skylights and what measures will be taken to protect personnel below when skylights are being installed.

29.0 STEEL ERECTION

Contractors must meet all requirements contained in OSHA Construction Standards Subpart R and the Fall Protection Program safety bulletin including:

- Site Layout and Construction Sequence

- Certification of proper curing of concrete in footings, piers, etc. for steel columns from controlling contractor to the steel erector.
- Controlling contractor to provide erector with a safe site layout including pre-planning routes for hoisting loads.

➢ Site-Specific Erection Plan
- Steel erector to provide pre-planning of key erection elements, including coordination with controlling contractor before erection begins, in certain circumstances.

➢ Hoisting and Rigging
- Crane safety for steel erection.
- Minimize team member exposure to overhead loads through pre-planning and work practice requirements.
- Proper procedure for multiple lifts (Christmas-treeing).

➢ Structural Steel Assembly
- Provide safer walking/working surfaces by eliminating tripping hazards
- Specific work practices regarding safely landing deck bundles and prompt protection from fall hazards in interior openings.

➢ Column Anchorage
- 4 anchor bolts per column required along with other column stability requirements.
- Procedure for adequacy of anchor bolts that have been modified in the field.

➢ Beams and Columns
- Requirements for making double connections at columns.

➢ Open Web Steel Joists
- Requirements minimizing collapse of lightweight steel joists by addressing need for erection bridging and method of attachment.
- Requirements for bridging terminus anchors with illustrations and drawings in a non-mandatory appendix (provided by SJI).
- New requirements to minimize collapse in placing loads on steel joists.

➢ Systems-Engineered Metal Buildings
- Requirements to minimize collapse in the erection of these specialized structures that account for a major portion of steel erection in this country.

➢ Falling Object Protection
- Provisions that address hazards of falling objects in steel erection.

➢ Fall Protection
- Controlled decking zone (CDZ) provisions to prevent decking fatalities.

- **All** individuals engaged in structural steel erection shall be protected from falling whenever exposed to a potential fall in excess of **6 feet**. This includes, but is not limited to, connectors, welders, individuals bolting up and installing decking.
- Acceptable fall protection includes, but is not limited to, standard guardrails, floor hole covers, personal fall arrest systems consisting of full body harness, lanyard, anchorage points and/or devices, retractable lifelines, etc. Every anchorage point and/or device shall be capable of supporting 5,000 pounds for each individual that is simultaneously secured to it, i.e., if three (3) individuals are secured to one anchorage point, that anchorage shall be capable of supporting 15,000 pounds. The use of "safety belts" in personal fall arrest systems is prohibited.
- Prior to starting work on our projects, contractors and/or subcontractors engaged in structural steel shall meet with the Construction Manager to review the means and methods that will be used by the contractor and/or subcontractor to comply with fall protection requirements.

➢ Training
- A qualified person must train exposed workers in fall protection.

Fill out the Steel Erection Checklist in section 38.0.

30.0 TAR KETTLES

A Hot Work Permit shall be issued and received prior to firing the kettle. Refer to Section 10.0

Tar kettles shall be kept away from any combustible materials, building air intakes and as far away from buildings as possible. A barricade shall be erected around the equipment.

The area around the kettle shall be kept free of tools, material, and waste to eliminate any tripping hazards.

As a minimum, two 20-pound ABC dry chemical fire extinguishers shall be kept with 25 feet of each kettle. The extinguishers shall be inspected before each shift. Extinguishers that have lost their charge shall be replaced or recharged immediately.

Each kettle shall be tended at all times. Each kettle shall be equipped with an operable temperature gauge and temperatures shall be continuously monitored and controlled to prevent ignition.

Tools, equipment, and buckets shall be free of moisture to prevent "spattering" of hot liquid.

Personnel handling molten liquid in buckets or tending the equipment shall wear appropriate personal protective equipment including, but not limited to, long-sleeved shirts, gloves, long pants, sturdy work boots, safety glasses, and full faceshield. Respirator protection shall also be required if exposed to excessive vapors.

31.0 TEMPORARY ELECTRIC

All electrical work shall be installed by qualified electricians in accordance with the National Electric Code and all Local and State requirements.

All 120V electrical tools and cords shall be protected by ground fault circuit interrupters. When extension cords are plugged into permanent power sources, they are considered temporary wiring and shall be protected by ground fault circuit interrupters (GFCI) or an assured grounding program as outlined in OSHA 1926.404. Contractors must provide their written electrical safety program to the Safety Manager.

All extension cords shall be of the three-wire, grounded type and shall be of the heavy-duty type.

All exposed temporary wiring and extension cords shall be inspected at the beginning of each work shift. Any damaged equipment shall be placed out of service until repaired.

All GFCI's shall be tested each time they are plugged into by pushing the test button to make sure it trips.

All temporary wiring and extension cords shall be suspended at a safe height whenever possible. If cords must be on floors or the ground, they shall be kept out of traffic areas or properly covered or buried and marked.

All temporary lighting shall be hung securely overhead, except for specialized floodlights. Bulbs shall be equipped with protective cages. All wiring shall be in good condition; any broken bulbs and/or protective cages shall be replaced immediately. Safe temporary lighting levels shall be provided and maintained in accordance with OSHA requirements.

Before work on electrical systems is started, all systems to be worked on shall be de-energized, controls opened and locked and tagged to show that work is being conducted. Follow the requirements in section 7.8 and in the Zero Energy State Safety Bulletin.

32.0 WELDING AND BURNING

No welding, cutting, burning, soldering, or other spark and flame-producing activities shall begin until a Hot Work Permit has been issued by the Safety Manager. Requirements for obtaining a Hot Work Permit can be found in Section 7.5 of this Manual.

For welding activities, either good ventilation will be provided or respiratory protection will be required. If respirators are used, a written respiratory protection program will be in place.

Welders will be instructed to keep their head out of the plume while welding.

Additional requirements are located in the Welding and Cutting Hazard Assessment safety bulletin and in the Watch For Fire, Smoke, and Sparks safety bulletin located in Appendix A.

33.0 EMERGENCY PROCEDURES

The purpose of this section is to provide basic emergency and accident guidelines that can be utilized in developing project-specific emergency procedures.

Project-specific emergency procedures will be developed by the Construction Manager, Safety Committee, and Corporate Safety Director. These procedures shall incorporate Client requirements.

For any emergency:

- All emergency notification on the project site shall be handled by the Construction Manager if possible.
- All emergency services can be reached using 911 from any phone including cellular phones.
- Radio channels and telephone lines shall be reserved for site communications during an emergency.
- After calling 911 or at the same time, call Mall security at 315-466-6011. They will dispatch a security vehicle to help guide the emergency vehicle(s) to the appropriate location. They also have AED capability.
- At time of mobilization, each contractor shall submit to the Construction Manager a list of after-hours telephone numbers where the contractor's key personnel can be contacted in case of an emergency. A master list shall be developed which will include all contractors on site and telephone numbers where key personnel can be reached. This master list shall be kept current by the Construction Manager and contractor.

33.1 Fire

Any fire that cannot be quickly extinguished with available fire-fighting equipment (extinguishers, water hoses, etc.) shall be abandoned.

The Construction Manager's project field office shall be notified immediately. Notify the Construction Manager of the location of the fire and if any personnel are injured or trapped.

The Construction Manager shall immediately notify the appropriate emergency response groups (fire, police, ambulance, etc) by calling 911.

- Give your name and location
- Describe the emergency
- Tell them if there are any known injuries
- Stay on the line until they hang up

Assign personnel to direct emergency vehicles to the proper location. After calling 911 or at the same time, call Mall security at 315-466-6011. They will dispatch a security vehicle to help guide the emergency vehicle(s) to the appropriate location

Determine if the project shall be evacuated.

If evacuation is necessary, an air horn shall be sounded by three (3) long blows by Construction Management Personnel.

This signal means all personnel MUST evacuate the construction area immediately.

After evacuating the construction area all personnel shall report to their designated assembly area. Each contractor shall determine if any of their personnel are missing and report this information to the Construction Manager.

The Construction Manager shall assign personnel to assist emergency personnel if requested.

As soon as possible, the Construction Manager shall:

- Notify the Client
- Notify the Construction Manager Corporate Safety Director
- Conduct a complete investigation and prepare report.

33.2 Spill or Leak

In the event of a spill of petroleum or other hazardous material, the following procedure shall be followed:

- The responsible contractor shall immediately notify the Construction Manager.

- Provided the safety and health of team members will not be jeopardized, the contractor shall attempt to prevent the material from entering the soil, waterways, or sewer openings by containing the spill with sand, absorbent booms, sewer covers, etc.

- The Construction Manager shall immediately notify the Client of the spill. The Construction Manager and Client shall assess the situation to determine which, if any, Local, State or Federal agencies need to be notified and what remedial actions need to be taken.

- The contractor responsible for the spill will be responsible for remediation in strict compliance with applicable Local, State, Federal and Client standards.

- Follow specific requirements of the site spill prevention and response plan in Appendix B.

The Construction Manager shall investigate the incident and submit a written report to the Client and Construction Manager Corporate Safety Director.

33.3 Serious Injury / Fatality

The following steps shall be taken by the Construction Manager or his/her Designee in the event of a serious injury or fatality:

- Survey the accident scene – Do not be another victim.

- Do not move injured personnel unless a life-threatening situation exists.

- Call 911 or direct a specific person to call.

    - Give your name and location
    - Give specific location for rescue equipment to respond to
    - Describe the emergency
    - Describe known injuries and numbers of injured
    - Stay on the line until they hang up

- Appoint a specific person(s) to intercept and direct emergency response unit to the location. After calling 911 or at the same time, call Mall security at 315-466-6011. They will dispatch a security vehicle to help guide the emergency vehicle(s) to the appropriate location

- Take only the action required to sustain injured party until emergency medical team arrives.

- Notify the Construction Manager immediately 24 hours a day, 7 days a week.

- The Construction Manager will notify the Client, Corporate Safety Director, and pertinent contractors. OSHA will be contacted if necessary for fatality and or 3 or more injured that have to go to the hospital.

- After the injured person has been removed, the accident scene shall be secured, cordoned off, and not disturbed until investigations are completed.

- Conduct investigations and prepare report.

33.4 Property Damage

The following steps shall be taken when an incident involving property damage occurs:

- In the event of an accident resulting in damage to equipment, buildings or other property, immediately notify the Construction Manager.

- The Construction Manager will notify the Client.

- Do not remove equipment or make modifications unless imminent danger to personnel or the public is present.

- Keep all non-essential personnel out of area.

33.5 Emergency Evacuation Plan

In the event of an emergency, all members of the contractors crew will be instructed by three (3) blows of a hand held horn by the Construction Manager or representative to exit the area and meet at the area designated in the contingency plan. An emergency consists of any serious accident or any conditions discovered by the on-site Safety & Health individual would suggest the presence of a hazardous situation, fire, or chemical exposure.

Precaution shall also be taken to avoid exposure to other individuals. If there is a chemical exposure, the contaminated clothing shall be removed and all areas of the body washed with a significant amount of water and soap. For personal injury, complete the incident first report form. Refer to the evacuation map and designated safe areas located on the map. If there is a significant release, the DEC and EPA shall be notified by dialing the appropriate hot line (refer to the spill plan in Appendix B). The Construction Manager will coordinate any applicable government reporting. The Construction Manager will be the sole contact with any media during an emergency event.

The Construction Manager will develop a plan view drawing. This drawing will clearly identify the following:

Building Footprint
Primary and Secondary Assembly Areas
Exits
Fire Alarm Pull Box
Site Telephones
Stairs
Fire Extinguishers
Construction Manager Project Office
First Aid Kit Locations

The Construction Manager shall ensure a copy of the site plan is given to every contractor; copies are conspicuously posted and maintained throughout the project; the plan is routinely reviewed at contractor meetings and the plan is addressed during team member orientation.

Emergency Telephone Numbers

The Construction Manager shall ensure that emergency phone numbers are conspicuously posted. The Emergency Phone List shall include the following numbers:

- Ambulance - 911
- Fire - 911
- Police – 911
- Mall Security 315-466-6011
- Home and Business number for key personnel of the Construction Manager, Client, Contractors, Insurance Company and Risk Managers.

33.6 Bloodborne Pathogen Exposure Control Plan

Definitions

The intent of the OSHA regulation and the Exposure Control Plan is to **reduce the chance of exposure to infectious disease in the workplace and provide appropriate medical treatment in the event of exposure**. The bloodborne diseases targeted are HIV / AIDS and Viral Hepatitis B.

The plan consists of the following components:

Exposure Determination

An exposure incident occurs when human blood, body fluids, or other infectious material contacts the mucous membranes (i.e., eyes, nose, or mouth) or broken skin of another human. A team member should be considered exposed if during the course of performing their duties human blood or body fluids enters their system through:

- a glass cut or puncture
- a splash to the eyes, nose, or mouth
- an open wound or non-intact skin
- any contact to the skin

Symptoms of bloodborne diseases can be, but are not limited to, flu-type symptoms (i.e., fever, sore throat, coughing, diarrhea, or jaundice).

Exposure Control

Even though industry related exposure incidents at our facility are few, any team member could potentially be at risk of exposure. It is recommended that **emergency CPR and First Aid providers, Security, or other positions (Good Samaritan) that could face potential exposure receive bloodborne pathogens exposure control training**:

Although any area of our site could present an emergency risk of exposure, **extra caution should be observed by contractors in the following areas:**

1. **Cleaning Areas and Outhouses:**

   Blood and/or body fluids may be found on soiled/broken glass or metal shavings. ***Check carefully before handling.***

2. **Cleaning Grounds and Exterior Trash Handling**

   Use gloves and tongs for handling of all potentially hazardous material.

3. **Providing First Aid – Good Samaritan during an Emergency**

   Blood and/or body fluids can easily be transferred during an emergency situation if protective equipment is not worn**. All blood / body fluids** should be treated as potentially infectious material.

General Responsibilities

Each contractor shall ensure the proper administration of all Bloodborne Pathogen Regulations. In general, the following guidelines shall be adhered to by each contractor:

A. Train all its team members with exposure. The plan shall be reviewed and kept current with OSHA Regulations as well as provide refresher training annually.

B. Have this plan available to any OSHA inspection upon request.

Prevention

Destiny USA is committed to eliminating or reducing the risk of bloodborne pathogen exposure. Implementation of the following guidelines by the contractors shall meet those responsibilities:

- The contractors shall review specific job duties and eliminate or minimize the exposure to human blood, body fluid, or other infectious material associated with any job task.

- The contractors shall provide, train, and ensure team member use of protective equipment in the form of latex gloves, eye shield, antiseptic wipes, and red biohazard collection bag (labeled as **BIOHAZARD** material).

- The contractors shall provide a piece of equipment necessary for handling contaminated items. This is a puncture resistant, leakproof container (red in color and labeled **BIOHAZARD** material) for discarding needles, syringes, broken (contaminated) glass, or other sharp objects.

Post Exposure Evaluation

In the event a team member does become exposed to bloodborne pathogens, follow the guidelines in the Blood Borne Pathogen safety bulletin in Appendix A.

34.0 HAZARD COMMUNICATION PROGRAM

Contractor Requirements

All contractors, at any tier, that will have team members working on the jobsite shall submit a copy of their Hazard Communication Program to the Safety Manager.

The contractor's Project Safety Representative shall ensure that all secondary containers are labeled with either an extra copy of the original manufacturer's label or with labels that have the identity and the appropriate hazard warning.

Material Safety Data Sheets

The contractor's Project Safety Representative shall establish and monitor the Project Material Safety Data Sheets (MSDS) Program for this project. He/she shall make sure procedures are developed to obtain the necessary MSDSs and shall review incoming MSDSs for new or significant health and safety information. He/she shall see that any new information is passed on to affected team members.

Team member Training and Information

Prior to starting work, each new team member of each contractor shall attend a Site Safety Orientation that includes the following information and training:

- An overview of the requirements contained in the Hazard Communication Standard.
- Hazardous chemicals present at his/her workplaces.
- Physical and health risks of the hazardous chemicals.
- The symptoms of overexposure
- How to determine the presence or release of hazardous chemicals in his/her work area
- How to reduce or prevent exposure to hazardous chemicals through the use of control procedures, work practices and personal protective equipment
- Steps the Company has taken to reduce or prevent exposure to hazardous chemicals
- Procedures to follow if team members are overexposed to hazardous chemicals.
- How to read labels and review MSDSs to obtain hazard information

- Fire fighting and personal protection procedures.
- Location of MSDS file and written Hazardous Communication Program

Prior to introducing a new chemical, each team member shall be given information and training as outlined above as part of the activity plan review for the new chemical hazard.

After attending any training class, each team member shall sign a form to verify that he attended the training, received written materials, and understood the policies on hazard communication.

Hazardous Non-Routine Tasks

Periodically, team members are required to perform hazardous non-routine tasks. Prior to starting work on such projects, each affected team member shall be given information by their supervisors (as part of the activity plan) about hazardous chemicals to which they may be exposed during such activity.

List of Hazardous Chemicals

It is the responsibility of the contractor's Project Safety Representative to compile a list of all hazardous chemicals used by all contractors using MSDSs on this project. This list will be composed of the table of contents from each MSDS book and will be updated as necessary. A copy of the list is kept in the Field Office of that contractor and a copy shall be transmitted to the Construction Manager.

Informing Other Contractors

The Construction Manager shall ensure other contractors with team members who may be exposed to hazardous chemicals used by them at this jobsite have access to the following information:

- Where the MSDSs are available
- The name and location of the hazardous chemicals or materials to which their team members may be exposed and any appropriate protective measures required to minimize their exposure.
- An explanation of the labeling system used at the jobsite.

The contractor's Project Safety Representative will ensure that each contractor bringing chemicals or materials on this jobsite will provide the Construction Manager with the appropriate hazard information of those substances.

Refer to the Hazard Communication Safety Bulletin in Appendix A for the complete written site program.

35.0 HEARING CONSERVATION PROGRAM

The purpose of the Hearing Conservation Program is to prevent hearing loss that may be caused by prolonged exposure to loud noise. Exposure to high levels of sound may cause damage to the ear resulting in temporary or permanent hearing loss. The extent of the damage to hearing is related to the intensity of the noise and duration of exposure.

Hearing Conservation Measures

- Monitoring team member's exposure to noise.
- Use of hearing protection.
- Engineering and administrative controls to reduce noise such as moving portable generators farther away from the work area to reduce exposure.
- Posting of high noise areas requiring the use of hearing protection.
- Team member training, stressing the effects of noise exposure and the use of hearing protection.
- Refer to the Hearing Conservation Program Safety Bulletin in Appendix A for additional requirements.

36.0 INCIDENT INVESTIGATION AND REPORTING

The purpose of this section is to establish and implement incident investigation and reporting procedures that will benefit the project in the following ways:

- Improve incident prevention on site, which will reduce number and degree of occupational illnesses and injuries.
- Allow steps to be taken to remove causes and eliminate future incidents.
- Reduces workers' compensation, public liability insurance, and property damage as well as increases worker productivity.

36.1 Major Accidents or Incidents

All accidents or incidents, including fire, that result in serious injury, a fatality, damage to property or equipment shall be investigated by the Construction Manager, Project Safety

Manager, and Superintendent. Representatives of contractors directly or indirectly involved in the incident will also participate.

Depending on the nature and severity of the incident, representatives of the Client and outside third parties (OSHA in the event of a fatality, manufacturer in the event of equipment failure, etc.) may participate in the investigation.

A thorough in-depth incident investigation shall begin as soon as possible. A formal report shall be filled out within 24 hours and shall include, but not be limited to, the following:

- Analysis of the accident or incident.
- Signed witness statements.
- Photographs, sketches and/or drawings
- OSHA must be notified within eight (8) hours of a fatality or accident that results in the hospitalization of three (3) or more individuals. The Construction Manager is responsible for making this notification, preferably after the Construction Manager has completed its initial investigation.

Forms to be utilized in the investigation of major accidents or incidents as applicable are as follows:

- Site First Report of Injury
- Witness Statement
- Any report forms required by the Client

Contractors shall submit a copy of their report(s) to the Construction Manager. A copy of this report shall be sent to the Construction Manager Corporate Safety Director.

36.2 OSHA Recordable / First Aid Incidents

All accidents or incidents that require medical treatment by a licensed physician or simple on-site first aid shall be investigated by the Project Safety Manager and Superintendent and the contractor representative.

The First Report of Injury or equivalent and any Client required reports shall be completely filled out by the contractor's Project Safety Manager or Superintendent. A copy of these reports shall be distributed within 24 hours of the occurrence to the following:

- Client
- Construction Manager Safety Director
- Project File

This report shall be kept in the project files.

36.3 Property Damage / Small Fire

Any accident, incident, or fire that results in moderate damage to property or equipment shall be investigated by the Construction Manager and representatives of affected contractors. Photographs of damaged equipment or property should be taken.

A Loss Report shall be completely filled out by the Project Safety Manager or Superintendent. A copy of this report shall be distributed within 24 hours of the occurrence to the following:

- Client
- Construction Manager Corporate
- Project File

The contractor(s) shall submit a copy of its report to the Construction Manager. This report shall be kept in the project files.

The Construction Manager shall give written notice to the responsible contractors that they will be held accountable for all damages. The Construction Manager shall make sure the responsible contractor(s) have notified their respective insurance carriers.

36.4 Near Miss

A near miss is an incident that had the potential to cause personal injury or damage to property or equipment but did not.

An example of this could be a piece of material that is knocked over the edge of an upper floor and lands on the ground without incident.

Contractors shall report any near miss to the Construction Manager, Project Safety Manager, or Superintendent.

The involved contractor shall investigate the incident and determine what action shall be taken to prevent recurrence.

The contractor's Project Safety Manager or Superintendent shall complete the First Report of Incident within 24 hours of the incident. This report shall be distributed to:

- Client
- The Construction Manager Corporate Safety Director
- Project File

37.0 PERMITS

The permitting requirements and safeguards contained in this Section are intended to minimize the possibility of personal injury, property damage, or interruptions during the performance of various activities.

Compliance with these permitting requirements is mandatory. Anyone violating these requirements shall be subject to immediate dismissal from the project.

Excavation Permit

Introduction:
An excavation at this site is defined as: Any man made cut cavity, trench, or depression in soils or earth.

Requirements:

A permit shall be required for any excavation on this site with a depth of 5 feet or more. This shall be completed and notice given to the owners safety director ASAP but a least 48 hours prior to digging. Protection shall be in place for such an excavation.

A Competent Person must be designated in writing (using the form in section 38.0) and present at all the above operations. He or she shall be capable of determining soil types, hazards, and have the ability to stop the work if needed. Whenever possible and there is adequate room, the contractor shall attempt to bench vs. slope and use the Class C angle of repose. If a shield or box is used, tabulated data or manufactured data shall be kept of the job site.

The contractor shall determine if there are any underground utilities or hazards (gas, sewer, water, telephone, and fiber optic) prior to any excavation activity and the Utility Safety Checklist contained in the forms section of this plan (38.0).

Safe means of exit (ladder, ramp, earth embankment, or stairway) shall be provided for any excavation four feet or more in depth. No more than 25 feet of lateral travel shall be allowed for any team member to gain access to a safe egress.

Team members shall not work in excavations in which there is an accumulation of water.

Any team member working in an excavation shall be protected from excavated materials and equipment. All excavated materials and equipment shall be kept back at least two feet from the opening.

All wells, pits, shafts etc. must be guarded or covered.

Upon completion of work, any temporary well, pit, shaft etc. must be backfilled ASAP.

In areas with known contaminated soils, i.e., "hot" spots, the excavation shall be tested or air contaminants and lack of oxygen. No one shall be allowed to enter the excavation until air sampling has been completed and then one member of the excavation team shall don a gas meter at all times while in the excavation, i.e., continuous monitoring.

38.0 FORMS AND CHECKLISTS

See following sample forms and checklists

Competent Person Form

Definition

A competent person is that person who has the ability to recognize existing and predictable hazards, has the knowledge to correct them, and has authority to take the necessary action(s) to correct them.

Responsibility

The designated competent person for __(Project)_______ is responsible for recognizing and correcting safety risks/hazards encountered or predicted. They have the **AUTHORITY** to stop all work in the affected area when necessary due to identified hazards. The competent person for an activity must be onsite and observe the ongoing work. A person may be competent in more than one area (e.g. fall protection, scaffolding, rigging, etc.) and a work activity may require more than one competent person (e.g. one for rigging and one for excavation). Multiple work areas and multiple crews may also require additional competent persons. Competent persons must be identified by name on the activity plan for the work.

This form must be completed for each person that will be designated as a competent person on this jobsite.

Acknowledgement

I, __(Project Manager/Project Superintendent)__, representing ______(Company)__, have assigned _____(Competent Person name)_______ to be a designated competent person in the area(s) circled below. I acknowledge that this individual is thoroughly trained and/or experienced in the recognition of hazards associated with the work and is authorized to take all necessary actions, up to and including stopping the work, until the potentially hazardous condition or imminent danger situation has been abated and it is safe to resume activities.

Project Manager/Project Superintendent:

Name: ____________________________________ Signature: _________________________________

Title: _____________________________________ Date: _____________________________________

I, __(Competent Person)__ acknowledge that I have been thoroughly trained and/or have the experience to perform the duties as the competent person for ____(Project name)______, in the areas circled below including knowledge of the specific OSHA standard. I understand that I have the authority and responsibility to correct any and all potential hazardous conditions and to stop all work in the event of imminent danger.

Fall Protection	Scaffolding	Rigging
Lead	Lockout/Tag out	Confined Space
Silica	Excavation	Respiratory Protection
Electrical	Traffic Control	Other (List): ___________
		___________
		___________

Competent Person Signature: _________________________________

Date: ________________

(safety file)

DESTINY USA

Activity Plan Daily

Supplement to the Major Activity Plan or for Short Work Activity

Date: ______________________ Jobsite: ______________________

Prepared By: ______________________ Job/Code Number: ______________________

Competent Persons: Use these people as a resource in planning and point them out to your crew as a source of expert help.

Confined Space	☐ Yes ☐ No		Rigging	☐ Yes ☐ No	
Traffic Control	☐ Yes ☐ No		Lead/Silica	☐ Yes ☐ No	
Fall Protection	☐ Yes ☐ No		Scaffolding	☐ Yes ☐ No	
Excavations	☐ Yes ☐ No		Electrical	☐ Yes ☐ No	

General description of activity:	Productivity goals for today (Needs to be clear to the crew):

Work Activity / Hazard Analysis: Work with your crew and competent persons to develop a safe and efficient plan for completing the work. See the checklists on the second page for reminders and requirements – attach more sheets as necessary. Modify activity steps as necessary to reduce / control / eliminate hazards.

Work Steps	**Hazards**	**Controls / Solutions**

Quality Assurance and Quality Control

1. Have you reviewed the project activity plan in its entirety including the QA/QC Checklist? ☐ **Yes** ☐ **No**
2. Does the project activity plan need to be updated or modified? ☐ **Yes** ☐ **No**

Emergency Planning

Small tools, materials, consumables & equipment:

1. ______________ 7. ______________
2. ______________ 8. ______________
3. ______________ 9. ______________
4. ______________ 10. ______________
5. ______________ 11. ______________
6. ______________ 12. ______________

Escape Route / Assembly Point:

Locate showers / alarms and other emergency devices:

Emergency Number:

Reminders – Will you need?

Lockouts	☐ Yes ☐ No	Equip. Insp. Card	☐ Yes ☐ No	Special Licenses	☐ Yes ☐ No
Staging Inspection	☐ Yes ☐ No	MSDS Review	☐ Yes ☐ No	Barricades	☐ Yes ☐ No
Hot Work Permit	☐ Yes ☐ No	Dig Safe	☐ Yes ☐ No	Prelift Checklists	☐ Yes ☐ No
Fire Extinguishers	☐ Yes ☐ No	Temporary Power	☐ Yes ☐ No	Assured Grounding	☐ Yes ☐ No
Rigging Inspection	☐ Yes ☐ No	Welding Leads / Outlets	☐ Yes ☐ No		

Hazard(s) Identified in Planned Work Activity, Need Solutions
Please circle yes or no, if you circle yes show solutions in the plan.

Yes ☐	No ☐	Cold/hot/wet, weather (outside work)	Yes ☐	No ☐	Repetitive Motion
Yes ☐	No ☐	Do They Need A Place To Tie Off?	Yes ☐	No ☐	Slippery Surfaces (oils/water/ice/chemicals)
Yes ☐	No ☐	Pinch/Crush Points	Yes ☐	No ☐	Rotating Equipment tools
Yes ☐	No ☐	Sharp Edges/Objects	Yes ☐	No ☐	Sharp Hand Tools
Yes ☐	No ☐	Electrical (current)	Yes ☐	No ☐	Dermatitis/Skin Disorders (poison ivy/oak/sumac/chemicals)
Yes ☐	No ☐	Hot Work (welding/burning/cutting)	Yes ☐	No ☐	Punctures (splinters/tie wire/nails/shavings)
Yes ☐	No ☐	Hot Pipes/Objects	Yes ☐	No ☐	Traffic Exposure
Yes ☐	No ☐	Vibration Tools	Yes ☐	No ☐	Airborne hazards (dust, silica, lead, welding fume, other)
Yes ☐	No ☐	Chemicals and Burn Causing Substances	Yes ☐	No ☐	Demolition
Yes ☐	No ☐	Biohazards (blood borne pathogens)	Yes ☐	No ☐	Working over / under others

SELECT, ORDER, USE THE APPROPRIATE PROTECTION FOR THE SPECIFIC HAZARD IDENTIFIED ABOVE.
REMEMBER: ENGINEER THE HAZARD OUT, PPE IS LAST RESORT

Gloves					Special Eye Care	**Lockbox Information**
	Anti-Vibration		Rubber		Goggles	Lockbox Number:
	Cold Temperature		Tig		Spare Clean Safety Glasses	
	Cotton		Welding		Face Shields	Lockbox Location:
	Cut Resistant		Special		Clean Hardhat Regularly	
	Drivers				Eye Wash Station	
	High Voltage				Overhead Work	
	Kevlar				Lens Cleaning Station	LOTO Coordinator:

How about an Observation today? It's your turn!

Crew signatures – By signing here you are indicating that the plan has been explained to you and you understand your role.

Name	ID #	Name	ID #

Were there lessons learned, problems or things that need to be changed? Possible problems with information / materials / coordination / equipment, etc. ☐ Yes ☐ No
Explain.

Did we remove locks ☐ Yes ☐ No ____________
Remove barricade tape ☐ Yes ☐ No ____________
Clean up work area ☐ Yes ☐ No ____________
Other ____________

Reviewed By:

Supervisor	Safety	Other

End of Shift Signatures:

Name:	ID #	Were you injured today?	Name:	ID #	Were you injured today?
		YES☐ NO☐			YES☐ NO☐
		YES☐ NO☐			YES☐ NO☐
		YES☐ NO☐			YES☐ NO☐
		YES☐ NO☐			YES☐ NO☐
		YES☐ NO☐			YES☐ NO☐

PROJECT HAZARD ANALYSIS

1. Receive material on site unload	Material Handling	Stack steel on level ground so it won't fall over Use proper rigging equipment
2. Lift into position (crane)	Heavy Lifting	Use crane of lift heavy pieces No one is allowed under steel lifted by crane All rigging checked by competent person prior to lift Crane radius protected at all times Secure steel pieces as they are placed on building Prelift checklist done for lifts >75% of chart capacity
3. Bolt up/Weld	Fire hazard Fall hazard Welding and cutting Housekeeping Ventilation Ladders	Required portable fire fighting equipment available, properly located and maintained Safety harness and lanyards used when exposed to falls greater than 6" Use proper PPE at all times (Personal Protective Equipment) Review MSDS sheets Ladders extended 36" above landing and secured Daily inspection of ladders Proper Personal Protective Equipment provided, in good condition and being used All oxygen and acetylene gauges in working condition All oxygen and acetylene hoses in good condition and free of grease and oil Use Mechanical lighter for igniting torches, No cigarette lighters or matches Store Oxygen and Acetylene cylinders upright, in designated areas w/caps in place Locate All Oxygen & Acetylene hose in a proper position so as not to be damaged by moving equipment or to create a tripping hazard Electric arc welding cables in good condition and properly attached by lugs to Welding Machine

Equipment To Be Used	**Inspection Requirements**	**Training Requirements**
Fork Lift Crane Welder Cutting Torch	Back up Alarms Horns Crane Inspection Welding/Cutting Equipment Fire Extinguishers	Safe operation of welding and cutting equipment Weekly tool box talks Proper ventilation or use of Respirator Use experienced, certified welders Haz-Com Rod holders in good condition Shields provided to protect other workers from flash burns Welders' shields and helpers' goggles in good conditions and equipped with proper lenses Fire extinguishers provided within 25' of welding, cutting or burning operations All flammable material removed from welding, cutting and burning operations areas

PROJECT HAZARD ANALYSIS

Activity Structural Steel/Misc Metal Analyzed By/Date ________________ Review By/Date ________________________________

Principal Steps	Potential Hazards	Recommended Controls
1. Receive and store material 2. Set up work area (ladders) 3. Set up sprayers 4. Mix Paint 5. Apply paint –all walls, doors, etc. 6. Handle waste paint, rags, solvents	Material handling Fires Health - MSDSs	Use proper PPE Illumination in work areas adequate Review MSDS sheets for paint, caulk, cleaning solvents (Haz-Com) Required portable & fire fighting equipment available, properly located and maintained Approved metal safety cans used for handling and use of flammables "No Smoking or Open Flame" sign posted in storage area Flammable liquids stored in flammable cabinets Solvent waste stored in approved containers in a Hazardous waste storage area Solvent rags stored in covered metal containers Respiratory protective equipment provided and worn when workers exposed to harmful dusts, fumes, and gases. Written plan in place. Paint in areas where other contractors have been removed

Equipment To Be Used	Inspection Requirements	Training Requirements
Hand and power tools Spray guns Generator Ladders	Daily inspection Take defective tools out of service and remove from site Inspect fire extinguishers	Haz-Com training Weekly job site safety tool box talks Review manufacturers' steps to applying paint products Review manufacturers' specifications on caulking

PROJECT HAZARD ANALYSIS

Activity: Analyzed By/Date ____________________ Review By/Date _________________

Principal Steps	Potential Hazards	Recommended Controls
Equipment To Be Used	**Inspection Requirements**	**Training Requirements**

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Steel Erection Checklist

Project Managers/Project Superintendents:

1. Do the steel erectors have a contract with us? Yes___ No___
   If NO, stop here.
   If YES, have the erectors been given written verification of the following:

   A. Curing to a level that would provide adequate strength. Yes___ No __
   B. Prior to erecting columns have any anchor rods or bolts been repaired, replaced and/or modified, and if so were these modifications done with the written approval of the project engineer of record. Yes___ No___

2. Do we control the site layout"? Yes____No ____
   If NO, stop here.
   If YES,

   A. Have we provided and maintained adequate access roads into and through the site for safe delivery and movement of equipment, materials and pedestrians and vehicle traffic. Yes___ No___
   B. Is there adequate space for safe storage of materials and safe operation of erector equipment which is:

firm and	____	properly graded	____
drained	____	readily accessible	____

3. Have we ensured that no other team members are allowed below the steel erection activity unless overhead protection is in place? Yes No

4. Is there inspection of fall protection left in place by the erectors. Yes____No ____

5. Have we asked the erectors for a site-specific erection plan? Yes____No ____

6. Have we asked the erectors for their site-specific fall protection plan? Yes____No ____

______________________________ ______________________

Project Manager/Superintendent Signature Date

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UTILITY SAFETY CHECKLIST

EXCAVATION/PILE DRIVING/DRILLING/FENCING

PROJECT: ______________________________

WORK DESCRIPTION: ______________________________

SPECIFIC LOCATION OF WORK: ______________________________

ANSWER YES OR NO TO ALL THAT APPLY, N/A FOR ITEMS THAT ARE NOT APPLICABLE

Utility	Location Identified and Clearly Marked	Utility Shut Off	Locked Out	Demo Supt. Aware of Utilities that Remain
GAS				
ELECTRIC				
WATER				
FIRE PROTECTION				
TELEPHONE				
STEAM				
SEWER				
COMPUTER				
PROCESS LINES				
OTHER (LIST):				
REMARKS/NOTES:				

THE SUPERINTENDENT AND APPROPRIATE SUBCONTRACTOR SUPERINTENDENT (S) WILL COMPLETE AND SIGN-OFF ON THIS FORM PRIOR TO ALLOWING ANY EXCAVATION OR DEMOLITION WORK TO BEGIN

SUPERINTENDENT: ______________________________ DATE: ____________________

SUBCONTRACTOR: ______________________________ DATE: ____________________

SUBCONTRACTOR SUPERINTENDENT: ____________________

Excavation Permit

1. Name of Company performing work: ____

2. Description of work: ____

   ____

   ____

3. Excavation Equipment to be used:

4. Has equipment been grounded? __________

5. Is Lock out or blocking needed? _________

6. If performing in impacted soil areas, has air sampling been conducted and all precautions followed? Is a Confined Space Permit needed? ____

7. Who is your competent person? ____

8. What is the soil type and how determined? If not type C, what tests used to determine soil type?

9. What is the method of protection if over 5 feet?

10. What is the method of safe exit if over 4 feet?

Signatures:

Date: _____________

Excavation Supervisor: ____

Authorized Permit Issuer: ____

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BURNING, WELDING AND HOT WORK PERMIT

BOTH PAGES OF PERMIT
MUST BE COMPLETED.

☐ Good this date only ____________

☐ From _________ to ____________

Permit is required prior to starting any welding, burning, soldering, or other flame/spark-producing activity.

Requested by ____

Location ____

Nature of work ____

____

____

I certify that the location where the above work is to be done has been personally examined. The required been checked as indicated.

Contractor Superintendent ____

Superintendent ____

I have been properly instructed in appropriate hot work procedures and understand my duties.

WORKERS:

____

____

I have been properly instructed in my duties as Fire Watch.

SIGNED:

____

Areas exposed to flame, sparks, slag, etc., were checked at least 30 minutes after work was completed.

SIGNED:

____

____

Original:	Superintendent
Copy:	Post at Job - Return to

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BEFORE THIS PERMIT CAN BE SIGNED, THE FOLLOWING RULES MUST BE SATISFACTORILY COMPLETED WITH AN APPROPRIATE BOX CHECKED:

1. Sprinkler System: ☐ In service ☐ Out of Service ☐ Not Applicable

2. The following applicable precautions must be taken:
   - A. Hazardous work in the area stopped.
     ☐ Yes ☐ No
   - B. Pump and valves containing flammable liquids must be locked and tagged.
     ☐ Yes ☐ Not Necessary
   - C. Glass lines in the immediate area must be drained and flushed.
     ☐ Yes ☐ Not Necessary
   - D. Area swept clean and wet down - floors and surroundings.
     ☐ Yes ☐ Not Necessary
   - E. All combustibles moved 30-40 feet from operation or protected with an approved material.
     ☐ Yes ☐ Not Necessary
   - F. All floor or wall openings adequately protected.
     ☐ Yes ☐ Not Necessary
   - G. Men assigned to watch for dangerous sparks in area as well as above and below.
     ☐ Yes ☐ Not Necessary
   - H. Proper Fire Protection - Hoses or adequate extinguishers.
     ☐ Yes ☐ Not Necessary
   - I. Electrical, circuit turned off and locked out or fuses pulled.
     ☐ Yes ☐ Not Necessary

3. No burning, welding, electrical or other hot work to be permitted in the presence of flammable dust, vapors and liquids or unpurged tanks, lines, etc., and equipment previously containing such material.
   - A. Tanks, lines, other equipment, cleaned and purged.
     ☐ Yes ☐ Not Necessary
   - B. Atmosphere tested for flammable vapors.
     Tested by ______________________________
     % ______Time __________________________
     Not Necessary ___________________________ (Signature)
   - C. Confined space entry permit completed.
     ☐ Yes ☐ Not Necessary

4. Burning, welding, or hot work equipment inspected and found in safe condition? ☐ Yes
   Welding screens necessary? ☐ Yes

5. Area, including floors above and below where exposed, should be checked at least 30 minutes after work is completed... Person assigned? ☐ Yes

6. Gas Cylinders are not exposed to heat sources above ambient conditions. ☐ Yes

7. Additional precautions:____

Contractor Pre-Qualification Form

1. LIST EXPERIENCE MODIFICATION RATE FOR THE PAST THREE YEARS

Contractor Name: ___________________ Telephone #: ________________ Date: ______________

Year	
20___	____
20___	____
20___	____

2. FROM LAST YEAR'S OSHA NO. 300 LOG:

A. NUMBER OF FATALITIES ____________

B. NUMBER OF LOST WORKDAY CASES ____________

C. NUMBER OF INJURIES AND ILLNESSES WITHOUT LOST WORKDAYS ____________

D. TEAM MEMBER HOURS WORKED LAST YEAR ____________

A. INDICATE HOW OFTEN TOOLBOX SAFETY MEETINGS ARE HELD.

____

B. ARE REGULAR SAFETY/HOUSEKEEPING INSPECTIONS CONDUCTED?

____

C. DO YOU HAVE AN ACCIDENT INVESTIGATION PROCEDURE? Explain

____

D. INDICATE HOW OFTEN JOBSITE FOREMEN'S SAFETY MEETINGS ARE HELD.

____

3. PLEASE INDICATE THE FOLLOWING:

4. PLEASE SUBMIT:

A. COPIES OF OSHA NO. 300 LOG FOR THE PAST CALENDAR YEAR

B. VERIFICATION BY YOUR INSURANCE CARRIER OF THE EMR LISTED IN ITEM #1 ABOVE, INCLUSIVE OF EXPLANATION IF EMR IS GREATER THAT 1.00.

C. SUBMIT YOUR WRITTEN SAFETY PROGRAM INCLUDING SAFETY ORIENTATION FOR NEW HIRES AND ANY ADDITIONAL TRAINING FOR FORMEN.

D. SUBMIT YOUR HAZARD COMMUNICATION PROGRAM.

5. DO YOU HAVE THE FOLLOWING PROGRAMS?

ASSURED EQUIPMENT GROUNDING _______ LOCKOUT/TAGOUT _______

DRUG FREE WORKPLACE _______ _______

SAFETY INSPECTION

PROJECT: ____ **DATE:** ________________

CONDUCTED BY: ____

The purpose of this checklist is to assist the Construction Supervisor in identifying conditions that can be corrected so as to eliminate, or at least minimize, team member exposure to injuries or unhealthful conditions and is not designed to include every possible situation that could be potential hazard.

		Yes	No	NA
1.	Is the OSHA Safety and Health protection poster on the job?			
2.	Are emergency phone numbers conspicuously posted?			
3.	Are first-aid kits and supplies on the job?			
4.	Is temporary lighting adequate?			
5.	Are warning signs and posters adequate?			
6.	Is there an adequate supply of personal protective gear available? • Hard Hats • Fall Protection (Harness & Lanyard with shock absorber) • Hearing Protection • Eye and Face Protection • Respiratory Protection			
7.	Are all personnel wearing the appropriate personal protective gear?			
8.	Is there an adequate slope or support provided for all trenches, and are all excavations barricaded? Is there a competent person on site for excavations?			
9.	Is temporary electrical service grounded, and is all other electrical equipment grounded? Are ground fault circuit interrupters (GFCI) being used?			
10.	Are all electrical hand tools double insulated or equipped with three-wire ground plugs?			
11.	Is the housekeeping adequate - are all aisles, passageways and stairways clear of obstructions?			
12.	Have safety hazards (such as protruding nails, broken tools, trash, etc) been removed?			
13.	Are all ladders in good condition no broken rungs, no rotten wood, etc.?			
14.	Is there an adequate number of ladders for this job, and are all ladders in use tied off at the top?			

SAFETY INSPECTION – cont'd

		Yes	No	NA
15.	Is all scaffolding material is good condition? Is there a competent person on site for scaffolding?			
16.	Do all scaffolds have stable footing and complete bracing?			
17.	Hazard Communications Standard being complied with?			
18.	Do all guardrails on scaffolds meet the requirements?			
19.	Do all scaffolds meet the planking requirements?			
20.	Do all elevators, floor openings, stairs, floor perimeters and roof perimeter have the adequate guardrails?			
21.	Have cranes and all other hoisting equipment been thoroughly inspected, and is there a record of the inspections on file?			
22.	Are there any fire hazards on the job that could be eliminated?			
23.	Is the jobsite fire protection adequate? • Fire Extinguishers - Have they been checked? • Available Water Hoses • Barrels of Water with Buckets			
24.	Is there adequate clearance between equipment or machinery and energized power lines?			
25.	Is there temporary filler material installed in metal stairways?			
26.	Is the record of injurers and illness properly maintained and on file?			
27.	Are there jobsite toolbox safety meetings being held at least once a week?			
28.	Is there a competent person appointed as safety representative on the job?			
29.	Does my Company's safety program meet OSHA requirements?			
30.	Are all new team members indoctrinated with respect to their individual safety responsibilities?			
31.	Do my personal safety practices set a good example for all team members?			

32: Good Practices/Safe Behaviors Observed:______________________________________

____

____

Attach a separate page with explanations, actions, and completion dates for each item checked NO.

39.0 RECORDKEEPING

This section summarizes the documentation and recordkeeping requirements contained throughout this program.

Orientation

The Contractor Safety Orientation shall be documented and include:

- Date of Orientation
- Project Name
- Attendees' signature and employer
- Instructor's signature
- Topics discussed

Copies of this documentation shall be maintained in the Project files.

Tool Box Meetings

Contractors are required to conduct and document weekly toolbox meetings. Documentation shall include:

- Date of Meeting
- Project Name
- Company Name
- Signed Attendance Sheet
- Topic discussed
- Name of individual conducting meeting

Contractors are required to submit a copy of all meeting minutes to the Construction Manager. This documentation shall be maintained in the Project files.

Training and Safety Meeting Records

All Safety Meetings and training sessions involving the Construction Manager and/or contractors shall be documented and a copy maintained in the Project files.

Safety Inspections and Audits

A copy of all documented safety inspections and audits as described in Section 5.0, as well as any documented safety inspections conducted by the Client and contractors, shall be maintained.

The contractor's Superintendent shall provide a written response to the Construction Manager of all discrepancies and/or recommendations noted on inspection reports. The response shall note what action was taken in response to each discrepancy and/or recommendation.

Monthly Reports

The Construction Manager shall include a Safety Status Report in each monthly progress report to the owner and Risk Manager.

The Safety Status Report shall include the following information:

- Cumulative work hours worked on the Project.
- Number of work hours worked that month.
- Number of work hours without a lost-time accident.
- Incident rates for Lost Workday Cases; Non-Fatal OSHA Recordable Cases without Lost Workdays; Lost Workdays.
- Brief summary of any incidents or accidents that occurred during the month.
- Listing of any new contractor on site since the last month's report.

Accident Reports

Copies of all accident, incident and near-miss reports shall be distributed to:

Construction Manager Safety Director
Corporate Safety Department
Client/Owner (when applicable)
Project File
Insurance Company (if OCIP)

OSHA Recordkeeping

Each contractor shall independently maintain their own OSHA 300 logs.

The Construction Manager shall be responsible for maintaining the site OSHA 300 log.

40.0 RETURN TO WORK PROGRAM

Destiny USA and Destiny USA are committed to a Return-to-Work Program on this site. It is better for the worker and for the company for workers to return to work as soon as possible from both work related and non-work related injuries. Procedures are in place to allow workers to return to work within their capacity identified by their doctor.

Our goal is to reduce Workers' Compensation costs and minimize the effect of injuries on site operations and team member morale.

Refer to the Injury Management Safety Bulletin in Appendix A.

41.0 DRUG AND ALCOHOL PROGRAM

Each contractor shall be responsible for implementing a written program which includes, at a minimum:

1. A written drug and alcohol policy
2. Reasonable suspicion testing
3. Post accident testing
4. Pre employment/post conditional offer testing

Each program shall identify the consequences for violations. Destiny USA is a drug free, alcohol free project.
For any injury on the site that requires a trip to the clinic will require that employee to be subjected to a drug and alcohol test.

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APPENDIX A - SAFETY BULLETINS

1. Hazard Communication Program
2. Zero Energy State (LOTO)
3. Fall Protection Program
4. Excavation Safety
5. Crane Safety
6. Hoisting Personnel
7. Safe Rigging Operations
8. Confined Space Entry
9. Elevating Work Platforms
10. Scaffold Safety is Everyone's Responsibility
11. Injury Management
12. Work Area Barricade Protection
13. Watch for Fire, Smoke, and Sparks
14. Crystalline Silica Protection Program
15. Workplace Protection Program for Lead and Other Heavy Metals
16. Welding and Cutting Hazard Assessment Program

APPENDIX B - SPILL PREVENTION AND CONTROL

1. Spill Prevention and Control Plan
2. SPCC plan when becomes required (1320 gal total of oil in above ground tanks of 55 gal or larger)

SPILL PREVENTION AND RESPONSE PLAN

PREVENTION:

- Fuels and Hazardous Materials will be properly stored and labeled in designated areas away from any waterways or storm drains.
- Storm drains in area will be blocked using filter fabric, stone, and oil socks.
- All bulk fuel (B100 or other) will be stored in secondary containment or double walled tanks.
- Drip pans or oil pads will be used underneath fueling operations
- All pile hammers, vibratory hammers, and power packs will have biodegradable hydraulic oil in them (Chevron Clarity). Cranes will be evaluated on a case-by-case basis.
- Equipment operators to report any drips or leaks so repairs can be made. Use oil pads or pans to catch leak until fixed.

RESPONSE:

All spills will be handled in the following manner:

In the event of a petroleum spill, the first thing to do is remain calm, and attempt to contain the spill and prevent it from reaching any body of water. If spill is beyond your control, get help.

Notify your team leader as soon as possible.

- Area will be secured immediately to prevent entry into the environment. Do not put yourself at risk if you think the situation is unsafe or you do not know the chemical involved.

- Take any brief action, which will prevent or delay oil from reaching navigable waters. If oil has reached or may reach a water source, immediately deploy oil booms. This should be done for any spill involving a product entering water or possibly entering the water.

- Take any brief action, which will prevent or delay oil from spreading across the surface of the ground. This may require building a dike with oil booms, speedy-dry, rags, and pads or dirt to divert or contain the flow.

- Any danger of fire call, call 911 for the fire department

- Stop the source of the spill, if possible, by valving, plugging, caulking, or other means available.

- Call project superintendent to inform him of the spill. If he is not available, contact the safety specialist.

- Complete OIL SPILL REPORT FORM and call Corporate Safety Department within 30 minutes of the spill:

Contact ______???________(???) ???-????

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- **All petroleum spills** that occur within New York State (NYS) must be reported to the NYS Spill Hotline (1-800-457-7362) within 2 hours of discovery, except spills that meet **<u>all of the following criteria</u>:**
    1. The quantity is known to be less than 5 gallons; and
    2. The spill is contained and under the control of the spiller; and
    3. The spill has not and will not reach the State's water or any land** and
    4. The spill is cleaned up within 2 hours of discovery.

    **A spill is considered to have not impacted land if it occurs on a paved surface such as asphalt or concrete. A spill in a dirt or gravel parking lot is considered to have impacted land and is reportable. (Note: If the spill is to the gravel pad placed above the pavement in the parking lot, the spill will be considered to not have impacted land.)
- Call National Response Center (U.S. Coast Guard) **1-800-424-8802** within 2 hours if spill exceeds the RQ or reaches water.

- Clean up Area by:

    1. Double wash all solid, impervious surfaces with a strong non-hazardous detergent
    2. Place all oil stained soils and speedi-dri into DOT 55 gallon drums lined with a 6-mil poly bag
    3. Place all rags, pads, booms, and protective clothing into 6-mil poly bags and then into a 55-gallon drum. Keep all bags to a 30-pound limit.
    4. Label drums appropriately
    Remove all contaminated soils.

    Chemical spills will be handled in the same manner as fuel spills

- Destiny USA approved clean up contractor to handle spills bigger than we can handle ourselves:
  Clean Harbors, **(800) 544-3128**

Spill kits will be placed in the work area and adjacent to bulk oil and fuels tanks. These will provide supplies and PPE to perform clean up of spills

OIL SPILL REPORT

Spill Date: ______________ Time: ______________ a.m. o p.m. o

Spill Location: ______________ Street: ______________ Route No.: ______

State: ______________ Town: ______________ Country: ______________

Equipment Type, Make and Size: ______________ S/N: ______________

Weather: ______________ Oil Type: ______________ Amount Released: ______________

Amount Released: Basis for Estimate:

Did Spill Enter Water? o YES o NO Name of the Body of Water: ______________

Visual Observation of Water (oil, sheen, cloudy, etc.) ______________

Duration of Discharge From: ______________ To: ______________

Cause of Spill: ______________

____

Cleanup Measures/Description of Items Cleaned/Depth of Soil Removed ______________

____

Contractor used? o YES o NO Name of Contractor Used: ______________

Cleanup Completion: Date ______________ Time: ______ Amount Recovered ______________

Cleanup Waste: Name of Disposal Contractor

______________ bags/barrels soil/speedi-dri/brush ______________

______________ bags/barrels rags/pads/booms/burnables ______________

______________ other ______________

Name/Address Telephone of Property Owner Suffering Damages: ______________

____

Safety Dept. Contact: ______________ Date: ______________ Time: ______

Comments: ______________

____

Measures Taken To Prevent Reoccurrence of This Type of Incident ______________

____

I hereby certify to the best of my knowledge that the information contained in this report and attachments is accurate and complete.

Signature of Supervisor: ______________ Date: ______________

Name of Supervisor (Print): ______________

DEP Contact: ______________ Date: ______ Time: ______ Spill No. ______

NCR Contact: ______________ Date: ______ Time: ______ Spill No. ______

Contact Made to Agencies By: ______________ Date: ______ Time: ______

Ambient Testing: ______________

Chemical Testing: ____

(Send within 2 days of cleanup)

APPENDIX B

QUALITY ASSURANCE, QUALITY CONTROL PLAN

QUALITY ASSURANCE PROJECT PLAN
FOR
REMEDIAL ACTIVITIES

"PHASE I SITE"
DESTINY SITE
WEST HIAWATHA BOULEVARD
SYRACUSE, NEW YORK

Prepared for:

Gilberti Stinziano Heintz & Smith, P.C.
555 East Genesee Street
Syracuse, New York 13202

Prepared by:

Spectra Environmental Group, Inc.
19 British American Boulevard
Latham, New York 12110
Project #06448

May 2009

QUALITY ASSURANCE PROJECT PLAN
FOR REMEDIAL INVESTIGATION
REMEDIAL ACTIVITIES
DESTINY PHASE I SITE
WEST HIAWATHA BOULEVARD
SYRACUSE, NEW YORK

Table of Contents

1.0 Project Organization and Responsibility

This QAPP provides for designated qualified personnel to review sampling procedures, laboratory test methods, data results and data interpretations. This QAPP also outlines the approach to be followed to ensure that the remedial investigating results are of sufficient quality. This plan will provide for direct and constant operational responsibility, clear lines of authority, and the integration of QA activities. The various QA functions of the project positions are explained in the following subsections.

Project Manager
The project manager will have overall responsibility for ensuring that the project meets the objectives and quality standards as presented in the Work Plan and this QAPP. He/she will be responsible for implementing the project and will have the authority to commit the resources necessary to meet project objectives and requirements. The project manager's primary function is to ensure that technical, financial, and scheduling objectives are achieved successfully. The project manager will provide the major point of contact and control for matters concerning the project. In addition, he/she will be responsible for technical quality control and project oversight, and will be the primary point-of-contact.

Team Leaders
The project manager will be supported by a team leader or leaders who will be responsible for leading and coordinating the day-to-day activities of the various resource specialists under their supervision. The team leader is a highly experienced environmental professional who will report directly to the project manager.

Technical Staff
The technical staff (team members) for this project will be drawn from corporate resources and appropriately qualified subcontractors. The technical team staff will be used to gather and analyze data, and to prepare various task reports and support materials. The designated technical team members will be experienced professionals who possess the degree of specialization and technical competence required to effectively and efficiently perform the required work.

Project QA Director
The Project QA Director will be responsible for maintaining QA for the project. The position may be filled by the Project Manager, Team Leader, or another designated staff person.

2.0 QA Objectives for Data Measurement

Measurements will be made to ensure that analytical results are representative of the media and conditions measured. Unless otherwise specified, data will be calculated and reported in units consistent with other organizations who report similar data to allow comparability of databases among organizations.

The key considerations for the QA assessment of generated data are accuracy, precision, completeness, representativeness, and comparability. These characteristics are defined below:

Accuracy: Accuracy is the degree of agreement of a measurement or average of measurements with an accepted reference or "true" value and is a measure of bias in the system.

Precision: Precision is the degree of mutual agreement among individual measurements of a given parameter.

Completeness: Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount expected to be obtained under correct normal conditions.

Representativeness: Representativeness expresses the degree to which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition or and environmental condition.

Comparability: Comparability expresses the confidence with which one data set can be compared to another.

2.1 Goals

The QA/QC goal will focus on controlling measurement error within the limits established and will ultimately provide a database for estimating the actual uncertainty in the measurement data.

Target values for detection limit, percent spike recovery and percent "true" value of known check standards, and relative percent difference of duplicates/replicates are provided in the referenced analytical procedures. It should be noted that target values are not always attainable. Instances may arise where high samples concentrations, non-homogeneity of samples, or matrix interferences preclude achievement of target detection limits or other quality control criteria. In such instances, the laboratory will report reasons for deviations from these detection limits or noncompliance with quality control criteria.

3.0 Sampling Procedures

The sampling of various environmental media will be completed as part of the investigation activities. The proposed analytical testing for the site including location, matrix and analytical requirements, is contained within the investigation work plan.

3.1 Sampling Protocol

The following sections outline the sampling procedures for the collection of environmental media samples of soils and groundwater. Groundwater monitoring well installation procedures are described in the Work Plan.

3.1.1 Soil Samples from Geoprobe Soil Borings

Continuous soil samples will be collected from Geoprobe soil boring to the target depth as outlined in the Work Plan. An experienced geologist will observe the work associated with the soil borings.

Collected soil samples will be described according to soil type, color, texture, grain size, moisture content, and will be visually noted for physical indications of contamination, such as staining, oils, fill material and/or odor.

Each soil sample interval will be screened with a photoionization (PID-Minirae Model 2000 or equivalent) with a 10.6 eV lamp for the presence of elevated levels of volatile organic vapors.

During the drilling operations, the most impacted soil, based on field screening and visual observations, will be obtained from each sample sleeve or split spoon. A portion of this apparently contaminated soil will be containerized and the accumulated vapors within the container will then be subjected to headspace analysis for VOCs using the PID.

The VOC data from the headspace analysis, soil type and depth of sample will be used to select which soil sample is submitted for laboratory analyses.

Soil samples to be submitted for chemical analysis will be extracted from samplers using a stainless steel trowel, knife, or latex glove. Each sample container will be handled, packaged, and shipped in accordance with the procedures as outlined in Section 4.0.

3.1.2 Groundwater Samples From Monitoring Wells

New and existing groundwater monitoring wells will be developed prior to purging and sampling using disposable polyethylene bailers, dedicated inertial pumps or dedicated peristaltic pump tubing. Prior to development, wells will be allowed to equilibrate for at least 48-hours following installation. All development water will be collected and stored on site in 55-gallon drums. All drums will be labeled with paint markers according to matrix, location, and date of generation. Turbidity readings and the number of consecutive well volumes removed will be recorded during well development. The wells will be developed to reduce sediment and turbidity to the maximum extent possible.

Following well development, each well will be allowed to equilibrate for at least 24-hours prior to purging and sampling. Purging of each new and existing well will be performed with a low flow peristaltic pump and dedicated polyethylene tubing or disposable polyethylene bailers. Purging of each well for at least three consecutive well volumes or until dry will allow representative formation water to enter the well prior to sample collection. Visual observations or water quality field parameters (turbidity) will be recorded during the purging and sampling.

Immediately following the completion of purging and monitoring well recovery, groundwater samples will be collected using a dedicated disposable polyethylene bailer or low flow peristaltic pump with dedicated tubing. New latex gloves will be used for collection of each sample. Each sample container will be labeled, handled, packaged, and shipped in accordance with the procedures as outlined in Section 4.0.

3.2 Field Quality Control Samples

The following quality control samples will be used during the investigation activities.

3.2.1 Field Duplicates

Field quality control samples will be collected to verify reproducibility of the sampling and analytical methods. Field duplicates will be obtained as follows:

- one field duplicate soil sample collected from the Geoprobe soil borings;
- one field duplicate groundwater sample collected from one groundwater monitoring well;

3.2.2 Trip Blanks

Trip blanks will be used to assess whether samples has been exposed to volatile constituents during sample storage and transport. Trip blanks will be submitted at a frequency of once per cooler for samples to be analyzed for volatile organics. The trip blank will consist of a container filled by the laboratory with analyte-free water. The trip blank will remain unopened throughout the sampling event and will only be analyzed for volatile organics.

3.2.3 Matrix Spike/Matrix Spike Duplicates

Matrix Spike/Matrix Spike Duplicates (MS/MSD) will be obtained as follows:

- one MS/MSD soil sample collected from a representative Geoprobe soil boring; and
- one MS/MSD groundwater sample collected from representative groundwater monitoring well.

3.2.4 Laboratory Quality Control Checks

Internal laboratory quality control checks will also be used to monitor data integrity. These checks include method (equipment) blanks, spike blanks, internal standards, surrogate samples, calibration standards and reference standards.

3.3 Sample Containers

The volumes and container types required for the sampling activities will be based upon the specific lab procedure and SW-846 methodologies. Pre-washed sample containers will be provided by the laboratory. All bottles are to be prepared in accordance with EPA bottle washing procedures.

3.4 Decontamination

Dedicated and/or disposable sampling equipment will be used to minimize decontamination requirements and the possibility of cross-contamination.

The water level indicator, stainless steel trowels, split spoons and Geoprobe are pieces of sampling equipment to be used at more than one location. They will be decontaminated between locations by the following decontamination procedures:

- initial cleaning of any foreign matter with paper towels;
- low phosphate detergent wash;
- de-ionized water rinse; and
- air-dry.

3.5 Levels of Protection/Site/Safety

Field sampling will be conducted under a documented Health and Safety Plan (see Appendix B). On the basis of air monitoring, the level of protection may be downgraded or upgraded at the discretion of the site safety officer. Crew members will stand upwind of open boreholes or wellheads during the collection of samples, when possible.

All work will initially be conducted in Level D (refer to Site Specific Health and Safety Plan). Air purifying respirators (APRs) will be available if monitoring indicates an upgrade to Level C is appropriate.

4.0 Sample Custody

This section describes standard operating procedures for sample identification and chain-of-custody to be used for all field activities. The purpose of these procedures is to ensure that the quality of the samples is maintained during collection, transportation, storage and analysis. All chain-of-custody requirements comply with standard operating procedures indicated in USEPA and NYSDEC sample-handling protocol.

Sample identification documents will be carefully prepared so that sample identification and chain-of-custody can be maintained and sample disposition controlled. Sample identification documents include:

- Field records,
- Sample label,
- Custody seals, and
- Chain-of-custody records.

4.1 Chain-of-Custody

The primary objective of the chain-of-custody procedures is to provide an accurate written or computerized record that can be used to trace the possession and handling of a sample from collection to completion of all required analyses.

4.1.1 Sample Labels

Sample labels attached to or affixed around the sample container must be used to properly identify all samples collected in the field. The sample labels are to be placed on the bottles so as not to obscure any QA/QC lot numbers on the bottles. Sample information must be printed in a legible manner using waterproof ink. Field identification must be sufficient to enable cross-reference with the field sampling records or sample logbook. For chain-of-custody purposes, all QC samples are subject to exactly the same custodial procedures and documentation as "real" samples.

4.1.2 Custody Seals

Custody seals are preprinted adhesive-backed seals with security slots designed to break if the seals are disturbed. Sample shipping containers (coolers, cardboard boxes, etc., as appropriate) are sealed in as many places as necessary to ensure security. Seals must be signed and dated before use. On receipt at the laboratory, the custodian must check (and certify, by completing logbook entries) that seals on shipping containers are intact. Strapping or other clear packaging tape should be placed over the seals to ensure that seals on shipping containers are not accidentally broker during shipment.

4.1.3 Chain-of-Custody Record

The chain-of-custody record must be fully completed at least in duplicate by the field technician who has been designated by the project manager as being responsible for sample shipment to the appropriate laboratory for analysis. In addition, if samples are known to require rapid turnaround in the laboratory because of project time constraints or analytical concerns (e.g. extraction time or sample retention period limitations, etc.), the person completing the chain-of-custody record should note these constraints in the "Remarks" section of the custody record.

4.1.4 Field Custody Procedures

a. As few persons as possible should handle samples.

b. Sample bottles will be obtained pre-cleaned by the laboratory and shipped to the sampling personnel in charge of the field activities. Coolers or boxes containing cleaned bottles should be sealed with a custody tape seal during transport to the field or while in storage prior to use.

c. The sample collector is personally responsible for the care and custody of samples collected until they are transferred to another person or dispatched properly under chain-of-custody rules.

d. The sample collector will record sample data in a controlled field notebook and/or an appropriate field sampling records.

e. The site team leader will determine whether proper custody procedures were followed during the fieldwork and decide if additional samples are required.

4.2 Documentation

4.2.1 Sample Identification

All containers of samples collected from the project will be identified using the following format on a label or tag fixed to the sample container:

- YY – These initials identify the sample matrix in accordance with the following abbreviations:

  S-Soil
  GW – Groundwater
  V-Vapor

- ZZ – Sub Sample Type – Field duplicates, rinsate blanks and trip blanks will be assigned unique sample numbers (if applicable):

  DUP – Duplicate Sample
  TB – Trip Blank
  MS/MSD – Matrix Spike/Matrix Spike Duplicate

Each sample will be labeled, chemically preserved, if required, and sealed immediately after collection. To minimize handling of sample containers, labels will be filled out using waterproof ink and will be firmly affixed to the sample containers. The Sample label will give the following information:

- Name of sampler;
- Date and time of collection;
- Sample number;
- Intended analysis; and
- Preservation required.

4.2.2 Daily Logs

Daily logs and data forms are necessary to provide sufficient data and observations to enable participants to reconstruct events that occurred during the project. All daily logs will be kept in a notebook and consecutively numbered. All entries will be made in waterproof ink, dated and signed. Sampling data will be recorded in the sampling records. All information will be completed in waterproof ink. Corrections will be made according to the procedures given at the end of this section.

4.3 Sample Handling, Packaging and Shipping

The transportation and handling of samples will be accomplished in a manner that not only protects the integrity of the sample, but also prevents any detrimental effects due to the possible hazardous nature of samples. Regulations for packaging, marking, labeling and shipping hazardous materials are promulgated by the United States Department of Transportation (DOT) in the Code of Federal Regulations, 49 CFR through 177.

All chain-of-custody requirements will comply with standard operating procedures in the NYSDEC and USEPA sample handling protocol. Field personnel will make arrangements for transportation samples to the laboratory. When custody is relinquished to a shipper, field personnel will telephone the laboratory custodian to inform him of the expected time of arrival of the sample shipment and to advise him of any time constraints on sample analysis. All samples will be delivered to the laboratory no later than 48 hours from the day of collection.

5.0 Calibration Procedures and Frequency

Instruments and equipment used during sampling and analysis will be operated, calibrated, and maintained according to the manufacturer's guidelines and recommendations as well as criteria set forth in the applicable analytical methodology references.

5.1 Field Instruments

A calibrations program will be implemented to ensure that routine calibration is performed on all field instruments. Field team members familiar with the field calibration and operations of the equipment will maintain proficiency and perform the prescribed calibration procedures outlines in the Operation and Field Manuals accompanying the respective instruments. Calibration records for each field instrument used on the project will be maintained on-site during the respective field d activities and a copy will be kept in the project files.

5.1.1 Portable Total Organic Vapor Monitor

Any vapor monitor will undergo routine maintenance and calibration prior to shipment to the project site. Daily calibration and instrument checks will be performed by a trained team member at the start of each day. Daily calibrations will be performed according to the manufacturer's specifications and are to include the following:

Battery check: If the equipment fails the battery check, recharge the battery.

- Gas standard: The gauge should display an accurate reading when a standard gas is used.
- Cleaning: If proper calibration cannot be achieved, then the instrument ports must be cleaned.

5.1.2 pH, Specific Conductance and Turbidity (if applicable)

The following steps should be observed by personnel engaged in groundwater sampling for pH and specific conductance:

- The operations of the instruments should be checked with fresh standard buffer solution (pH 4 and pH 10) prior to each day's sampling.
- The specific conductance meter should be calibrated prior to each day's sampling using a standard solution of known specific conductance.
- The turbidity meter should be calibrated prior to each day's sampling using a standard solution of known turbidity.

More frequent calibrations may be performed as necessary to maintain analytical integrity. Calibration records for each field instrument used on the project should be maintained and a copy kept in the project files.

5.2 Laboratory Instruments

Laboratory calibration procedures are addressed in detail in the attached laboratory QAPP (Appendix A-1). All calibration will be consistent with the method used for analysis.

6.0 Analytical Procedures

6.1 Field

On-site procedures for analysis of total organic vapor and other field parameters are addressed in the Work Plan.

6.2 Laboratory

Analytical methods to be used for the sampling tasks are referenced in the NYSDEC's Analytical Services Protocols (ASP), 1995 or its most current version.

Specific analytical methods for constituents of interest in soil, groundwater, and air are listed in the RIWP. The laboratory will maintain and have available for the appropriate operators standard operating procedures relating to sample preparation and analysis according to the methods.

7.0 Data Reduction and Reporting

QA/QC requirements will be strictly adhered to during sampling and analytical work. Laboratory data generated will be reviews by comparing and interpreting results from chromatograms (responses, stability of retention times), accuracy (mean percent recovery of spiked samples), and precision (reproducibility of results).

Data storage and documentation will be maintained using logbooks and data sheets that will be kept on file. Analytical QC will be documented and included in the analytical testing report. A central file will be maintained for the sampling and analytical effort after the final laboratory report is issued.

Relevant calculations and data manipulations are included in the appropriate methodology references. Control charts and calibration curves will be used to review the data and identify outlying results. Prior to the submission of the report to the client, all the data will be evaluated for precision, accuracy, and completeness.

Laboratory reports will be reviewed by the laboratory supervisor, the QA officer, laboratory manager and/or director, and the project manager. Analytical reports will contain a data tabulation including results and supporting QC information will be provided. Raw Data will be available for later inspection, if required, and maintained in the control job file.

8.0 Internal Quality Control Checks

QC data are necessary to determine precision and accuracy and to demonstrate the absence of interferences and/or contamination of glassware and reagents. The procedures to be followed for internal quality control checks are to be consistent with NYSDEC and NYSDOH Programs.

9.0 Preventive Maintenance

9.1 Field

Field personnel assigned to complete the work will be responsible for preventative maintenance of all field instruments. The field sampling personnel will protect the portable total organize vapor monitors, temperature, conductivity, pH and turbidity instruments by placing them in portable boxes and/or protective cases.

Field equipment will be subjected to a routine maintenance program, prior to and after each use. The routine maintenance program for each piece of equipment will be in accordance with the manufacturer's operations and maintenance manual. All equipment will be cleaned and checked for integrity after each use. Necessary repairs will be performed immediately after any defects are observed, and before the item of equipment is used again. Equipment parts with a limited life (such as batteries, membranes and some electronic components) will be periodically checked and replaces or recharged as necessary according to the manufacture's specifications.

9.2 Laboratory

The laboratory's preventative maintenance procedures are provided in the laboratory's QAPP (Appendix A-1).

10.0 Data Assessment Procedures

Laboratory data results will be evaluated for accuracy, precision and completeness of collected measurement data.

10.1 Precision

Precision of a particular analysis is measured by assessing its performance with duplicate or replicate samples. Duplicate samples are pairs of samples taken in the field transported to the laboratory as distinct samples. Their identity as duplicated is sometimes not known to the laboratory and usually not known to bench analysts, so their usefulness for monitoring analytical precision at bench level is limited. For most purposes precision is determined by the analysis of replicate pairs (i.e., two samples prepared at the laboratory from one original sample.) Often in replicate analysis the sample chosen for replication does not contain target analytes so that quantification of precision is impossible. Replicate pairs of spiked samples, known as matrix spike/matrix spike duplicate samples, are used for precision studies. This has the advantage that two real positive values for a target analyte can be compared.

Precision is calculated in terms of Relative Percent Difference (RPD), which is expressed as follows:

$$RPD = \frac{\underline{(X_1 - X_2)} \times 100}{(X1 + X2)/2}$$

Where X_1 and X_2 represent the individual values found for the target analyte in the two replicate analyses or in the matrix spike/matrix duplicate analyses.

RPDs must be compared to the method RPD for the analysis. The analyst or his supervisor must investigate the cause of RPDs outside stated acceptance limits. This may include a visual inspection of the sample for non-homogeneity, analysis of check samples, etc. Follow-up action may include sample re-analysis or flagging of the data as suspect if problems cannot be resolved.

10.2 Accuracy

Accuracy of a particular analysis is measured by assessing its performance with ‘known” samples. These “knowns” can take the form EPA or NBS traceable standards (usually spiked into a pure water matrix), or laboratory prepared solutions of target analytes into a pure water or sample matrix, or (in the case of GC or GC/MS analyses) solutions of surrogate compounds which can be spiked into every sample and are designed to mimic the behavior of target analytes without interfering with their determination. In each case the recovery of the analyte is measured as a percentage, corrected for analytes known to be present in the original sample if necessary, as in the case of a matrix spike analysis. For EPA or NBS supplied known solutions, this recovery is compared to the published data that accompany the solution. For prepared solutions, the recovery is compared to EPA-developed data or historical data as available. For surrogate compounds, recoveries are compared to USEPA CLP acceptable recovery tables. If recoveries do not meet required criteria, then the analytical data for the batch (or, in the case of surrogate compounds, for the individual sample) are considered potentially inaccurate.

For highly contaminated samples, recovery of matrix spike may depend on sample homogeneity. As a rule, analyses are not corrected for recovery of matrix spike or surrogate compounds.

10.3 Completeness

Completeness is a measure of the amount of valid data obtained from a measurement system compared to the total amount expected to be obtained under normal conditions. Completeness for each parameter is calculated as:

Completeness = <u>Number of successful analyses x 100</u>

Number of requested analyses

Target value for completeness for all parameters is 100%. A completeness value of 95% will be considered acceptable. Incomplete results will be reported to the client project officer.

10.4 Representativeness

The characteristic of representatives is not quantifiable. Subjective factors to be taken into account are as follows:

- The degree of homogeneity of a site;
- The degree of homogeneity of a sample taken from one point in a site; and
- The available information on which a sampling plan is based.

To maximize representatives of results, sampling techniques and sample locations will be carefully chosen so that they provide laboratory samples representatives of the site and the specific area.

11.0 Quality Assurance Summary

Upon completion of a project sampling effort, analytical and QC data will be included in a comprehensive report that summarizes the work and provides a data evaluation. A discussion of the validity of the results in the context of QA/QC procedures will be made, as well as a summation of all QA/QC activity, and an identification of any analytical problems.

APPENDIX A-1

LABORATORY QUALITY ASSURANCE MANUAL

Columbia Analytical Services INC.
An Employee - Owned Company

QUALITY ASSURANCE MANUAL

1 Mustard St. Suite 250
Rochester, NY 14609

Phone: (585) 288-5380
Fax: (585) 288-8475

Revision Date: March 29, 2006
Effective Date: April 10, 2006

Approved by:

Laboratory Director: Michael K Perry
Mike Perry

Quality Assurance Program Manager: Lisa Reyes 3/30/06
Lisa Reyes

Annual review of this QAM has been performed and the QAM still reflects current practice.
Initials: MR Date: 5/11/07
Initials: ______ Date: ______
Initials: ______ Date: ______

DOCUMENT CONTROL
NUMBER: QAM-002
Initials: JR Date: 4/10/06

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3.0 INTRODUCTION AND COMPANY QUALITY ASSURANCE POLICY

Columbia Analytical Services, Inc. (CAS) is a professional consulting laboratory which performs chemical and microbiological analyses on a wide variety of sample matrices, including drinking water, groundwater, surface water, wastewater, soil, sediment, sludge, tissue, industrial and hazardous waste, and other material. CAS/Rochester is a part of a multi Lab Network operating throughout the USA. See Corporate Organization Chart (Appendix B) for locations.

It is a policy at CAS that there will be sufficient Quality Assurance (QA) activities conducted in the laboratory to ensure that all analytical data generated and processed will be scientifically sound, legally defensible, of known and documented quality, and will accurately reflect the material being tested. This goal is achieved by ensuring that adequate Quality Control (QC) procedures are used throughout the monitoring process, and by establishing a means to assess performance of these Quality Control and other QA activities. Under the authority of the owner of CAS, a quality policy statement is available under separate cover and is posted on the employee bulletin board.

We recognize that quality assurance requires a commitment to quality and ethics by everyone in the organization - individually, within each operating unit, and throughout the entire laboratory. All employees of CAS undergo lengthy data integrity training and are encouraged to participate in CAS open door policy to ensure a quality product and protect employees from any undue pressures. CAS also has stringent requirements and signed statements from employees to protect client confidentiality and ethical agreements. All personnel must familiarize themselves with the quality documentation and implement the policies and procedures in their work.

The information in this document has been organized according to the format described in *National Environmental Laboratory Accreditation Program (NELAP) Quality Systems Standards*, July 2003 in order to meet the compliance requirements of this standard. This document is controlled under policies required by CAS Document Control SOP (ADM-DOCCTRL). Each CAS network laboratory maintains its own lab specific Quality Assurance Manual.

4.0 QUALITY SYSTEM PROGRAM DESCRIPTION

The purpose of the QA program at CAS is to ensure that our clients are provided with analytical data that is scientifically sound, legally defensible, and of known and documented quality. The concept of Quality Assurance can be extended, and is expressed in the Vision of CAS:

> "CAS Holdings, Inc. applies creative thinking and strategic integration of our talents to be the best in all business endeavors we pursue. The Company is a leader in our industry demonstrated by:
>
> - Unprecedented customer satisfaction
> - Sustained profitability
> - Exceptional technical excellence
> - Superior Quality Systems
>
> We value our company's most valuable asset, our employee-owners. We are committed to make CAS Holdings Inc the preferred place to work and grow as individuals and professionals."

In support of this vision, our QA program addresses all aspects of laboratory operations, including laboratory organization and personnel, standard operating procedures, sample management, sample and quality control data, calibration data, standards traceability data, equipment maintenance records, method proficiency data (such as method detection limit studies and control charts), document storage and staff training records.

4.1 Facilities and Equipment

CAS features over 17,000 square feet of laboratory and administrative workspace at its Rochester, NY location. The facility is secured to the rest of the building using a swipe card entry system. Upon hire, each employee is assigned an access card and security code that must be used with their card. This employee-specific card provides access to the lab. SOP's are in place to protect the integrity of samples throughout the laboratory process (SMO-ICOC). A company software Quality Assurance plan exists to provide standard procedures to protect the integrity of electronic data. The laboratory has been designed and constructed to provide safeguards against cross-contamination of samples and is arranged according to work function, which enhances the efficiency of analytical operations.

Specialized areas include:

- Shipping and Receiving/Purchasing

- Sample Management Office (including a separate, controlled-access sample storage area)
- Inorganic/Metals Sample Preparation Laboratories (2)
- ICP and ICP/MS Laboratory
- AA Laboratory
- Water Chemistry & General Chemistry Laboratories
- Gas Chromatography Laboratory (including a separate sample preparation laboratory)
- Gas Chromatography/Mass Spectrometry Laboratory (including a separate sample preparation laboratory)
- Volatile Organics Laboratory (including a separate standard preparation laboratory)
- HPLC and Petroleum Laboratory (including GC and GC/MS)
- Microbiology Laboratory
- Laboratory Deionized Water System
- Laboratory Management, Client Service, Report Generation and Administration
- Data Archive
- Information Technology (IT) and LIMS
- Hazardous Waste Storage Area

In addition, segregated laboratory areas were designed for efficient and safe handling of a variety of sample types. Figures 4-1, 4-2, and 4-3 shows the facility location and layout of our Rochester, NY location. The laboratory is equipped with state-of-the-art analytical and administrative support equipment. Appendix A lists the major equipment at the Rochester facility, illustrating the laboratory's depth and overall capabilities. All analytical instrumentation must be verified for each test prior to reporting data to ensure documented quality (see analytical SOPs and/or ADM-TRANDOC).

Good housekeeping is an essential practice at CAS. Each department is responsible for their own area, keeping isles clear, counters free of debris and chemicals that may cause contamination during analysis. A contracted cleaning service removes all garbage and recyclables, mops the floors, and vacuums each working day.

4.2 Technical Elements of the Quality Assurance (QA) Program

4.2.1 Quality Assurance Manual.

This document describes in detail the company's quality assurance program as well as provides information about test methods available, personnel, equipment, and facilities. The contents of the manual are reviewed annually by the Quality Assurance Program Manager (QAPM) and revised as needed to ensure that it continuously reflects current policies and practices. Personnel information is also updated annually as needed. The QAPM and the Lab Manager must approve all revisions before they are put into effect.

4.2.2 Standard Operating Procedures (SOPs) and Laboratory Notebooks.

CAS maintains SOPs for use in both technical and administrative functions. Included in the list of available SOPs are procedures for the preparation of an SOP document, and for enforcing the control of documents through the laboratory

(ADM-SOP & ADM-DOCCTRL, respectively). Each SOP is implemented as written and has been reviewed and approved by the Laboratory Director, the Quality Assurance Program Manager. In most cases, the SOP has also been approved by the appropriate laboratory supervisor. The SOPs are reviewed annually and are revised as necessary to reflect actual objectives, flow of tasks, and staff responsibilities. The document control process associated with an SOP ensures that only the most currently prepared version of an SOP is being used for guidance and instruction. In addition to SOPs, each laboratory supervisor maintains a current file of all the promulgated methodology used to perform analyses. This file is accessible to all laboratory staff regardless of discipline. Laboratory notebook entries have been standardized following the guidelines in the *Making Entries into Logbooks and onto Benchsheets* SOP (SOP No. ADM-DATANTRY). The entries made into laboratory notebooks are reviewed and approved by the appropriate supervisor at a regular interval (e.g. monthly, quarterly, etc...)

4.2.3 Standard Reference Materials

All analytical measurements generated at CAS are performed using materials and/or processes that are traceable to a Standard Reference Material (SRM). Metrology equipment (analytical balances, thermometers, etc...) is calibrated using SRMs traceable to the National Institute of Standards and Technology (NIST). Consumable SRMs routinely purchased by the laboratories (e.g. primary stock standards) are purchased from nationally-recognized, reputable vendors. Most vendors have fulfilled the requirements for ISO 9001 certification and/or are accredited by A_2LA. Traceability throughout the laboratory is accomplished by following the guidelines set in the SOP, *Making Entries Into Logbooks and Onto Benchsheets* (ADM-DATANTRY).

All sampling containers provided to the client by the laboratory are purchased as precleaned (Level 1) containers, with certificates of analysis available for each bottle type. Certifications of Analysis provided by the vendors of reference materials and bottles are reviewed prior to use and kept on file by the laboratory.

4.2.4 Operational Assessments

There are a number of methods used to assess the laboratory and its daily operations. In addition to the routine quality control (QC) measurements used by a laboratory to measure quality, the senior laboratory management staff at CAS examine a number of other performance indicators to assess the overall ability of the laboratory to successfully perform analyses for its clients. On-time performance, Analytical Report defect rate and Customer Invoice defect rate are a few of the measurements performed at CAS that are used to assess performance from an external perspective (i.e. client satisfaction). A frequent, routine assessment must also be made of the laboratory's facilities and resources in anticipation of accepting an additional or increased workload. CAS utilizes a number of different methods to insure that adequate resources are available in anticipation of the demand for service. Regularly scheduled senior staff meetings, tracking of outstanding proposals and an accurate, current synopsis of incoming work all assist the senior staff in properly allocating resources to achieve the required results.

4.2.5 Additional Quality Records

Quality Reports to Management, Internal and External Audits, and NCAR Forms discuss quality assurance program issues, continuous process improvements, and corrective actions throughout the program and are the responsibility of the QAPM.

4.2.6 Deviation from Standard Operating Procedures, Policies, or Standard Specifications

When a customer requests a modification to an SOP, policy, or standard specification the Project Manager handling that project must discuss the proposed deviation with the lab director, departmental manager, or QA to obtain approval for the deviation. It is recommended that all project-specific requirements must be on-file and with the service request upon logging in the samples. A Project-Specific Communication Form is available to document such deviations.

4.3 Subcontracting

Analytical services are subcontracted when CAS/Rochester needs to balance workload and/or when the requested analyses are not performed in Rochester. However, subcontracting is only done with the knowledge and approval of the client. Subcontracting to another CAS laboratory is preferred over external-laboratory subcontracting. Further, subcontracting is only done to capable and qualified laboratories approved by the client. Subcontractors must be accredited by the applicable state or program to which apply to the samples being analyzed. Established procedures are followed to qualify external subcontract laboratories, see *Qualifying Subcontract Labs* (ADM-SUBLAB).

Figure 4-1
CAS/Rochester Laboratory Floor Plan

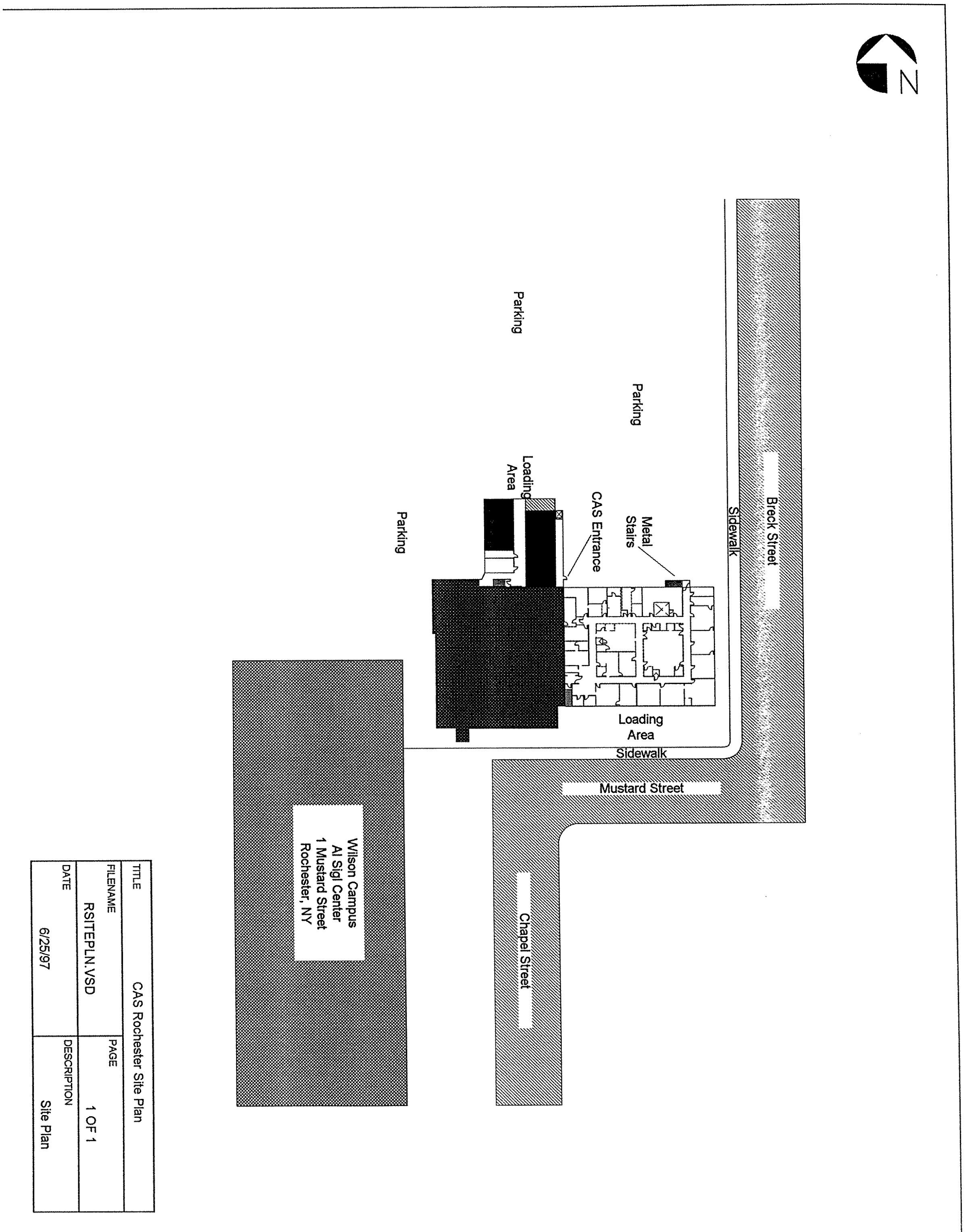


Figure 4-2
CAS/Rochester Laboratory Floor Plan

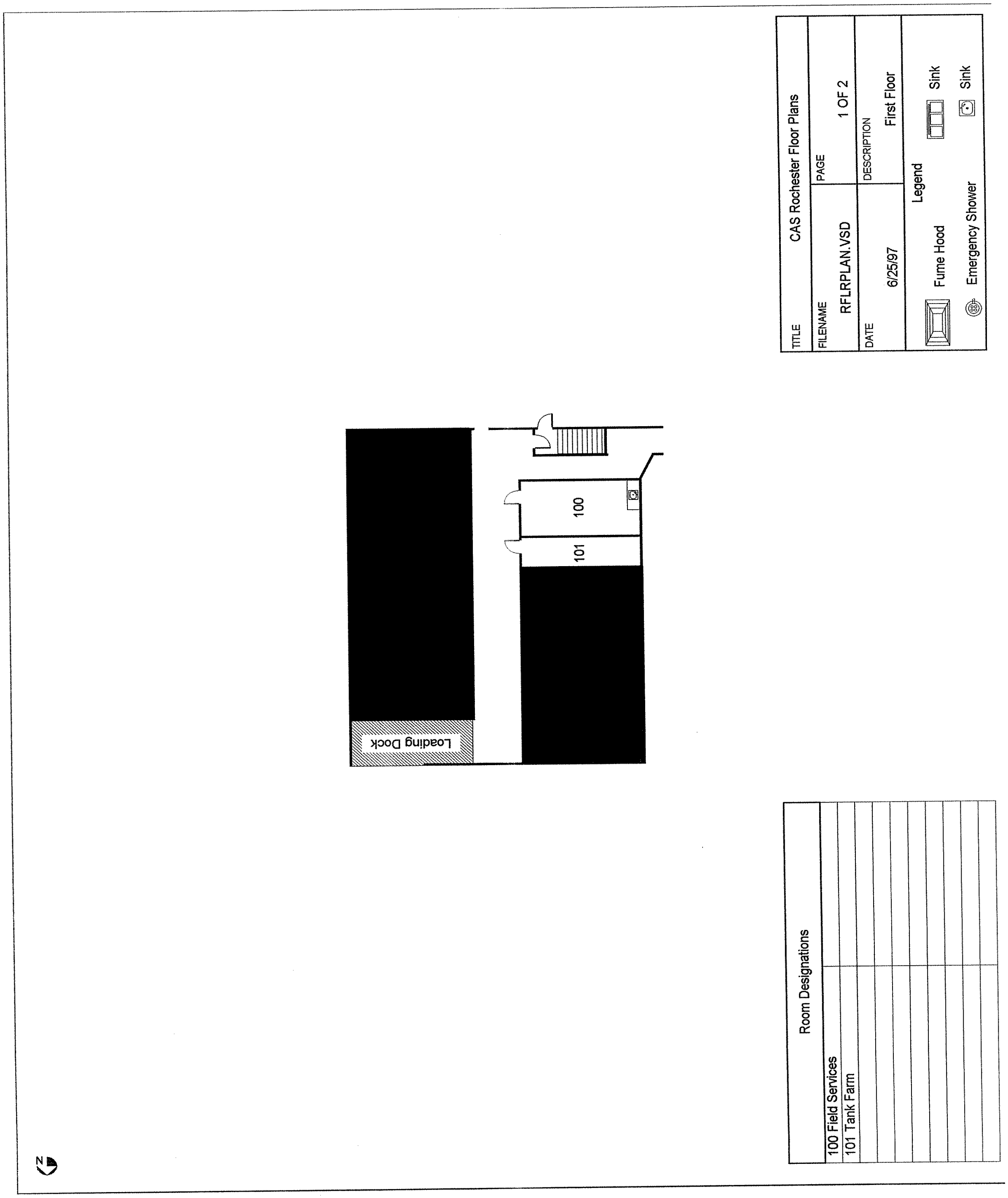
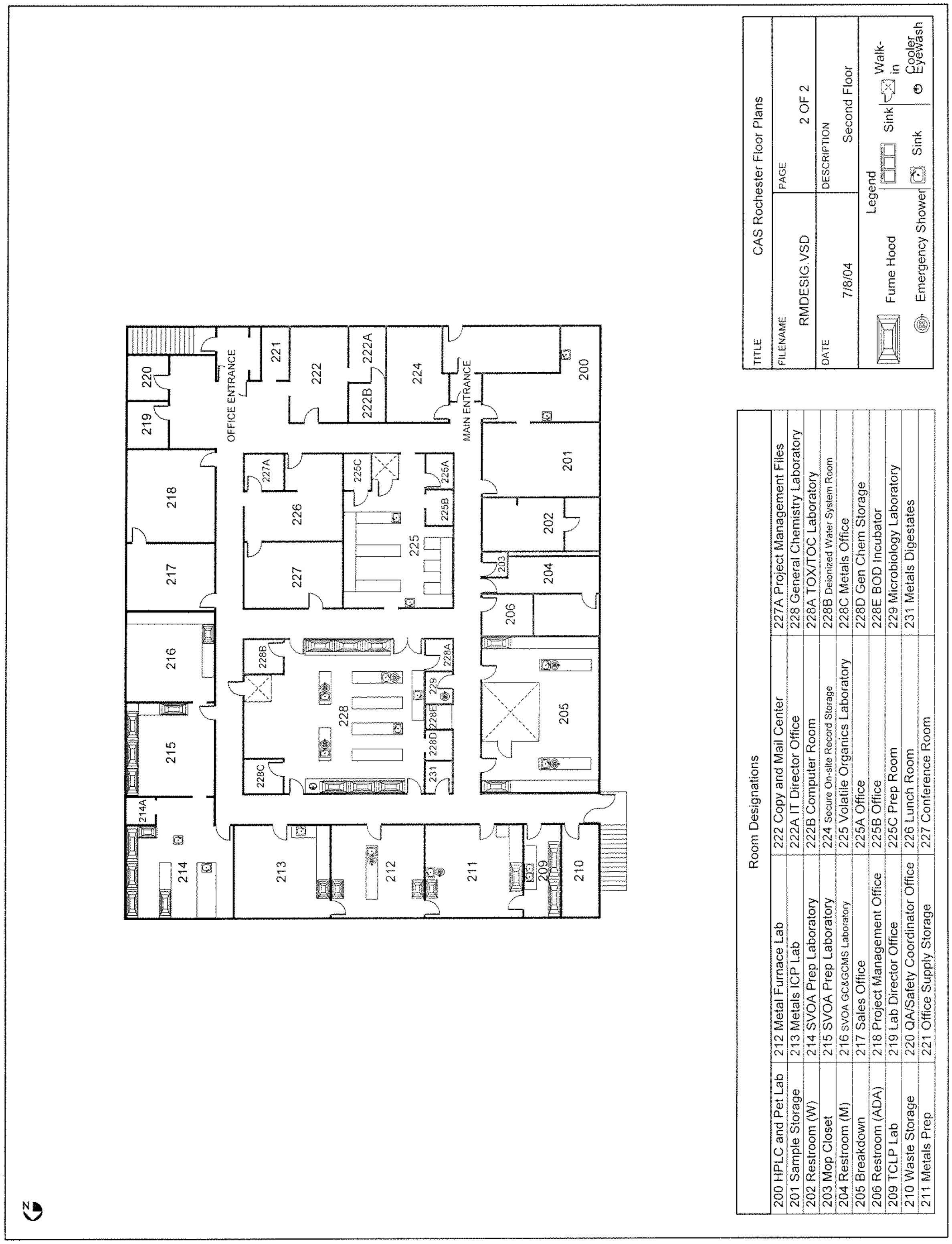


Figure 4-3
CAS/Rochester Laboratory Floor Plan



5.0 STATEMENT OF PROFESSIONAL CONDUCT AND LABORATORY PRACTICE

One of the most important aspects of the success of CAS as a company is the emphasis placed on the integrity of the data provided and the services rendered. This success is reliant on both the professional conduct of all employees within CAS as well as established laboratory practices. All personnel involved with environmental testing and calibration activities must familiarize themselves with the quality documentation and implement the policies and procedures in their work.

5.1 Professional Conduct

To promote quality, CAS requires certain standards of conduct and ethical performance among employees. The following examples of documented CAS policy are representative of these standards, and are not intended to be limiting or all-inclusive:

- Under no circumstances is the willful act of fraudulent manipulation of analytical data condoned. Such acts are to be reported immediately to senior management for appropriate corrective action.

- Unless specifically required in writing by a client, alteration, deviation or omission of written contractual requirements is not permitted. Such changes must be in writing and approved by senior management.

- Falsification of data in any form will not be tolerated. While much analytical data is subject to professional judgment and interpretation, outright falsification, whenever observed or discovered, will be documented, and appropriate remedies and punitive measures will be taken toward those individuals responsible.

- Unauthorized release of confidential information about the company or its clients is taken very seriously and is subject to formal disciplinary action. All employees sign a confidentiality agreement upon hire to protect the company and client's confidentiality and proprietary rights.

5.2 Prevention and Detection of Improper, Unethical or Illegal Actions

It is the intention of CAS to proactively prevent and/or detect any improper, unethical or illegal action conducted within the laboratory. This is performed by the implementation of a program designed for not only the detection but also prevention. Prevention consists of educating all laboratory personnel in their roles and duties as employees, company policies, inappropriate practices, and their corresponding implications as described in Section 5.3 of this document.

In addition to education, appropriate and inappropriate practices are included in SOPs such as manual integration, data review and specific method procedures. Other aspects of this program include electronic data tape audits, post-analysis and whenever possible single blind and/or double blind analyses. All aspects of this program is documented and retained on file according to the company policy on record retention.

5.3 Laboratory Ethics Training Plan (Data Integrity Training Plan)

Laboratory ethics training (approximately 8-hours) is held annually for every new on-site employee including all full and part time personnel. The training session includes at a minimum the following legal and ethical topics:

- Triggers and types of unethical behavior
- CAS Employee Handbook (overview including mechanism for reporting and seeking advice on ethical decisions, organizational mission and its relationship to critical need for honesty and full disclosure).
- CAS' Commitment to Excellence in Data Quality (overview including legal consequences and specific examples of breaches of ethical behavior)
- Discuss and review all data integrity procedures and documentation
- Measures taken to prevent and detect fraud; how and when to report data integrity issues.
- Record keeping and examples of data falsification or misrepresentation
- Acceptable and unacceptable solutions to typical laboratory problems (emphasis on the importance of proper written narration by the analyst with respect to where analytical data may be useful, but in some way partially deficient)
- Data validation (in-depth data monitoring and electronic audits)
- Implications of laboratory data fraud and data investigations
- Potential punishments and penalties for improper, unethical or illegal actions (immediate termination, or civil/criminal prosecution)

It is the responsibility of the Quality Assurance Program Manager to ensure that the training plan described in this section including content and frequency is conducted. All employees may review the mechanism for reporting and seeking advice on ethical decisions as well as the legal consequences of unethical behavior in the CAS Employee Handbook & CAS Commitment to Excellence in Data Quality Statement, both of which are available to all employees. In addition, the Excellence in data Quality Statement is reviewed and signed on an annual basis by all laboratory personnel. Also, all employees are required to complete an ethics "refresher" training (approximately 1-hour) session. The subject and content are generally at the discretion of the Corporate Quality Assurance Department.

5.4 Laboratory Practices Affecting Personnel

CAS makes an attempt to ensure that it is impartial and it's employees are free from any commercial, financial, or other undue pressures that might affect their technical judgement or quality of work. This is accomplished by utilizing each of the following policies, programs and procedures, wherever necessary.

CAS Corporate Ethics Point Program – An anonymous and confidential reporting system available to all employees that is used to communicate misconduct and other concerns. The program shall help minimize negative morale and promote a positive work place. Associated upper management is notified and the investigations are documented.

- Open Door Policy (CAS Employee Handbook) – Employees are encouraged to bring any work related problems or concerns to the attention of local management or their Human Resources representative. However, depending on the extent or sensitivity of the concern, employees are encouraged to directly contact any member of upper management.

- Project Scheduling – Jobs are scheduled (when prior notice is available) according to capacity and work schedules set and discussed by customer service personnel and laboratory supervisors. The scheduling is done not only to prevent missed holding times and on-time deliveries but as a way for management and analysts to be prepared for incoming samples and to utilize flexible work schedules, whenever necessary.

- Flexible Work Hours – Analysts are able to work flexible work hours (with management approval). Additionally, analysts may "team" with a co-worker (again with approval) and work split shifts in order to extend the work day and increase the number of samples that can be analyzed, whenever necessary.

- Gifts and Favors (CAS Employee Handbook) – To avoid possible conflict of interest implications, employees do not receive unusual gifts or favors to, nor accept such gifts or favors from, persons outside the Company who are, or may be, in any way concerned with the projects on the Company is professionally engaged. Anything beyond an occasional meal, an evening's entertainment, or a nominal holiday gift is considered an "unusual gift or favor".

6.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

The CAS/Rochester staff, consisting of approximately 50 employees, includes chemists, technicians and support personnel. They represent diverse educational backgrounds and experience, and provide the comprehensive skills that a modern, state-of-the-art analytical laboratory requires.

CAS is committed to providing an environment that encourages excellence. Everyone within CAS shares responsibility for maintaining and improving the quality of our analytical services. The responsibilities of key personnel within the laboratory are described below. An organizational chart of the laboratory, as well as the resumes of key personnel, can be found in Appendix B. Specific Job Descriptions are available and kept on file by human resources.

- The role of the **Laboratory Director** is to provide technical, operational, and administrative leadership through planning, allocation and management of personnel and equipment resources. This person is responsible for quality (including compliance with the current version of the Quality Systems, NELAC, Chapter 5), overall laboratory efficiency, and financial performance of the Rochester CAS facility. The Laboratory Director also provides support for business development by identifying and developing new markets and through continuing support of the management of existing client activities. The Lab Director, QA Program Manager and Business Development Manager are authorized signatories for the Rochester facility.
- The responsibility of the **Quality Assurance Program Manager** (QAPM) is to provide a focus for overall QA activities within the laboratory and maintain compliance with the Quality Systems Standards (NELAC, Chapter 5). This person works with individual laboratory production units to establish effective quality assurance and quality control. The QAPM is also responsible for maintaining this QA Manual and performing an annual review of it, updating it if necessary; reviewing, approving, and controlling SOPs; ensure continuous process improvements through the use of control charts and proficiency test samples; reviewing data (Section 12.0); maintaining the laboratory's certifications and approvals (Section 13.0); performing internal QA audits (Section 13.0); preparing QA reports (Section 16.0); maintaining training documentation for all employees including IDCs, CDCs, Training Plan forms, and seminar attendance; maintaining MDL study documentation, responding to QA needs, problems, and requests from technical staff. This person is a technical advisor and is responsible for summarizing and reporting overall unit performance.
- The Quality Assurance Director (Corporate Quality Assurance) is responsible for the overall QA program at all the CAS laboratories. The QA Director is responsible for performing an annual on-site audit at each CAS laboratory and preparing a written report; maintaining a data base of information about state certifications and accreditation programs; writing laboratory-wide SOPs; maintaining a data base of CAS-approved subcontract laboratories; providing assistance to QAPMs and laboratory managers; preparing an annual QA activity report; etc.

- The **Health and Safety Officer** is responsible for the administration of the laboratory health and safety policies. This includes the formulation and implementation of safety policies, the supervision of new-employee safety training, the review of accidents, incidents and prevention plans, the monitoring of hazardous waste disposal and the conducting of departmental safety inspections. The safety officer is also designated as the Chemical Hygiene Officer.
- The **Client Services Manager** is responsible for the Client Services Department (customer services/project managers, and marketing functions). The Client Services Department provides a complete interface with clients from initial project specification to final deliverables.
- The **Project Manager** is a senior-level, non-line scientist assigned to each client to act as a technical liaison between the client and the laboratory. The Project Manager is responsible for ensuring that the analyses performed by the laboratory meet all project, contract, and regulatory-specific requirements. This entails coordinating with the CAS laboratory and administrative staff to ensure that client-specific needs are understood, and that the services CAS provides are properly executed and satisfy the requirements of the client.
- **Information Technology** (IT) staff are responsible for the administration of the Laboratory Information Management System (LIMS) and other necessary support services. Other functions of the IT staff include laboratory network maintenance, education of analytical staff in the use of scientific software, custom software development and implementation, Electronic Data Deliverable (EDD) generation and data back-up, archival and integrity operations.
- The <u>Analytical Laboratory</u> is divided into operational units, based upon specific disciplines. Each department is responsible for establishing, maintaining and documenting a quality control program based upon the requirements within the Quality Assurance Manual. Each **Department Supervisor/Manager** has the responsibility to ensure that quality control functions are carried out as planned, and to guarantee the production of high quality data. Supervisors have the responsibility to monitor the day-to-day operations to ensure that productivity and data quality objectives are met. Each analyst in the laboratory has the responsibility to carry out testing according to prescribed methods, standard operating procedures and quality control guidelines particular to the laboratory in which he/she is working.
- The **Sample Management Office** plays a key role in the laboratory QA program by providing documentation for all samples received by the laboratory, distributing samples, and maintaining proper storage.
- **Support Services** are provided by corporate purchasing departemtn and/or local purchasing representative to coordinate facility and instrument maintenance, ordering of standards, supplies, reagents, and any other services required.

Analytical work will be conducted by the laboratory under the approval of the client. If any aspect of a project requires sub-contracting, CAS project manager shall notify the client and obtain approval for any sub-contractors prior to completing the analytical program.

7.0 SAMPLING, SAMPLE PRESERVATION, AND HANDLING PROCEDURES

The quality of analytical results is highly dependent upon the quality of the procedures used to collect, preserve and store samples. CAS recommends that clients follow sampling guidelines described in specificly reference methods including EPA, NIOSH, ASTM, and SW846. Sample handling factors that must be taken into account to insure accurate, defensible analytical results include:

- Amount of sample taken
- Type of container used
- Type of sample preservation
- Sample storage time
- Proper custodial documentation

CAS uses the sample preservation, container, and holding-time recommendations published in a number of documents. The primary documents of reference are: USEPA SW-846, Third Edition (wastewater, soils, and hazardous waste samples), USEPA 600/4-79-020 and 600/4-82-057 (wastewater samples), USEPA 600/4-88-039, 600/4-91-010 and 600/R-93/100 (drinking water samples) and NIOSH, Manual of Analytical Methods 4th Edition (air samples) . The complete citation for each reference can be found in section 18.0 of this document. The container, preservation and holding time information are summarized in Table 7-1.

CAS routinely provides sample containers with appropriate preservatives for our clients. The containers are purchased as “precleaned” to a level 1 status, and conform to the requirements for analytical sample established by the USEPA. Certificates of analysis for the sampling containers are available upon request. Our sample kits typically consist of foam-lined, precleaned shipping coolers, specially prepared and labeled sample containers individually wrapped in bubble wrap, chain-of-custody (COC) forms, and custody seals. An example of a sample container label and a custody seal is shown in Figure 7-1. Figure 7-2 is a copy of the chain-of-custody form used at CAS. For extremely large sample container shipments, the containers may be shipped in their original boxes. Such shipments will consist of several boxes of labeled sample containers and sufficient materials (bubble wrap, COC forms, custody seals, shipping coolers, etc...) to allow the sampling personnel to process the sample containers and return them to CAS. The proper preservative will be always be added to the sample containers or provided in a separate vial prior to shipment, unless otherwise instructed by the client. CAS keeps client-specific shipping requirements on file and utilizes all major transportation carriers to guarantee that sample shipping requirements (same-day, overnight, etc.) are met. CAS also provides its own courier service that makes regularly scheduled trips to the Buffalo, Rochester area.

Table 7-1
Sample Preservation and Holding Times[a]

DETERMINATION	MATRIX[b]	CONTAINER[c]	PRESERVATION	MAXIMUM HOLDING TIME
Bacterial Tests				
Coliform, Fecal and Total	W	P,G	Cool, 4°C, 0.008% $Na_2S_2O_3$[d]	6-24 hours[e]
Inorganic Tests				
Acidity	W	P,G	Cool, 4°C	14 days
Alkalinity	W	P,G	Cool, 4°C	14 days
Ammonia	W	P,G	Cool, 4°C, H_2SO_4 to pH<2	28 days
Biochemical Oxygen Demand (BOD)	W	P,G	Cool, 4°C	48 hours
Bromide	W	P,G	None Required	28 days
Chemical Oxygen Demand (COD)	W	P,G	Cool, 4°C, H_2SO_4 to pH<2	28 days
Chloride	W	P,G	None Required	28 days
Chlorine, Total Residual	W	P,G	None Required	24 hours
Color	W	P,G	Cool, 4°C	48 hours
Cyanide, Total and Amenable to Chlorination	W	P,G	Cool, 4°C, NaOH to pH>12, plus 0.6 g Ascorbic Acid	14 days
Cyanide, Weak Acid Dissociable	W	P,G	Cool, 4°C, NaOH to pH >12	14 days
Fluoride	W	P,G	None Required	28 days
Hardness	W	P,G	HNO_3 or H_2SO_4 to pH<2	6 months
Hydrogen Ion (pH)	W	P,G	None Required	24 hours
Ignitability	W	G	None Required	14 days
Kjeldahl and Organic Nitrogen	W	P,G	Cool, 4°C, H_2SO_4 to pH<2	28 days
Nitrate	W	P,G	Cool, 4°C	48 hours
Nitrate-Nitrite	W	P,G	Cool, 4°C, H_2SO_4 to pH<2	28 days
Nitrite	W	P,G	Cool, 4°C	48 hours
Orthophosphate	W	P,G	Filter Immediately, Cool, 4°C	48 hours
Oxygen, Dissolved (Probe)	W	G, Bottle and Top	None Required	Analyze immediately
Oxygen, Dissolved (Winkler)	W	G, Bottle and Top	Fix on Site and Store in Dark	8 hours
Phenolics, Total	W	G Only	Cool, 4°C, H_2SO_4 to pH<2	28 days
Phosphorus, Elemental	W	G Only	Cool, 4°C	48 hours
Phosphorus, Total	W	P,G	Cool, 4°C, H_2SO_4 to pH<2	28 days
Residue, Total	W	P,G	Cool, 4°C	7 days
Residue, Filterable (TDS)	W	P,G	Cool, 4°C	7 days
Residue, Nonfilterable (TSS)	W	P,G	Cool, 4°C	7 days
Residue, Settleable	W	P,G	Cool, 4°C	48 hours
Residue, Volatile	W	P,G	Cool, 4°C	7 days

Table 7-1 (continued)
Sample Preservation and Holding Times[a]

DETERMINATION	MATRIX[b]	CONTAINER[c]	PRESERVATION	MAXIMUM HOLDING TIME
Silica	W	P Only	Cool, 4°C	28 days
Specific Conductance	W	P,G	Cool, 4°C	28 days
Sulfate	W	P,G	Cool, 4°C	28 days
Sulfide	W	P,G	Cool, 4°C, Add Zinc Acetate plus Sodium Hydroxide to pH>9	7 days
Sulfite	W	P,G	None Required	24 hours
Surfactants (MBAS)	W	P,G	Cool, 4°C	48 hours
Tannin and Lignin	W	P,G	Cool, 4°C	28 days
Temperature	W	P,G	None Required	Analyze immediately
Turbidity	W	P,G	Cool, 4°C	48 hours
Metals				
Chromium VI	W	P,G	Cool, 4°C	24 hours
Mercury	W	P,G	HNO_3 to pH<2	28 days
	S	P,G	Cool, 4°C	28 days
Metals, except Chromium VI	W	P,G	HNO_3 to pH<2	180 days
and Mercury	S	G, Teflon-Lined Cap	Cool, 4°C	180 days
	A	Filters in Cassettes	None Required	180 days
Organic Tests				
Oil and Grease	W	G, Teflon-Lined Cap	Cool, 4°C, H_2SO_4 to pH<2	28 days
Organic Carbon, Total (TOC)	W	P,G	Cool, 4°C, H_2SO_4 to pH<2	28 days
Organic Halogens, Total (TOX)	W	G, Teflon-Lined Cap	Cool, 4°C, H_2SO_4 to pH<2	28 days
Organic Halogens, Adsorbable (AOX)	W	G, Teflon-Lined Cap	Cool, 4°C, HNO_3 to pH<2	28 days
Petroleum Hydrocarbons, Total Recoverable	W	G, Teflon-Lined Cap	Cool, 4°C, HCl or H_2SO_4 to pH<2	28 days
Petroleum Hydrocarbons, Total	W	G, Teflon-Lined Cap	Cool, 4°C, HCl or H_2SO_4 to pH<2	7 days until extraction; 40 days after extraction
	S	G, Teflon-Lined Cap	Cool, 4°C	14 days until extraction; 40 days after extraction
Petroleum Hydrocarbons, Volatile (Gasoline-Range Organics)	W	G, Teflon-Lined Septum Cap	Cool, 4°C, HCl to pH<2 No Headspace	14 days
	S	G, Teflon-Lined Cap	Cool, 4°C Minimize Headspace	14 days

Table 7-1 (continued)
Sample Preservation and Holding Times[a]

DETERMINATION	MATRIX[b]	CONTAINER[c]	PRESERVATION	MAXIMUM HOLDING TIME
Volatile Organics				
Purgeable Halocarbons	W	G, Teflon-Lined Septum Cap	**No Residual Chlorine Present**: HCl to pH<2, Cool, 4°C, No Headspace **Residual Chlorine Present**: 10% $Na_2S_2O_3$, HCl to pH<2, Cool, 4°C, No Headspace	14 days
	S	G, Teflon-Lined Cap	Cool, 4°C, Minimize Headspace	14 days
Purgeable Aromatic Hydrocarbons (including BTEX and MTBE)	W	G, Teflon-Lined Septum Cap	**No Residual Chlorine Present**: HCl to pH<2, Cool, 4°C, No Headspace **Residual Chlorine Present**: 10% $Na_2S_2O_3$, HCl to pH<2, Cool, 4°C, No Headspace	14 days
	S	G, Teflon-Lined Cap	Cool, 4°C, Minimize Headspace	14 days
Acrolein, Acrylonitrile, Acetonitrile	W	G, Teflon-Lined Septum Cap	Adjust pH to 4-5, Cool, 4°C, No Headspace	14 days
Semivolatile Organics				
Petroleum Hydrocarbons, Extractable (Diesel-Range Organics)	W,S	G, Teflon-Lined Cap	Cool, 4°C	7 days until extraction;[f] 40 days after extraction
EDB and DBCP	W,S	G, Teflon-Lined Cap	Cool, 4°C, HCl to pH<2, No Headspace	28 days
Alcohols and Glycols	W,S	G, Teflon-Lined Cap	Cool, 4°C[g]	7 days until extraction;[f] 40 days after extraction
Phenols	W,S	G, Teflon-Lined Cap	Cool, 4°C[g]	7 days until extraction;[f] 40 days after extraction
Phthalate Esters	W,S	G, Teflon-Lined Cap	Cool, 4°C[g]	7 days until extraction;[f] 40 days after extraction
Nitrosamines	W,S	G, Teflon-Lined Cap	Cool, 4°C, Store in Dark[g]	7 days until extraction;[f] 40 days after extraction
Organochlorine Pesticides and PCBs	W,S	G, Teflon-Lined Cap	Cool, 4°C	7 days until extraction;[f] 40 days after extraction

Table 7-1 (continued)
Sample Preservation and Holding Times[a]

DETERMINATION	MATRIX[b]	CONTAINER[c]	PRESERVATION	MAXIMUM HOLDING TIME
Nitroaromatics and Cyclic Ketones	W,S	G, Teflon-Lined Cap	Cool, 4°C, Store in Dark[g]	7 days until extraction;[f] 40 days after extraction
Polynuclear Aromatic Hydrocarbons	W,S	G, Teflon-Lined Cap	Cool, 4°C, Store in Dark[g]	7 days until extraction;[f] 40 days after extraction
Haloethers	W,S	G, Teflon-Lined Cap	Cool, 4°C[g]	7 days until extraction;[f] 40 days after extraction
Chlorinated Hydrocarbons	W,S	G, Teflon-Lined Cap	Cool, 4°C[g]	7 days until extraction;[f] 40 days after extraction
Organophosphorus Pesticides	W,S	G, Teflon-Lined Cap	Cool, 4°C[g]	7 days until extraction;[f] 40 days after extraction
Nitrogen- and Phosphorus-Containing Pesticides	W,S	G, Teflon-Lined Cap	Cool, 4°C[g]	7 days until extraction;[f] 40 days after extraction
Chlorinated Herbicides	W,S	G, Teflon-Lined Cap	Cool, 4°C[g]	7 days until extraction;[f] 40 days after extraction
Chlorinated Phenolics	W	G, Teflon-Lined Cap	Cool, 4°C[g]	30 days
Resin and Fatty Acids	W	G, Teflon-Lined Cap	Cool, 4°C[g]	30 days
Carbonyl Compounds (Formaldehyde)	W	G, Teflon-Lined Cap	Cool, 4°C	3 days until extraction, 3 days after extraction
Industrial Hygiene Solvents	A	IH Air Tubes	None Required	14 days from sample collection
Toxicity Characteristic Leaching Procedure (TCLP)				
Mercury	HW	P,G	Sample: Cool, 4°C TCLP extract: HNO_3 to pH<2	28 days until extraction; 28 days after extraction
Metals, except Mercury	HW	P,G	Sample: Cool, 4°C TCLP extract: HNO_3 to pH<2	180 days until extraction; 180 days after extraction
Volatile Organics	HW	G, Teflon-Lined Cap	Sample: Cool, 4°C Minimize Headspace TCLP extract: Cool, 4°C, HCl to pH<2, No Headspace	14 days until extraction; 14 days after extraction

Table 7-1 (continued)
Sample Preservation and Holding Times[a]

DETERMINATION	MATRIX[b]	CONTAINER[c]	PRESERVATION	MAXIMUM HOLDING TIME
Semivolatile Organics	HW	G, Teflon-Lined Cap	Sample: Cool, 4°C, Store in Dark[g] TCLP extract: Cool, 4°C, Store in Dark[g]	14 days until TCLP ext'n; 7 days until extraction; 40 days after extraction
Organochlorine Pesticides	HW	G, Teflon-Lined Cap	Sample: Cool, 4°C TCLP extract: Cool, 4°C	14 days until TCLP ext'n; 7 days until extraction; 40 days after extraction
Chlorinated Herbicides	HW	G, Teflon-Lined Cap	Sample: Cool, 4°C TCLP extract: Cool, 4°C	14 days until TCLP ext'n; 7 days until extraction; 40 days after extraction
Contract Laboratory Program (CLP)				
Cyanide, Total and Amenable to Chlorination	W	P,G	Cool, 4°C, NaOH to pH 12, plus 0.6 g Ascorbic Acid	12 days[h]
	S	P,G	Cool, 4°C	12 days[h]
Mercury	W	P,G	HNO_3 to pH<2	26 days[h]
	S	P,G	Cool, 4°C	26 days[h]
Metals, except Mercury	W	P,G	HNO3 to pH<2	180 days[h]
	S	P,G	Cool, 4°C	180 days[h]
Volatile Organics	W,S	G, Teflon-Lined Cap	W-Cool, 4°C, Minimize Headspace Soil – see SOP	10 days[h]
Semivolatile Organics	W,S	G, Teflon-Lined Cap	Cool, 4°C, Store in Dark[g]	5 days until extraction;[h,i] 40 days after extraction
Organochlorine Pesticides and PCBs	W,S	G, Teflon-Lined Cap	Cool, 4°C	5 days until extraction;[h,i] 40 days after extraction

a See Section 18.0 for sources of holding time information.
b W = Water; S = Soil or Sediment; HW = Hazardous Waste; A = Air
c P = Polyethylene; G = Glass
d For chlorinated water samples
e The recommended maximum holding time is variable, and is dependent upon the geographical proximity of sample source to the laboratory.
f Fourteen days until extraction for soil, sediment, and sludge samples.
g If the water sample contains residual chlorine, 10% sodium thiosulfate is used to dechlorinate.
h Number of days following sample receipt at the laboratory.
i Ten days until extraction for soil, sediment, and sludge samples.

Figure 7-1
Sample Container Label and Custody Seal

CLIENT:	JOB#:	006
LOCATION:		
DATE SAMPLED:		
ANALYSIS:		
PRESERVATIVE:		
COMMENTS:		

Custody Seal

Date ____________ Project ____

Signature ______________________________________ Container# ______ of ______

Figure 7-2
Chain of Custody Form

Columbia Analytical Services INC.
An Employee-Owned Company
www.caslab.com

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

One Mustard St., Suite 250 • Rochester, NY 14609-0859 • (716) 288-5380 • 800-695-7222 x11 • FAX (716) 288-8475 PAGE ________ OF ________

SR #

CAS Contact

Project Name	Project Number
Project Manager	Report CC
Company/Address	
Phone #	FAX#
Sampler's Signature	Sampler's Printed Name

ANALYSIS REQUESTED (Include Method Number and Container Preservative)

PRESERVATIVE

CLIENT SAMPLE ID	FOR OFFICE USE ONLY LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	NUMBER OF CONTAINERS	GC/MS VOA's ☐ 8260 ☐ 624 ☐ CLP	GC/MS SVOA's ☐ 8270 ☐ 625 ☐ CLP	GC VOA's ☐ 8021 ☐ 601/602	PESTICIDES/ PCB's ☐ 8081 ☐ 608 ☐ CLP ☐ 8082	STAR'S LIST 8021 VOA's ☐ TOTAL ☐ TCLP	STAR'S LIST 8270 SVOA's ☐ TOTAL ☐ TCLP	TCLP ☐ METALS ☐ VOA's ☐ SVOA's ☐ H/P	WASTE CHARACTERIZATION ☐ React ☐ Corros. ☐ Ignit.	METALS, TOTAL (List in comments below)	METALS, DISSOLVED (List in comments below)					REMARKS/ ALTERNATE DESCRIPTION

Preservative Key
0. NONE
1. HCL
2. HNO_3
3. H_2SO_4
4. NaOH
5. Zn. Acetate
6. MeOH
7. $NaHSO_4$
8. Other ______

SPECIAL INSTRUCTIONS/COMMENTS
Metals

See QAPP ☐

TURNAROUND REQUIREMENTS
____ RUSH (SURCHARGES APPLY)
____ 24 hr ____ 48 hr ____ 5 day
____ STANDARD
REQUESTED FAX DATE
____
REQUESTED REPORT DATE
____

REPORT REQUIREMENTS
____ I. Results Only
____ II. Results + QC Summaries (LCS, DUP, MS/MSD as required)
____ III. Results + QC and Calibration Summaries
____ IV. Data Validation Report with Raw Data
____ V. Specialized Forms / Custom Report
Edata ____ Yes ____ No

INVOICE INFORMATION
PO#
BILL TO:
SUBMISSION #:

SAMPLE RECEIPT: CONDITION/COOLER TEMP: ________ CUSTODY SEALS: Y N

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature	Signature	Signature	Signature	Signature	Signature
Printed Name	Printed Name	Printed Name	Printed Name	Printed Name	Printed Name
Firm	Firm	Firm	Firm	Firm	Firm
Date/Time	Date/Time	Date/Time	Date/Time	Date/Time	Date/Time

Distribution: White - Return to Originator; Yellow - Lab Copy; Pink - Retained by Client

SCOC-0402-40

8.0 SAMPLE CUSTODY

Standard Operating Procedures have been established for the receiving of samples into the laboratory. These procedures ensure that samples are received and properly logged into the laboratory, and that all associated documentation, including chain of custody forms, is complete and consistent with the samples received.

Sample Acceptance Policy:

Samples delivered to the CAS Sample Management Office (SMO) and are received by a Sample Custodian. The Chain of Custody (COC) is reviewed for completeness and accuracy and a Cooler Receipt and Preservation Form (CRPF) (Figure 8-1) is used to document the condition of the cooler and its contents as received by the sample custodian. Verification of sample integrity by the Sample Custodian includes the following activities:

- Assessment of custody seal presence/absence, location and signature.
- Temperature of sample containers upon receipt.
- Chain of custody documents present and properly completed.

  Entries should be made in blue or black ink and at a minimum, shall include sample identification, description, date, time, and location of sample collection, the name and signature(s) of the sample collector and intermediate sample custodian(s), date and time of each sample transfer, and signature of the CAS Sample Custodian upon receipt. For an example COC, see Figure 7-2.
- Sample containers checked for integrity (broken, leaking, etc...)
- Sample is clearly marked with the sample ID, date and time of collection.
- Appropriate containers (size, type) are received for the requested analyses.
- Sample container labels and/or tags agree with chain of custody entries (Identification, required analyses, etc...)
- Assessment of proper sample preservation (If inadequate, corrective action is employed).
- VOC containers are inspected for the presence/absence of bubbles. (No assessment of proper preservation is performed for VOC containers by SMO personnel).

Any anomalies or discrepancies observed during the initial assessment are recorded on the CRPF and/or chain of custody documents. All potential problems with a sample shipment are addressed by contacting the client and discussing the pertinent issues. When the Project Manager and client have reached a satisfactory resolution, the log-in process may commence. The laboratory has formally accepted the samples. If resolution cannot be reached with the client or the samples do not comply with the requirements of the CRPF, these samples may be rejected by the laboratory.

Sample Log-in;

During the log-in process, each sample is given a unique laboratory code and an analytical request form is generated. The laboratory code consists of an order number and submission number. Each sample is given an order number by the LIMS system based upon the order of log-in. A submission number is assigned to a particular job in the same manner. The submission number is coded with the lab location and year as follows:

e.g. Submission No. R20001784	=	R -	Rochester
		20 -	Year 2000
		001784 -	Job Number (sequential number of jobs logged)

The analytical request contains client information, sample descriptions, sample matrix information, required analyses, sample collection dates, analysis due dates and other pertinent information. This analytical request is reviewed by the appropriate Project Manager for accuracy, completeness, consistency of requested analyses and for client project objectives and COC.

Each container received by the lab receives a unique barcode which is scanned by those handling the sample for storage, analysis, or disposal. The sample tracking information from the scan is put in a database which can create a complete Internal Chain of Custody for each sample container. This information is reported in package reports only.

All samples, except those designated for metals analyses, are kept in a refrigerated condition until they undergo analysis. CAS stores samples in one of three walk-in refrigerators. These refrigerators are segregated by method of analysis. The temperature of each storage facility used at CAS is monitored daily and the data recorded in a logbook.

Disposal:

Upon completion of all analyses, most aqueous and soil samples and sample extracts are retained at 0-6°C refrigerators for 30 days (unless other arrangements have been made in advance). Upon expiration of these time limits, the samples are either returned to the client or disposed of according to approved disposal practices. All samples are characterized according to hazardous/non-hazardous waste criteria and are segregated accordingly. All hazardous waste samples are disposed of according to formal procedures outlined in the Sample Disposal SOP (SMO-SPLDIS). It should be noted that all waste produced at the laboratory, including the laboratory's own various hazardous waste streams, is treated in accordance with all applicable local and Federal laws. The bar coding system used to track samples through the lab, including disposal, produces cradle to grave sample history for each sample aliquot.

Figure 8-1

Cooler Receipt And Preservation Check Form

Project/Client________________________________Submission Number__________________.

Cooler received on__________ by:________ **COURIER:** CAS UPS FEDEX CD&L CLIENT

1.	Were custody seals on outside of cooler?	YES	NO	
2.	Were custody papers properly filled out (ink, signed, etc.)?	YES	NO	
3.	Did all bottles arrive in good condition (unbroken)?	YES	NO	
4.	Did any VOA vials have significant air bubbles?	YES	NO	N/A
5.	Were **Ice** or **Ice packs** present?	YES	NO	
6.	Where did the bottles originate?	CAS/ROC,	CLIENT	
7.	Temperature of cooler(s) upon receipt: _______ _______ _______ _______ _______			

Is the temperature within 0° - 6° C?:	Yes	Yes	Yes	Yes	Yes
If No, Explain Below	No	No	No	No	No

Date/Time Temperatures Taken: ____

Thermometer ID: 161 or IR GUN Reading From: Temp Blank or Sample Bottle

If out of Temperature, Client Approval to Run Samples_________________________________

Cooler Breakdown: Date :____________________________by:_____________________________

1.	Were all bottle labels complete (*i.e.* analysis, preservation, etc.)?	YES	NO
2.	Did all bottle labels and tags agree with custody papers?	YES	NO
3.	Were correct containers used for the tests indicated?	YES	NO

4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A

Explain any discrepancies: ____

		YES	NO	Sample I.D.	Reagent	Vol. Added
pH	Reagent					
12	NaOH					
2	HNO_3					
2	H_2SO_4					
Residual Chlorine (+/-)	for TCN & Phenol					
5-9**	P/PCBs (608 only)					

YES = All samples OK NO = Samples were preserved at lab as listed PC OK to adjust pH______________

**If pH adjustment is required, use NaOH and/or H_2SO_4

VOC Vial pH Verification (Tested after Analysis) Following Samples Exhibited pH > 2				

Other Comments:

P:\QAQC\QA_DOCUM\SOP\DRAFT\Attachments\Cooler Receipt And Preservation Check Form.doc

9.0 QUALITY CONTROL OBJECTIVES (PRECISION, ACCURACY, SENSITIVITY, AND COMPLETENESS)

A primary focus of Columbia Analytical Services Quality Assurance (QA) Program is to ensure the accuracy, precision and comparability of all analytical results. CAS has established Quality Control (QC) objectives for precision and accuracy that are used to determine the acceptability of the data that is generated in its laboratories. These QC limits are either specified in the methodology or are statistically derived and are based on the laboratory's actual historical data obtained from control-charting the various QC measurements for each analytical method. The Quality Control objectives are defined below and the acceptable numeric values are shown in the table in Appendix C. The actual types of QC samples required for analysis is discussed in the specific analytical SOP.

9.1 Accuracy

Accuracy is a measure of the closeness of an individual measurement (or an average of multiple measurements) to the true or expected value. Accuracy is determined by calculating the mean value of results from ongoing analyses of standard reference materials, standard solutions and laboratory-fortified blanks. In addition, laboratory-fortified (i.e. matrix-spiked) samples are also measured; this indicates the accuracy or bias in the actual sample matrix. Accuracy is expressed as percent recovery (% REC) of the measured value, relative to the true or expected value. The acceptance limits for accuracy (shown in the table in Appendix C) originate from two different sources: Where acceptance limits are defined and stated in the individual methods, CAS has adopted the limits without modification. If no acceptance limits are given in a method, CAS adopts the limits derived from control charts that are generated for each appropriate method. These control charts are updated once a year for the appropriate Surrogate, Laboratory Control Sample, and Matrix Spike compounds.

$$\text{Accuracy (\%REC)} = \frac{A - B}{C} \times 100$$

Where A = Analyte total concentration from spiked sample
B = Analyte concentration from unspiked sample
C = Concentration of spike added

9.2 Precision

Precision is the ability of an analytical method or instrument to reproduce its own measurement. It is a measure of the variability, or random error, in sampling, sample handling and in laboratory analysis.

Precision is measured through the use of replicate sample analyses within the same batch and is expressed as the relative percent difference (RPD) between the replicate measurements.

$$RPD = \frac{D1 - D2}{(D1+D2)/2} \times 100$$

Where D1 = Original Result
D2 = Duplicate Result

9.3 Practical Quantitation Limits

The PQLs used at CAS are the routinely reported lower limits of quantitation which take into account day-to-day fluctuations in instrument sensitivity as well as other factors. These PQLs are the levels to which CAS routinely reports results in order to minimize false positive or false negative results. The PQL is normally two to ten times the method detection limit (MDL), which is determined by a procedure outlined in 40 CFR 136, Appendix B. MDLs for analytical methods routinely performed at CAS are determined annually.

9.4 Completeness

Completeness is a measure of the amount of valid data that is obtained, compared to the amount that is expected. It is expected that all analyses conducted in accordance with the approved analytical methods and standard laboratory operating procedures will meet QC acceptance criteria for 95% if the samples tested, however, the CAS objective for completeness is 100%.

$$\text{Completeness (\%)} = \frac{\text{valid data obtained}}{\text{total data planned}} \times 100$$

9.5 Representativeness

Representativeness is the degree to which a samples aliquot that is analyzed gives results identical to analysis of the whole. CAS has sample handling protocols to ensure that the sample given to the laboratory for analysis is thoroughly homogenized before the aliquot for analysis is removed. Further, analytical SOPs specify appropriate sample sizes to further ensure the sample aliquot that is analyzed is representative of the whole.

9.6 Comparability

Comparability expresses the confidence with which one data set can be compared to another. To ensure comparability, SOPs are used for the preservation, handling, and analysis of all samples. Data is reported in units specified by the customer.

10.0 QUALITY CONTROL PROCEDURES

The specific types, frequencies, and processes for quality control sample analysis are described in detail in method-specific standard operating procedures. These sample types and frequencies have been adopted for each method and a definition of each type of QC sample is provided below. In addition, a number of other quality control processes which may impact analytical results are also described below.

10.1 Modified Procedures

CAS strives to perform published methods as described in the referenced documents. If there is a material deviation from the published method, the method is cited as a “Modified” method in the analytical report. Standard operating procedures are available to analysts and are also available to our clients for review. If the modification is such that the method becomes “Performance Based,” client approval is obtained for the use of the method prior to the performance of the analysis.

10.2 Procedures for Accepting New Work

Due to the increase in analytes used in the industry and found in the environment, analytes are requested to be analyzed using existing methodologies and/or new methodologies. These requests must be reviewed prior to accepting new work and creating new methodologies. These requests typically include:

1. The addition of analytes to an existing scan.
2. Complete start-up of an established method.
3. Analyte(s) requested with no established method.
4. Specific Confidentiality requests

<u>The addition of analytes to an existing scan.</u>
The analytical method is reviewed to determine if its use is appropriate for the new analyte. The standards are purchased from a commercial vendor and prepared. If the analyte is available from more than one source, a second source may be purchased to verify the calibration standard. A reference is spiked with a mid-level concentration of the appropriate standard and analyzed to determine retention time, resolution, etc. Temperature programs and instrument conditions may be modified to optimize resolution for the analyte. If the analyte may be resolved and detected by the method, an MDL study is performed to determine a detection limit suitable for the analyte. An in-house SOP may be written or modified to include the analyte.

<u>Complete start-up of an established method</u>
The method is obtained and reviewed by the analyst, technical manager, and/or supervisor to determine if the instrumentation and reagents needed by the method are

available. If the required instrumentation is available, then reagents, standards, equipment, and supplies are gathered and purchased. If the analyte(s) are available from more than one source, a second source may be purchased to verify the calibration source. A qualified analyst performs the method, elution times are determined, temperature programs are optimized, and batch QC is performed to monitor accuracy and precision. An MDL study is performed per instrument to determine detection limit(s) and each analyst performing the method must complete an Initial Demonstration of Capability (IDOC) study. An SOP is written by a qualified analyst and QAPM.

Analyte(s) requested with no established method.
The analyte to be analyzed is researched and reviewed by the technical manager for chemical nature, formula, and other related information. The Merck Index and CRC Handbook are reviewed for boiling point, vapor pressure to determine the type of compound. After determining the type of compound, it is assumed that it can be analyzed by an existing method. If not, perhaps a modification of a method or the creation of a method could be tried. The different approaches to testing the analyte may be tried, comparing the efficiency of the various approaches. The method, which allows for the acceptable precision and accuracy, shall be used. Follow procedures outlined above. Precision and accuracy should be documented using the MDL and DOC studies where applicable.

Specific confidentiality requests
Investigate the confidentiality requests of the client. The client may have specific requests regarding the release of the report/data, the retention of the samples and the data, and the disposal of the samples.

Method Performance
Reporting limits are based upon an MDL study performed according to ADM-MDL. At Columbia Analytical Services, the MDL is equal to the limit of detection (LOD) which is used to determine the limit of quantitation (LOQ). See SOP, ADM-MDL.

10.3 Analytical Batch

The basic unit for analytical quality control is the analytical batch. An analytical batch is that all the samples in a batch, both field samples and quality control samples, are to be handled and processed in exactly the same way, and all of the data from each analysis is to be manipulated in exactly the same manner.

The minimum requirements of an analytical batch are:

1. The number of field samples in a batch is not to exceed 20.

2. All field samples in a batch are of the same matrix.

3. The QC samples to be processed with the field samples include:
    - Method Blank - to determine possible laboratory contamination.
    - Laboratory Control Sample - to assess method performance.

- Matrix Spike (field sample) - to assess possible matrix problems.
- Duplicate Matrix Spike or Duplicate (field) Sample - to assess batch precision and possible matrix problems.

4. A single lot of reagents is used to process the batch of samples.

5. Refer to SOP, *Analytical Batches and Sequences* (ADM-BCHSQ), for additional batching requirements. Specific project, program or method requirements may create exceptions. The more stringent QC requirements shall be followed in most all cases.

10.4 Method Blank

The method blank is either analyte-free water or analyte-free soil (when available), subjected to the entire analytical process. When analyte-free soil is not available, anhydrous sodium sulfate, organic-free sand, or an acceptable substitute may be used instead. The method blank is analyzed to demonstrate that the analytical system itself is not contaminated with the analyte(s) being measured. The method blank results should be below the reporting limit for the analyte(s) being tested. A method blank is included with the analysis of every analytical batch, every 20 samples, or as stated in the method, whichever is more frequent.

For Industrial Hygiene samples, blanks shall be analyzed with each batch of samples to detect and measure possible contamination of sampling media and reagents used for analysis. Blanks should be supplied by the client as a representative sampling media of the same lot or batch as the field samples.

10.5 Calibration Blanks

Calibration blanks are prepared along with calibration standards. Calibration blanks are free of the analyte of interest, and provide the zero point of the calibration curve.

10.6 Continuing Calibration Blanks

Continuing calibration blanks (CCBs) are solutions of either analyte-free water or solvent that are analyzed in order to verify the zero point of the analytical system. The frequency of CCB analysis is either once every ten samples or as indicated in the method, whichever is greater.

10.7 Calibration Standards

Calibration standards are solutions of known concentration prepared from primary standard solutions which are, in turn, prepared from stock standard materials. Calibration standards are used to calibrate the instrument response with respect to analyte concentration. Standards are analyzed in accordance with the requirements stated in the particular method being used.

10.8 Initial (or Independent) Calibration Verification Standards

Initial (or independent) calibration verification standards (ICVs) are standards that are analyzed *after* calibration but *prior to* sample analysis, in order to verify the calibration of the analytical system. They are prepared from materials obtained from a source independent of that used for preparing the calibration standards. ICVs are also analyzed in accordance with method-specific requirements.

10.9 Continuing Calibration Verification Standards

Continuing calibration verification standards (CCVs) are midrange standards that are analyzed in order to verify that the calibration of the analytical system is still acceptable. The frequency of CCV analysis is either once every ten samples, or as indicated in the method, whichever is greater.

10.10 Internal Standards

Internal standards consist of known amounts of specific compounds that are added to each sample following sample preparation or extraction. Internal standards are generally used for GC/MS and ICP-MS procedures to correct sample results that have been affected by changes in instrument conditions or changes caused by certain matrix effects. The integrated area of the internal standard compared to the continuing calibration check standard should vary by no more than the limits specified in each method.

10.11 Surrogates

Surrogates are organic compounds which are similar in chemical composition and chromatographic behavior to the analytes of interest, but which are not normally found in environmental samples. Depending on the analytical method, one or more of these compounds is added to method blanks, calibration and check standards, and samples (including duplicates, matrix spike samples, duplicate matrix spike samples and laboratory control samples) prior to extraction and analysis in order to monitor the method performance on each sample. The percent recovery is calculated for each surrogate, and the recovery is a measurement of the overall method performance. The acceptance criteria for these various analytes are listed in Appendix C, along with other data quality capabilities.

10.12 Matrix Spikes

Matrix spiked samples are aliquots of samples to which a known amount of the target analyte (or analytes) has been added. The samples are then prepared and analyzed in the same analytical batch, and in exactly the same manner as are routine samples. The spike recovery measures the effects of interferences caused by the sample matrix and reflects the accuracy of the method for the particular matrix in question. Spike recoveries are calculated as discussed in Section 9.1.

For the appropriate methods, matrix spiked samples are prepared and analyzed at a minimum frequency of one spiked sample (and one duplicate spiked sample, if appropriate) per twenty samples. Control limits are summarized in Appendix C.

Matrix spikes are not applicable with industrial hygiene sampling media for air analysis.

Note: A sample identified as a field blank, equipment blank, or trip blank is not to be matrix spiked.

10.13 Laboratory Duplicates and Duplicate Matrix Spikes

Duplicates are additional replicates of samples that are subjected to the same preparation and analytical scheme as the original sample. Depending on the method of analysis, either a duplicate analysis (and/or a matrix spiked sample) or a matrix spiked sample and matrix spike duplicate sample (MS/MSD) are analyzed. The relative percent difference between duplicate analyses or between an MS and MSD is a measure of the precision for a given method and analytical batch. The relative percent difference (RPD) for these analyses is calculated as discussed in Section 9.2.

Depending on the method of analysis, either duplicate and/or matrix spike duplicate analyses are performed at a minimum frequency of one set per 20 samples. Control limits are summarized in Appendix C.

Duplicate analysis is not applicable with industrial hygiene sampling media for air analysis.

Note: A sample identified as a field blank, equipment blank, or trip blank is not to be duplicated.

10.14 Laboratory Control Samples

The laboratory control sample (LCS) is an aliquot of analyte-free water or analyte-free soil (or anhydrous sodium sulfate or equivalent) to which known amounts of the method analyte(s) is(are) added. A standard reference material (SRM) of known matrix type, containing certified amounts of target analytes, may also be used as an LCS. The LCS sample is prepared and analyzed in the same analytical batch, and in exactly the same manner, as the other routine samples. Stock solutions used for LCSs are purchased or prepared independently of calibration standards. The percent recovery (% REC.) of the target analytes in the LCS assists in determining whether the methodology is in control and whether the laboratory is capable of making accurate and precise measurements at the required reporting limit. Comparison of batch-to-batch LCS analyses enables the laboratory to evaluate batch-to-batch precision and accuracy. An LCS is prepared and analyzed at a minimum frequency of one LCS per 20 samples, with every analytical batch or as stated in the method, whichever is more frequent. Acceptance criteria for LCS analyses are summarized in Appendix C.

For industrial hygiene samples (air) LCSs shall be performed in duplicate to assess accuracy and precision for each batch, not to exceed 10 samples. Acceptance criterion of 80 – 120% shall be used until enough data points are available to statistically generate a lab QC limit.

10.15 Interference Check Samples

An interference check sample (ICS) is a solution containing both interfering and analyte elements of known concentration that can be analyzed to verify background and interelement correction factors in metals analyses. The ICS is prepared to contain known concentrations of interfering elements that will provide an adequate test of the correction factors. The ICS is spiked with the elements of interest at concentrations of approximately ten times the instrument detection limits. The ICS is analyzed at the beginning and end of an analytical run or every eight hours, whichever is more frequent, and the results must be within ± 20% of the true values.

10.16 Post Digestion Spikes

Post digestion spikes are samples prepared for metals analyses that have an analyte spike added to determine if matrix effects may be a factor in the results. The spike addition should produce a method-specified minimum concentration above the instrument detection limit. A post digestion spike is analyzed with each batch of samples and recovery criteria are specified for each method.

10.17 Source and Preparation of Standard Reference Materials

CAS relies on a primary vendor for the majority of its analytical supplies. In addition, consumable primary stock standards are obtained from certified commercial sources or from sources referenced in a specific method, as discussed in section 4.2.2 of this document. All reference materials that are received at CAS are recorded by the technical staff in the appropriate notebook(s) and are stored under conditions that provide maximum protection against deterioration and contamination. The notebook entry includes such information as an assigned logbook identification code, the source of the material (i.e. vendor identification), solvent (if applicable) and concentration of analyte(s), reference to the certificate of analysis and an assigned expiration date. In addition, the date that the standard is received in the laboratory is marked on the container.

Stock solutions and/or calibration standard solutions are prepared fresh as often as necessary according to their stability. After preparation, all standard solutions are properly labeled as to name, concentration, date, preparer, and expiration date; these entries are also recorded in the appropriate notebook. See SOP, *Making Entries onto Benchsheets and Logbooks* (ADM-DATANTRY). To ensure traceability, all standards are labeled with an in-house code that can be traced back to the original stock standard received by the vendor and thus, the certificate of analysis. Prior to introduction into the analytical system/process, some reference materials are verified for accuracy with a second, independent source of the material. In addition, the independent source of reference material is also used to check the calibration standards for signs of deterioration. All standards, reagents and reference materials shall be stored per analytical SOP requirements to ensure their integrity. Safe handling and transportation of these materials are discussed in the respective analytical SOP and/or Laboratory Safety Manual.

10.18 Control Charting

The generation of control charts is performed annually at CAS. MS, LCS, and Surrogate recoveries are monitored and charted for key parameters to determine new control limits using the data generated in the previous year. After review of the data by the Quality Assurance Program Manager, the new acceptance criteria may replace the previous criteria and method conformity is assessed using the new values. See SOP for *Determination of Statistical Control Limits* (ADM-CRTL-LIM). Old charts are archived for a period of 10 years.

10.19 Proficiency Testing Participation

Each discipline and test method for most analytes are monitored using A2LA or NELAP approved vendors for Proficiency Testing on a semi-annual basis. Results of the proficiency samples are reviewed by the Laboratory Director, the QAPM, the Corporate QA Director and the laboratory staff. Any problems surfacing during the review are investigated, and corrective action is taken regarding any and all deficiencies.
Interlaboratory Proficiencies are performed annually to determine continued lab performance throughout the network of CAS laboratories. Such studies are organized by Corporate QA. Proficiency test results are also used to show continued acceptable performance per analyst.

10.20 Glassware Washing

Glassware washing and maintenance play an crucial role in the daily operation of a laboratory. The glassware used at CAS undergoes a rigorous cleansing procedure prior to every usage. Departmental specific glassware washing SOP’s (GEN-GC, MET-GC and EXT-GC) have been generated that outline the various procedures used at CAS; each is specific to the end-use of the equipment as well as to the overall analytical requirements of the project.

11.0 CALIBRATION PROCEDURES AND FREQUENCY

All equipment and instruments used at CAS are operated, maintained and calibrated according to the manufacturer's guidelines and recommendations, as well as to criteria set forth in the applicable analytical methodology. Operation and calibration are performed by personnel who have been properly trained in these procedures. Documentation of calibration information is maintained in appropriate reference files. The frequency of calibration and concentration of calibration standards are determined by the manufacturers guidelines, the analytical method, or the requirements of special contracts. See specific analytical SOP's for frequency and criteria. Generally, purchased standards have a shelf life of 12-36 months and prepared standards have a shelf life of 1-12 months. Recalibration is required at anytime that the instrument is not operating correctly or functioning at the proper sensitivity. Brief descriptions of the calibration procedures for our major laboratory equipment and instruments are described below.

11.1 Temperature Control Devices

Temperatures are monitored and recorded for all of our temperature-regulating devices including ovens, incubators and refrigerators. Bound record books are kept which contain recorded temperatures, identification and location of equipment, and the initials of the technician who performed the checks. All thermometers have been identified and the calibration of these thermometers is checked annually against a National Institute of Standards and Technology (NIST) certified thermometer. Calibration records are maintained by the QA PM. (See SOP SMO-DALYCK).

11.2 Analytical Balances

Analytical balances are serviced on an annual basis by a professional metrology organization. New certificates of calibration for each balance are issued to the laboratory on an annual basis. The calibration of each analytical balance is checked prior to use with Class-1 verified weights, which assess the accuracy of the balance at the working range. Bound record books are kept which contain the recorded measurements, identification and location of equipment, and the initials of the technician who performed the checks. (See SOP SMO-DALYCK).

11.3 Inductively Coupled Plasma (ICP) and ICP-Mass Spectrometry (ICP-MS)

Each emission line on the ICP is calibrated daily against a blank and three standards. Analyses of calibration standards, initial and continuing calibration verification standards, and inter-element interference check samples are carried out as specified in the applicable method being utilized (see Section 18.0 for references).

11.4 Atomic Absorption Spectrophotometers (AAS)

These instruments are calibrated daily using a minimum of four standards and a blank. Calibration is validated using reference standards, and is verified at a minimum frequency of once every ten samples.

11.5 GC/MS Systems

All GC/MS instruments are calibrated at five different concentration levels for the analytes of interest, using procedures outlined in Standard Operating Procedures (SOPs) and/or appropriate USEPA method citations. All SRMs used for this function are "EPA-Certified." Compounds selected as system performance check compounds (SPCCs) must show a method-specified response factor in order for the calibration to be considered valid. Calibration check compounds (CCCs) must also meet method specifications for percent difference from the multipoint calibration. Method-specific instrument tuning is regularly checked using bromofluorobenzene (BFB) for volatile organic chemical (VOC) analysis, or decafluorotriphenylphosphine (DFTPP) for semi-volatile analysis. Mass spectral peaks for the tuning compounds must conform both in mass numbers and in relative intensity criteria before analyses can proceed.

11.6 Gas Chromatographs

Calibration and standardization follow SOP guidelines and/or appropriate USEPA method citations. Initial calibration standards are prepared at three to five concentration levels for each analyte of interest. The lowest standard is near the method reporting limit; additional standards define the working range of the GC detector. Results are used to establish response factors and retention-time windows for each analyte. Calibration is verified at a minimum frequency of once every ten samples.

11.7 Infrared Analyzer

The instrument is calibrated using a blank and four standards. The calibration is validated at the beginning of each analysis, and continuing calibration is verified at a minimum frequency of once every ten samples.

11.8 UV-Visible Spectrophotometer (manual colorimetric analyses)

Routine calibrations for colorimetric and turbidimetric analyses involve generating a 5-point calibration curve including a blank. Correlation coefficients must meet method or SOP specifications before analysis can proceed. Independent calibration verification standards (ICVs) are analyzed with each batch of samples. Continuing calibration is verified at a minimum frequency of once every ten samples.

11.9 Flow Injection Analyzer (automated colorimetric analysis)

A minimum of five standards and a blank are used to calibrate the instrument daily. Standard CAS acceptance limits are used to evaluate the calibration curve prior to sample analysis. All linear regressions must have a correlation coefficient of 0.995 or better before analysis may proceed.

11.10 Ion Chromatographs

Calibration of the ion chromatograph (IC) involves generating a 5-point calibration curve. A correlation coefficient of 0.995 or better for the curve is required before analysis can proceed. Quality Control (QC) samples that are routinely analyzed include blanks and laboratory control samples. The target analytes typically determined by the IC include nitrate, chloride, fluoride, and sulfate.

11.11 Turbidimeter

Calibration of the turbidimeter requires analysis of formazin and polymer standards measured as NTU. Quality Control samples that are routinely analyzed include blanks, and duplicates.

11.12 Ion-selective electrode

Two standards are used to calibrate the electrodes before analysis. The slope of the curve must be within acceptance limits before analysis can proceed. Quality Control samples that are routinely analyzed include blanks, LCSs and duplicates.

11.13 HPLC

Calibration and standardization follow SOP guidelines and/or appropriate USEPA method citations. Initial calibration standards are prepared with at least five concentration levels for each analyte of interest. The lowest standard is near the method reporting limit; additional standards define the working range of the detector. Results are used to establish response factors and retention-time windows for each analyte. Calibration is verified at a minimum frequency of once every ten samples.

11.14 Other Instruments

Calibration for the total organic carbon (TOC) and other instruments is performed following manufacturer's recommendations and applicable SOPs.

12.0 DATA REDUCTION, VALIDATION, AND REPORTING

CAS reports the analytical data produced in its laboratories to the client via the certified analytical report. This report typically includes a transmittal letter, a case narrative, client project information, specific test results, quality control data, chain of custody information, and any other project-specific support documentation. The following procedures describe our data reduction, validation and reporting procedures.

12.1 Laboratory Information Management System (LIMS)

CAS/Rochester currently uses StarLIMS v.6.11a throughout the laboratory. This data management and retrieval system is the PC based StarLIMS that runs on a Novell Network. The LIMS is used for sample tracking, sample workload projections, sample result storage, reporting, and invoicing. The system allows you to acquire data from instrumentation and can generate ASCII, spreadsheet, database, and/or print files.
Periodically, historical data is checked on the LIMs for authenticity and ability to recreate data files. These files are reviewed for data integrity and possible corruption. See Software Quality Assurance Plan.

12.2 Data Reduction and Custody

All data is initially reviewed and processed by analysts using appropriate methods (e.g. chromatographic software, instrument printouts, hand calculation, etc.) The resulting data set is either manually entered (e.g. some general chemistry parameters) into the LIMS system or is electronically transferred into LIMS from the software used to process the original data set (e.g. chromatographic software). A file of all raw data is generated and given to the departmental supervisor or other certified analyst for secondary review. Once the complete data set has been reviewed to be complete and correct by two analysts, the LIMs data is validated against the raw data which allows the data to be available to Project Managers and Report Writers. Upon approval of the data the supervisor relinquishes the raw data file to a Report Writer, who generates a final report from the LIMS system. The resulting final report is then reviewed by the Project Manager for accuracy. Typically, all data is reported in the units and MRLs listed in Appendix C. An estimation of the uncertainty of the measurements is available upon request using the procedures in the CAS SOP ADM-UNCERT. Assessment of the analytical data includes a check on data consistency by looking for comparability of duplicate analyses, comparability of previous data from the same sampling location (if available), adherence to accuracy and precision control limits, and anomalous low or high parameter values. Once the data has been checked for accuracy and acceptability, the final report and raw data is forwarded to the Lab Director or Quality Assurance Project Manager, who further reviews the data package for errors. When the entire data set has been found to be acceptable the report is signed, distributed, and the raw data is filed for approximately one year, then archived.

All hard copy and electronic backups are archived in a secured room for a period of at least 5 years from the date of the final report (as discussed in section 12.6.1). It is not unusual to have various clients require a 10-year retention of records, therefore, the archivist, project manager, and possibly the client are consulted prior to the destruction of the records.

12.3 Confirmation Analysis

12.3.1 Gas Chromatographic Analyses

For gas chromatographic (GC) analyses, most positive results are confirmed by a second column, a second detector, or by GC/MS analysis, unless exempted by one of the following situations:

- The analyte of interest produces a chromatogram containing "pattern" peaks which match appropriate standards. These analytes include polychlorinated biphenyls (PCBs) and hydrocarbon fuels (e.g., gasoline and diesel).

- The sample is analyzed for benzene, toluene, ethylbenzene and xylenes (BTEX), and the sample is found, by a separate analysis, to contain gasoline. In a sample containing no gasoline, the presence of BTEX compounds will be confirmed.

- The sample meets all of the following requirements:

  1. All samples (liquid or solid) come from the same source (e.g., groundwater samples from the same well) for continuous monitoring.

  2. All analytes have been previously analyzed, identified and confirmed by a second column or by GC/MS. The documents indicating previous confirmation must be available for review.

  3. The resulting chromatogram is relatively simple and does not contain complex or overlapping peaks.

  4. The chromatogram is largely unchanged from the one for which confirmation was carried out.

12.3.2 Confirmation Data

Confirmation data will be provided as specified in the method. Identification criteria for GC or GC/MS methods are summarized below:

- GC Methods - The analyte must fall within plus or minus three times the standard deviation (SD) of the retention time of the daily midpoint standard in order to be qualitatively identified. The retention-time windows will be established and documented, as specified in the appropriate Standard Operating Procedure (SOP).

- GC/MS Methods - Two criteria are used to verify identification:

  1. Elution of the analyte in the sample will occur at the same relative retention time (RRT) as that of the analyte in the standard.

2. The mass spectrum of the analyte in the sample must, in the opinion of a qualified analyst or the department manager, correspond to the spectrum of the analyte in the standard or the current GC/MS reference library.

12.4 Data Validation

The integrity of the data generated in the laboratory is primarily assessed by the analyst, supervisor and project manager through the use of a variety of measures that may include reagent blanks, laboratory fortified blanks, duplicates, matrix spikes and QC samples. The numerical criteria for evaluation of these QC samples are listed in Appendix C; these various QC sample analyses are evaluated using the flow diagrams found in Figures 12-1 through 12-9. Other validation measures of the data include a check of the linearity of the calibration curve, an accuracy check of the QC standards and a check of the system sensitivity. Data transcriptions and calculations are also reviewed. Specific calculations used for determining the concentration or value of the measured parameters from the raw data are given in each of the analytical methods or CAS SOPs.
The QA department performs in-depth periodic monitoring of the data integrity program using data validation and electronic data audits (see ADM-IAUD and ADM-E DATA).

12.5 Data Reporting

When an analyst determines that the data has met the data quality objectives (and/or any client-specific data quality objectives) of the method and has qualified any anomalies in a clear, acceptable fashion, the data is validated by the supervisor. Validated data is reported from LIMS by report writers using specialized forms created by LIMS (see SOP, ADM-RG). Prior to release of the report to the client, the project manager must also review the entire body of data for completeness and to ensure that any and all client-specified objectives were successfully achieved. If required, samples exceeding any established state/federal maximum contaminant level or reportable concentration level, must be reported to the client. A case narrative may be written by the project manager to explain any unusual problems with a specific analysis or sample, client-specific objectives, exceedences, etc... The original raw data, along with a copy of the final report, is filed for archiving. CAS maintains control of analytical results by adhering to standard operating procedures and by observing sample custody requirements. All data are calculated and reported in units consistent with project specifications, to enable easy comparison of data from report to report. Typical qualifiers used to flag analytical results are listed in Appendix D.

12.6 Document Control

A document control system ensures that all documents are accounted for when the project is complete. A submission number is assign to each project for reporting and filing purposes. This number is associated with each order number (sample).

12.6.1 Documentation and Archiving of Routine Analysis Data

The archiving system includes all of the following items for each set of analyses performed:

- Benchsheets describing sample preparation (if appropriate)
- Instrument parameters
- Sample analysis sequence
- Analysis benchsheets and instrument printouts

- Chromatograms and peak integration reports for all samples, standards, blanks, spikes and reruns
- Log book ID number for the appropriate standards
- Copies of report submitted to the client

Individual sets of analyses are indexed by analysis date and/or submission number. Since many analyses are performed with computer-based data systems, the final sample concentrations can be automatically calculated. If additional calculations are needed, they are written on the integration report or securely stapled to the chromatogram, if done on a separate sheet. The archive room is a separte file room in which files shall be maintained for a period of at least five years (from date of report issue). It is not unusual to have various clients require a 10-year retention of records, such as NAVY and NYS Drinking Water Programs, therefore the archivist, project manager, and possibly the client are consulted prior to destruction of the records. The archive room is kept locked and access keys are controlled. All documents must be signed out if needed outside of the archive room and returned in a timely manner. A designated archivist monitors filing, incoming, and outgoing data from the archive.

In the event that the laboratory transfer's ownership or goes out of business, laboratory records shall be maintained for the contracted period and clients shall be notified prior to early destruction / disposal of samples or data.

All related quality documentation such as the quality manual, standard operating procedures, temperature and balance records, maintenance logs, (see Section 4.2 QAM) etc. are controlled and retained by the laboratory for 5-10 years depending upon the program (See ADM-DOC_CTRL).

12.6.2 Reporting Deliverables

In order to meet individual project needs, CAS provides several levels of analytical reports. Basic specifications for each level of deliverable are described in Table 12-1. Turnaround time and package level are negotiable on a project to project basis.

12.6.3 Electronic Data Deliverables (EDD)

CAS/Rochester offers standard Excel format as well as a variety of custom developed EDDs such as ASCII, dBase, and GISKEY. EDDs are available upon request on a project to project basis.

Figure 12-1
Evaluation of Method Calibration

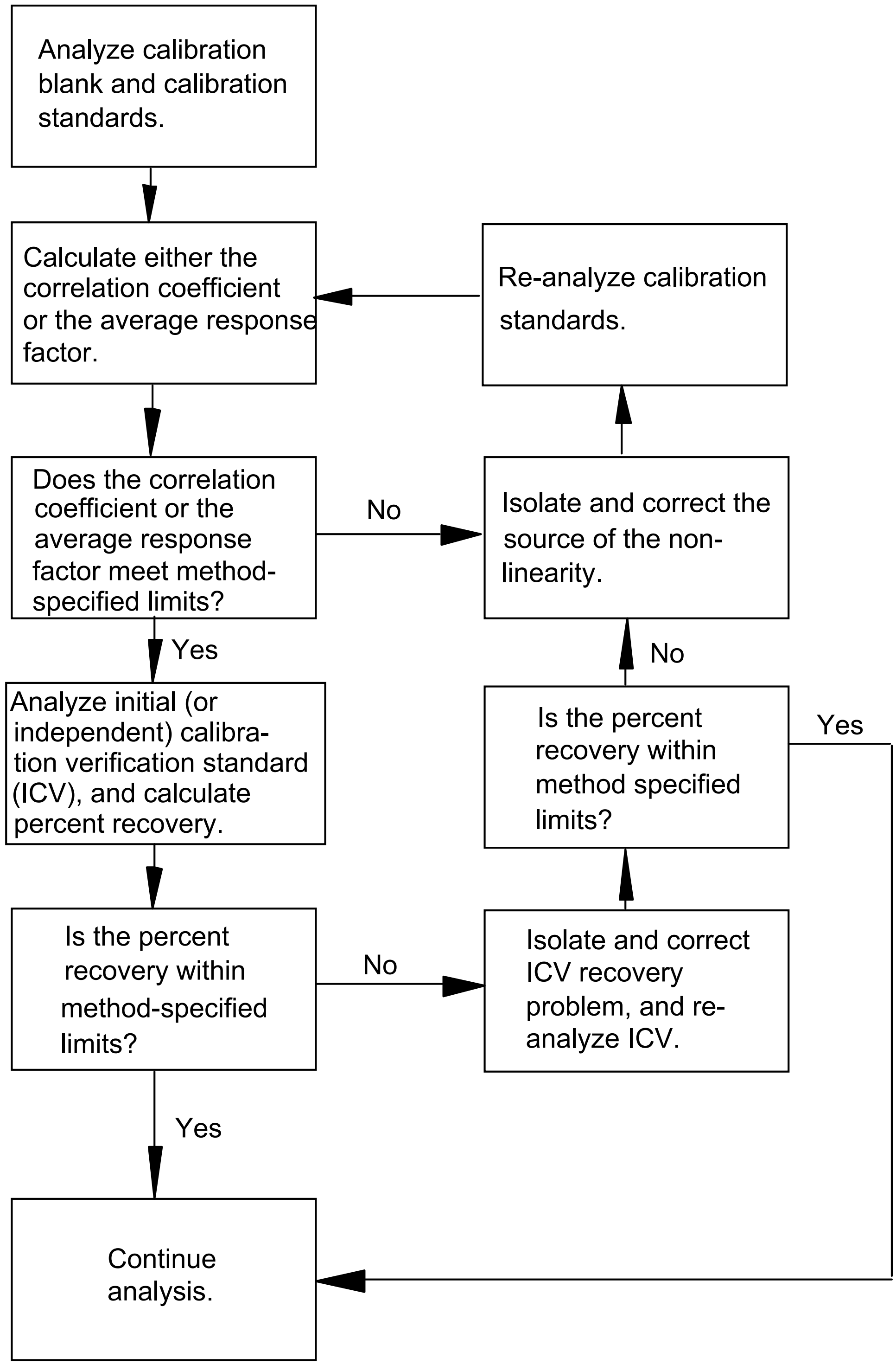


Figure 12-2
Evaluation of Continuing Calibration

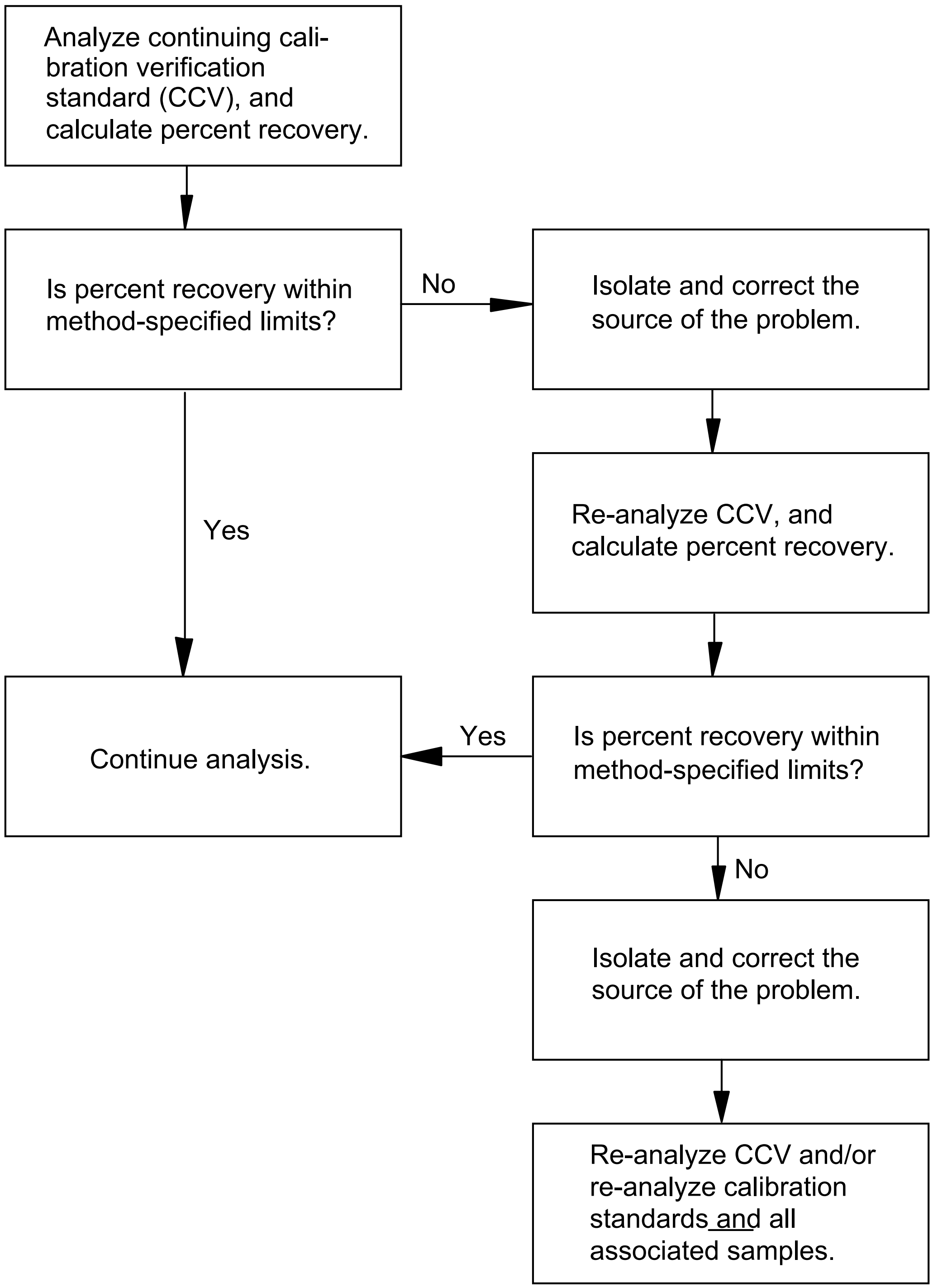


Figure 12-3
Evaluation of Method Blank and Instrument Blank Results

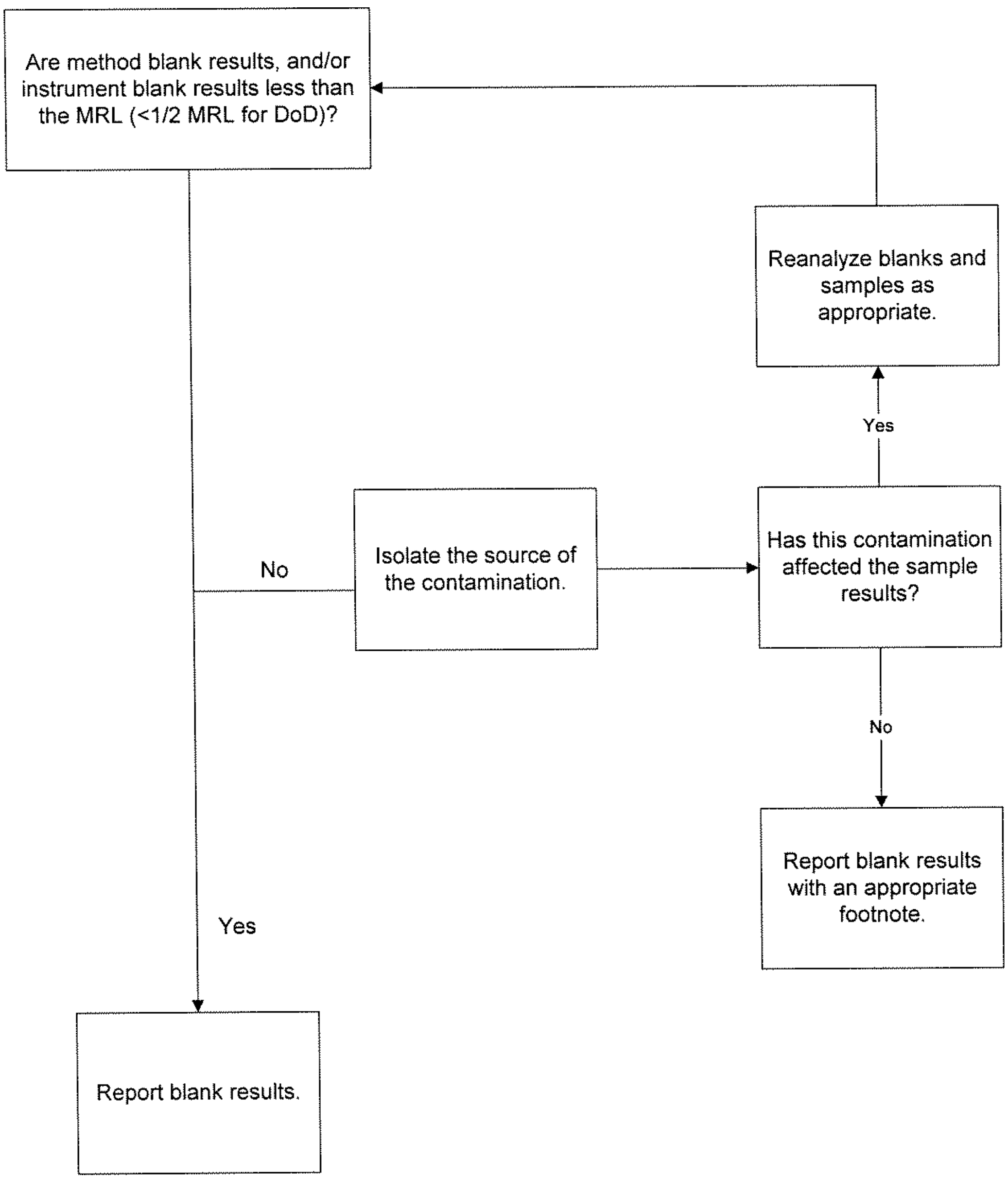


Figure 12-4
Evaluation of Sample Results for Inorganic Analyses

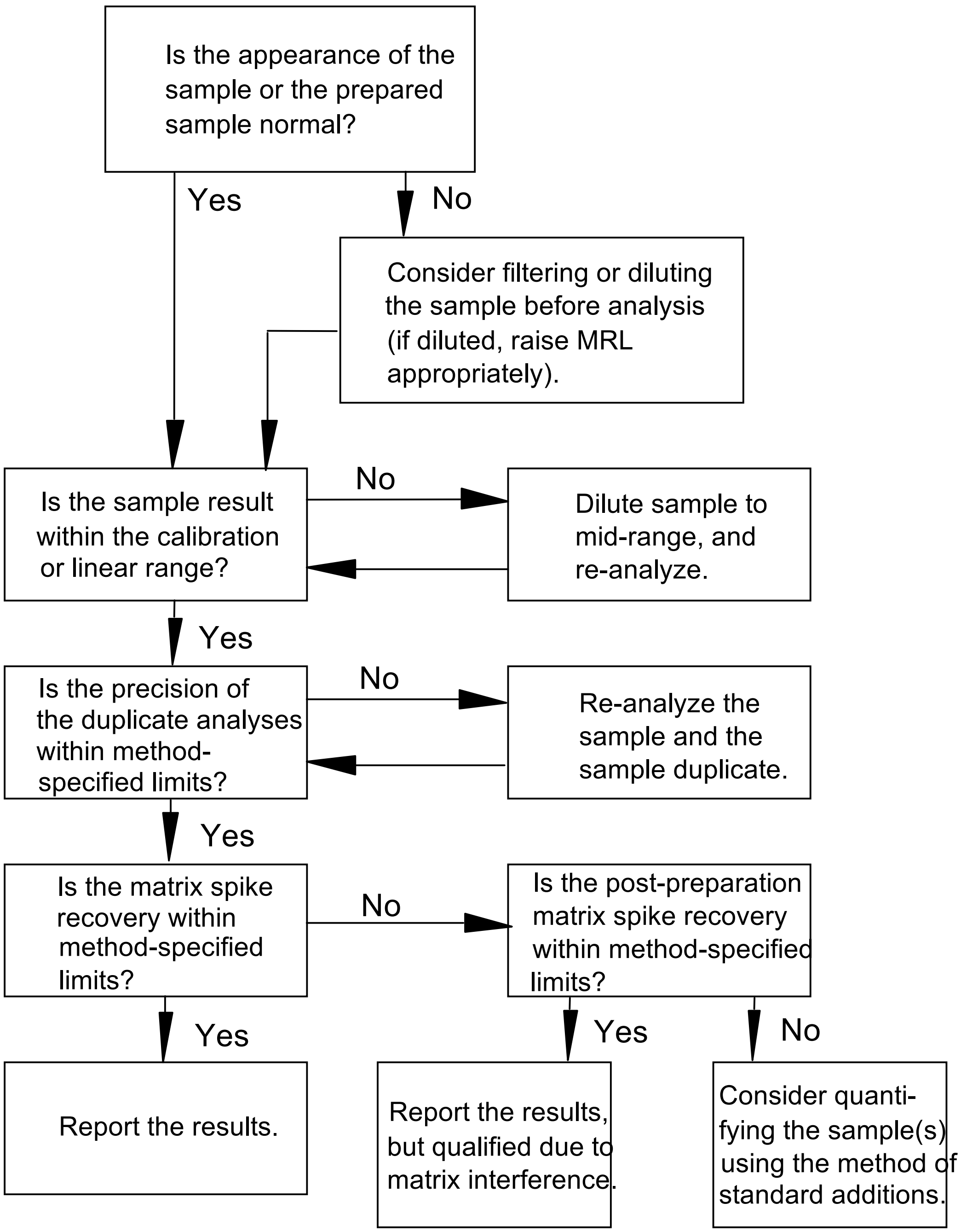


Figure 12-5
Evaluation of Sample Results for Organic Analyses

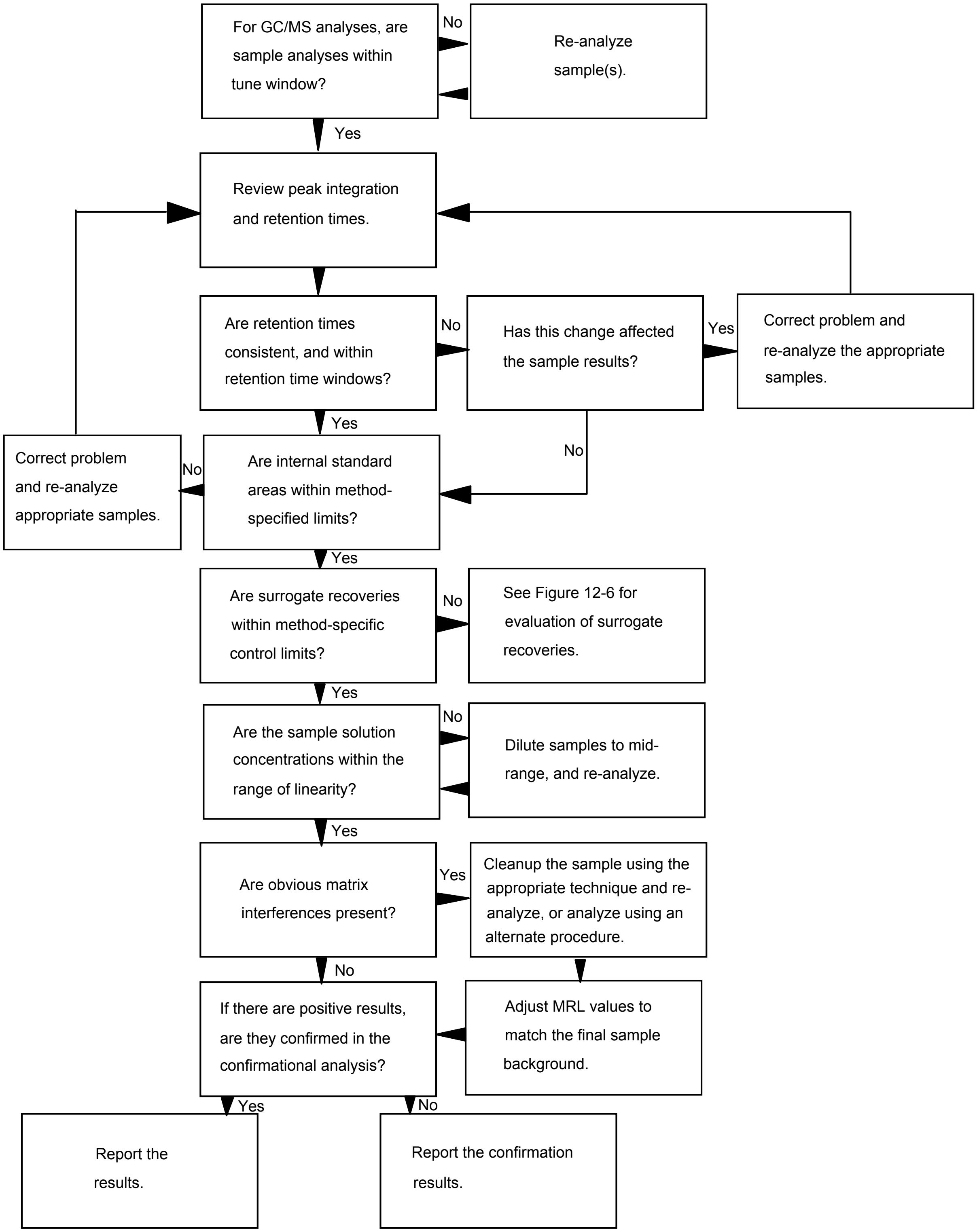


Figure 12-6
Evaluation of Surrogate Compound Recoveries

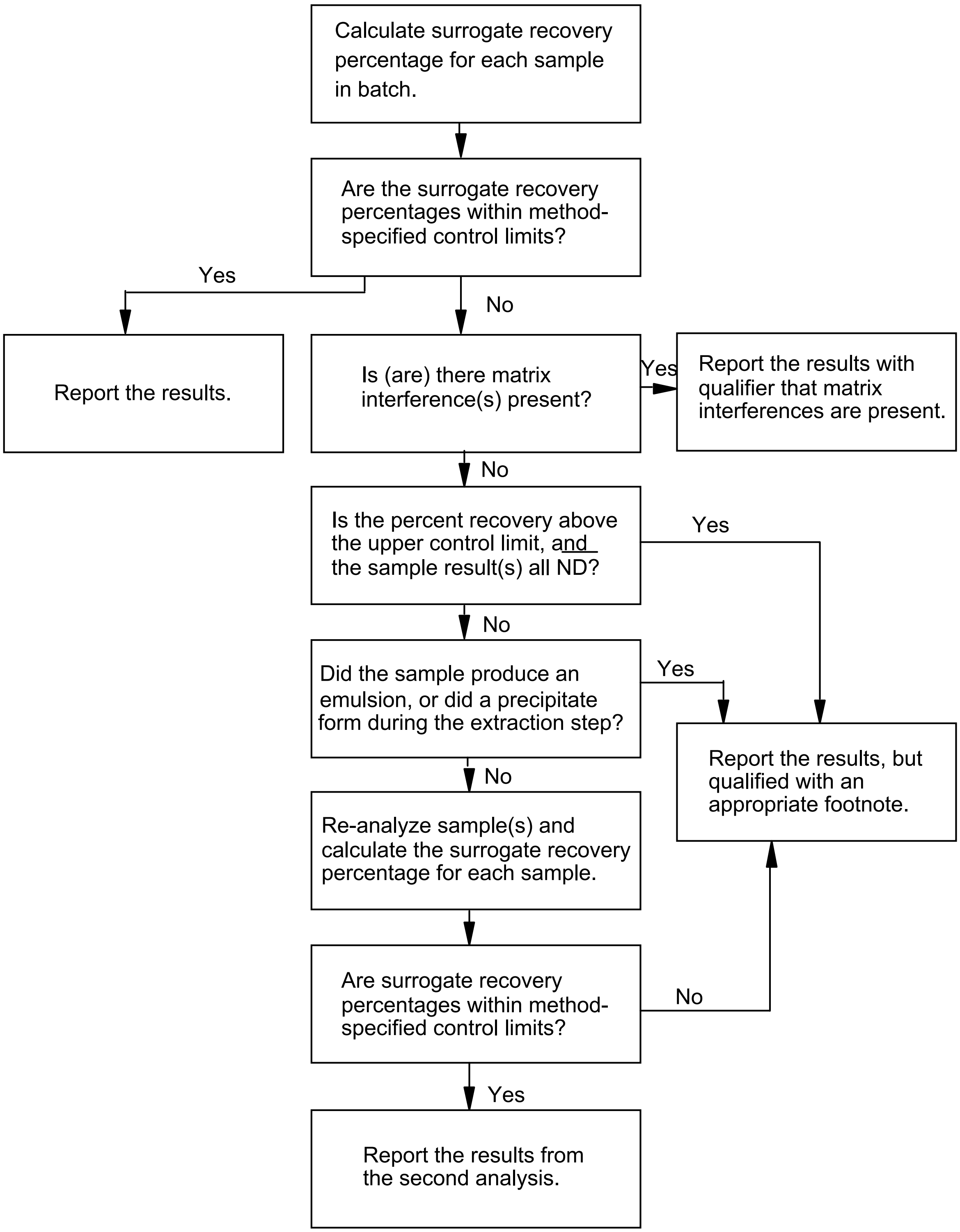


Figure 12-7
Evaluation of Duplicate Sample and/or Duplicate Matrix Spike Results

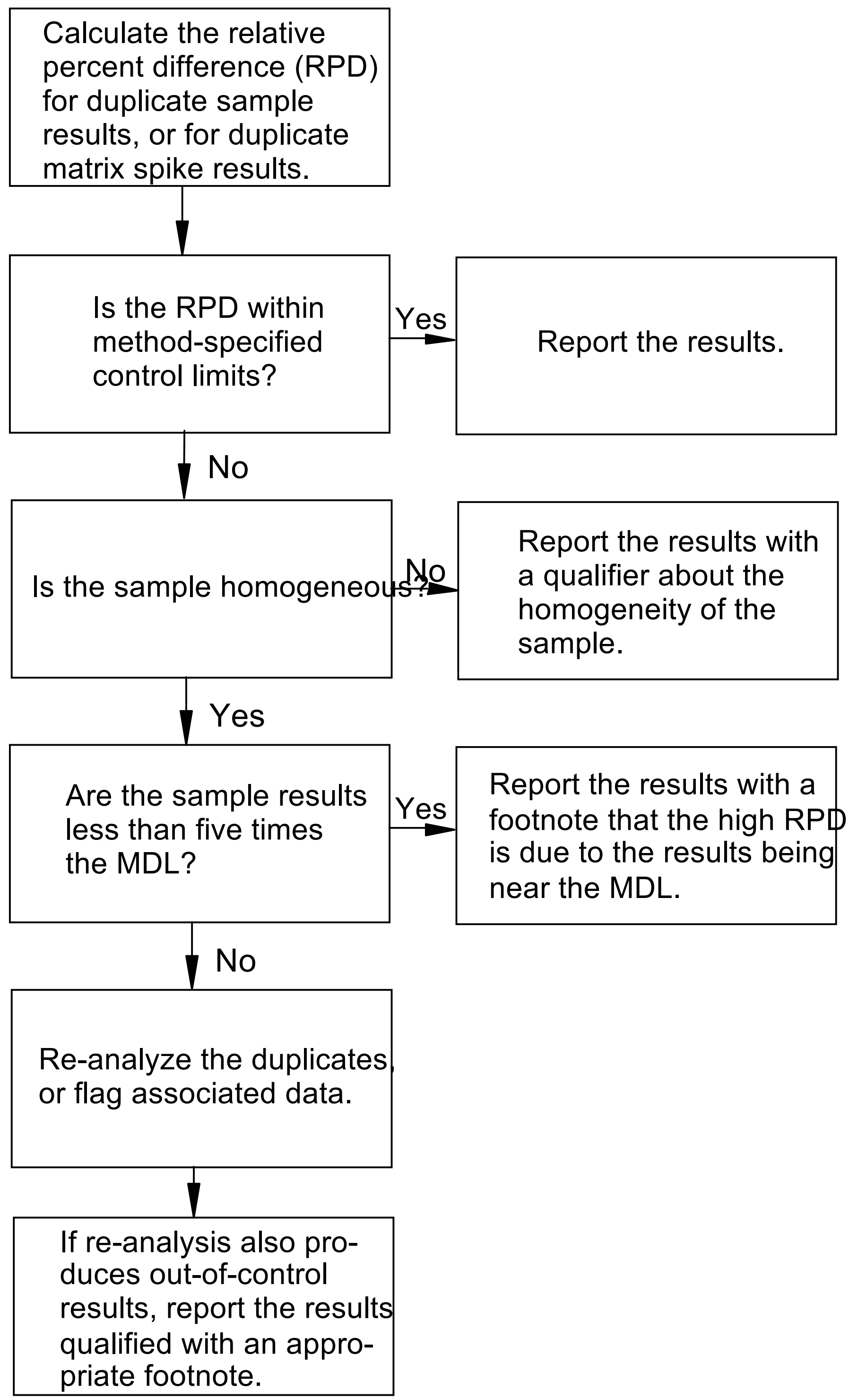


Figure 12-8
Evaluation of Matrix Spike Recoveries

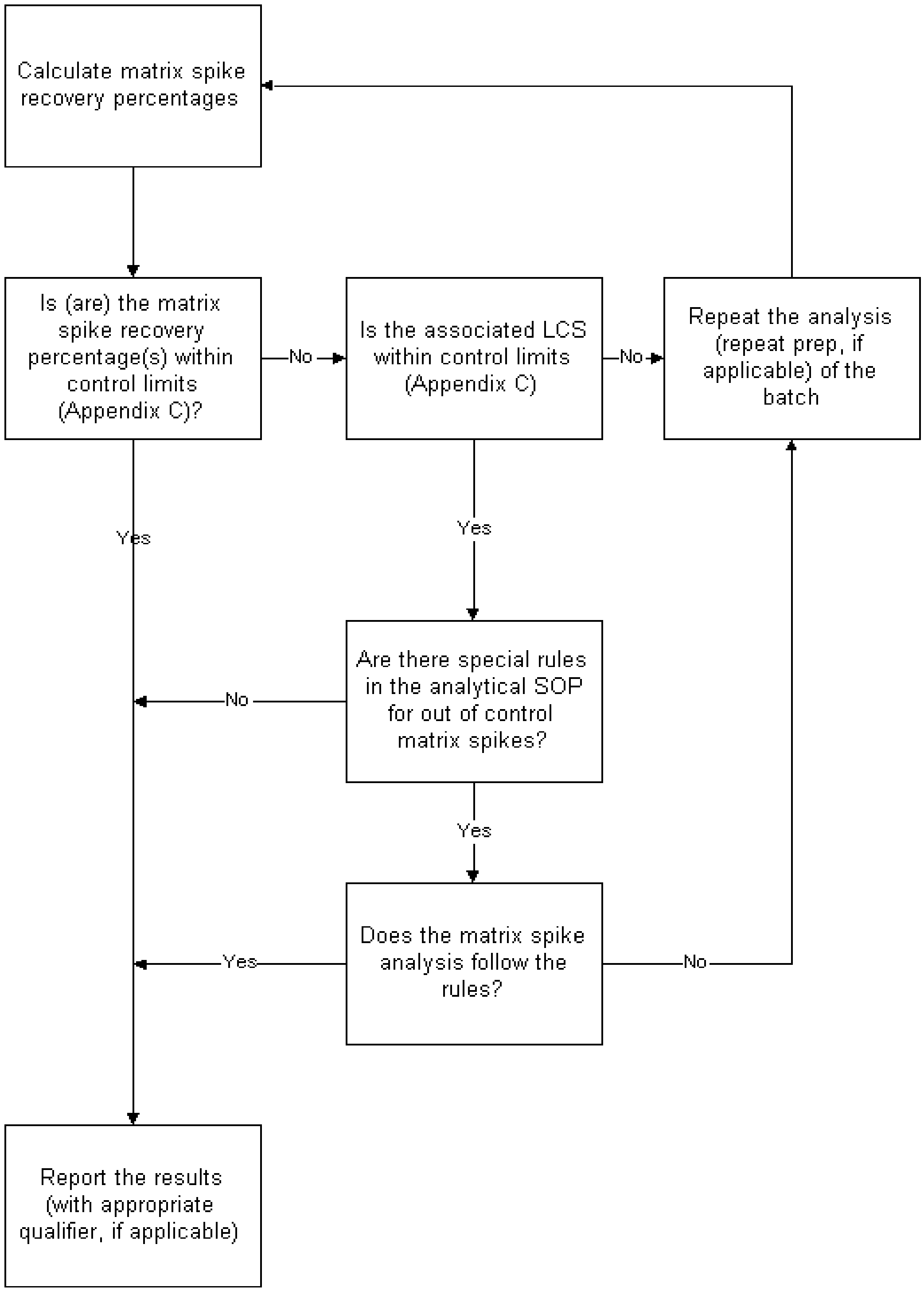


Figure 12-9
Evaluation of Laboratory Control Sample (LCS) Results

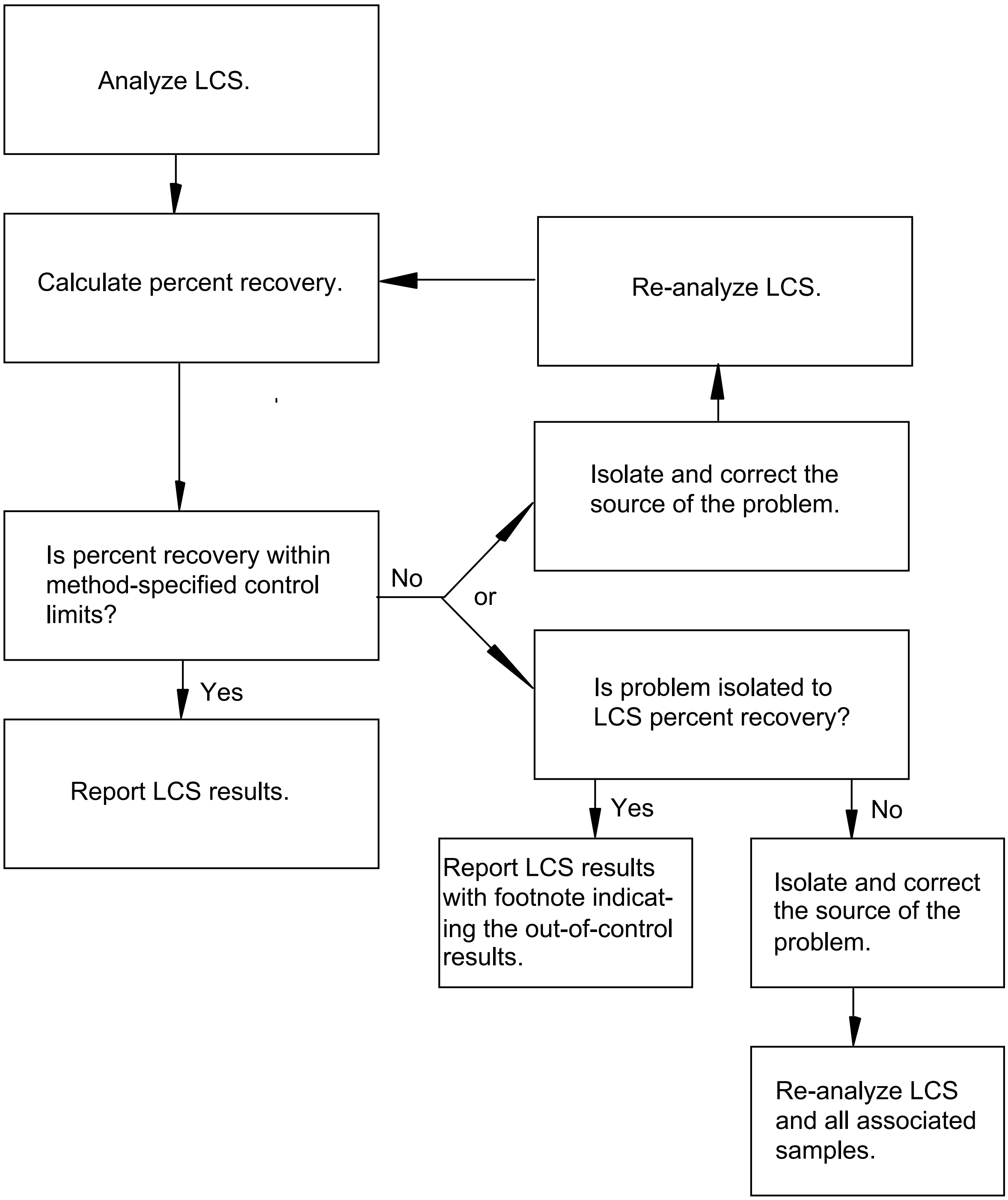


Table 12-1
Laboratory Data Deliverables

Package 1. A Routine Certified Analytical Report Includes the Following

1. Transmittal Letter
2. Sample Analytical Results
3. Method Blank Results
4. Surrogate Recovery Results for appropriate organic methods, including associated EPA or CAS acceptance criteria
5. Chain of Custody Documents

Package 2. In Addition to the Package 1 Deliverables, this Report Includes the Following:

1. Case Narrative

Package 3. In Addition to the Package 2 Deliverables, this Report Includes the Following:

1. Calibration Summaries and Results of initial and continuing calibration verification standards, with calculated recoveries
2. Method Blank Summaries

Package 4. In Addition to the Package 3 Deliverables, this Report Includes the Following:

1. Sample Quantitation Report
2. Standards Prepartation Information

Package 5. Full Data Packages

A complete validatable data package, fulfills all deliverable requirements, as specified in the EPA CLP Statement of Work. The data package may include diskette deliverables, upon request.

13.0 AUDITS AND VERIFICATION PRACTICES

Quality Control (QC) audits are an essential part of CAS's QA program. There are two types of audits used at the facility: System Audits are conducted to qualitatively evaluate the operational details of the field and laboratory QA program, while Performance Audits are conducted by analyzing performance evaluation samples in order to quantitatively evaluate the outputs of the various measurement systems.

The system audit examines the presence and appropriateness of laboratory systems. External system audits of CAS are conducted regularly by various regulatory agencies and clients. Appendix F summarizes some of the major programs in which CAS/Rochester participates. Additionally, internal system audits of CAS/Rochester are conducted regularly by the Quality Assurance Program Manager and by the CAS Quality Assurance Director. The internal system audits are scheduled as four to five auditing events:

- Comprehensive lab-wide system audit - annually
- Audits examining compliance with all QA program requirements as applied to selected projects - 2 per year.

The results of each audit are reported to the Laboratory Director and Supervisors for review and comment. Any deficiencies noted by the auditor are summarized in an audit report and corrective action is taken within a specified length of time to correct each deficiency. Should problems impacting data quality be found during an internal audit, any client whose data is adversely impacted will be given written notification if not already provided. (See SOP ADM-IAUD).

Additionally, CAS/Rochester participates in the analysis of performance evaluation (PE) samples. Results of the performance evaluation samples and audits are reviewed by the Laboratory Director, the QA Program Manager, the Corporate QA Director and the laboratory staff. Any problems surfacing during the audit are investigated, and corrective action is taken regarding any and all deficiencies. See SOP ADM-PTS.

14.0 PREVENTIVE MAINTENANCE

Preventive maintenance is a crucial element of Columbia Analytical Services Quality Assurance program. Instruments at CAS (e.g., GC/MS systems, atomic absorption spectrometers, analytical balances, gas and liquid chromatographs, etc...) are maintained under commercial service contracts or by qualified, in-house personnel. All instruments are operated and maintained according to the instrument operating manuals. All routine and special maintenance activities pertaining to the instruments are recorded in instrument maintenance logbooks. The maintenance logbooks used at CAS contain extensive information about the instruments used at the laboratory.

All preventive maintenance requires a reference to acceptable QC to verify instrument has returned to proper operating functions. An initial demonstration of analytical control is required on **every** instrument used at CAS before sample analyses may proceed. If an instrument is modified or repaired, a return to analytical control is **required** before subsequent sample analyses can continue. When an instrument is acquired at the laboratory, the following information is recommended to be noted in a bound maintenance notebook specifically associated with the new equipment:

- Instrument Name, manufacturer, make, model and type
- The equipment's serial number.
- Date the equipment was received.
- Date the equipment was placed into service.
- Condition of equipment when received (new, used, reconditioned, etc...)
- Prior history of damage, malfunction, modification or repair (if known).

Preventative maintenance procedures, frequencies, etc... are available for each instrument used at CAS. They may be found in the various SOPs for routine methods performed on an instrument and may also be found in the operating or maintenance manuals provided with the equipment at the time of purchase. Responsibility for ensuring that routine maintenance is performed lies with the section supervisor. Each laboratory section maintains a critical parts inventory. The parts inventories include the items needed to perform the preventative maintenance procedures listed in Appendix E. This inventory or "parts list" also includes the items needed to perform any other routine maintenance and certain in-house non-routine repairs.

When performing maintenance on an instrument (whether preventative or otherwise), additional information about the problem, attempted repairs, etc... is also recorded in the notebook. Typical logbook entries include the following information:

- Details and symptoms of the problem
- Repairs and/or maintenance performed
- Description and/or part number of replaced parts
- Source(s) of the replaced parts
- Analyst's signature and date
- Demonstration of return to analytical control

For most major equipment, back-up equipment is available to avoid downtime. All major analytical equipment is summarized in Appendix A. The section supervisor is responsible to coordinate repair with the manufacturer. The project manager shall assess the effect of the downtime on the samples in-house and notify the appropriate clients of any delays and/or the possibilities of subcontracting.

15.0 CORRECTIVE ACTION AND COMPLAINTS

Failure to meet established analytical controls, such as the quality control objectives outlined in Sections 9.0 and 12.0, prompts corrective action. In general, corrective action may take several forms and may involve a review of the calculations, a check of the instrument maintenance and operation, a review of analytical technique and methodology, and reanalysis of quality control and field samples. If a potential problem develops that cannot be solved directly by the responsible analyst, the supervisor, the department manager, and/or the QAPM may examine and pursue alternative solutions. In addition, the appropriate project manager may be notified in order to ascertain if contact with the client is necessary.

The QAPM initiates corrective action due to a performance audit or a check sample problem; the affected laboratory personnel are promptly informed, as are the laboratory supervisors and managers. In cases where data quality is or may be impacted, the client is notified.

In either case, a Nonconformity and Corrective Action Form is generated to document and notify the appropriate personnel of the nonconformity. Procedures for issuing and filing nonconformities are discussed in SOP, *Nonconformity and Corrective Action* (ADM-NCAR).

In special cases, the Laboratory Director may give permission to the analyst, Supervisor, or Project Manager to deviate from CAS Policy. Typically, a Nonconformity form must be issued to the Director and signed off as being acceptable. Otherwise verbal instructions are given and documented on the raw data as being accepted by the Laboratory Director.

In cases were there are complaints from the clients, follow policy procedures outlined in the SOP, *Dealing with Complaints* (ADM-CMPLT).

Corrective actions may also be used to monitor continuous process improvements and tracking of missed proficiency test samples. Laboratory management is responsible for following through with the proficiency testing programs, ensuring that the corrective actions are implemented after testing, and evaluating the effectivness of the corrective action.

Figure 15-1

Nonconformity and Corrective Action Report

SAMPLES/SYSTEM/JOB/CLIENT AFFECTED N&CA Report No. ______________

NONCONFORMITY

Analysis/Event: ______________________________

Instrument/System: ______________________________ Date: __________

Detailed Description of Nonconformity:

Originator (name): ______________________________ Date: __________

Supervisor Verification: ______________________________ Date: __________

CORRECTIVE ACTION AND OUTCOME

Detailed Description: (Re-establishment of conformity must be demonstrated and documented. Describe the steps that were taken, or are planned to be taken, to correct the particular Nonconformity and prevent the reoccurrence of the Nonconformity.)

Is the data to be flagged in the Analytical Report with an appropriate qualifier? **No** **Yes**

Person Responsible: ______________________________ Date: __________

Supervisor Verification: ______________________________ Date: __________

NOTIFICATION - CUSTOMER/CLIENT - INTERNAL/EXTERNAL

Project Chemist Notified by: ______________________________ Date: __________

Customer Notified? **No** **Yes** If Yes, Notifier: ______________ Date: __________

Project Chemist/Customer Comments (Retain record, e.g. telephone record, e-mail) ______________

ACCEPTANCE OF CORRECTIVE ACTION

Comments:

Corrective Action(s) have been implemented. QA Pgm Mgr: ______________________ Date: __________

Original: Client File Photocopies: Supervisor and QA Pgm Mgr N&CA_RPT.DOC 1/26/2001

16.0 QUALITY ASSURANCE REPORTS

Quality assurance requires an active, ongoing commitment by CAS personnel at all levels of the organization. Information flow and feedback mechanisms are designed so that analysts, supervisors and managers are aware of quality assurance issues in the laboratory.

Analysts performing routine tests in the laboratory are aware of the various method acceptance criteria and in-house control limits that must be met in order to generate acceptable results. Any non-conformities and corrective actions may also be attached to the data prior to review. Supervisors, or designee, review all of the completed analytical batches to ensure that all QC criteria have been examined and any deficiencies noted and corrected if possible.

It is the responsibility of each laboratory unit to provide the Project Manager with a final report of the data, accompanied by signature approval. Footnotes and/or narrative notes must also accompany any data package if problems were encountered that require further explanation to the client. Each data package is submitted to the appropriate project manager, who in turn reviews the entire collection of analytical data for completeness. The Project Manager must also review the entire body of data to ensure that any and all client-specified objectives were successfully achieved. A case narrative may be written by the project manager to explain any unusual problems with a specific analysis or sample, etc...

The Quality Assurance Program Manager provides overview support to the Project Manager if required to do so (e.g. contractually specified, etc...) The Quality Assurance Program Manager is also responsible for the oversight of all internal and external audits, for all performance evaluation sample and analysis programs, and for all laboratory certification/accreditation responsibilities.

The QAPM also prepares quarterly reports for the QA Director which summarizes the various QA/QC activities that have occurred during the previous quarter. These reports include a summary of the various audits performed during the last quarter, new accreditations/certifications received by the laboratory, scores of the most current performance evaluation studies, updates/revisions to controlled documents, etc...

On an annual basis, the lab director shall review the laboratory's quality system to introduce any necessary changes or improvements. The review will take into account the outcome of recent internal or external audits, proficiency results, changes in volume and type of work, feedback from clients or authorities, corrective action reports, complaints, etc. See SOP ADM-MGMTRVW.

17.0 PERSONNEL TRAINING

Technical position descriptions are available for all employees, regardless of position or level of seniority. These documents are maintained by the QA Program Manager and Human Resources. In order to assess the technical capabilities and qualifications of a potential employee, all candidates for employment at CAS are evaluated, in part, against the appropriate technical description.

Training begins the first day of employment at CAS when the administrative, quality assurance, and health and safety policies are presented and discussed. Each new employee is presented with example ethical dilemmas and resolutions as an initial Ethics training. Within 12 months, each employee shall participate in an 8-hour company Ethics Training Seminar. Thereafter, ethics training is on-going throughout the tenure of each employee.

Technical training is documented following SOP requirements discussed in *Documentation of Technical Training* (ADM-TRANDOC). Training for analytical procedures typically begins with the reading of the analytical SOP. Hands-on training begins with the observation of an experienced analyst performing the method, followed by the trainee performing the method under close supervision, and culminating with independent performance of the method on quality control samples. Successful completion of the analysis must include an Initial Demonstration of Capability Study of four replicate quality control samples. If quality control samples are not readily available, the following approach may be used to show adequate capability per analyst for particular parameters, such as solids, paint filter, peroxides, etc.

Analyze a fictitiously prepared sample volume or use excess sample volume from historical samples to demonstrate acceptable performance of the method. Use results from another analyst for the same four aliquots to demonstrate accuracy (relative) and precision.

Continued demonstration of capability is monitored by QA or departmental supervisor. Copies of all training forms and certifications (demonstrations of capability) are maintained by QA department.

Safety training begins with the reading of the *Safety Manual*. All employees are recommended to attend quarterly safety meetings during which the safety programs discussed and safety training is presented by the Environmental, Health and Safety Officer.

CAS encourages its personnel to continue to learn and develop new skills that will enhance their performance and value to the company. Ongoing training occurs for all employees through a variety of mechanisms. The “CAS University” education system, external and internal technical seminars and training courses, laboratory-specific training exercises and performance of external PE samples analysis are all used to provide employees with professional growth opportunities.

Safety and QA/QC requirements are integral parts of all technical SOPs and, consequently, are integral parts of all processes at CAS.

18.0 REFERENCES FOR ANALYTICAL PROCEDURES

The analytical methods used at CAS generally depend upon the end-use of the data. Since most of our work involves the analysis of environmental samples for regulatory purposes, specified federal and/or state testing methodologies are used and followed closely. Several factors are involved with the selection of analytical methods to be used in the laboratory. These include the method detection limit, the concentration of the analyte being measured, method selectivity, accuracy and precision of the method, the type of sample being analyzed, and the regulatory compliance objectives. Typical methods used at CAS are taken from the following references:

- *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, 1986 and Updates I (7/92), II (9/94), IIA (8/93), IIB (1/95), and III (12/96). See Chapters 1, 2, 3, and 4.

- *Methods for Chemical Analysis of Water and Wastes*, EPA 600/4-79-020, Revised March 1983.

- *Methods for the Determination of Metals in Environmental Samples*, EPA 600/4-91-010, June 1991 and Supplement I, EPA/600/R-94/111, May, 1994.

- *Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater*, EPA 600/4-82-057, July 1982 and 40 CFR Part 136, Appendix A.

- *Methods for the Determination of Inorganic Substances in Environmental Samples*, EPA 600/R-93/100, August 1993.

- *Methods for the Determination of Organic Compounds in Drinking Water*, EPA 600/4-88-039, December 1988 and Supplement I (7/90) and Supplement II (8/92).

- *Standard Methods for the Examination of Water and Wastewater*, 16th Edition, 1985; 17th Edition, 1989; 18th Edition, 1992, and 19th Edition, 1995.

- 40 CFR Part 136, Guidelines for Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act.

- 40 CFR Part 141, National Primary Driniking Water Regulations.

- State-specific total petroleum hydrocarbon methods for the analysis of samples for gasoline, diesel, and other petroleum hydrocarbon products.

- Annual Book of ASTM Standards.
- EPA Contract Laboratory Program, Statement of Work for Organics Analysis, OLM04.2. May 1999 and OLM04.3.
- EPA Contract Laboratory Program, Statement of Work for Inorganics Analysis, ILM04.1 and ILM05.1.
- G*ood Automated Laboratory Practices, Priciples and Guidance to Regulations For Ensuring Data Integrity In Automated Laboratory Operations*, EPA 2185, August 1995.
- *National Environmental Laboratory Accreditation Conference*, *Quality Standards, Chapters 1-5*, July 2003.

APPENDIX A

MAJOR ANALYTICAL EQUIPMENT

EQUIPMENT LIST

Instrument ID	Instrument Configuration	Manufacturer Part	Serial Number	Analyses Performed	Year Acquired
MASS SPECTROMETERS - VOAs					
GC/MS #3	Gas Chromatograph	HP 5890II	3133A37456	VOAs	2001
	Mass Spec Detector	HP 5971A	3118A02764		
	AutoSampler	Archon	13070		
	Concentrator	Tekmar 2000	91227014		
	Computer Workstation	Gateway P5-133	5360356		
	Analytical Software	Enviroquant Chemstation G1032C v.C.01.00			
GC/MS #5	Gas Chromatograph	HP 5890II	3121A35679	VOAs	1991
	Mass Spec Detector	HP 5971	3118A02532		
	AutoSampler	Archon	12727		
	Concentrator	Tekmar 3000	98125008		
	Computer Workstation	Gateway P5-133	5360357		
	Analytical Software	Enviroquant Chemstation G1032C v.c.01.00			
GC/MS #6	Gas Chromatograph	HP 6890	US00023178	VOAs	1998
	Mass Spec Detector	HP 5973	US82311143		
	AutoSampler	Archon			
	Concentrator	EST Encon	261043003		
	Computer Workstation	HP Kayak XA	US3T653217		
	Analytical Software	Enviroquant Chemstation G1701BA v.B.00.00			
GC/MS #7	Gas Chromatograph	HP 5890II	3235A43994	VOAs	2001
	Mass Spec Detector	HP 5971	323A03964		
	AutoSampler	Archon	13589		
	Concentrator	Tekmar 2000	91267022		
	Computer Workstation	Compaq DeskPro	6124FR4ZD257		
	Analytical Software	Enviroquant Chemstation G1701BA v.B.01.00			

EQUIPMENT LIST

Instrument ID	Instrument Configuration	Manufacturer Part	Serial Number	Analyses Performed	Year Acquired
GC/MS #8	Gas Chromatograph	HP 5890II	3126A36850	VOAs	2004
	Mass Spec Detector	HP 5972	3435A01975		
	AutoSampler	EST Centurion	CENT145061104		
	Concentrator	EST Encon	374062504		
	Computer Workstation	Compaq DeskPro	6946CJM7M878		
	Analytical Software	Enviroquant Chemstation G1701BA v.B.01.00			
GC/MS #9	Gas Chromatograph	HP 6890	US00029263	VOAs in air TO-15	2004
	Mass Spec Detector	HP 5973	US91922619		
	AutoSampler	Enteck 7016CA	00156		
	Concentrator	Enteck 7100	0088		
	Computer Workstation	HP Kayak XA	92181198		
	Analytical Software	Enviroquant Chemstation G1701BA v.B.01.00 Enteck Smart Lab 2000 v3.32			
GC/MS #10	Gas Chromatograph	Agilent 6890N	CN10633045	VOAs	2006
	Mass Spec Detector	Agilent 5975B	US62723782		
	Purge and Trap	EST-Varian Archon	14702		
	Concentrator	EST Encon	ELEC-523103006E PATH-523103006P		
	Computer Workstation	Dell E520	8PT52C1		
	Analytical Software	Chemstation	D.03.00.552		
Digital Display 1-Channel	Mass Flow Controller Digital Display	MKS Instruments 247C	92290101A	VOAs	2006
Digital Display 4-Channel		MKS Instruments 246B	94200203A	VOAs	2006
Flow Controller #1	Mass Flow Controllers	Model 1359C-10000SK	0258C10583442	VOAs	2006
Flow Controller #2		Model 1359C-00200SK	0258C10598442	VOAs	2006
Flow Controller #3		Model 1359C-000205SK	0258C15231304	VOAs	2006
Flow Controller #4		Model 1359C-00010SK	0258C10581442	VOAs	2006

EQUIPMENT LIST

<table>
<tr><th>Instrument ID</th><th>Instrument Configuration</th><th>Manufacturer Part</th><th>Serial Number</th><th>Analyses Performed</th><th>Year Acquired</th></tr>
<tr><td colspan="6">MASS SPECTROMETERS -SVOAs</td></tr>
<tr><td rowspan="6">GC/MS 5973A</td><td>Gas Chromatograph</td><td>HP 6890</td><td>US00024148</td><td rowspan="6">SemiVOAs/CLP</td><td rowspan="6">1998</td></tr>
<tr><td>Mass Spec Detector</td><td>HP 5973</td><td>US82311266</td></tr>
<tr><td>AutoSampler</td><td>HP 7683</td><td>US00307019</td></tr>
<tr><td>Injector</td><td>Agilent 7683</td><td>US10301831</td></tr>
<tr><td>Computer Workstation</td><td>Gateway GP7-600</td><td>17904248</td></tr>
<tr><td>Analytical Software</td><td>HP Chemstation B.02.05
EnviroQuant G1701BA
v.B.01.00</td><td></td></tr>
<tr><td rowspan="6">GC/MS 5973B</td><td>Gas Chromatograph</td><td>HP 6890</td><td>US00029105</td><td rowspan="6">SemiVOAs/CLP</td><td rowspan="6">1999</td></tr>
<tr><td>Mass Spec Detector</td><td>HP 5973</td><td>US91911849</td></tr>
<tr><td>AutoSampler</td><td>HP7683</td><td>US92005373</td></tr>
<tr><td>Injector</td><td>HP7683</td><td>US93408790</td></tr>
<tr><td>Computer Workstation</td><td>HP Kayak XA6/400</td><td>US92280466</td></tr>
<tr><td>Analytical Software</td><td>HP Chemstation B.02.05
EnviroQuant G1701BA
v.B.01.00</td><td></td></tr>
<tr><td rowspan="6">GC/MS 5973C</td><td>Gas Chromatograph</td><td>Agilent 6890N (G1530N)</td><td>US10232036</td><td rowspan="6">SemiVOAs</td><td rowspan="6">2002</td></tr>
<tr><td>Mass Spec Detector</td><td>Agilent 5973 (G2578A)</td><td>US21853642</td></tr>
<tr><td>AutoSampler</td><td>Agilent 7683 (G2614A)</td><td>CN23021382</td></tr>
<tr><td>Injector</td><td>Agilent 7683 (G2613A)
Agilent LVI being installed</td><td>CN23126455</td></tr>
<tr><td>Computer Workstation</td><td>Gateway P7-450</td><td>13645026</td></tr>
<tr><td>Analytical Software</td><td>HP Chemstation Enviroquant
G1701 v.D.00.00.38</td><td></td></tr>
</table>

EQUIPMENT LIST

Instrument ID	Instrument Configuration	Manufacturer Part	Serial Number	Analyses Performed	Year Acquired
GAS CHROMATOGRAPHS - EXTRACTABLES					
HP5890(II)- A	Gas Chromatograph	HP 5890II	3203A41098	Petroleum Hydrocarbons	1990
	Detector	FID	(integrated)		
	Injector	HP7673	3120A26909		
	Autosampler	18596B	3050A23516		
	Controller	HP7673	3113A26132		
	Computer Workstation	Gateway P5-133	5360538		
	Analytical Software	HPChemstation G1034C v.03.00			
HP5890(II)-B	Gas Chromatograph	HP 5890	2728A14298	Petroleum Hydrocarbons	1988
	Detector	FID	(integrated)		
	Autosampler	HP7673	3417A35264		
	Injector	HP7673	303A22979		
	Controller	HP7673	3416A35332		
	Computer Workstation	Gateway P5-133	5360538		
	Analytical Software	HPChemstation G1034C v.03.00			
HP5890(II)-H	Gas Chromatograph	HP 5890II	3336A56596	Alcohols/ WAPA	2005
	Detector	FID	(integrated)		
	Autosampler	18596C	US22508157		
	Injector	Agilent 6890	CN34222775		
	Controller	G1512A	CN00005087		
	Computer Workstation	HP KAYAK XA	US8345093		
	Analytical Software	HP Chemstation B.02.05 EnviroQuant G1701BA v.B.01.00			

EQUIPMENT LIST

Instrument ID	Instrument Configuration	Manufacturer Part	Serial Number	Analyses Performed	Year Acquired
HP5890(II)- C	Gas Chromatograph	HP 5890II	2643A11567	Herb/PCB	1989
	Detector	Dual ECD			
	Autosampler	18596B	3032A22303		
	Injector	HP7673	3205A29661		
	Computer Workstation	HP Vectra XA 5/233	US81450241		
	Analytical Software	HP Chemstation v.B.02.05 EnviroQuant G1701BA v.B.01.00			
HP5890(II)-L	Gas Chromatograph	HP 5890II	2950A27718	Herb/PCB	1989
	Detector	Dual ECD			
	Autosampler	18596C	US4008144		
	Injector	Agilent 6890	CN22321966		
	Computer Workstation	HP Vectra XA 5/233	US81450241		
	Analytical Software	HP Chemstation v.B.02.05 EnviroQuant G1701BA v.B.01.00			

HP6890- D	Gas Chromatograph	HP 6890	22174	Pest/PCB/8011	1998
	Detector	Dual ECD			
	Injector	HP7683	US81501041		
	Autosampler	G2614A	US81800809		
	Computer Workstation	DELL	7BQRS71		
	Analytical Software	Enviroquant MSD Chemstation D.01.02.16 15 June 2001			

6890N- G	Gas Chromatograph	Agilent 6890N	US10520018	Herb/PCB	2005
	Detector	Micro ECD			
	Injector	Agilent G2913A	CN51624717		
	Autosampler	Agilent G2614A	CN51032422		
	Computer Workstation	DELL	7BQRS71		
	Analytical Software	Enviroquant MSD Chemstation D.01.02.16 15 June 2001			

EQUIPMENT LIST

Instrument ID	Instrument Configuration	Manufacturer Part	Serial Number	Analyses Performed	Year Acquired
EXTRACTABLES SUPPORT EQUIPMENT					
GPC	GPC	OI Analytical AP2000	A122330318	Cleanups	2002
RapidVap #1	Nitrogen Evaporation System	LabConco RapidVap	11296345E	Concentrations	2001
RapidVap #2	Nitrogen Evaporation System	LabConco RapidVap	20998065F	Concentrations	2002
N-EVAP	Organomation N-EVAP	Model 112	7531	Concentrations	
Hot Orbital Shaker		Armalab OR200	3560	Extractions	2004
Autoshaker#1	Lab-Line Extraction Mixer	Model 6000	0904-3735	Extractions	2004
Autoshaker#2	Lab-Line Extraction Mixer	Model 6000	0904-3736	Extractions	2004
Autoshaker#3	Lab-Line Extraction Mixer	Model 6000	0904-3737	Extractions	2004
SPE-DEX 4790#1	Solid Phase Extractor	Horizon	05-0593	Extractions	2005
SPE-DEX 4790#2	Solid Phase Extractor	Horizon	05-0595	Extractions	2005
SPE-DEX 4790#3	Solid Phase Extractor	Horizon	05-0594	Extractions	2005
Tekmar 500		TM-500	7460E	Sonication	
Tekmar 600		TM-600	13232	Sonication	
VibraCell #1		VC375	15144E	Sonication	
VibraCell#2		VC505	37629G	Sonication	

EQUIPMENT LIST

Instrument ID	Instrument Configuration	Manufacturer Part	Serial Number	Analyses Performed	Year Acquired
GAS CHROMATOGRAPHS - VOLATILES					
V1	Gas Chromatograph	Varian 3400	4808	VOAs	1998
	PID Detector	OI 4430	OI 1009		
	PID Controller	OIA 5200	A240213		
	ELCD Detector	OIA 4420	2942-8-686		
	AutoSampler	Tekmar 2016	89016001		
	Concentrator	Tekmar 2000	91063007		
	Computer Workstation	GP6-233	9767125		
	Analytical Software	Varian System Control v.4.5.2	D57543610		
V2	Gas Chromatograph	Varian 3300	4130	Alcohols/Gases	1999
	Detector	FID	(integrated)		
	Computer Workstation	PowerFlex	120518		
	Analytical Software	Varian System Control v.4.51	D57543610		
V3	Gas Chromatograph	Varian 3400	10989	VOAs	1999
	PID Controller	OIA 5200	B509500481		
	PID Detector	OI 4430			
	ELCD Detector	OIA 5300	B05223456		
	AutoSampler	Varian Archon	13316		
	Concentrator	Tekmar 3000	98124003		
	Computer Workstation	Gateway 2000	10221502		
	Analytical Software	Varian System Control v.4.51	D57543610		
V4	Gas Chromatograph	Varian 3400	15248	VOAs	2001
	PID Detector	OI 4436	OI1000		
	ELCD Detector	OI 5300	C449553665		
	PID Controller		A218047		
	AutoSampler	Archon	13596		
	Concentrator	Encon	130122900 E/P		
	Computer Workstation	GP6-233	9767125		
	Analytical Software	Varian System Control v.4.5.2	D57543610		

Instrument ID	Instrument Configuration	Manufacturer Part	Serial Number	Analyses Performed	Year Acquired
HP1	Gas Chromatograph	HP5890II	3121A35575	VOAs	2001
	PID Detector	OIA 4430	31030		
	FID Detector	(integrated)	-		
	AutoSampler	Tekmar 2016	89220008		
	Concentrator	Tekmar 2000	89013002		
	Sample Heater	Tekmar	91065008		
	Computer Workstation	Gateway GP5-233	9352344		
	Analytical Software	Varian System Control v.4.5.2	00159-1908-cd1-22bd		

T6	Gas Chromatograph	Varian 3400	4143	VOAs/VPH/GRO	1998
	PID Detector	OI 4430	OI1006		
	FID Detector	Integrated	-		
	AutoSampler	Tekmar 2016	91298028		
	Concentrator	Tekmar 2000	91331001		
	Sample Heater	Tekmar	88264001		
	Computer Workstation	Gateway GP5-233	9352344		
	Analytical Software	Varian System Control v.4.5.2	00159-1a08-cd1-22bd		

Instrument ID	Instrument Configuration	Manufacturer Part	Serial Number	Analyses Performed	Year Acquired
HPLC					
HPLC02 (LC/MS)	Binary Pump	Agilent 1100	DE11108496	Perchlorate Explosives	2005
	Diode Array Detector	Agilent 1100	DE11112376		
	Column Thermostat	Agilent 1100	DE11120893		
	Wellplate Autosampler	Agilent 1100	DE11300879		
	Sample Thermostat	Agilent 1100	DE82207519		
	MSD	Agilent G1946D	US12411208		
	Computer Workstation	HP Vectra	US12475439		
	Analytical Software	Chemstation for HPLC Rev.A.10.02			

HPLC03	Binary Pumps	Shimadzu LCD10ADVP	1(A) C20963851348US 2(B) C20963851344US	Formaldehyde Metabolic Acids Hydroquinone Tolytriazole PAHs	2005
	UV/VIS Detector	Shimadzu SPD10AVVP	C21004050470US		
	Electrochemical Detector	BAS LC4C/CC5	LC-4C 7014		
	AutoSampler	Shimadzu SIL10ADVP	C21053850511US		
	System Controller	Shimadzu SCL10AVP	C21013851302US		
	Degasser	Shimadzu DGU 14A	101076		
	Temperature Control Module	Waters	TCM-001304		
	Computer Workstation				
	Analytical Software				

EQUIPMENT LIST

Instrument ID	Instrument Configuration	Manufacturer Part	Serial Number	Analyses Performed	Year Acquired
METALS					
FIMS	CVAA-FIMS	Perkin Elmer	1258	Mercury	1997
	Computer Workstation	Soyata			
	Analytical Software	PE AA WinLab for Windows v.2.50			
4100ZL #1	AA	Perkin Elmer AA 4100ZL	6066	Furnace Metals	1991
	Computer Workstation	Gateway GP5-233			
	Analytical Software	PE AA WinLab for Windows v.2.50			
4100ZL #2	AA	Perkin Elmer AA 4100ZL	6245	Furnace Metals	1998
	Computer Workstation	Gateway GP6-400			
	Analytical Software	PE AA WinLab for Windows v.2.50			
Leeman Hydra AFG+	CVAF	Leeman Hydra AFG+	112-00067-1	Low Level Mercury (Method 1631)	2004
	Computer Workstation	Dell Dimension 2400	35180912881		
	Analytical Software	WinHg Runner 1.5 CT Rev0.286	-		
ICP #1	Instrument	Perkin Elmer Optima 3000XL	069N4060401	Metals - Low Level	1994
	Computer Workstation	Gateway GP5-233	10221500		
	Analytical Software	PE ICP WinLab v.1.42			
ICP #2	Instrument	Perkin Elmer Optima 3000XL	069N6062602	Metals - Low Level	1999
	Computer Workstation	Gateway GP5-233	9352702		
	Analytical Software	PE ICP WinLab v.1.42			
ICP #3	Instrument	Perkin Elmer 5300DV	077N5112802	Metals	2006
	Computer Workstation	Dell Optiplex GX620			
	Analytical Software	PE ICP WinLab v.3.1			
ICPMS	SCIEX ICP/MS	Perkin Elmer Elan 9000	PO370203	Metals	2002
	Autosampler	PE AS93Plus			
	Computer Workstation	Dell Optiplex GX150			
	Analytical Software	ELAN v.2.4			

EQUIPMENT LIST

Instrument ID	Instrument Configuration	Manufacturer Part	Serial Number	Analyses Performed	Year Acquired
HOTBLOCKS - METALS					
Hotblock #1		Environmental Express		Metals Digestions	2001
Hotblock #2		Environmental Express		Metals Digestions	2001
Hotblock #3		Environmental Express		Metals Digestions	2005
Hotblock #4		Environmental Express		Metals Digestions	2005
ModBlock A		CPI		Metals Digestions	2003
ModBlock B		CPI		Metals Digestions	2003

EQUIPMENT LIST

Instrument ID	Instrument Configuration	Manufacturer Part	Serial Number	Analyses Performed	Year Acquired
GENERAL CHEMISTRY					
TOC#1	TOC Analyzer	OI Model 1010	J245710349	TOC - waters	2003
	Autosampler	OI Model 1051	B247751184		
	Computer Workstation	Gateway GP6-300	10709094		
	Analytical Software	OI WinTOC for 1010 v.01 Rev 225	-		
TOC#2	TOC Analyzer	Dohrman DC190	9507646	TOC - soils	2001
	Boat Sampler	Dohrman 183 s/s1	9507610		
Lachat 8000	Flow Injection System	Lachat 8000		Chloride, TKN, NO2/NO3, NH3, Alkalinity, Hardness, Phosphorus, Silica, Cr6+	1999
	Colorimeter	Lachat	A83000-1286		
	Pump	Lachat	A82000-525		
	Autosampler	Lachat	A81010-168		
	Computer Workstation	Gateway GP6-233	9767124		
	Analytical Software	Omnion FIA v.2	-		
QCIV	Flow Injection System	Lachat Quick Chem IV		Chloride, TKN, NO2/NO3, NH3, Alkalinity, Hardness, Phosphorus, Silica, Cr6+	1986
	Colorimeter	Lachat	125181		
	Pump	Lachat	125209		
	Module	Lachat	125304		
	Autosampler	Lachat	125203		
	Computer Workstation	IBM-compatable generic brand	-		
Technicon #1	Flow Injection System	Technicon		Cyanide	Pre-1982
	Colorimeter	Technicon	19900670		
	Pump	Technicon	TE80139		
	Chart Recorder	Technicon	199-051241		
	Autosampler	Technicon	worn-off		
Technicon #2	Flow Injection System	Technicon		Phenol	Pre-1982
	Colorimeter	Technicon	199-006701D		
	Pump	Technicon	PR0276		
	Chart Recorder	Technicon	82A3321		
	Autosampler	Technicon	681-Rest worn off		
	Module	Technicon	83035		
AquaKem	Instrument	AquaKem 200	A0419913	Nitrite, Ammonia, Phosphate, Chloride, Hexavalent Chromium	2005
	Computer Workstation	Sell SX280	3KSDF1J		
	Analytical Software	6.5.AQ1 rc4			

EQUIPMENT LIST

Instrument ID	Instrument Configuration	Manufacturer Part	Serial Number	Analyses Performed	Year Acquired
IC#1	Ion Chromatograph	Dionex Series 4000i		Anions	Pre-1982
	Basic Chromatography Module	Dionex	871602		
	Gradient Pump	Dionex	871608		
	Conductivity Detector	Dionex	871242		
	Controller Pump	Dionex	31528		
	Autosampler	Dionex	931526		
	Integrator	4270	037/24782		
	Computer Workstation	Gateway GP6-400	11809650		
	Analytical Software	Dionex PeakNet v.5.1	116-987-2806		
IC#2	Ion Chromatograph	Dionex Series 4000i	13458	Anions	Pre-1982
	Gradient Pump	Model APG-1	921553		
	Conductivity Detector	Model CDM-2	921513		
	Degas Module	EDM-2	930211		
	Autosampler	ASM-2	880113		
	Interface	ACI-1	925205		
	Computer Workstation	Gateway GP6-400	11809650		
	Analytical Software	Dionex PeakNet v.5.1	116-987-2806		
IC#3	Ion Chromatograph	Metrohm 861 Advanced Compact IC		Anions	2005
	Basic Chromatography Module	Metrohm	861-02114		
	Pump	Metrohm	62824100s20		
	Conductivity Detector	Metrohm	integrated		
	Autosampler	Metrohm	838-04105		
	Computer Workstation	Dell OptiPlex GX520	6VRC581		
	Analytical Software	IC NET 2.3 SR2	A.701.0016		

EQUIPMENT LIST

Instrument ID	Instrument Configuration	Manufacturer Part	Serial Number	Analyses Performed	Year Acquired
IC # 4	Ion Chromatograph	Dionex 500DX		ANIONS	2007
	Basic Chromatography Module	LC20-1	97110393		
	Gradient Pump	GP40-1	97110534		
	Conductivity Detector	ED40-1	97110074		
	Autosampler	AS40-1	97110671		
	Computer Workstation	Gateway 2000 GP6-266	10239250		
	Analytical Software	Peaknet 5.21	192-994-1564		
Adiabatic Calorimeter	Adiabatic Calorimeter	Parr 1241	3744	BTU, Combustion Prep	1997
Isoperibol Calorimeter	Isoperibol Calorimeter	Parr 6300	27187	BTU, Combustion Prep	2004
Autoclave	Autoclave	Amsco	none	Micro/TPO4	Pre-1970
Midi A	Midi Cyanide Distillation System	BSL Co	none	Cyanide/Phenol/ Sulfide Distillation	1997
Midi B	Midi Cyanide Distillation System	BSL Co	none	Cyanide/Phenol/ Sulfide Distillation	1997
Midi C	Midi Cyanide Distillation System			Cyanide/Phenol/ Sulfide Distillation	2004
Bullwinkle	pH Meter	Orion SA520	2305	pH	1990
Rocky	pH Meter	Orion 720A	5012		1992
	pH Electrode	Orion 915600			
	Fluoride Electrode	Orion 9409			
	Reference Electrode	Orion 90-01-00			
Jenway	pH/Conductivity Meter	Jenway 4330	1344	pH/Conductivity	2000
Turbidimeter	Turbidimeter	HF Scientific Micro 100	609246	Turbidity	2000

EQUIPMENT LIST

Instrument ID	Instrument Configuration	Manufacturer Part	Serial Number	Analyses Performed	Year Acquired
MR 21	Spectro-photometer	Milton Roy Spectronic 21	1225601	COD, MBAS, Cr6+, Ferrous Iron	1989
B&L	Spectro-photometer	B&L MSR002	114	Peroxide	1987
Buck IR	IR Spec / TPH Analyzer	Buck Scientific HC404	492	TPH	1994
DO Meter #1	Dissolved Oxygen Meter	YSI Model 54A	D8024621	DO, BOD	Pre-1990
DO Meter #2	Dissolved Oxygen Meter	YSI Model 57	A9016921	DO, BOD	Pre-1990
Open Cup	Open Cup Flashpoint Tester	Koehler Instru.Co. Model 420	none	Ignitability - solids	1989
Closed Cup	Closed Cup Flashpoint Tester	Boekel Model 152800	none	Ignitability - liquids	1993
Aquameter	Aquameter	Beckman KF4	none	% Water	1988

EQUIPMENT LIST

Instrument ID	Instrument Configuration	Manufacturer Part	Serial Number	Analyses Performed	Year Acquired
Mettler Toledo PB602-1	Top Loading Balances	Mettler Toledo PB602-1	1118331281	Wetchem/Metals	
American Scientific PTL2500-1		American Scientific PTL2500-1	20466	Wetchem	
Denver S-400		Denver S-400	25232	Extractables	
Fisher		Fisher	7384	Metals	
Fisher Scientific 7303 OA		Fisher Scientific 7303 OA	13556	Volatiles	

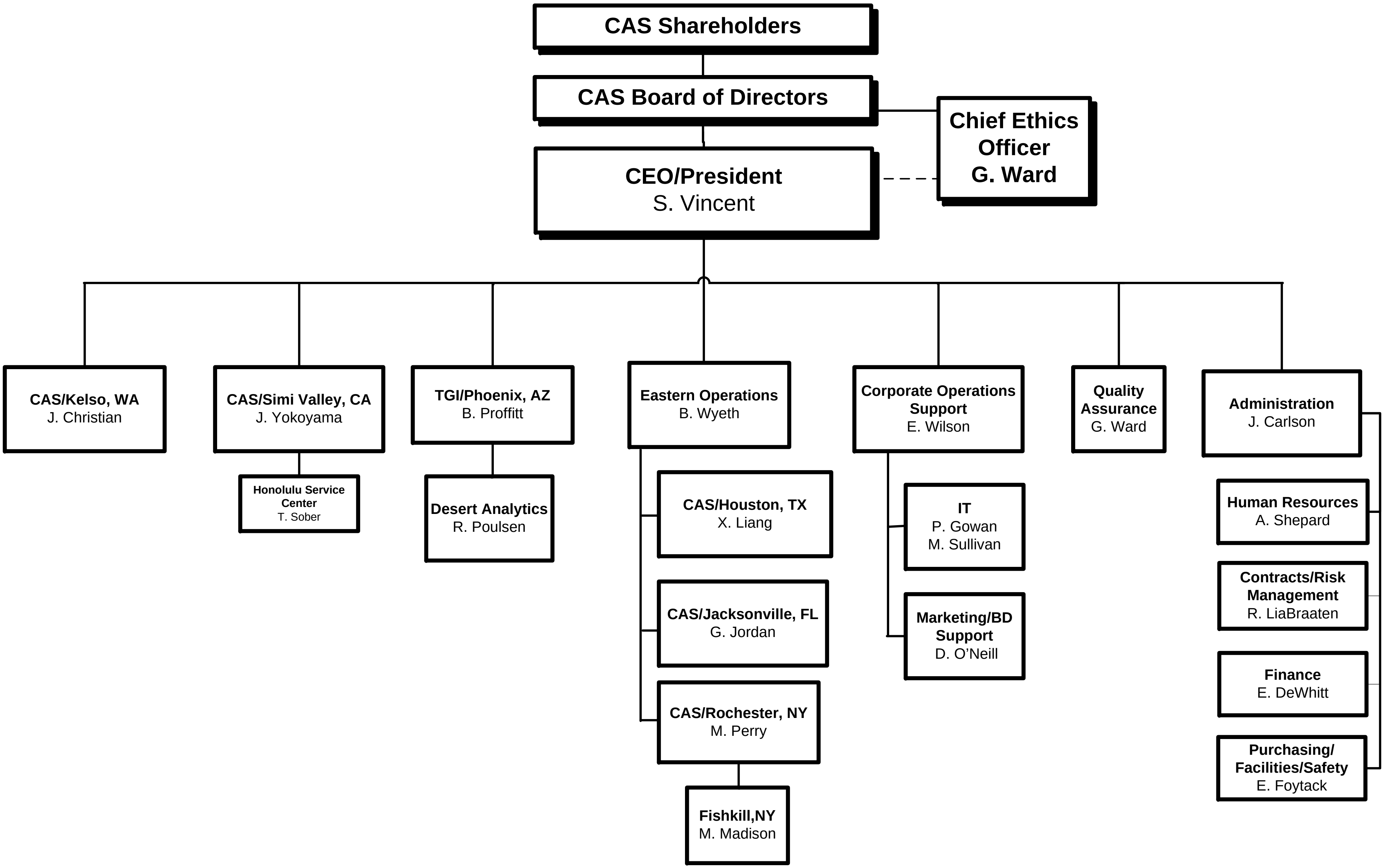
Fisher Analytical Balance	Analytical Balances	Fisher Analytical Balance	8887	Volatiles	1990
Mettler AG204		Mettler Toledo Balance	120330501	Wetchem	2001
Mettler AE240		Mettler Analytical Balance	F96727	Wetchem	1996 used

Note that the computers listed with the instruments are dedicated to that instrument for data aquisition, but the data files are saved to a lab-wide network and data may be accessed by any computer with the correct software - provided the user is authorized to do so.

APPENDIX B

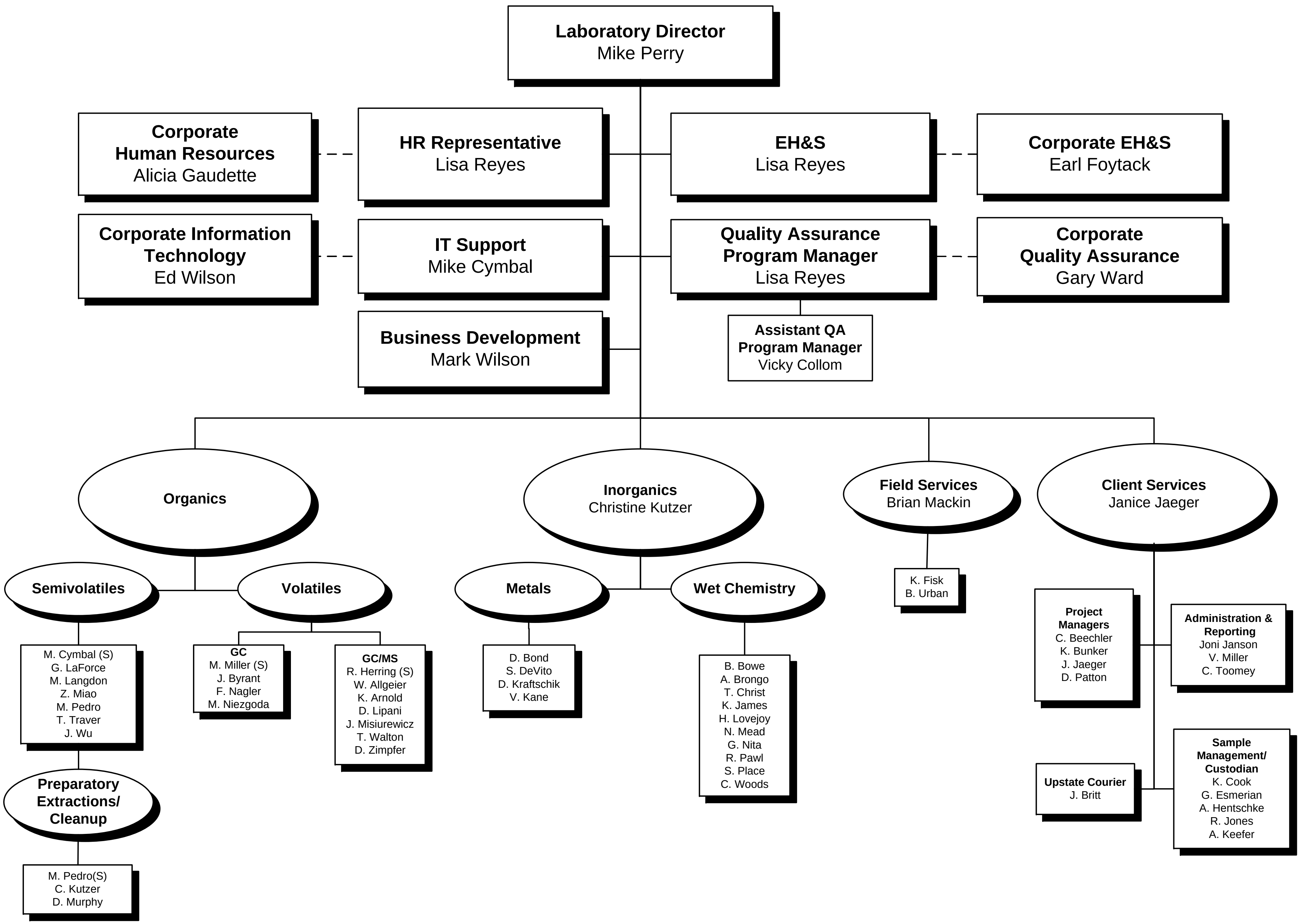
ORGANIZATIONAL CHART and RESUMES OF KEY PERSONNEL

Columbia Analytical Services, Inc.
Laboratory Division Organization



Revised 5/31/07

Columbia Analytical Services, Inc.
Rochester, New York Laboratory Organization



Revised 9/12/07 dm

MICHAEL K. PERRY

1996 TO PRESENT

Columbia Analytical Services, Inc., 1 Mustard St., Suite 250, Rochester, NY 14609 (585) 228-5380

Current Position

LABORATORY DIRECTOR – 1996 to Present

Responsibilities

Primary responsibilities include management of all laboratory departments, scheduling, productivity, reporting and evaluation of analytical methodologies, project planning and Quality Assurance/Quality Control protocols. In addition, other responsibilities include direct responsibility for contracts and consultants relating to the EPA SITE program, ACOE remediation program and the technical interface for the New York State ASP CLP program and other large national based clients.

Documentation of Demonstration of Capabilities is available for review.

Experience

Project Chemist, *General Testing Corporation, Rochester, New York,* 1995-1996. In addition to the duties of Laboratory Director listed below, responsibilities expanded to include the supervision of four teams of Project Chemists. Production management was shifted to the Laboratory Supervisors in order to increase client contact. Directly responsible for contracts and consultants relating to the EPA SITE program, ACOE remediation program and the New York State ASP CLP program.

Laboratory Director, *General Testing Corporation, Rochester, New York,* 1985-1995. Primary responsibilities included management of all laboratory departments, scheduling, productivity, reporting and evaluation of analytical methodologies and Quality Assurance/Quality Control protocols.

Instrument Manager, *General Testing Corporation, Rochester, New York,* 1979-1985. Responsibilities included operation and maintenance of all laboratory instruments and supervision of personnel associated with the instrumentation laboratory. Analyses included metals, volatile organics, pesticides/PCBs, and semi-volatile organics.

Senior Quality Assurance Technician, *Coca-Cola Corporation, Atlanta, Georgia*, 1976-1979. Responsible for analysis of raw materials and finished product using both wet chemistry and instrumentation techniques.

Laboratory Technician, *Penwalt Pharmaceutical Company, Rochester, New York,* 1975. Worked in the Quality Control Department.

Education

Coursework toward MS, Chemistry, *Rochester Institute of Technology, Rochester, New York,* 1983-1986
GC/MS, *ACS Short Course,* 1986
Effective Management of Chemical Analysis Laboratories, *ACS Short Course,* 1985
BS, Chemistry, *Georgia State University, Atlanta, Georgia,* 1979
AAS, Chemistry, *State University of New York at Alfred, Alfred, New York,* 1975

Affiliations

American Chemical Society

Columbia Analytical Services INC
An Employee - Owned Company

LISA M. REYES

1997 TO PRESENT

Columbia Analytical Services, Inc., 1 Mustard St., Suite 250, Rochester, NY 14609 (585) 2285380

Current Position

QUALITY ASSURANCE/QUALITY CONTROL PROGRAM MANAGER – 1997 to Present

Responsibilities

Responsible for the overall coordination of the laboratory QA program and for ensuring that established quality objectives are met. Responsible for Quality Assurance functions including the Quality Assurance Manual, certifications, documenting standard operating procedures, and maintaining performance evaluation records. Oversees balance calibration and sample storage temperature control. Maintains certifications/accreditations for regulatory agencies and client certifications or approval programs. Acts as primary point of contact during laboratory audits. Provides audit responses and initiates any changes in procedures resulting from an audit. Coordinates the analysis of performance evaluation samples required for certification/accreditation programs. Reports and reviews results for these analyses. Conducts internal audits and makes recommendations for corrective action.

Provides technical assistance to laboratory staff on QA/QC issues, project feasibility, and methods interpretation/development.

Documentation of Demonstration of Capabilities is available for review.

Experience

Environmental Chemist, *TreaTek-CRA Company/Conestoga-Rovers & Associates, Niagara Falls, New York*, 1992-1997. Data quality, assessments and validations of ASP, CLP, and SW-846 organic and inorganic analytical data. Liaison with analytical contract laboratories, CRA field personnel, and state and federal agencies. Prepared QAPPs, laboratory bidding documents, and contracts. Also responsible for performance of laboratory audits

Manager of Quality Management Office, *Huntingdon Analytical Services, Middleport, New York*, 1989-1992. Manager of QA for Environmental, Agrochemical, Asbestos, and Engineering Soil laboratories. Responsible for in-house QA/QC programs, inspections, and instrument maintenance. Also responsible for employee safety and hazardous waste training, as well as manifesting hazardous waste. Routinely performed inorganic analyses, and reviewed analytical data, reports, and CLP packages.

Research Assistant, *Research Foundation, State University of New York College at Brockport, Brockport, New York*, 1986-1989. Performed routine sampling of surface water and lakes. Also did inorganic analyses on water and soil matrices. Assisted in graduate projects dealing with fish, plankton, water chemistry, and crayfish.

Education

CLP Inorganic Data Validation, *US EPA Region II, Westchester Community, Westchester, New York,* 1993.
CLP Organic Data Validation, *US EPA Region II, Westchester Community, Westchester, New York,* 1992.
BS, Biology, *State University of New York at Brockport, Brockport, New York,* 1988

Affiliations

American Chemical Society

MARK WILSON
1996 TO PRESENT

Columbia Analytical Services, Inc., 1 Mustard St., Suite 250, Rochester, NY 14609 (585) 228-5380

Current Position

DIRECTOR OF BUSINESS DEVELOPMENT II – 2004 to Present

Responsibilities

Responsible for sales maintenance for the Rochester laboratory territory including coordination of marketing and sales with national sales team.

Documentation of Demonstration of Capabilities is available for review.

Experience

Client Services Manager, *Columbia Analytical Services, Rochester, NY*, 1996-2004. Responsible for supervision of Project Chemists, sales staff, Sample Management Office (SMO) and reporting departments. Responsible for project management and client interface regarding analytical services.

Laboratory Manager, *Columbia Analytical Services, Rochester, New York*, 1996. Responsible for supervision of laboratory staff, scheduling of projects, evaluations of analytical QC procedures, and review of all analytical data.

Laboratory Manager, *General Testing Corporation, Rochester, New York,* 1992-1996. Responsibilities were primarily same as above.

Assistant Laboratory Director, *General Testing Corporation, Rochester, New York,* 1988-1992. Was responsible for assisting lab director with supervision of lab staff, scheduling of projects, evaluations of analytical and QC procedures, and review of all analytical data.

Organics Department Manager, *General Testing Corporation, Rochester, New York,* 1986-1996. Responsible for supervising all organics analyses including GC/MS, GC volatile organics, and GC extractables, and coordinating production and method development.

Organic Extractables Manager, *General Testing Corporation, Rochester, New York*, 1985-1992. Was responsible for GC operation and analysis, GC maintenance, trouble shooting, development, and GC/MS operation and start up.

Staff Technician II, *Medical Center University of Kentucky, Lexington, Kentucky,* 1979-1985. Was responsible for GC and AA analysis on biological fluids, drug screening and monitoring, heavy metals analysis, thin-layer chromatography, HPLC, and water testing.

Education

BS, Medical Technology with 32 hours of Chemistry, *State University of New York at Buffalo, Buffalo, New York,* 1978.

JANICE M. JAEGER

1996 TO PRESENT

Columbia Analytical Services, Inc., 1 Mustard St., Suite 250, Rochester, NY 14609 (585) 288-5380

Current Position

CLIENT SERVICES MANAGER I, 2004-Present

Responsibilities

Responsible for the supervision of Project Managers, Sample Management Office (SMO) and Reporting Departments. Assist clients to determine what analyses are required. Oversee projects from quote initiation to final report submission. Act as liaison between client requirements and laboratory capabilities for projects. Update clients on progress if their project and answer any questions they may have. Respond promptly to client requests and develop new client contacts within and outside of our current client base.

Documentation of Demonstration of Capabilities is available for review.

Experience

Project Manager III, *Columbia Analytical Services, Rochester, NY*. 1996-2004. Assist clients to determine what analyses are required. Responsibilities primarily as above without the supervisory role.

Customer Service Representative/Sample Receiving, *General Testing Corporation, Rochester, New York,* 1989-1996. Primary responsibilities included client services as listed above. Also responsible for sample receipt, log in and distribution as well as bottle preparation.

Surgical Assistant, *Penfield Veterinary Hospital Rochester, New York,* 1984-1989. Primary responsibilities included preparation of instruments, surgical area, and animal for surgery. Also responsible for monitoring the animal before and after surgery.

Education

BA, Pre-Veterinary Medicine and Pre-Professional Zoology (double Major), *Ohio Wesleyan University, Delaware, Ohio,* 1983.

CHRISTINE M. KUTZER

1996 TO PRESENT

Columbia Analytical Services, Inc., 1 Mustard St., Suite 250, Rochester, NY 14609 (585) 288-5380

Current Position

TECHNICAL MANAGER II, INORGANICS LABORATORY – 2004 to Present

Responsibilities

Plans and manages all activities in the Inorganics Department, including Metals and General Chemistry. Responsible for coordinating the workload and scheduling employees' daily activities. Assist in the operation, troubleshooting, and maintenance of instrumentation. Responsible for scheduling samples. Accountable for analytical data entry, analytical data approval and High Level metals package generation through MARRS.

Documentation of Demonstration of Capabilities is available for review.

Experience

Technical Manager II, Metals and Organics Prep Laboratories, *Columbia Analytical Services, Inc., Rochester, New York,* 2002-2004. Duties as above for Metals Department. Responsible for coordinating the workload and scheduling employees' daily activities and troubleshooting in the organics preparation laboratory.

Technical Manager I, Metals Laboratory, *Columbia Analytical Services, Inc., Rochester, New York,* 1996-2002. Duties as above for Metals Department.

Analyst III, *Columbia Analytical Services, Rochester, New York*, 1996. Responsible for instrument troubleshooting and maintenance, digestion of samples, and TCLP extractions. Also responsible for data entry, approval, and package review.

Chemist, *General Testing Corporation, Rochester, New York,* 1992-1996. Duties were as listed above.

Education

BS, Chemistry, *St. Bonaventure University, Olean, New York,* 1992

MICHAEL W. CYMBAL

1996 TO PRESENT

Columbia Analytical Services, Inc., 1 Mustard St., Suite 250, Rochester, NY 14609 (585) 288-5380

Current Position

TECHNICAL MANAGER I – Information Technology 1998 to Present

- Extractables Department 2004 to Present

Responsibilities

Responsible for computer systems (Novel Lan, Starlims) and instrument analysis of software. Also responsible for client spreadsheets and disk deliverables, computer maintenance and upgrades.

Responsible for the oversight of the extractables department including extactions and instrumental analysis (HPLC, GC, and GC/MS).

Documentation of Demonstration of Capabilities is available for review.

Experience

Systems Analyst III, *Columbia Analytical Services, Inc., Rochester, New York,* 1997-1998. Duties primarily as above.

Systems Analyst I, *Columbia Analytical Services, Inc., Rochester, New York,* 1996-1997. Duties primarily as above.

Computer Administration, *General Testing Corporation, Rochester, New York,* 1995-1996. Oversaw computer systems (Novel Lan, StarLIMS, Seven Reporting Systems) and created client spreadsheets and disk deliverables.

Analyst, *General Testing Corporation, Rochester, New York,* 1990-1995. Responsible for Organic Analyses (Volatile and Semi-Volatile Pesticides) for GC and GC/MS. Also responsible for Instrument Maintenance and Sample Preparation.

Education

BS, Chemistry, *Robert's Wesleyan College, Rochester, New York,* 1990.

RODERICK "ROD" J. HERRING

1996 TO PRESENT

Columbia Analytical Services, Inc., 1 Mustard St., Suite 250, Rochester, NY 14609 (585) 288-5380

Current Position

TECHNICAL MANAGER II, MS VOLATILES – 2002 to Present

Responsibilities

Responsible for the daily operations of the GC/MS laboratory, including the scheduling of department analyses, instrument calibration, and troubleshooting/maintenance activities. Accountable for personnel training, data approval, quality program support.

Documentation of Demonstration of Capabilities is available for review.

Experience

Scientist I, GC/MS VOA Laboratory, *Columbia Analytical Services, Inc., Rochester, New York,* 1996-2002. Responsible for analysis of water, soil, and air samples for specific target contaminants using EPA methods by GC/MS technology. Also responsible for generation of analytical reports via Laboratory Information Management System (LIMS), monitoring activities for second shift, and helping in other laboratory areas as needed.

Scientist I, GC/MS VOA Laboratory, *General Testing Corporation, Rochester, New York,* 1991-1996. Responsibilities were as listed above.

GC VOAs/2nd Shift Supervisor, *General Testing Corporation, Rochester, New York,* 1998-1991. Was responsible for analysis of water, soil, and air samples via EPA methods, maintaining instrumentation, and helping with departmental organization.

TOX/TOC Operator, *General Testing Corporation, Rochester, New York,* 1988. Was responsible for analysis of water and soil for organic halogens and organic carbon, maintaining instrumentation, and organizing department and workload.

Wet Chemistry Technician, *General Testing Corporation, Rochester, New York*, 1987-1988. Was responsible for solids, grease and oils, MBAs, TKNs, alkalinities, other inorganic analyses, organizing daily workload, and reporting.

Education

BA, Natural Science and Biochemistry, *State University of New York, Utica, New York,* 1987.
AS, Biology, *Jamestown Community College, Olean, New York,* 1984.

Publications/ Presentations

The Effects of Phthalate Esters on Spinach and Pea Seedlings, FEBS Letters 1987 co-authored with Larry Bering, PhD and presented at ACS Conference, Rochester, New York, 1988.

APPENDIX C

DATA QUALITY CAPABILITIES

ROCHESTER ORGANIC QC LIMITS

METHOD	ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
504.1	1,2-DIBROMOETHANE	WATER	0.06		UG/L	0.0060	30	60-140	50-150
504.1	1,2-DIBROMO-3-CHLOROPROPANE	WATER	0.06		UG/L	0.0040	30	60-140	50-150
524.2	1,1,1,2-TETRACHLOROETHANE	WATER	0.50		UG/L	0.12	20	70-130	70-130
524.2	1,1,1-TRICHLOROETHANE	WATER	0.50		UG/L	0.082	20	70-130	70-130
524.2	1,1,2,2-TETRACHLOROETHANE	WATER	0.50		UG/L	0.078	20	70-130	70-130
524.2	1,1,2-TRICHLOROETHANE	WATER	0.50		UG/L	0.12	20	70-130	70-130
524.2	1,1-DICHLOROETHANE	WATER	0.50		UG/L	0.11	20	70-130	70-130
524.2	1,1-DICHLOROETHENE	WATER	0.50		UG/L	0.094	20	70-130	70-130
524.2	1,1-DICHLOROPROPENE	WATER	0.50		UG/L	0.15	20	70-130	70-130
524.2	1,2,3-TRICHLOROBENZENE	WATER	0.50		UG/L	0.15	20	70-130	70-130
524.2	1,2,3-TRICHLOROPROPANE	WATER	0.50		UG/L	0.15	20	70-130	70-130
524.2	1,2,4-TRICHLOROBENZENE	WATER	0.50		UG/L	0.12	20	70-130	70-130
524.2	1,2,4-TRIMETHYLBENZENE	WATER	0.50		UG/L	0.13	20	70-130	70-130
524.2	1,2-DIBROMO-3-CHLOROPROPANE	WATER	0.50		UG/L	0.29	20	70-130	70-130
524.2	1,2-DIBROMOETHANE	WATER	0.50		UG/L	0.11	20	70-130	70-130
524.2	1,2-DICHLOROBENZENE	WATER	0.50		UG/L	0.14	20	70-130	70-130
524.2	1,2-DICHLOROETHANE	WATER	0.50		UG/L	0.13	20	70-130	70-130
524.2	1,2-DICHLOROPROPANE	WATER	0.50		UG/L	0.097	20	70-130	70-130
524.2	1,3,5-TRIMETHYLBENZENE	WATER	0.50		UG/L	0.12	20	70-130	70-130
524.2	1,3-DICHLOROBENZENE	WATER	0.50		UG/L	0.13	20	70-130	70-130
524.2	1,3-DICHLOROPROPANE	WATER	0.50		UG/L	0.12	20	70-130	70-130
524.2	1,4-DICHLOROBENZENE	WATER	0.50		UG/L	0.14	20	70-130	70-130
524.2	2,2-DICHLOROPROPANE	WATER	0.50		UG/L	0.075	20	70-130	70-130
524.2	2-CHLOROTOLUENE	WATER	0.50		UG/L	0.13	20	70-130	70-130
524.2	4-CHLOROTOLUENE	WATER	0.50		UG/L	0.11	20	70-130	70-130
524.2	BENZENE	WATER	0.50		UG/L	0.099	20	70-130	70-130
524.2	BROMOBENZENE	WATER	0.50		UG/L	0.13	20	70-130	70-130
524.2	BROMOCHLOROMETHANE	WATER	0.50		UG/L	0.15	20	70-130	70-130
524.2	BROMODICHLOROMETHANE	WATER	0.50		UG/L	0.085	20	70-130	70-130
524.2	BROMOFORM	WATER	0.50		UG/L	0.12	20	70-130	70-130
524.2	BROMOMETHANE	WATER	0.50		UG/L	0.14	20	70-130	70-130
524.2	CARBON TETRACHLORIDE	WATER	0.50		UG/L	0.19	20	70-130	70-130
524.2	CHLOROBENZENE	WATER	0.50		UG/L	0.13	20	70-130	70-130
524.2	CHLOROETHANE	WATER	0.50		UG/L	0.17	20	70-130	70-130
524.2	CHLOROFORM	WATER	0.50		UG/L	0.10	20	70-130	70-130
524.2	CHLOROMETHANE	WATER	0.50		UG/L	0.22	20	70-130	70-130
524.2	CIS-1,2-DICHLOROETHENE	WATER	0.50		UG/L	0.081	20	70-130	70-130
524.2	CIS-1,3-DICHLOROPROPENE	WATER	0.50		UG/L	0.077	20	70-130	70-130
524.2	DIBROMOCHLOROMETHANE	WATER	0.50		UG/L	0.14	20	70-130	70-130
524.2	DIBROMOMETHANE	WATER	0.50		UG/L	0.11	20	70-130	70-130
524.2	DICHLORODIFLUOROMETHANE	WATER	0.50		UG/L	0.13	20	70-130	70-130
524.2	ETHYLBENZENE	WATER	0.50		UG/L	0.089	20	70-130	70-130
524.2	HEXACHLOROBUTADIENE	WATER	0.50		UG/L	0.076	20	70-130	70-130
524.2	ISOPROPYLBENZENE	WATER	0.50		UG/L	0.16	20	70-130	70-130
524.2	M+P-XYLENE	WATER	1.0		UG/L	0.29	20	70-130	70-130
524.2	METHYLENE CHLORIDE	WATER	0.50		UG/L	0.15	20	70-130	70-130
524.2	NAPHTHALENE	WATER	0.50		UG/L	0.085	20	70-130	70-130

ROCHESTER ORGANIC QC LIMITS

METHOD	ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
524.2	N-BUTYLBENZENE	WATER	0.50		UG/L	0.14	20	70-130	70-130
524.2	N-PROPYLBENZENE	WATER	0.50		UG/L	0.14	20	70-130	70-130
524.2	O-XYLENE	WATER	0.50		UG/L	0.16	20	70-130	70-130
524.2	P-ISOPROPYLTOLUENE	WATER	0.50		UG/L	0.14	20	70-130	70-130
524.2	SEC-BUTYLBENZENE	WATER	0.50		UG/L	0.14	20	70-130	70-130
524.2	STYRENE	WATER	0.50		UG/L	0.11	20	70-130	70-130
524.2	TERT-BUTYLBENZENE	WATER	0.50		UG/L	0.16	20	70-130	70-130
524.2	TETRACHLOROETHENE	WATER	0.50		UG/L	0.11	20	70-130	70-130
524.2	TOLUENE	WATER	0.50		UG/L	0.085	20	70-130	70-130
524.2	TRANS-1,2-DICHLOROETHENE	WATER	0.50		UG/L	0.11	20	70-130	70-130
524.2	TRANS-1,3-DICHLOROPROPENE	WATER	0.50		UG/L	0.14	20	70-130	70-130
524.2	TRICHLOROETHENE	WATER	0.50		UG/L	0.16	20	70-130	70-130
524.2	TRICHLOROFLUOROMETHANE	WATER	0.50		UG/L	0.14	20	70-130	70-130
524.2	VINYL CHLORIDE	WATER	0.50		UG/L	0.20	20	70-130	70-130
524.2	BROMOFLUOROBENZENE -SURR	WATER	NA		UG/L	NA	NA	70-130	70-130
524.2	1,2-DICHLOROBENZENE-D4 -SURR	WATER	NA		UG/L	NA	NA	70-130	70-130
524.2 ADDITIONAL COMPOUNDS BY REQUEST									
	TERT-BUTYL ALCOHOL	WATER	20		UG/L	3.7	20	70-130	70-130
	METHYL-TERT-BUTYL-ETHER	WATER	0.50		UG/L	0.097	20	70-130	70-130
	2-BUTANONE (MEK)	WATER	5.0		UG/L	1.7	20	70-130	70-130
	2-HEXANONE	WATER	5.0		UG/L	1.8	20	70-130	70-130
	4-METHYL-2-PENTANONE (MIBK)	WATER	5.0		UG/L	1.6	20	70-130	70-130
	ACETONE	WATER	5.0		UG/L	1.9	20	70-130	70-130

ROCHESTER ORGANIC QC LIMITS

METHOD		ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
601		BROMODICHLOROMETHANE	WATER	1.0		UG/L	0.34	30	42-172	42-172
601		BROMOFORM	WATER	1.0		UG/L	0.18	30	13-159	13-159
601		BROMOMETHANE	WATER	1.0		UG/L	0.13	30	d-144	d-144
601		CARBON TETRACHLORIDE	WATER	1.0		UG/L	0.41	30	43-143	43-143
601		CHLOROBENZENE	WATER	1.0		UG/L	0.21	30	38-150	38-150
601		CHLOROETHANE	WATER	1.0		UG/L	0.47	30	46-137	46-137
601		2-CHLOROETHYLVINYL ETHER	WATER	1.0		UG/L	0.26	30	14-186	14-186
601		CHLOROFORM	WATER	1.0		UG/L	0.33	30	49-133	49-133
601		CHLOROMETHANE	WATER	1.0		UG/L	0.38	30	42-172	42-172
601		DIBROMOCHLOROMETHANE	WATER	1.0		UG/L	0.25	30	13-159	13-159
601		DICHLORODIFLUOROMETHANE	WATER	1.0		UG/L	0.31	30	70-130	50-150
601		1,2-DICHLOROBENZENE	WATER	1.0		UG/L	0.12	30	d-144	d-144
601		1,3-DICHLOROBENZENE	WATER	1.0		UG/L	0.15	30	43-143	43-143
601		1,4-DICHLOROBENZENE	WATER	1.0		UG/L	0.15	30	38-150	38-150
601		1,1-DICHLOROETHANE	WATER	1.0		UG/L	0.32	30	46-137	46-137
601		1,2-DICHLOROETHANE	WATER	1.0		UG/L	0.30	30	14-186	14-186
601		1,1-DICHLOROETHENE	WATER	1.0		UG/L	0.32	30	49-133	49-133
601		TRANS-1,2-DICHLOROETHENE	WATER	1.0		UG/L	0.36	30	d-193	d-193
601		1,2-DICHLOROPROPANE	WATER	1.0		UG/L	0.29	30	d-208	d-208
601		CIS-1,3-DICHLOROPROPENE	WATER	1.0		UG/L	0.27	30	7-187	7-187
601		TRANS-1,3-DICHLOROPROPENE	WATER	1.0		UG/L	0.19	30	42-143	42-143
601		METHYLENE CHLORIDE	WATER	1.0		UG/L	0.39	30	47-132	47-132
601		1,1,2,2-TETRACHLOROETHANE	WATER	1.0		UG/L	0.25	30	51-147	51-147
601		TETRACHLOROETHENE	WATER	1.0		UG/L	0.31	30	28-167	28-167
601		1,1,1-TRICHLOROETHANE	WATER	1.0		UG/L	0.50	30	38-155	38-155
601		1,1,2-TRICHLOROETHANE	WATER	1.0		UG/L	0.28	30	39-136	39-136
601		TRICHLOROETHENE	WATER	1.0		UG/L	0.45	30	35-146	35-146
601		TRICHLOROFLUOROMETHANE	WATER	1.0		UG/L	0.42	30	21-156	21-156
601		VINYL CHLORIDE	WATER	1.0		UG/L	0.40	30	28-163	28-163
601		BROMOCHLOROMETHANE -SURR	WATER	NA		UG/L	NA	NA	60-117	60-117
601		1,2,3 -TRICHLOROPROPANE -SURR	WATER	NA		UG/L	NA	NA	70-124	70-124
601		CHLOROFLUOROBENZENE -SURR	WATER	NA		UG/L	NA	NA	61-120	61-120
602		BENZENE	WATER	1.0		UG/L	0.20	30	39-150	39-150
602		CHLOROBENZENE	WATER	1.0		UG/L	0.21	30	55-135	55-135
602		1,3-DICHLOROBENZENE (M)	WATER	1.0		UG/L	0.36	30	50-141	50-141
602		1,2-DICHLOROBENZENE (O)	WATER	1.0		UG/L	0.15	30	37-154	37-154
602		1,4-DICHLOROBENZENE (P)	WATER	1.0		UG/L	0.39	30	42-143	42-143
602		ETHYLBENZENE	WATER	1.0		UG/L	0.23	30	32-160	32-160
602		TOLUENE	WATER	1.0		UG/L	0.18	30	46-148	46-148
602		M+P-XYLENE	WATER	2.0		UG/L	0.36	30	70-130	50-150
602		O-XYLENE	WATER	1.0		UG/L	0.17	30	70-130	50-150
602		CHLOROFLUOROBENZENE (PID) -SURR	WATER	NA		UG/L	NA	NA	73-110	73-110
601/602 ADDITIONAL COMPOUNDS BY REQUEST										
		CIS-1,2-DICHLOROETHENE	WATER	1.0		UG/L	0.30	30	24-191	24-191
		FREON 113	WATER	1.0		UG/L	0.36	30	70-130	50-150
		METHYL-TERT-BUTYL ETHER (MTBE)	WATER	1.0		UG/L	0.25	30	70-130	50-150
		TOTAL XYLENES	WATER	3.0		UG/L	0.52	30	70-130	50-150

ROCHESTER ORGANIC QC LIMITS

METHOD		ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
624 PPL		ACROLEIN	WATER	10		UG/L	4.0	30	36-124	36-124
624 PPL		ACRYLONITRILE	WATER	10		UG/L	1.2	30	71-111	71-111
624 PPL		BENZENE	WATER	1.0		UG/L	0.18	30	37-151	37-151
624 PPL		BROMODICHLOROMETHANE	WATER	1.0		UG/L	0.24	30	35-155	35-155
624 PPL		BROMOFORM	WATER	1.0		UG/L	0.57	30	45-169	45-169
624 PPL		BROMOMETHANE	WATER	1.0		UG/L	0.75	30	d-242	d-242
624 PPL		CARBON TETRACHLORIDE	WATER	1.0		UG/L	0.44	30	70-140	70-140
624 PPL		CHLOROBENZENE	WATER	1.0		UG/L	0.20	30	37-160	37-160
624 PPL		CHLOROETHANE	WATER	1.0		UG/L	0.33	30	14-230	14-230
624 PPL		2-CHLOROETHYLVINYL ETHER	WATER	10		UG/L	0.31	30	d-305	d-305
624 PPL		CHLOROFORM	WATER	1.0		UG/L	0.17	30	51-138	51-138
624 PPL		CHLOROMETHANE	WATER	1.0		UG/L	0.33	30	d-273	d-273
624 PPL		DIBROMOCHLOROMETHANE	WATER	1.0		UG/L	0.26	30	53-149	53-149
624 PPL		1,1-DICHLOROETHANE	WATER	1.0		UG/L	0.30	30	59-155	59-155
624 PPL		1,2-DICHLOROETHANE	WATER	1.0		UG/L	0.14	30	49-155	49-155
624 PPL		1,1-DICHLOROETHENE	WATER	1.0		UG/L	0.31	30	d-234	d-234
624 PPL		TRANS-1,2-DICHLOROETHENE	WATER	1.0		UG/L	0.22	30	54-156	54-156
624 PPL		1,2-DICHLOROPROPANE	WATER	1.0		UG/L	0.25	30	d-210	d-210
624 PPL		CIS-1,3-DICHLOROPROPENE	WATER	1.0		UG/L	0.36	30	d-227	d-227
624 PPL		TRANS-1,3-DICHLOROPROPENE	WATER	1.0		UG/L	0.23	30	17-183	17-183
624 PPL		ETHYLBENZENE	WATER	1.0		UG/L	0.17	30	37-162	37-162
624 PPL		METHYLENE CHLORIDE	WATER	1.0		UG/L	0.20	30	d-221	d-221
624 PPL		1,1,2,2-TETRACHLOROETHANE	WATER	1.0		UG/L	0.27	30	46-157	46-157
624 PPL		TETRACHLOROETHENE	WATER	1.0		UG/L	0.27	30	64-148	64-148
624 PPL		TOLUENE	WATER	1.0		UG/L	0.11	30	47-150	47-150
624 PPL		1,1,1-TRICHLOROETHANE	WATER	1.0		UG/L	0.13	30	52-162	52-162
624 PPL		1,1,2-TRICHLOROETHANE	WATER	1.0		UG/L	0.47	30	52-150	52-150
624 PPL		TRICHLOROETHENE	WATER	1.0		UG/L	0.26	30	71-157	71-157
624 PPL		VINYL CHLORIDE	WATER	1.0		UG/L	0.18	30	d-251	d-251
624		4-BROMOFLUOROBENZENE -SURR	WATER	NA		UG/L	NA	NA	77-117	77-117
624		DIBROMOFLUOROMETHANE-SURR	WATER	NA		UG/L	NA	NA	86-126	86-126
624		1,2-DICHLOROETHANE-D4 -SURR	WATER	NA		UG/L	NA	NA	85-122	85-122
624		TOLUENE-D8 -SURR	WATER	NA		UG/L	NA	NA	85-115	85-115

ROCHESTER ORGANIC QC LIMITS

METHOD		ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
624 ADDITIONAL COMPOUNDS BY REQUEST										
624		1,1,1,2-TETRACHLOROETHANE	WATER	1.0		UG/L	0.37	30	70-130	50-150
624		1,2,3-TRICHLOROPROPANE	WATER	5.0		UG/L	0.10	30	70-130	50-150
624		1,2-DIBROMO-3-CHLOROPROPANE	WATER	1.0		UG/L	0.17	30	70-130	50-150
624		1,2-DIBROMOETHANE	WATER	1.0		UG/L	0.27	30	70-130	50-150
624		1,2-DICHLOROBENZENE	WATER	1.0		UG/L	0.31	30	18-190	18-190
624		1,3-DICHLOROBENZENE	WATER	1.0		UG/L	0.35	30	59-156	59-156
624		1,4-DICHLOROBENZENE	WATER	1.0		UG/L	0.20	30	18-190	18-190
624		1-BROMO-2-CHLOROETHANE	WATER	10		UG/L	1.9	30	70-130	50-150
624		2-BUTANONE (MEK)	WATER	10		UG/L	0.75	30	70-130	50-150
624		2-HEXANONE	WATER	10		UG/L	0.73	30	70-130	50-150
624		4-CHLOROBENZOFLUORIDE	WATER	10		UG/L	1.80	30	50-150	50-150
624		4-METHYL-2-PENTANONE (MIBK)	WATER	10		UG/L	0.54	30	70-130	50-150
624		ACETONE	WATER	10		UG/L	1.3	30	50-150	50-150
624		BROMOCHLOROMETHANE	WATER	1.0		UG/L	0.082	30	70-130	50-150
624		CARBON DISULFIDE	WATER	10		UG/L	0.99	30	70-130	50-150
624		CIS-1,2-DICHLOROETHENE	WATER	1.0		UG/L	0.33	30	70-130	50-150
624		DIBROMOMETHANE	WATER	1.0		UG/L	0.10	30	70-130	50-150
624		DICHLORODIFLUOROMETHANE	WATER	1.0		UG/L	0.29	30	70-130	50-150
624		IODOMETHANE	WATER	5.0		UG/L	1.2	30	70-130	50-150
624		ISOBUTYL ALCOHOL	WATER	100		UG/L	18	30	70-130	50-150
624		M+P XYLENE	WATER	2.0		UG/L	0.25	30	70-130	50-150
624		METHYL-TERT-BUTYL ETHER	WATER	1.0		UG/L	0.17	30	70-130	50-150
624		NAPHTHALENE	WATER	5.0		UG/L	0.14	30	70-130	50-150
624		O-XYLENE	WATER	1.0		UG/L	0.27	30	70-130	50-150
624		STYRENE	WATER	1.0		UG/L	0.33	30	70-130	50-150
624		TERT-BUTYL ALCOHOL	WATER	100		UG/L	3.9	30	50-150	50-150
624		TETRAHYDROFURAN	WATER	10		UG/L	1.1	30	50-150	50-150
624		TRANS-1,4-DICHLORO-2-BUTENE	WATER	1.0		UG/L	0.17	30	70-130	50-150
624		TRICHLOROFLUOROMETHANE	WATER	1.0		UG/L	0.42	30	17-181	17-181
624		TRICHLOROTRIFLUOROETHANE	WATER	1.0		UG/L	0.35	30	70-130	50-150
624		VINYL ACETATE	WATER	5.0		UG/L	0.45	30	70-130	50-150

ROCHESTER ORGANIC QC LIMITS

METHOD		ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
625 PPL		1,2,4-TRICHLOROBENZENE	WATER	5.0		UG/L	0.65	30	44-142	44-142
625 PPL		1,2-DICHLOROBENZENE	WATER	5.0		UG/L	0.67	30	32-129	32-129
625 PPL		1,2-DIPHENYLHYDRAZINE	WATER	5.0		UG/L	0.48	30	59-113	59-113
625 PPL		1,3-DICHLOROBENZENE	WATER	5.0		UG/L	0.50	30	d-172	d-172
625 PPL		1,4-DICHLOROBENZENE	WATER	5.0		UG/L	0.58	30	20-124	20-124
625 PPL		2,2-OXYBIS(1-CHLOROPROPANE)	WATER	5.0		UG/L	0.78	30	36-166	36-166
625 PPL		2,4,6-TRICHLOROPHENOL	WATER	5.0		UG/L	0.59	30	37-144	37-144
625 PPL		2,4-DICHLOROPHENOL	WATER	5.0		UG/L	0.37	30	39-135	39-135
625 PPL		2,4-DIMETHYLPHENOL	WATER	5.0		UG/L	1.8	30	39-135	39-135
625 PPL		2,4-DINITROPHENOL	WATER	50		UG/L	14	30	d-191	d-191
625 PPL		2,4-DINITROTOLUENE	WATER	5.0		UG/L	0.53	30	39-139	39-139
625 PPL		2,6-DINITROTOLUENE	WATER	5.0		UG/L	0.55	30	50-158	50-158
625 PPL		2-CHLORONAPHTHALENE	WATER	5.0		UG/L	0.55	30	60-118	60-118
625 PPL		2-CHLOROPHENOL	WATER	5.0		UG/L	0.69	30	23-134	23-134
625 PPL		2-NITROPHENOL	WATER	5.0		UG/L	0.61	30	29-182	29-182
625 PPL		3,3'-DICHLOROBENZIDINE	WATER	5.0		UG/L	0.73	30	d-262	d-262
625 PPL		4,6-DINITRO-2-METHYLPHENOL	WATER	50		UG/L	0.51	30	d-181	d-181
625 PPL		4-BROMOPHENYL-PHENYLETHER	WATER	5.0		UG/L	0.67	30	53-127	53-127
625 PPL		4-CHLORO-3-METHYLPHENOL	WATER	5.0		UG/L	0.50	30	22-147	22-147
625 PPL		4-CHLOROPHENYL-PHENYLETHER	WATER	5.0		UG/L	0.49	30	25-158	25-158
625 PPL		4-NITROPHENOL	WATER	50		UG/L	6.7	30	d-132	d-132
625 PPL		ACENAPHTHENE	WATER	5.0		UG/L	0.48	30	47-145	47-145
625 PPL		ACENAPHTHYLENE	WATER	5.0		UG/L	0.33	30	33-145	33-145
625 PPL		ANTHRACENE	WATER	5.0		UG/L	0.60	30	27-133	27-133
625 PPL		BENZIDINE	WATER	100		UG/L	43	30	10-113	10-113
625 PPL		BENZO(A)ANTHRACENE	WATER	5.0		UG/L	0.54	30	33-143	33-143
625 PPL		BENZO(A)PYRENE	WATER	5.0		UG/L	0.42	30	17-163	17-163
625 PPL		BENZO(B)FLUORANTHENE	WATER	5.0		UG/L	0.54	30	24-159	24-159
625 PPL		BENZO(G,H,I)PERYLENE	WATER	5.0		UG/L	0.62	30	d-219	d-219
625 PPL		BENZO(K)FLUORANTHENE	WATER	5.0		UG/L	0.53	30	11-162	11-162
625 PPL		BIS(-2-CHLOROETHOXY)METHANE	WATER	5.0		UG/L	0.86	30	33-184	33-184
625 PPL		BIS(2-CHLOROETHYL)ETHER	WATER	5.0		UG/L	0.74	30	12-158	12-158
625 PPL		BIS(2-ETHYLHEXYL)PHTHALATE	WATER	5.0		UG/L	0.48	30	8-158	8-158
625 PPL		BUTYL BENZYL PHTHALATE	WATER	5.0		UG/L	0.59	30	d-152	d-152
625 PPL		CHRYSENE	WATER	5.0		UG/L	0.53	30	17-168	17-168
625 PPL		DIBENZO(A,H)ANTHRACENE	WATER	5.0		UG/L	0.63	30	d-227	d-227
625 PPL		DIETHYLPHTHALATE	WATER	5.0		UG/L	0.31	30	d-114	d-114
625 PPL		DIMETHYL PHTHALATE	WATER	5.0		UG/L	0.53	30	d-112	d-112
625 PPL		DI-N-BUTYLPHTHALATE	WATER	5.0		UG/L	0.39	30	1-118	1-118
625 PPL		DI-N-OCTYL PHTHALATE	WATER	5.0		UG/L	0.45	30	4-146	4-146
625 PPL		FLUORANTHENE	WATER	5.0		UG/L	0.32	30	26-137	26-137
625 PPL		FLUORENE	WATER	5.0		UG/L	0.47	30	59-121	59-121
625 PPL		HEXACHLOROBENZENE	WATER	5.0		UG/L	0.43	30	d-152	d-152
625 PPL		HEXACHLOROBUTADIENE	WATER	5.0		UG/L	0.69	30	24-116	24-116
625 PPL		HEXACHLOROCYCLOPENTADIENE	WATER	5.0		UG/L	1.1	30	10-130	10-130
625 PPL		HEXACHLOROETHANE	WATER	5.0		UG/L	0.48	30	40-113	40-113
625 PPL		INDENO(1,2,3-CD)PYRENE	WATER	5.0		UG/L	0.49	30	d-171	d-171
625 PPL		ISOPHORONE	WATER	5.0		UG/L	0.61	30	21-196	21-196
625 PPL		NAPHTHALENE	WATER	5.0		UG/L	0.62	30	21-133	21-133
625 PPL		NITROBENZENE	WATER	5.0		UG/L	0.78	30	35-180	35-180
625 PPL		N-NITROSODIMETHYLAMINE	WATER	5.0		UG/L	0.79	30	27-130	27-130
625 PPL		N-NITROSO-DI-N-PROPYLAMINE	WATER	5.0		UG/L	1.19	30	d-230	d-230
625 PPL		N-NITROSODIPHENYLAMINE	WATER	5.0		UG/L	0.75	30	70-130	70-130
625 PPL		PENTACHLOROPHENOL	WATER	50		UG/L	0.60	30	14-176	14-176
625 PPL		PHENANTHRENE	WATER	5.0		UG/L	0.45	30	54-120	54-120
625 PPL		PHENOL	WATER	5.0		UG/L	0.54	30	5-112	5-112
625 PPL		PYRENE	WATER	5.0		UG/L	0.65	30	52-115	52-115
625		TERPHENYL-d14 -SURR	WATER	NA		UG/L	NA	NA	45-135	45-135
625		NITROBENZENE-d5 -SURR	WATER	NA		UG/L	NA	NA	41-129	41-129
625		PHENOL-d6 -SURR	WATER	NA		UG/L	NA	NA	15-58	15-58
625		2-FLUOROBIPHENYL -SURR	WATER	NA		UG/L	NA	NA	51-111	51-111
625		2-FLUOROPHENOL -SURR	WATER	NA		UG/L	NA	NA	27-78	27-78
625		2,4,6-TRIBROMOPHENOL -SURR	WATER	NA		UG/L	NA	NA	44-146	44-146
625 ADDITIONAL COMPOUNDS BY REQUEST										
625		1,1-BIPHENYL	WATER	5.0		UG/L	0.55	30	50-130	50-130

ROCHESTER ORGANIC QC LIMITS

METHOD		ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
625		1-METHYLNAPHTHALENE	WATER	5.0		UG/L	0.62	30	50-130	50-130
625		2,4,5-TRICHLOROPHENOL	WATER	5.0		UG/L	0.84	30	40-110	40-110
625		2-CHLOROPYRIDINE	WATER	10		UG/L	0.42	30	58-130	50-130
625		2-METHYLNAPHTHALENE	WATER	5.0		UG/L	0.45	30	42-107	42-107
625		2-METHYLPHENOL	WATER	5.0		UG/L	0.79	30	16-102	16-102
625		2-NITROANILINE	WATER	50		UG/L	0.59	30	63-112	63-112
625		3-CHLOROPYRIDINE	WATER	10		UG/L	0.67	30	56-130	50-130
625		3-NITROANILINE	WATER	50		UG/L	0.43	30	56-111	56-111
625		4-CHLOROANILINE	WATER	5.0		UG/L	0.72	30	39-107	39-107
625		4-METHYLPHENOL	WATER	5.0		UG/L	1.5	30	26-99	26-99
625		4-NITROANILINE	WATER	50		UG/L	0.59	30	50-130	50-130
625		ACETOPHENONE	WATER	5.0		UG/L	1.35	30	40-130	40-130
625		ANILINE	WATER	5.0		UG/L	0.78	30	13-123	13-123
625		ATRAZINE	WATER	5.0		UG/L	1.3	30	50-130	50-130
625		BENZALDEHYDE	WATER	5.0		UG/L	1.3	30	50-130	50-130
625		BENZOIC ACID	WATER	50		UG/L	15	30	30-130	30-130
625		BENZYL ALCOHOL	WATER	5.0		UG/L	1.1	30	31-109	31-109
625		CAPROLACTAM	WATER	50		UG/L	1.0	30	50-130	50-130
625		CARBAZOLE	WATER	5.0		UG/L	0.47	30	70-130	70-130
625		DIBENZOFURAN	WATER	5.0		UG/L	0.41	30	70-130	70-130
625		PYRIDINE	WATER	5.0		UG/L	1.0	30	10-130	10-130
680		MONOCHLOROBIPHENYLS, TOTAL	WATER	0.005		UG/L	0.0017	30	50-125	50-125
680		DICHLOROBIPHENYLS, TOTAL	WATER	0.006		UG/L	0.0014	30	50-125	50-125
680		TRICHLOROBIPHENYLS, TOTAL	WATER	0.006		UG/L	0.0015	30	50-125	50-125
680		TETRACHLOROBIPHENYLS, TOTAL	WATER	0.010		UG/L	0.0023	30	50-125	50-125
680		PENTACHLOROBIPHENYLS, TOTAL	WATER	0.010		UG/L	0.0045	30	50-125	50-125
680		HEXACHLOROBIPHENYLS, TOTAL	WATER	0.020		UG/L	0.0032	30	50-125	50-125
680		HEPTACHLOROBIPHENYLS, TOTAL	WATER	0.020		UG/L	0.0033	30	50-125	50-125
680		OCTACHLOROBIPHENYLS, TOTAL	WATER	0.040		UG/L	0.0054	30	50-125	50-125
680		NONACHLOROBIPHENYLS, TOTAL	WATER	0.025		UG/L	0.0057	30	50-125	50-125
680		DECACHLOROBIPHENYLS, TOTAL	WATER	0.040		UG/L	0.0085	30	50-125	50-125
680		GAMMA-BHC -SURR	WATER	NA		UG/L	NA	30	59-128	59-128
680		4-4'-DDT -SURR	WATER	NA		UG/L	NA	30	45-155	45-155
8011		1,2-DIBROMOETHANE	WATER	0.06		UG/L	0.0062	30	70-130	50-150
8011		1,2-DIBROMO-3-CHLOROPROPANE	WATER	0.06		UG/L	0.0057	30	70-130	50-150
8011		TETRACHLORO-META-XYLENE (TCMX) -SU	WATER	NA		UG/L	NA	NA	70-130	50-150

ROCHESTER ORGANIC QC LIMITS

METHOD	ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
8015B-SVOA-SILOX	N,N-DIMETHYLFORAMIDE	WATER	2000		UG/L	411	30	50-150	50-150
8015B-SVOA-SILOX	HEXAMETHYLCYCLOTRISILOXANE	WATER	2000		UG/L	447	30	50-150	50-150
8015B-SVOA-SILOX	OCTAMETHYLCYCLOTRISILOXANE	WATER	2000		UG/L	460	30	50-150	50-150
8015B-SVOA-SILOX	OCTAMETHYLTETRASILOXANE	WATER	2000		UG/L	473	30	50-150	50-150
8015B-SVOA(WAPA)	1,4-DIOXANE	WATER	1000		UG/L	310	30	70-130	70-130
8015B-SVOA(WAPA)	2-PROPANOL (ISOPROPANOL)	WATER	1000		UG/L	339	30	70-130	70-130
8015B-SVOA(WAPA)	ETHYL ACETATE	WATER	1000		UG/L	320	30	70-130	70-130
8015B-SVOA(WAPA)	ISOBUTYL ALCOHOL (ISOBUTANOL)	WATER	1000		UG/L	275	30	50-150	50-150
8015B-SVOA(WAPA)	METHANOL	WATER	1000		UG/L	260	30	70-130	50-150
8015B-SVOA(WAPA)	N-BUTANOL (1-BUTANOL)	WATER	1000		UG/L	322	30	70-130	70-130
8015B-SVOA	1-BUTANOL (N-BUTANOL)	WATER	1000		UG/L	320	30	70-130	70-130
8015B-SVOA	1-METHOXY-2-PROPANOL	WATER	1000		UG/L	190	30	70-130	70-130
8015B-SVOA	1-PROPANOL (N-PROPANOL)	WATER	1000		UG/L	215	30	65-143	65-143
8015B-SVOA	2-ETHOXYETHANOL (CELLOSOLVE)	WATER	1000		UG/L	130	30	70-130	50-150
8015B-SVOA	2-ETHYLHEXANOL	WATER	1000		UG/L	464	30	70-130	50-150
8015B-SVOA	2-PROPANOL (ISOPROPANOL)	WATER	1000		UG/L	340	30	70-130	70-130
8015B-SVOA	DIMETHYLSULFOXIDE	WATER	1000		UG/L		30	50-150	50-150
8015B-SVOA	ETHANOL	WATER	1000		UG/L	440	30	70-130	50-150
8015B-SVOA	ETHER (DIETHYL ETHER)	WATER	1000		UG/L	296	30	50-150	50-150
8015B-SVOA	ETHYL ACETATE	WATER	1000		UG/L	320	30	70-130	70-130
8015B-SVOA	ISOPROPYL ETHER	WATER	1000		UG/L	135	30	50-150	50-150
8015B-SVOA	METHANOL	WATER	1000		UG/L	260	30	70-130	50-150
8015B-SVOA	METHYL CELLOSOLVE (2-METHOXYETHANO	WATER	1000		UG/L	79	30	50-150	70-130
8015B-SVOA	METHYL-TERT-BUTYL ETHER	WATER	1000		UG/L		30	70-130	70-130
8015B-SVOA	N-BUTYL ACETATE	WATER	1000		UG/L		30	40-150	40-150
8015B-SVOA	N-PROPYL ACETATE	WATER	1000		UG/L		30	40-150	40-150
8015B-SVOA	SEC-BUTANOL (2-BUTANOL)	WATER	1000		UG/L	260	30	70-130	50-150
8015B-SVOA	TETRAHYDROFURAN	WATER	1000		UG/L		30	50-150	50-150
8015B-SVOA	1-PROPANOL-OPTIONAL SURR	WATER	NA		UG/L	NA	NA	50-150	50-150
8015B-SVOA	2-HEXANONE-OPTIONAL SURR	WATER	NA		UG/L	NA	NA	50-150	50-150
8015B-SVOA	n-BUTANOL-OPTIONAL SURR	WATER	NA		UG/L	NA	NA	50-150	50-150
8015B -VOA	METHANOL	WATER	1000		UG/L	488	30	70-130	50-150
8015B -VOA	ETHANOL	WATER	1000		UG/L	267	30	70-130	50-150
8015B -VOA	ISOPROPANOL	WATER	1000		UG/L	164	30	70-130	50-150
8015B -VOA	N-PROPANOL	WATER	1000		UG/L	279	30	70-130	50-150
8015B -VOA	SEC-BUTANOL	WATER	1000		UG/L	214	30	70-130	50-150
8015B -VOA	N-BUTANOL	WATER	1000		UG/L	172	30	70-130	50-150
8015B -VOA	N-PROPANOL -SURR/TARGET	WATER	NA		UG/L	NA	NA	65-143	65-143
8015B -VOA	MINERAL SPIRITS	WATER	100		UG/L	35	30	41-145	41-145
8015B -VOA	1,4-DIFLUOROBENZENE -SURR	WATER	NA		UG/L	NA	NA	59-122	59-122
8015B -VOA	MINERAL SPIRITS	SOIL	100		UG/KG		30	70-130	50-150
8015B -VOA	1,4-DIFLUOROBENZENE -SURR	SOIL	NA		UG/KG	NA	NA	85-115	85-115
8015B	GASOLINE RANGE ORGANICS	WATER	50		UG/L	10	30	70-130	50-150
8015B	CHLOROFLUOROBENZENE (FID) -SURR	WATER	NA		UG/L	NA	NA	65-136	65-136
8015B	GASOLINE RANGE ORGANICS	SOIL	50		UG/KG	7.7	50	70-130	50-150
8015B	CHLOROFLUOROBENZENE (FID) -SURR	SOIL	NA		UG/KG	NA	NA	44-131	44-131
8015B	DIESEL RANGE ORGANICS	WATER	100		UG/L	61	30	10-154	10-154
8015B	O-TERPHENYL -SURR	WATER	NA		UG/L	NA	NA	56-128	56-128
8015B	DIESEL RANGE ORGANICS	SOIL	40000		UG/KG	13000	50	51-114	51-114
8015B	O-TERPHENYL -SURR	SOIL	NA		UG/KG	NA	NA	68-138	68-138

ROCHESTER ORGANIC QC LIMITS

METHOD	ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
8015B ETPH-CT	ETPH	WATER	75		UG/L	14	30	50-150	50-150
8015B ETPH-CT	FUEL OIL #2	WATER	100		UG/L	11	30	50-150	50-150
8015B ETPH-CT	FUEL OIL #4	WATER	100		UG/L	NA	30	50-150	50-150
8015B ETPH-CT	FUEL OIL #6	WATER	100		UG/L	NA	30	50-150	50-150
8015B ETPH-CT	KEROSENE	WATER	100		UG/L	NA	30	50-150	50-150
8015B ETPH-CT	MOTOR OIL	WATER	1000		UG/L	NA	30	50-150	50-150
8015B ETPH-CT	O-TERPHENYL-SURR	WATER	NA		UG/L	NA	NA	44-148	44-148
8015B ETPH-CT	ETPH	SOIL	2500		UG/KG		30	50-150	50-150
8015B ETPH-CT	FUEL OIL #2	SOIL	3300		UG/KG		30	50-150	50-150
8015B ETPH-CT	FUEL OIL #4	SOIL	3300		UG/KG		30	50-150	50-150
8015B ETPH-CT	FUEL OIL #6	SOIL	3300		UG/KG		30	50-150	50-150
8015B ETPH-CT	KEROSENE	SOIL	3300		UG/KG		30	50-150	50-150
8015B ETPH-CT	MOTOR OIL	SOIL	33000		UG/KG		30	50-150	50-150
8015B ETPH-CT	O-TERPHENYL-SURR	SOIL	NA		UG/KG	NA	NA	25-148	25-148
8015B FINGERPRINT	FUEL OIL #2	WATER	1000		UG/L	220	30	50-150	50-150
8015B FINGERPRINT	GASOLINE	WATER	1000		UG/L	190	30	50-150	50-150
8015B FINGERPRINT	KEROSENE	WATER	1000		UG/L	290	30	50-150	50-150
8015B FINGERPRINT	MINERAL SPIRITS	WATER	1000		UG/L		30	50-150	50-150
8015B FINGERPRINT	MOTOR OIL	WATER	10000		UG/L		30	50-150	50-150
8015B FINGERPRINT	FUEL OIL #2	SOIL	100		MG/KG	29	30	50-150	50-150
8015B FINGERPRINT	GASOLINE	SOIL	100		MG/KG	23	30	50-150	50-150
8015B FINGERPRINT	KEROSENE	SOIL	100		MG/KG	66	30	50-150	50-150
8015B FINGERPRINT	MINERAL SPIRITS	SOIL	100		MG/KG		30	50-150	50-150
8015B FINGERPRINT	MOTOR OIL	SOIL	1000		MG/KG		30	50-150	50-150
8015B RSK	ETHANE	WATER	1.0		UG/L	0.11	30	50-150	50-150
8015B RSK	ETHYLENE	WATER	1.0		UG/L	0.11	30	50-150	50-150
8015B RSK	METHANE	WATER	1.0		UG/L	0.18	30	50-150	50-150
8015B RSK	PROPANE	WATER	1.0		UG/L	0.34	30	50-150	50-150
NY 310-13	FUEL OIL #2	WATER	1000		UG/L	220	30	46-150	46-150
NY 310-13	FUEL OIL #4	WATER	1000		UG/L	410	30	50-150	50-150
NY 310-13	FUEL OIL #6	WATER	1000		UG/L	400	30	50-150	50-150
NY 310-13	GASOLINE	WATER	1000		UG/L	190	30	50-150	50-150
NY 310-13	KEROSENE	WATER	1000		UG/L	290	30	50-150	50-150
NY 310-13	LUBE OIL	WATER	1000		UG/L	250	30	50-150	50-150
NY 310-13	N-DODECANE	WATER	1000		UG/L	120	30	50-150	50-150
NY 310-13	FUEL OIL #2	SOIL	100		MG/KG	29	30	70-155	70-155
NY 310-13	FUEL OIL #4	SOIL	100		MG/KG	22	30	50-150	50-150
NY 310-13	FUEL OIL #6	SOIL	100		MG/KG	26	30	50-150	50-150
NY 310-13	GASOLINE	SOIL	100		MG/KG	23	30	50-150	50-150
NY 310-13	KEROSENE	SOIL	100		MG/KG	66	30	50-150	50-150
NY 310-13	LUBE OIL	SOIL	100		MG/KG	29	30	50-150	50-150
NY 310-13	N-DODECANE	SOIL	100		MG/KG	8.5	30	50-150	50-150

ROCHESTER ORGANIC QC LIMITS

METHOD	ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
8021	1,1,2,2-TETRACHLOROETHANE	WATER	1.0		UG/L	0.25	30	70-130	70-130
8021	1,1,2-TRICHLOROETHANE	WATER	1.0		UG/L	0.17	30	70-130	70-130
8021	1,1-DICHLOROETHANE	WATER	1.0		UG/L	0.21	30	70-130	70-130
8021	1,1-DICHLOROETHENE	WATER	1.0		UG/L	0.27	30	70-130	70-130
8021	1,2-DICHLOROBENZENE	WATER	1.0		UG/L	0.17	30	70-130	70-130
8021	1,2-DICHLOROETHANE	WATER	1.0		UG/L	0.15	30	70-130	70-130
8021	1,2-DICHLOROPROPANE	WATER	1.0		UG/L	0.16	30	70-130	70-130
8021	1,3-DICHLOROBENZENE	WATER	1.0		UG/L	0.17	30	70-130	70-130
8021	1,4-DICHLOROBENZENE	WATER	1.0		UG/L	0.16	30	70-130	70-130
8021	2-CHLOROETHYLVINYL ETHER	WATER	1.0		UG/L	0.14	30	50-150	50-150
8021	BENZENE	WATER	1.0		UG/L	0.31	30	70-130	70-130
8021	BROMODICHLOROMETHANE	WATER	1.0		UG/L	0.34	30	70-130	70-130
8021	BROMOFORM	WATER	1.0		UG/L	0.17	30	70-130	70-130
8021	BROMOMETHANE	WATER	2.0		UG/L	0.12	30	50-150	50-150
8021	CARBON TETRACHLORIDE	WATER	1.0		UG/L	0.42	30	70-130	70-130
8021	CHLOROBENZENE	WATER	1.0		UG/L	0.22	30	70-130	70-130
8021	CHLOROETHANE	WATER	1.0		UG/L	0.48	30	50-150	50-150
8021	CHLOROFORM	WATER	1.0		UG/L	0.30	30	70-130	70-130
8021	CHLOROMETHANE	WATER	1.0		UG/L	0.39	30	50-150	50-150
8021	CIS-1,2-DICHLOROETHENE	WATER	1.0		UG/L	0.23	30	70-130	70-130
8021	CIS-1,3-DICHLOROPROPENE	WATER	1.0		UG/L	0.21	30	70-130	70-130
8021	DIBROMOCHLOROMETHANE	WATER	1.0		UG/L	0.11	30	70-130	70-130
8021	DICHLORODIFLUOROMETHANE	WATER	1.0		UG/L	0.29	30	50-150	50-150
8021	ETHYLBENZENE	WATER	1.0		UG/L	0.23	30	70-130	70-130
8021	FREON 113	WATER	1.0		UG/L	0.38	30	70-130	70-130
8021	M+P-XYLENE	WATER	2.0		UG/L	0.36	30	70-130	70-130
8021	METHYLENE CHLORIDE	WATER	1.0		UG/L	0.24	30	70-130	70-130
8021	O-XYLENE	WATER	1.0		UG/L	0.17	30	70-130	70-130
8021	TETRACHLOROETHENE	WATER	1.0		UG/L	0.30	30	70-130	70-130
8021	TOLUENE	WATER	1.0		UG/L	0.18	30	70-130	70-130
8021	TRANS-1,2-DICHLOROETHENE	WATER	1.0		UG/L	0.26	30	70-130	70-130
8021	TRANS-1,3-DICHLOROPROPENE	WATER	1.0		UG/L	0.19	30	70-130	70-130
8021	TRICHLOROETHENE	WATER	1.0		UG/L	0.15	30	70-130	70-130
8021	TRICHLOROFLUOROMETHANE	WATER	1.0		UG/L	0.42	30	50-150	50-150
8021	VINYL CHLORIDE	WATER	1.0		UG/L	0.41	30	50-150	50-150
8021	1,2,3 TRICHLOROPROPANE -SURR	WATER	NA		UG/L	NA	NA	61-117	61-117
8021	BROMOCHLOROMETHANE -SURR	WATER	NA		UG/L	NA	NA	70-114	70-114
8021	CHLOROFLUOROBENZENE-SURR	WATER	NA		UG/L	NA	NA	72-116	72-116
8021	CHLOROFLUOROBENZENE (PID) -SURR	WATER	NA		UG/L	NA	NA	77-113	77-113

ROCHESTER ORGANIC QC LIMITS

METHOD	ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
8021	1,1,1-TRICHLOROETHANE	SOIL	1.0		UG/KG	0.33	30	70-130	70-130
8021	1,1,2,2-TETRACHLOROETHANE	SOIL	1.0		UG/KG	0.10	30	70-130	70-130
8021	1,1,2-TRICHLOROETHANE	SOIL	1.0		UG/KG	0.25	30	70-130	70-130
8021	1,1-DICHLOROETHANE	SOIL	1.0		UG/KG	0.27	30	70-130	70-130
8021	1,1-DICHLOROETHENE	SOIL	1.0		UG/KG	0.29	30	70-130	70-130
8021	1,2-DICHLOROBENZENE	SOIL	1.0		UG/KG	0.22	30	70-130	70-130
8021	1,2-DICHLOROETHANE	SOIL	1.0		UG/KG	0.29	30	70-130	70-130
8021	1,2-DICHLOROPROPANE	SOIL	1.0		UG/KG	0.20	30	70-130	70-130
8021	1,3-DICHLOROBENZENE	SOIL	1.0		UG/KG	0.23	30	70-130	70-130
8021	1,4-DICHLOROBENZENE	SOIL	1.0		UG/KG	0.20	30	70-130	70-130
8021	2-CHLOROETHYLVINYL ETHER	SOIL	1.0		UG/KG	0.12	30	50-150	50-150
8021	BENZENE	SOIL	1.0		UG/KG	0.20	30	70-130	70-130
8021	BROMODICHLOROMETHANE	SOIL	1.0		UG/KG	0.20	30	70-130	70-130
8021	BROMOFORM	SOIL	1.0		UG/KG	0.12	30	70-130	70-130
8021	BROMOMETHANE	SOIL	2.0		UG/KG	0.26	30	50-150	50-150
8021	CARBON TETRACHLORIDE	SOIL	1.0		UG/KG	0.34	30	70-130	70-130
8021	CHLOROBENZENE	SOIL	1.0		UG/KG	0.23	30	70-130	70-130
8021	CHLOROETHANE	SOIL	1.0		UG/KG	0.29	30	50-150	50-150
8021	CHLOROFORM	SOIL	1.0		UG/KG	0.26	30	70-130	70-130
8021	CHLOROMETHANE	SOIL	1.0		UG/KG	0.64	30	50-150	50-150
8021	CIS-1,2-DICHLOROETHENE	SOIL	1.0		UG/KG	0.25	30	70-130	70-130
8021	CIS-1,3-DICHLOROPROPENE	SOIL	1.0		UG/KG	0.23	30	70-130	70-130
8021	DIBROMOCHLOROMETHANE	SOIL	1.0		UG/KG	0.23	30	70-130	70-130
8021	ETHYLBENZENE	SOIL	1.0		UG/KG	0.21	30	70-130	70-130
8021	FREON 113	SOIL	1.0		UG/KG	0.28	30	70-130	70-130
8021	M+P-XYLENE	SOIL	2.0		UG/KG	0.39	30	70-130	70-130
8021	METHYLENE CHLORIDE	SOIL	1.0		UG/KG	0.63	30	70-130	70-130
8021	O-XYLENE	SOIL	1.0		UG/KG	0.19	30	70-130	70-130
8021	TETRACHLOROETHENE	SOIL	1.0		UG/KG	0.27	30	70-130	70-130
8021	TOLUENE	SOIL	1.0		UG/KG	0.17	30	70-130	70-130
8021	TRANS-1,2-DICHLOROETHENE	SOIL	1.0		UG/KG	0.27	30	70-130	70-130
8021	TRANS-1,3-DICHLOROPROPENE	SOIL	1.0		UG/KG	0.21	30	70-130	70-130
8021	TRICHLOROETHENE	SOIL	1.0		UG/KG	0.25	30	70-130	70-130
8021	TRICHLOROFLUOROMETHANE	SOIL	1.0		UG/KG	0.26	30	50-150	50-150
8021	VINYL CHLORIDE	SOIL	1.0		UG/KG	0.80	30	50-150	50-150
8021	1,2,3-TRICHLOROPROPANE -SURR	SOIL	NA		UG/KG	NA	NA	57-141	57-141
8021	CHLOROFLUOROBENZENE -SURR	SOIL	NA		UG/KG	NA	NA	41-146	41-146
8021	CHLOROFLUOROBENZENE (PID) -SURR	SOIL	NA		UG/KG	NA	NA	20-155	20-155
8021	BROMOCHLOROMETHANE -SURR	SOIL	NA		UG/KG	NA	NA	64-130	64-130

ROCHESTER ORGANIC QC LIMITS

METHOD		ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
8021 STARS		1,2,4-TRIMETHYLBENZENE	WATER	1.0		UG/L	0.27	30	70-130	70-130
8021 STARS		1,3,5-TRIMETHYLBENZENE	WATER	1.0		UG/L	0.24	30	70-130	70-130
8021 STARS		BENZENE	WATER	0.7		UG/L	0.18	30	70-130	70-130
8021 STARS		ETHYLBENZENE	WATER	1.0		UG/L	0.21	30	70-130	70-130
8021 STARS		ISOPROPYLBENZENE	WATER	1.0		UG/L	0.18	30	70-130	70-130
8021 STARS		M+P-XYLENE	WATER	2.0		UG/L	0.41	30	70-130	70-130
8021 STARS		METHYL-TERT-BUTYLETHER	WATER	1.0		UG/L	0.29	30	70-130	70-130
8021 STARS		NAPHTHALENE	WATER	1.0		UG/L	0.73	30	70-130	70-130
8021 STARS		N-BUTYLBENZENE	WATER	1.0		UG/L	0.24	30	70-130	70-130
8021 STARS		N-PROPYLBENZENE	WATER	1.0		UG/L	0.21	30	70-130	70-130
8021 STARS		O-XYLENE	WATER	1.0		UG/L	0.28	30	70-130	70-130
8021 STARS		P-ISOPROPYLTOLUENE	WATER	1.0		UG/L	0.25	30	70-130	70-130
8021 STARS		SEC-BUTYLBENZENE	WATER	1.0		UG/L	0.20	30	70-130	70-130
8021 STARS		TERT-BUTYLBENZENE	WATER	1.0		UG/L	0.19	30	70-130	70-130
8021 STARS		TOLUENE	WATER	1.0		UG/L	0.20	30	70-130	70-130
8021 STARS		CHLOROFLUOROBENZENE (PID) -SURR	WATER	NA		UG/L	NA	NA	77-113	77-113
8021 STARS		1,2,4-TRIMETHYLBENZENE	SOIL	1.0		UG/KG	0.29	30	70-130	70-130
8021 STARS		1,3,5-TRIMETHYLBENZENE	SOIL	1.0		UG/KG	0.23	30	70-130	70-130
8021 STARS		BENZENE	SOIL	1.0		UG/KG	0.19	30	70-130	70-130
8021 STARS		ETHYLBENZENE	SOIL	1.0		UG/KG	0.19	30	70-130	70-130
8021 STARS		ISOPROPYLBENZENE	SOIL	1.0		UG/KG	0.21	30	70-130	70-130
8021 STARS		M+P-XYLENE	SOIL	2.0		UG/KG	0.44	30	70-130	70-130
8021 STARS		METHYL-TERT-BUTYLETHER	SOIL	1.0		UG/KG	0.25	30	70-130	70-130
8021 STARS		NAPHTHALENE	SOIL	1.0		UG/KG	0.27	30	70-130	70-130
8021 STARS		N-BUTYLBENZENE	SOIL	1.0		UG/KG	0.25	30	70-130	70-130
8021 STARS		N-PROPYLBENZENE	SOIL	1.0		UG/KG	0.23	30	70-130	70-130
8021 STARS		O-XYLENE	SOIL	1.0		UG/KG	0.19	30	70-130	70-130
8021 STARS		P-ISOPROPYLTOLUENE	SOIL	1.0		UG/KG	0.23	30	70-130	70-130
8021 STARS		SEC-BUTYLBENZENE	SOIL	1.0		UG/KG	0.20	30	70-130	70-130
8021 STARS		TERT-BUTYLBENZENE	SOIL	1.0		UG/KG	0.24	30	70-130	70-130
8021 STARS		TOLUENE	SOIL	1.0		UG/KG	0.17	30	70-130	70-130
8021 STARS		CHLOROFLUOROBENZENE (PID) -SURR	SOIL	NA		UG/KG	NA	NA	20-155	20-155

ROCHESTER ORGANIC QC LIMITS

METHOD	ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
8081A TCL	4,4'-DDD	WATER	0.10		UG/L	0.0051	30	63-107	63-107
8081A TCL	4,4'-DDE	WATER	0.10		UG/L	0.0032	30	30-127	30-127
8081A TCL	4,4'-DDT	WATER	0.10		UG/L	0.0079	30	39-154	39-154
8081A TCL	ALDRIN	WATER	0.05		UG/L	0.0034	30	24-122	24-122
8081A TCL	ALPHA-BHC	WATER	0.05		UG/L	0.0023	30	70-130	50-150
8081A TCL	ALPHA-CHLORDANE	WATER	0.05		UG/L	0.0022	30	36-127	36-127
8081A TCL	ALPHA-ENDOSULFAN	WATER	0.05		UG/L	0.0019	30	39-125	39-125
8081A TCL	BETA-BHC	WATER	0.05		UG/L	0.0046	30	63-107	63-107
8081A TCL	BETA-ENDOSULFAN	WATER	0.10		UG/L	0.0049	30	64-107	64-107
8081A TCL	DELTA-BHC	WATER	0.05		UG/L	0.0026	30	49-116	49-116
8081A TCL	DIELDRIN	WATER	0.10		UG/L	0.0051	30	37-151	37-151
8081A TCL	ENDOSULFAN SULFATE	WATER	0.10		UG/L	0.0022	30	17-134	17-134
8081A TCL	ENDRIN	WATER	0.10		UG/L	0.0052	30	39-146	39-146
8081A TCL	ENDRIN ALDEHYDE	WATER	0.10		UG/L	0.0033	30	10-115	10-115
8081A TCL	ENDRIN KETONE	WATER	0.10		UG/L	0.0021	30	70-110	70-130
8081A TCL	GAMMA-BHC (LINDANE)	WATER	0.05		UG/L	0.0018	30	44-131	44-131
8081A TCL	GAMMA-CHLORDANE	WATER	0.05		UG/L	0.0039	30	48-122	48-122
8081A TCL	HEPTACHLOR	WATER	0.05		UG/L	0.0037	30	37-123	37-123
8081A TCL	HEPTACHLOR EPOXIDE	WATER	0.05		UG/L	0.0049	30	74-104	70-130
8081A TCL	METHOXYCHLOR	WATER	0.50		UG/L	0.0046	30	62-130	62-130
8081A TCL	TOXAPHENE	WATER	1.00		UG/L	0.20	30	46-84	46-84
8081A TCL	DECACHLOROBIPHENYL (DCB) -SURR	WATER	NA		UG/L	NA	NA	11-131	11-131
8081A TCL	TETRACHLORO-META-XYLENE (TCMX) -SU	WATER	NA		UG/L	NA	NA	13-125	13-125
8081A ADDITIONAL COMPOUNDS BY REQUEST									
8081A	CHLORDANE, TECHNICAL	WATER	0.25		UG/L	0.045	30	50-150	50-150
8081A	FAMPHUR	WATER	1.0		UG/L	0.240	30	50-150	50-150
8081A	HEXACHLOROBENZENE	WATER	0.05		UG/L	0.008	30	70-130	50-150
8081A	KEPONE	WATER	5.0		UG/L	3.5	30	50-150	50-150

ROCHESTER ORGANIC QC LIMITS

METHOD		ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
8081A TCL		4,4'-DDD	SOIL	3.3		UG/KG	0.19	30	65-106	65-106
8081A TCL		4,4'-DDE	SOIL	3.3		UG/KG	0.078	30	33-124	33-124
8081A TCL		4,4'-DDT	SOIL	3.3		UG/KG	0.17	30	45-159	45-159
8081A TCL		ALDRIN	SOIL	1.7		UG/KG	0.070	30	53-115	53-115
8081A TCL		ALPHA-BHC	SOIL	1.7		UG/KG	0.31	30	38-108	38-108
8081A TCL		ALPHA-CHLORDANE	SOIL	1.7		UG/KG	0.15	30	27-130	27-130
8081A TCL		ALPHA-ENDOSULFAN	SOIL	1.7		UG/KG	0.10	30	34-127	34-127
8081A TCL		BETA-BHC	SOIL	1.7		UG/KG	0.25	30	61-106	61-106
8081A TCL		BETA-ENDOSULFAN	SOIL	3.3		UG/KG	0.091	30	66-105	66-105
8081A TCL		DELTA-BHC	SOIL	1.7		UG/KG	0.089	30	44-119	44-119
8081A TCL		DIELDRIN	SOIL	3.3		UG/KG	0.26	30	26-174	26-174
8081A TCL		ENDOSULFAN SULFATE	SOIL	3.3		UG/KG	0.09	30	37-122	10-138
8081A TCL		ENDRIN	SOIL	3.3		UG/KG	0.11	30	45-143	45-143
8081A TCL		ENDRIN ALDEHYDE	SOIL	3.3		UG/KG	0.83	30	10-110	10-110
8081A TCL		ENDRIN KETONE	SOIL	3.3		UG/KG	0.12	30	70-130	50-150
8081A TCL		GAMMA-BHC (LINDANE)	SOIL	1.7		UG/KG	0.12	30	47-133	47-133
8081A TCL		GAMMA-CHLORDANE	SOIL	1.7		UG/KG	0.12	30	38-127	38-127
8081A TCL		HEPTACHLOR	SOIL	1.7		UG/KG	0.088	30	50-120	50-120
8081A TCL		HEPTACHLOR EPOXIDE	SOIL	1.7		UG/KG	0.11	30	77-106	77-106
8081A TCL		METHOXYCHLOR	SOIL	17		UG/KG	0.26	30	73-125	73-125
8081A TCL		TOXAPHENE	SOIL	33		UG/KG	9.7	30	46-130	46-130
8081A TCL		DECACHLOROBIPHENYL (DCB) -SURR	SOIL	NA		UG/KG	NA	NA	18-176	18-176
8081A TCL		TETRACHLORO-META-XYLENE (TCMX) -SU	SOIL	NA		UG/KG	NA	NA	24-136	24-136
8081A ADDITIONAL COMPOUNDS BY REQUEST										
8081A		CHLORDANE, TECHNICAL	SOIL	8.3		UG/KG	1.9	30	50-150	50-150
8081A		FAMPHUR	SOIL	33		UG/KG	6.8	30	50-150	50-150
8081A		HEXACHLOROBENZENE	SOIL	1.67		UG/KG	0.48	30	70-130	50-150
8081A		KEPONE	SOIL	167		UG/KG	57	30	50-150	50-150
8081A		MIREX	SOIL	1.67		UG/KG	0.27	30	70-130	31-134

ROCHESTER ORGANIC QC LIMITS

METHOD	ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
8082	PCB 1016	WATER	1.0	2.0	UG/L	0.39	30	53-118	53-118
8082	PCB 1221	WATER	2.0	3.0	UG/L	0.96	30	70-130	50-150
8082	PCB 1232	WATER	1.0	2.0	UG/L	0.58	30	70-130	50-150
8082	PCB 1242	WATER	1.0	2.0	UG/L	0.59	30	70-130	50-150
8082	PCB 1248	WATER	1.0	2.0	UG/L	0.41	30	56-119	56-119
8082	PCB 1254	WATER	1.0	2.0	UG/L	0.46	30	60-143	60-143
8082	PCB 1260	WATER	1.0	2.0	UG/L	0.44	30	57-129	42-132
8082	PCB 1268	WATER	1.0	2.0	UG/L	0.32	30	70-130	50-150
8082	DECACHLOROBIPHENYL -SURR	WATER	NA		UG/L	NA	NA	10-129	10-129
8082	TETRACHLORO-META-XYLENE -SURR	WATER	NA		UG/L	NA	NA	34-113	34-113
8082	PCB 1016	SOIL	33	67	UG/KG	9.1	30	34-130	33-132
8082	PCB 1221	SOIL	67	133	UG/KG	28	30	70-130	50-150
8082	PCB 1232	SOIL	33	67	UG/KG	11	30	70-130	50-150
8082	PCB 1242	SOIL	33	67	UG/KG	18	30	70-130	50-150
8082	PCB 1248	SOIL	33	67	UG/KG	19	30	49-140	49-140
8082	PCB 1254	SOIL	33	67	UG/KG	9.8	30	32-159	32-159
8082	PCB 1260	SOIL	33	67	UG/KG	8.6	30	57-141	24-178
8082	PCB 1268	SOIL	33	67	UG/KG	14	30	70-130	50-150
8082	DECACHLOROBIPHENYL -SURR	SOIL	NA		UG/KG	NA	NA	29-153	29-153
8082	TETRACHLORO-META-XYLENE -SURR	SOIL	NA		UG/KG	NA	NA	27-134	27-134
8082	PCB 1016	WIPES	33		UG/WIPE	9.1	30	70-130	50-150
8082	PCB 1221	WIPES	67		UG/WIPE	28	30	70-130	50-150
8082	PCB 1232	WIPES	33		UG/WIPE	11	30	70-130	50-150
8082	PCB 1242	WIPES	33		UG/WIPE	18	30	70-130	50-150
8082	PCB 1248	WIPES	33		UG/WIPE	19	30	70-130	50-150
8082	PCB 1254	WIPES	33		UG/WIPE	9.8	30	70-130	50-150
8082	PCB 1260	WIPES	33		UG/WIPE	8.6	30	70-130	50-150
8082	DECACHLOROBIPHENYL -SURR	WIPES	NA		UG/WIPE	NA	30	75-150	75-150
8082	TETRACHLORO-META-XYLENE -SURR	WIPES	NA		UG/WIPE	NA	30	73-139	73-139
8151A	2,4-D	WATER	0.5	1.0	UG/L	0.19	30	23-141	23-141
8151A	DICAMBA	WATER	0.5	1.0	UG/L	0.18	30	11-116	11-116
8151A	DINOSEB	WATER	0.5	1.0	UG/L	0.14	30	17-103	17-103
8151A	2,4,5-T	WATER	0.5	1.0	UG/L	0.24	30	18-140	18-140
8151A	2,4,5-TP (SILVEX)	WATER	0.5	1.0	UG/L	0.15	30	18-127	18-127
8151A	PENTACHLOROPHENOL	WATER	1.0		UG/L	0.14	30	40-115	40-115
8151A	DCAA -SURR	WATER	NA		UG/L	NA	NA	24-127	21-132
8151A	2,4-D	SOIL	100		UG/KG	26	30	45-134	45-134
8151A	DICAMBA	SOIL	100		UG/KG	20	30	50-150	50-150
8151A	2,4,5-T	SOIL	100		UG/KG	22	30	55-119	55-119
8151A	2,4,5-TP (SILVEX)	SOIL	100		UG/KG	22	30	45-112	45-112
8151A	PENTACHLOROPHENOL	SOIL	200		UG/KG	15	30	50-150	50-150
8151A	DCAA -SURR	SOIL	NA		UG/KG	NA	NA	20-150	20-150
METACIDS -HPLC	ACETIC ACID	WATER	1.0		MG/L	0.31	30	50-150	50-150
METACIDS -HPLC	BUTYRIC ACID	WATER	1.0		MG/L	0.18	30	50-150	50-150
METACIDS -HPLC	LACTIC ACID	WATER	1.0		MG/L	0.018	30	50-150	50-150
METACIDS -HPLC	PROPIONIC ACID	WATER	1.0		MG/L	0.17	30	50-150	50-150
METACIDS -HPLC	PYRUVIC ACID	WATER	0.1		MG/L	0.15	30	50-150	50-150

ROCHESTER ORGANIC QC LIMITS

METHOD		ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
8260B TCL	*	1,1,1-TRICHLOROETHANE	WATER	5.0		UG/L	0.67	30	70-130	70-130
8260B TCL		1,1,2,2-TETRACHLOROETHANE	WATER	5.0		UG/L	0.76	30	70-130	70-130
8260B TCL		1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE (FREON 113)	WATER	5.0		UG/L	0.71	30	70-130	70-130
8260B TCL		1,1,2-TRICHLOROETHANE	WATER	5.0		UG/L	0.77	30	70-130	70-130
8260B TCL	*	1,1-DICHLOROETHANE	WATER	5.0		UG/L	0.57	30	70-130	70-130
8260B TCL	*	1,1-DICHLOROETHENE	WATER	5.0		UG/L	0.65	30	70-130	70-130
8260B TCL		1,2,4-TRICHLOROBENZENE	WATER	5.0		UG/L	0.95	30	70-130	70-130
8260B TCL		1,2-DIBROMO-3-CHLOROPROPANE	WATER	5.0		UG/L	1.1	30	50-150	50-150
8260B TCL		1,2-DIBROMOETHANE	WATER	5.0		UG/L	0.77	30	70-130	70-130
8260B TCL	*	1,2-DICHLOROBENZENE	WATER	5.0		UG/L	0.69	30	70-130	70-130
8260B TCL	*	1,2-DICHLOROETHANE	WATER	5.0		UG/L	0.71	30	70-130	70-130
8260B TCL		1,2-DICHLOROPROPANE	WATER	5.0		UG/L	0.82	30	70-130	70-130
8260B TCL		1,3-DICHLOROBENZENE	WATER	5.0		UG/L	0.79	30	70-130	70-130
8260B TCL		1,4-DICHLOROBENZENE	WATER	5.0		UG/L	0.84	30	70-130	70-130
8260B TCL		2-BUTANONE (MEK)	WATER	10		UG/L	1.0	30	50-150	50-150
8260B TCL		2-HEXANONE	WATER	10		UG/L	0.80	30	70-130	70-130
8260B TCL		4-METHYL-2-PENTANONE (MIBK)	WATER	10		UG/L	0.66	30	70-130	70-130
8260B TCL		ACETONE	WATER	20		UG/L	2.0	30	50-150	50-150
8260B TCL	*	BENZENE	WATER	5.0		UG/L	0.69	30	70-130	70-130
8260B TCL		BROMODICHLOROMETHANE	WATER	5.0		UG/L	0.69	30	70-130	70-130
8260B TCL		BROMOFORM	WATER	5.0		UG/L	0.78	30	70-130	70-130
8260B TCL		BROMOMETHANE	WATER	5.0		UG/L	1.0	30	50-150	50-150
8260B TCL		CARBON DISULFIDE	WATER	10		UG/L	1.2	30	70-130	70-130
8260B TCL		CARBON TETRACHLORIDE	WATER	5.0		UG/L	0.66	30	70-130	70-130
8260B TCL	*	CHLOROBENZENE	WATER	5.0		UG/L	0.69	30	70-130	70-130
8260B TCL		CHLOROETHANE	WATER	5.0		UG/L	0.73	30	70-130	70-130
8260B TCL	*	CHLOROFORM	WATER	5.0		UG/L	0.60	30	70-130	70-130
8260B TCL		CHLOROMETHANE	WATER	5.0		UG/L	0.68	30	70-130	70-130
8260B TCL	*	CIS-1,2-DICHLOROETHENE	WATER	5.0		UG/L	0.76	30	70-130	70-130
8260B TCL		CIS-1,3-DICHLOROPROPENE	WATER	5.0		UG/L	0.52	30	70-130	70-130
8260B TCL		CYCLOHEXANE	WATER	10		UG/L	0.60	30	50-150	50-150
8260B TCL		DIBROMOCHLOROMETHANE	WATER	5.0		UG/L	0.67	30	70-130	70-130
8260B TCL		DICHLORODIFLUOROMETHANE (FREON 12)	WATER	5.0		UG/L	0.72	30	70-130	70-130
8260B TCL	*	ETHYLBENZENE	WATER	5.0		UG/L	0.81	30	70-130	70-130
8260B TCL		ISOPROPYLBENZENE	WATER	5.0		UG/L	0.74	30	70-130	70-130
8260B TCL		M+P-XYLENE	WATER	5.0		UG/L	1.4	30	70-130	70-130
8260B TCL		METHYL ACETATE	WATER	10		UG/L	0.79	30	50-150	50-150
8260B TCL		METHYLCYCLOHEXANE	WATER	10		UG/L	0.88	30	50-150	50-150
8260B TCL		METHYLENE CHLORIDE	WATER	5.0		UG/L	0.61	30	70-130	70-130
8260B TCL		METHYL-TERT-BUTYL ETHER (MTBE)	WATER	5.0		UG/L	0.82	30	70-130	70-130
8260B TCL	*	O-XYLENE	WATER	5.0		UG/L	0.75	30	70-130	70-130
8260B TCL		STYRENE	WATER	5.0		UG/L	0.75	30	70-130	70-130
8260B TCL	*	TETRACHLOROETHENE	WATER	5.0		UG/L	0.71	30	70-130	70-130
8260B TCL	*	TOLUENE	WATER	5.0		UG/L	0.72	30	70-130	70-130
8260B TCL	*	TRANS-1,2-DICHLOROETHENE	WATER	5.0		UG/L	0.51	30	70-130	70-130
8260B TCL		TRANS-1,3-DICHLOROPROPENE	WATER	5.0		UG/L	0.74	30	70-130	70-130
8260B TCL	*	TRICHLOROETHENE	WATER	5.0		UG/L	0.74	30	70-130	70-130
8260B TCL		TRICHLOROFLUOROMETHANE (FREON 11)	WATER	5.0		UG/L	0.94	30	70-130	70-130
8260B TCL	*	VINYL CHLORIDE	WATER	5.0		UG/L	0.64	30	70-130	70-130
8260B TCL		4-BROMOFLUOROBENZENE -SURR	WATER	NA		UG/L	NA	NA	80-123	80-123
8260B TCL		DIBROMOFLUOROMETHANE -SURR	WATER	NA		UG/L	NA	NA	89-115	89-115
8260B TCL		DICHLOROETHANE-D4 -SURR	WATER	NA		UG/L	NA	NA	80-120	80-120
8260B TCL		TOLUENE-D8 -SURR	WATER	NA		UG/L	NA	NA	88-124	88-124

ROCHESTER ORGANIC QC LIMITS

METHOD	ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
8260B ADDITIONAL COMPOUNDS BY REQUEST									
8260B	1,1,1,2-TETRACHLOROETHANE	WATER	5.0		UG/L	0.59	30	70-130	70-130
8260B	1,1-DICHLOROPROPENE	WATER	5.0		UG/L	0.76	30	70-130	70-130
8260B	1,2,3-TRICHLOROBENZENE	WATER	5.0		UG/L	0.92	30	70-130	70-130
8260B	1,2,3-TRICHLOROPROPANE	WATER	5.0		UG/L	1.70	30	70-130	70-130
8260B	1,2,4-TRIMETHYLBENZENE	WATER	5.0		UG/L	0.80	30	70-130	70-130
8260B	1,2-DICHLORO-1,1,2-TRIFLUOROETHANE (FREON 123A)	WATER	5.0		UG/L	0.77	30	70-130	70-150
8260B	1,3,5-TRIMETHYLBENZENE	WATER	5.0		UG/L	0.76	30	70-130	70-130
8260B	1,3-DICHLOROPROPANE	WATER	5.0		UG/L	0.61	30	70-130	70-130
8260B	1,4-DIOXANE	WATER	100		UG/L	28	30	50-150	50-150
8260B	2,2-DICHLORO-1,1,1-TRIFLUOROETHANE (FREON 123)	WATER	5.0		UG/L	0.45	30	70-130	70-130
8260B	2,2-DICHLOROPROPANE	WATER	5.0		UG/L	0.70	30	70-130	70-130
8260B	2-CHLORO-1,3-BUTADIENE	WATER	5.0		UG/L	0.75	30	70-130	70-130
8260B	2-CHLOROETHYLVINYL ETHER	WATER	5.0		UG/L	0.68	30	50-150	50-150
8260B	2-CHLOROTOLUENE	WATER	5.0		UG/L	0.75	30	70-130	70-130
8260B	2-NITROPROPANE	WATER	5.0		UG/L	1.8	30	50-150	50-150
8260B	2-PROPANOL	WATER	100		UG/L	12	30	70-130	70-130
8260B	3-CHLOROPROPENE (ALLYL CHLORIDE)	WATER	5.0		UG/L	1.1	30	70-130	70-130
8260B	4-CHLOROTOLUENE	WATER	5.0		UG/L	0.72	30	70-130	70-130
8260B	ACETONITRILE	WATER	100		UG/L	5.4	30	50-150	50-150
8260B	ACROLEIN	WATER	100		UG/L	13	30	50-150	50-150
8260B	ACRYLONITRILE	WATER	100		UG/L	8.1	30	50-150	50-150
8260B	ALLYL CHLORIDE	WATER	5.0		UG/L	1.1	30	70-130	70-130
8260B	BROMOBENZENE	WATER	5.0		UG/L	0.63	30	70-130	70-130
8260B	BROMOCHLOROMETHANE	WATER	5.0		UG/L	0.72	30	70-130	70-130
8260B	CYCLOHEXANONE	WATER	100		UG/L	10	30	50-150	50-150
8260B	DIBROMOMETHANE	WATER	5.0		UG/L	0.74	30	70-130	70-130
8260B	DICHLOROFLUOROMETHANE (FREON 21)	WATER	5.0		UG/L	0.74	30	50-150	50-150
8260B	DIETHYL ETHER	WATER	5.0		UG/L	0.74	30	70-130	70-130
8260B	ETHYL METHACRYLATE	WATER	10		UG/L	0.73	30	70-130	70-130
8260B	HEXACHLOROBUTADIENE	WATER	5.0		UG/L	1.5	30	70-130	70-130
8260B	IODOMETHANE	WATER	10		UG/L	0.73	30	50-150	50-150
8260B	ISOBUTYL ALCOHOL	WATER	100		UG/L	13	30	50-150	50-150
8260B	METHACRYLONITRILE	WATER	20		UG/L	0.52	30	50-150	50-150
8260B	METHYL METHACRYLATE	WATER	10		UG/L	0.71	30	70-130	70-130
8260B	NAPTHALENE	WATER	5.0		UG/L	0.66	30	50-150	50-150
8260B	N-BUTYLBENZENE	WATER	5.0		UG/L	0.82	30	70-130	70-130
8260B	N-HEPTANE	WATER	5.0		UG/L	1.4	30	70-130	70-130
8260B	N-PROPYLBENZENE	WATER	5.0		UG/L	0.79	30	70-130	70-130
8260B	P-ISOPROPYLTOLUENE	WATER	5.0		UG/L	0.84	30	70-130	70-130
8260B	PROPIONITRILE	WATER	100		UG/L	3.2	30	50-150	50-150
8260B	SEC-BUTYLBENZENE	WATER	5.0		UG/L	0.80	30	70-130	70-130
8260B	TERT-BUTYL ALCOHOL	WATER	100		UG/L	15	30	50-150	50-150
8260B	TERT-BUTYLBENZENE	WATER	5.0		UG/L	0.80	30	70-130	70-130
8260B	TETRA HYDROFURAN	WATER	5.0		UG/L	0.89	30	50-150	50-150
8260B	TRANS-1,4-DICHLORO-2-BUTENE	WATER	5.0		UG/L	0.54	30	50-150	50-150
8260B	VINYL ACETATE	WATER	10		UG/L	1.9	30	50-150	50-150

ROCHESTER ORGANIC QC LIMITS

METHOD		ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
8260B TCL	*	1,1,1-TRICHLOROETHANE	SOIL	5.0		UG/KG	0.60	30	70-130	70-130
8260B TCL		1,1,2,2-TETRACHLOROETHANE	SOIL	5.0		UG/KG	0.51	30	70-130	70-130
8260B TCL		1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE (FREON 113)	SOIL	5.0		UG/KG	0.39	30	70-130	70-130
8260B TCL		1,1,2-TRICHLOROETHANE	SOIL	5.0		UG/KG	0.22	30	70-130	70-130
8260B TCL	*	1,1-DICHLOROETHANE	SOIL	5.0		UG/KG	0.24	30	70-130	70-130
8260B TCL	*	1,1-DICHLOROETHENE	SOIL	5.0		UG/KG	0.48	30	70-130	70-130
8260B TCL		1,2,4-TRICHLOROBENZENE	SOIL	5.0		UG/KG	0.94	30	70-130	70-130
8260B TCL		1,2-DIBROMO-3-CHLOROPROPANE	SOIL	5.0		UG/KG	0.70	30	50-150	50-150
8260B TCL		1,2-DIBROMOETHANE	SOIL	5.0		UG/KG	0.40	30	70-130	70-130
8260B TCL	*	1,2-DICHLOROBENZENE	SOIL	5.0		UG/KG	0.23	30	70-130	70-130
8260B TCL	*	1,2-DICHLOROETHANE	SOIL	5.0		UG/KG	0.30	30	70-130	70-130
8260B TCL		1,2-DICHLOROPROPANE	SOIL	5.0		UG/KG	0.47	30	70-130	70-130
8260B TCL		1,3-DICHLOROBENZENE	SOIL	5.0		UG/KG	0.53	30	70-130	70-130
8260B TCL		1,4-DICHLOROBENZENE	SOIL	5.0		UG/KG	0.57	30	70-130	70-130
8260B TCL		2-BUTANONE (MEK)	SOIL	10		UG/KG	1.0	30	50-150	50-150
8260B TCL		2-HEXANONE	SOIL	10		UG/KG	0.72	30	70-130	70-130
8260B TCL		4-METHYL-2-PENTANONE (MIBK)	SOIL	10		UG/KG	0.95	30	70-130	70-130
8260B TCL		ACETONE	SOIL	20		UG/KG	1.5	30	50-150	50-150
8260B TCL	*	BENZENE	SOIL	5.0		UG/KG	0.19	30	70-130	70-130
8260B TCL		BROMODICHLOROMETHANE	SOIL	5.0		UG/KG	0.39	30	70-130	70-130
8260B TCL		BROMOFORM	SOIL	5.0		UG/KG	0.46	30	70-130	70-130
8260B TCL		BROMOMETHANE	SOIL	5.0		UG/KG	0.50	30	50-150	50-150
8260B TCL		CARBON DISULFIDE	SOIL	10		UG/KG	0.19	30	70-130	70-130
8260B TCL		CARBON TETRACHLORIDE	SOIL	5.0		UG/KG	0.35	30	70-130	70-130
8260B TCL	*	CHLOROBENZENE	SOIL	5.0		UG/KG	0.24	30	70-130	70-130
8260B TCL		CHLOROETHANE	SOIL	5.0		UG/KG	0.21	30	70-130	70-130
8260B TCL	*	CHLOROFORM	SOIL	5.0		UG/KG	0.15	30	70-130	70-130
8260B TCL		CHLOROMETHANE	SOIL	5.0		UG/KG	0.44	30	70-130	70-130
8260B TCL	*	CIS-1,2-DICHLOROETHENE	SOIL	5.0		UG/KG	0.55	30	70-130	70-130
8260B TCL		CIS-1,3-DICHLOROPROPENE	SOIL	5.0		UG/KG	0.20	30	70-130	70-130
8260B TCL		CYCLOHEXANE	SOIL	10		UG/KG	0.36	30	70-130	70-130
8260B TCL		DIBROMOCHLOROMETHANE	SOIL	5.0		UG/KG	0.32	30	70-130	70-130
8260B TCL		DICHLORODIFLUOROMETHANE (FREON 12)	SOIL	5.0		UG/KG	0.35	30	70-130	70-130
8260B TCL	*	ETHYLBENZENE	SOIL	5.0		UG/KG	0.37	30	70-130	70-130
8260B TCL		ISOPROPYLBENZENE	SOIL	5.0		UG/KG	0.40	30	70-130	70-130
8260B TCL		M+P-XYLENE	SOIL	5.0		UG/KG	0.78	30	70-130	70-130
8260B TCL		METHYLCYCLOHEXANE	SOIL	10		UG/KG	0.34	30	50-150	50-150
8260B TCL		METHYLENE CHLORIDE	SOIL	5.0		UG/KG	0.32	30	70-130	70-130
8260B TCL		METHYL-TERT-BUTYL ETHER (MTBE)	SOIL	5.0		UG/KG	0.19	30	70-130	70-130
8260B TCL	*	O-XYLENE	SOIL	5.0		UG/KG	0.31	30	70-130	70-130
8260B TCL		STYRENE	SOIL	5.0		UG/KG	0.16	30	70-130	70-130
8260B TCL	*	TETRACHLOROETHENE	SOIL	5.0		UG/KG	0.24	30	70-130	70-130
8260B TCL	*	TOLUENE	SOIL	5.0		UG/KG	0.30	30	70-130	70-130
8260B TCL	*	TRANS-1,2-DICHLOROETHENE	SOIL	5.0		UG/KG	0.30	30	70-130	70-130
8260B TCL		TRANS-1,3-DICHLOROPROPENE	SOIL	5.0		UG/KG	0.33	30	70-130	70-130
8260B TCL	*	TRICHLOROETHENE	SOIL	5.0		UG/KG	0.28	30	70-130	70-130
8260B TCL		TRICHLOROFLUOROMETHANE (FREON 11)	SOIL	5.0		UG/KG	0.32	30	70-130	70-130
8260B TCL	*	VINYL CHLORIDE	SOIL	5.0		UG/KG	0.68	30	70-130	70-130
8260B TCL		4-BROMOFLUOROBENZENE -SURR	SOIL	NA		UG/KG	NA	NA	50-135	50-135
8260B TCL		DIBROMOFLUOROMETHANE -SURR	SOIL	NA		UG/KG	NA	NA	58-133	58-133
8260B TCL		DICHLOROETHANE-D4	SOIL	NA		UG/KG	NA	NA	80-120	80-120
8260B TCL		TOLUENE-D8 -SURR	SOIL	NA		UG/KG	NA	NA	75-128	75-128

ROCHESTER ORGANIC QC LIMITS

METHOD	ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
8260B ADDITIONAL COMPOUNDS BY REQUEST									
8260B	1,1,1,2-TETRACHLOROETHANE	SOIL	5.0		UG/KG	0.44	30	70-130	70-130
8260B	1,1-DICHLOROPROPENE	SOIL	5.0		UG/KG	0.43	30	70-130	70-130
8260B	1,2,3-TRICHLOROBENZENE	SOIL	5.0		UG/KG	1.1	30	70-130	70-130
8260B	1,2,3-TRICHLOROPROPANE	SOIL	5.0		UG/KG	0.95	30	70-130	70-130
8260B	1,2,4-TRIMETHYLBENZENE	SOIL	5.0		UG/KG	0.42	30	70-130	70-130
8260B	1,3,5-TRIMETHYLBENZENE	SOIL	5.0		UG/KG	0.51	30	70-130	70-130
8260B	1,3-DICHLOROPROPANE	SOIL	5.0		UG/KG	0.38	30	70-130	70-130
8260B	1,4-DIOXANE	SOIL	100		UG/KG	21	30	50-150	50-150
8260B	2,2-DICHLOROPROPANE	SOIL	5.0		UG/KG	0.21	30	70-130	70-130
8260B	2-CHLORO-1,3-BUTADIENE	SOIL	5.0		UG/KG	0.53	30	70-130	70-130
8260B	2-CHLOROETHYLVINYL ETHER	SOIL	5.0		UG/KG	2.7	30	50-150	50-150
8260B	2-CHLOROTOLUENE	SOIL	5.0		UG/KG	0.28	30	70-130	70-130
8260B	2-NITROPROPANE	SOIL	5.0		UG/KG	1.5	30	50-150	50-150
8260B	2-PROPANOL	SOIL	100		UG/KG	39	30	70-130	70-130
8260B	3-CHLOROPROPENE (ALLYL CHLORIDE)	SOIL	5.0		UG/KG	1.0	30	70-130	70-130
8260B	4-CHLOROTOLUENE	SOIL	5.0		UG/KG	0.37	30	70-130	70-130
8260B	ACETONITRILE	SOIL	100		UG/KG	13	30	50-150	50-150
8260B	ACROLEIN	SOIL	100		UG/KG	5.4	30	50-150	50-150
8260B	ACRYLONITRILE	SOIL	100		UG/KG	3.6	30	50-150	50-150
8260B	ALLYL CHLORIDE	SOIL	5.0		UG/KG	1.0	30	70-130	70-130
8260B	BROMOBENZENE	SOIL	5.0		UG/KG	0.42	30	70-130	70-130
8260B	BROMOCHLOROMETHANE	SOIL	5.0		UG/KG	0.34	30	70-130	70-130
8260B	DIBROMOMETHANE	SOIL	5.0		UG/KG	0.35	30	70-130	70-130
8260B	DIETHYL ETHER	SOIL	5.0		UG/KG	0.49	30	70-130	70-130
8260B	ETHYL METHACRYLATE	SOIL	10.0		UG/KG	0.26	30	70-130	70-130
8260B	HEXACHLOROBUTADIENE	SOIL	5.0		UG/KG	0.60	30	70-130	70-130
8260B	IODOMETHANE	SOIL	10		UG/KG	0.35	30	50-150	50-150
8260B	ISOBUTYL ALCOHOL	SOIL	100		UG/KG	14	30	50-150	50-150
8260B	METHACRYLONITRILE	SOIL	20		UG/KG	1.7	30	50-150	50-150
8260B	METHYL METHACRYLATE	SOIL	10		UG/KG	1.2	30	70-130	70-130
8260B	NAPTHALENE	SOIL	5.0		UG/KG	1.1	30	50-150	50-150
8260B	N-BUTYLBENZENE	SOIL	5.0		UG/KG	0.61	30	70-130	70-130
8260B	N-HEPTANE	SOIL	5.0		UG/KG	0.36	30	70-130	70-130
8260B	N-PROPYLBENZENE	SOIL	5.0		UG/KG	0.36	30	70-130	70-130
8260B	P-ISOPROPYLTOLUENE	SOIL	5.0		UG/KG	0.41	30	70-130	70-130
8260B	PROPIONITRILE	SOIL	100		UG/KG	8.9	30	50-150	50-150
8260B	SEC-BUTYLBENZENE	SOIL	5.0		UG/KG	0.32	30	70-130	70-130
8260B	TERT-BUTYL ALCOHOL	SOIL	100		UG/KG	10	30	50-150	50-150
8260B	TERT-BUTYLBENZENE	SOIL	5.0		UG/KG	0.29	30	70-130	70-130
8260B	TETRA HYDROFURAN	SOIL	5.0		UG/KG	1.1	30	50-150	50-150
8260B	TRANS-1,4-DICHLORO-2-BUTENE	SOIL	5.0		UG/KG	0.98	30	50-150	50-150
8260B	VINYL ACETATE	SOIL	10		UG/KG	1.2	30	50-150	50-150

Columbia Analytical Services

ROCHESTER ORGANIC QC LIMITS

METHOD		ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
8270C TCL		1,1'-BIPHENYL	WATER	10		UG/L	0.55	30	40-150	40-150
8270C TCL		2,2'-OXYBIS(1-CHLOROPROPANE)	WATER	10		UG/L	0.78	30	10-140	10-140
8270C TCL	*	2,4,5-TRICHLOROPHENOL	WATER	10		UG/L	0.84	30	40-110	40-110
8270C TCL	*	2,4,6-TRICHLOROPHENOL	WATER	10		UG/L	0.59	30	40-110	40-110
8270C TCL		2,4-DICHLOROPHENOL	WATER	10		UG/L	0.37	30	66-104	66-104
8270C TCL		2,4-DIMETHYLPHENOL	WATER	10		UG/L	1.8	30	31-92	31-92
8270C TCL	*	2,4-DINITROPHENOL	WATER	50		UG/L	14	30	21-123	21-123
8270C TCL		2,4-DINITROTOLUENE	WATER	10		UG/L	0.53	30	68-113	58-114
8270C TCL		2,6-DINITROTOLUENE	WATER	10		UG/L	0.55	30	70-130	70-130
8270C TCL	*	2-CHLORONAPHTHALENE	WATER	10		UG/L	0.55	30	52-111	52-111
8270C TCL		2-CHLOROPHENOL	WATER	10		UG/L	0.69	30	16-116	37-105
8270C TCL	*	2-METHYLNAPHTHALENE	WATER	10		UG/L	0.45	30	42-107	42-107
8270C TCL		2-METHYLPHENOL	WATER	10		UG/L	0.79	30	16-102	16-102
8270C TCL		2-NITROANILINE	WATER	50		UG/L	0.59	30	63-130	63-130
8270C TCL		2-NITROPHENOL	WATER	10		UG/L	0.61	30	63-130	63-130
8270C TCL		3,3'-DICHLOROBENZIDINE	WATER	10		UG/L	0.73	30	48-119	48-119
8270C TCL		3-NITROANILINE	WATER	50		UG/L	0.43	30	56-111	56-111
8270C TCL	*	4,6-DINITRO-2-METHYLPHENOL	WATER	50		UG/L	0.51	30	47-130	47-130
8270C TCL	*	4-BROMOPHENYL-PHENYLETHER	WATER	10		UG/L	0.67	30	64-130	64-130
8270C TCL		4-CHLORO-3-METHYLPHENOL	WATER	10		UG/L	0.50	30	21-131	21-131
8270C TCL		4-CHLOROANILINE	WATER	10		UG/L	0.70	30	39-107	39-107
8270C TCL		4-CHLOROPHENYL-PHENYLETHER	WATER	10		UG/L	0.49	30	55-106	55-106
8270C TCL		4-METHYLPHENOL	WATER	10		UG/L	1.5	30	26-99	26-99
8270C TCL	*	4-NITROANILINE	WATER	50		UG/L	0.59	30	70-130	70-130
8270C TCL	*	4-NITROPHENOL	WATER	50		UG/L	6.7	30	11-130	10-130
8270C TCL	*	ACENAPHTHENE	WATER	10		UG/L	0.48	30	41-121	41-121
8270C TCL		ACENAPHTHYLENE	WATER	10		UG/L	0.33	30	36-125	36-125
8270C TCL		ACETOPHENONE	WATER	10		UG/L	1.4	30	40-150	40-150
8270C TCL		ANTHRACENE	WATER	10		UG/L	0.60	30	73-130	73-130
8270C TCL		ATRAZINE	WATER	10		UG/L	1.3	30	40-150	40-150
8270C TCL		BENZALDEHYDE	WATER	10		UG/L	1.3	30	40-150	40-150
8270C TCL		BENZO(A)ANTHRACENE	WATER	10		UG/L	0.54	30	71-130	40-130
8270C TCL		BENZO(A)PYRENE	WATER	10		UG/L	0.42	30	61-119	38-118
8270C TCL		BENZO(B)FLUORANTHENE	WATER	10		UG/L	0.54	30	68-130	39-130
8270C TCL		BENZO(G,H,I)PERYLENE	WATER	10		UG/L	0.62	30	50-125	50-125
8270C TCL		BENZO(K)FLUORANTHENE	WATER	10		UG/L	0.53	30	68-113	41-112
8270C TCL		BIS(-2-CHLOROETHOXY)METHANE	WATER	10		UG/L	0.86	30	61-130	61-130
8270C TCL		BIS(2-CHLOROETHYL)ETHER	WATER	10		UG/L	0.74	30	55-130	55-130
8270C TCL		BIS(2-ETHYLHEXYL)PHTHALATE	WATER	10		UG/L	0.48	30	70-130	70-130
8270C TCL		BUTYL BENZYL PHTHALATE	WATER	10		UG/L	0.59	30	22-141	22-141
8270C TCL		CAPROLACTAM	WATER	10		UG/L	1.0	30	8-100	8-100
8270C TCL		CARBAZOLE	WATER	10		UG/L	0.47	30	70-130	70-130
8270C TCL		CHRYSENE	WATER	10		UG/L	0.53	30	61-119	61-119
8270C TCL		DIBENZO(A,H)ANTHRACENE	WATER	10		UG/L	0.63	30	70-130	70-130
8270C TCL		DIBENZOFURAN	WATER	10		UG/L	0.41	30	70-130	70-130
8270C TCL		DIETHYLPHTHALATE	WATER	10		UG/L	0.31	30	31-124	31-124
8270C TCL		DIMETHYL PHTHALATE	WATER	10		UG/L	0.53	30	10-121	10-121
8270C TCL		DI-N-BUTYLPHTHALATE	WATER	10		UG/L	0.39	30	46-130	46-130
8270C TCL		DI-N-OCTYL PHTHALATE	WATER	10		UG/L	0.45	30	65-130	65-130
8270C TCL		FLUORANTHENE	WATER	10		UG/L	0.32	30	75-130	62-130
8270C TCL		FLUORENE	WATER	10		UG/L	0.47	30	60-111	27-113
8270C TCL	*	HEXACHLOROBENZENE	WATER	10		UG/L	0.43	30	58-130	58-130
8270C TCL		HEXACHLOROBUTADIENE	WATER	10		UG/L	0.69	30	13-130	13-130
8270C TCL		HEXACHLOROCYCLOPENTADIENE	WATER	10		UG/L	1.1	30	10-130	10-130
8270C TCL		HEXACHLOROETHANE	WATER	10		UG/L	0.48	30	11-130	11-130
8270C TCL		INDENO(1,2,3-CD)PYRENE	WATER	10		UG/L	0.49	30	70-130	70-130
8270C TCL		ISOPHORONE	WATER	10		UG/L	0.61	30	58-130	58-130
8270C TCL	*	NAPHTHALENE	WATER	10		UG/L	0.62	30	26-109	26-109
8270C TCL	*	NITROBENZENE	WATER	10		UG/L	0.78	30	49-130	49-130
8270C TCL	*	N-NITROSO-DI-N-PROPYLAMINE	WATER	10		UG/L	1.2	30	25-120	25-120
8270C TCL		N-NITROSODIPHENYLAMINE	WATER	10		UG/L	0.75	30	70-130	70-130
8270C TCL	*	PENTACHLOROPHENOL	WATER	50		UG/L	0.60	30	16-131	16-131
8270C TCL	*	PHENANTHRENE	WATER	10		UG/L	0.45	30	68-130	38-130
8270C TCL	*	PHENOL	WATER	10		UG/L	0.54	30	10-65	10-71
8270C TCL	*	PYRENE	WATER	10		UG/L	0.65	30	60-130	52-130

ROCHESTER ORGANIC QC LIMITS

METHOD		ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
8270C TCL		2,4,6-TRIBROMOPHENOL -SURR	WATER	NA		UG/L	NA	NA	41-135	41-135
8270C TCL		2-FLUOROBIPHENYL -SURR	WATER	NA		UG/L	NA	NA	38-100	38-100
8270C TCL		2-FLUOROPHENOL -SURR	WATER	NA		UG/L	NA	NA	17-74	17-74
8270C TCL		NITROBENZENE-d5 -SURR	WATER	NA		UG/L	NA	NA	38-105	38-105
8270C TCL		PHENOL-d6 -SURR	WATER	NA		UG/L	NA	NA	10-69	10-69
8270C TCL		TERPHENYL-d14 -SURR	WATER	NA		UG/L	NA	NA	40-137	40-137
8270C ADDITIONAL COMPOUNDS BY REQUEST										
8270C		1,2,4,5-TETRACHLOROBENZENE	WATER	10		UG/L	0.74	30	40-150	40-150
8270C	*	1,2,4-TRICHLOROBENZENE	WATER	10		UG/L	0.65	30	17-99	27-104
8270C		1,2-DICHLOROBENZENE	WATER	10		UG/L	0.67	30	23-130	23-130
8270C		1,2-DIPHENYLHYDRAZINE	WATER	10		UG/L	0.48	30	10-142	10-142
8270C		1,3,5-TRINITROBENZENE	WATER	10		UG/L	1.1	30	40-150	40-150
8270C		1,3-DICHLOROBENZENE	WATER	10		UG/L	0.50	30	17-130	17-130
8270C	*	1,4-DICHLOROBENZENE	WATER	10		UG/L	0.58	30	16-83	23-85
8270C		1,4-NAPHTHOQUINONE	WATER	50		UG/L	12	30	40-150	40-150
8270C		1-METHYLNAPHTHALENE	WATER	10		UG/L	0.62	30	40-150	40-150
8270C		1-NAPHTHYLAMINE	WATER	50		UG/L	4.5	30	40-150	40-150
8270C		2,3,4,6-TETRACHLOROPHENOL	WATER	10		UG/L	0.60	30	40-150	40-150
8270C		2,6-DICHLOROPHENOL	WATER	10		UG/L	0.82	30	40-150	40-150
8270C		2-ACETYLAMINOFLUORENE	WATER	10		UG/L	0.59	30	40-150	40-150
8270C		2-NAPHTHYLAMINE	WATER	50		UG/L	3.6	30	40-150	40-150
8270C		2-PICOLINE	WATER	10		UG/L	2.5	30	40-150	40-150
8270C		3,3'-DIMETHYLBENZIDINE	WATER	50		UG/L	24	30	40-150	40-150
8270C		3-METHYLCHOLANTHRENE	WATER	10		UG/L	2.2	30	40-150	40-150
8270C		4-AMINOBIPHENYL	WATER	50		UG/L	3.1	30	40-150	40-150
8270C		4-NITROQUINOLINE-1-OXIDE	WATER	50		UG/L	24	30	40-150	40-150
8270C		5-NITRO-O-TOLUIDINE	WATER	10		UG/L	1.4	30	40-150	40-150
8270C		7,12-DIMETHYLBENZ(a)ANTHRACENE	WATER	10		UG/L	2.4	30	40-150	40-150
8270C		aa-DIMETHYLPHENETHYLAMINE	WATER	50		UG/L	46	30	40-150	40-150
8270C		ANILINE	WATER	10		UG/L	0.78	30	13-123	13-123
8270C		ARAMITE	WATER	50		UG/L	6.3	30	40-150	40-150
8270C		BENZIDINE	WATER	100	200	UG/L	43	30	10-130	10-130
8270C		BENZOIC ACID	WATER	50	100	UG/L	15	30	30-130	30-130
8270C		BENZYL ALCOHOL	WATER	10		UG/L	1.1	30	31-109	31-109
8270C		CHLOROBENZILATE	WATER	10		UG/L	0.78	30	40-150	40-150
8270C		DIALLATE	WATER	10		UG/L	1.4	30	40-150	40-150
8270C		DIMETHOATE	WATER	50		UG/L	1.1	30	40-150	40-150
8270C		DINOSEB	WATER	50		UG/L	1.0	30	40-150	40-150
8270C		DIPHENYLAMINE	WATER	10		UG/L	0.64	30	40-150	40-150
8270C		DISULFOTON	WATER	10		UG/L	2.7	30	40-150	40-150
8270C		ETHYL METHANESULFONATE	WATER	10		UG/L	1.0	30	40-150	40-150
8270C		ETHYL PARATHION	WATER	10		UG/L	1.1	30	40-150	40-150
8270C		HEXACHLOROPHENE	WATER	500		UG/L	310	30	40-150	40-150
8270C		HEXACHLOROPROPENE	WATER	10		UG/L	1.4	30	40-150	40-150
8270C		ISODRIN	WATER	10		UG/L	1.1	30	40-150	40-150
8270C		ISOSAFROLE	WATER	10		UG/L	1.8	30	40-150	40-150
8270C		m-DINITROBENZENE	WATER	10		UG/L	0.69	30	40-150	40-150
8270C		METHAPYRILENE	WATER	50		UG/L	36	30	40-150	40-150
8270C		METHYL METHANESULFONATE	WATER	10		UG/L	1.1	30	40-150	40-150
8270C		METHYL PARATHION	WATER	10		UG/L	0.90	30	40-150	40-150
8270C		N-NITROSODIETHYLAMINE	WATER	10		UG/L	2.0	30	40-150	40-150
8270C		N-NITROSODIMETHYLAMINE	WATER	10		UG/L	0.79	30	27-130	27-130
8270C		N-NITROSODI-N-BUTYLAMINE	WATER	10		UG/L	2.7	30	40-150	40-150
8270C		N-NITROSOMETHYLETHYLAMINE	WATER	10		UG/L	1.8	30	40-150	40-150
8270C		N-NITROSOMORPHOLINE	WATER	10		UG/L	2.2	30	40-150	40-150
8270C		N-NITROSOPIPERIDINE	WATER	10		UG/L	2.6	30	40-150	40-150
8270C		N-NITROSOPYRROLIDINE	WATER	10		UG/L	2.2	30	40-150	40-150
8270C		ooo-TRIETHYL PHOSPHOROTHIOATE	WATER	10		UG/L	0.99	30	40-150	40-150
8270C		o-TOLUIDINE	WATER	10		UG/L	1.5	30	40-150	40-150
8270C		p-DIMETHYLAMINOAZOBENZENE	WATER	10		UG/L	1.0	30	40-150	40-150
8270C		PENTACHLOROBENZENE	WATER	10		UG/L	0.88	30	40-150	40-150
8270C		PENTACHLOROETHANE	WATER	10		UG/L	1.5	30	40-150	40-150
8270C		PENTACHLORONITROBENZENE	WATER	10		UG/L	0.89	30	40-150	40-150
8270C		PHENACETIN	WATER	10		UG/L	0.73	30	40-150	40-150
8270C		PHORATE	WATER	10		UG/L	1.2	30	40-150	40-150

ROCHESTER ORGANIC QC LIMITS

METHOD		ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
8270C		p-PHENYLENEDIAMINE	WATER	50		UG/L		30	40-150	40-150
8270C		PRONAMIDE	WATER	10		UG/L	1.0	30	40-150	40-150
8270C		PYRIDINE	WATER	50		UG/L	0.020	30	10-130	10-130
8270C		SAFROLE	WATER	10		UG/L	1.5	30	40-150	40-150
8270C		SULFOTEPP	WATER	10		UG/L	1.1	30	40-150	40-150
8270C		THIONAZIN	WATER	10		UG/L	0.98	30	40-150	40-150

ROCHESTER ORGANIC QC LIMITS

METHOD		ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
8270C TCL		1'1-BIPHENYL	SOIL	330		UG/KG	23	30	40-150	40-150
8270C TCL		2,2'-OXYBIS(1-CHLOROPROPANE)	SOIL	330		UG/KG	25	30	10-126	10-126
8270C TCL		2,4,5-TRICHLOROPHENOL	SOIL	330		UG/KG	24	30	34-121	34-121
8270C TCL	*	2,4,6-TRICHLOROPHENOL	SOIL	330		UG/KG	24	30	33-120	33-120
8270C TCL	*	2,4-DICHLOROPHENOL	SOIL	330		UG/KG	24	30	57-130	57-130
8270C TCL		2,4-DIMETHYLPHENOL	SOIL	330		UG/KG	19	30	45-130	45-130
8270C TCL		2,4-DINITROPHENOL	SOIL	1700		UG/KG	420	30	23-130	23-130
8270C TCL	*	2,4-DINITROTOLUENE	SOIL	330		UG/KG	32	30	46-124	46-124
8270C TCL		2,6-DINITROTOLUENE	SOIL	330		UG/KG	33	30	62-130	62-130
8270C TCL		2-CHLORONAPHTHALENE	SOIL	330		UG/KG	21	30	55-130	55-130
8270C TCL	*	2-CHLOROPHENOL	SOIL	330		UG/KG	18	30	36-116	18-126
8270C TCL		2-METHYLNAPHTHALENE	SOIL	330		UG/KG	22	30	52-130	13-130
8270C TCL	*	2-METHYLPHENOL	SOIL	330		UG/KG	27	30	26-105	26-105
8270C TCL		2-NITROANILINE	SOIL	1700		UG/KG	32	30	51-111	51-111
8270C TCL		2-NITROPHENOL	SOIL	330		UG/KG	26	30	55-130	55-130
8270C TCL		3,3'-DICHLOROBENZIDINE	SOIL	330		UG/KG	46	30	10-121	10-121
8270C TCL		3-NITROANILINE	SOIL	1700		UG/KG	25	30	10-130	10-130
8270C TCL		4,6-DINITRO-2-METHYLPHENOL	SOIL	1700		UG/KG	22	30	38-119	38-119
8270C TCL	*	4-BROMOPHENYL-PHENYLETHER	SOIL	330		UG/KG	36	30	61-113	61-113
8270C TCL	*	4-CHLORO-3-METHYLPHENOL	SOIL	330		UG/KG	26	30	40-125	28-130
8270C TCL		4-CHLOROANILINE	SOIL	330		UG/KG	33	30	10-130	10-130
8270C TCL		4-CHLOROPHENYL-PHENYLETHER	SOIL	330		UG/KG	27	30	60-130	60-130
8270C TCL		4-METHYLPHENOL	SOIL	330		UG/KG	52	30	22-108	22-108
8270C TCL		4-NITROANILINE	SOIL	1700		UG/KG	24	30	31-105	31-105
8270C TCL	*	4-NITROPHENOL	SOIL	1700	3300	UG/KG	710	30	25-132	12-128
8270C TCL	*	ACENAPHTHENE	SOIL	330		UG/KG	28	30	47-123	39-124
8270C TCL	*	ACENAPHTHYLENE	SOIL	330		UG/KG	22	30	44-124	31-124
8270C TCL		ACETOPHENONE	SOIL	330		UG/KG	60	30	40-150	40-150
8270C TCL		ANTHRACENE	SOIL	330		UG/KG	29	30	44-125	39-122
8270C TCL		ATRAZINE	SOIL	330		UG/KG	74	30	40-150	40-150
8270C TCL		BENZALDEHYDE	SOIL	330	670	UG/KG	130	30	40-150	40-150
8270C TCL		BENZO(A)ANTHRACENE	SOIL	330		UG/KG	28	30	48-122	35-129
8270C TCL		BENZO(A)PYRENE	SOIL	330		UG/KG	68	30	49-126	36-130
8270C TCL		BENZO(B)FLUORANTHENE	SOIL	330		UG/KG	32	30	42-128	37-124
8270C TCL		BENZO(G,H,I)PERYLENE	SOIL	330		UG/KG	35	30	42-126	34-129
8270C TCL		BENZO(K)FLUORANTHENE	SOIL	330		UG/KG	27	30	48-124	36-124
8270C TCL		BIS(-2-CHLOROETHOXY)METHANE	SOIL	330		UG/KG	43	30	48-130	48-130
8270C TCL		BIS(2-CHLOROETHYL)ETHER	SOIL	330		UG/KG	27	30	43-130	43-130
8270C TCL		BIS(2-ETHYLHEXYL)PHTHALATE	SOIL	330		UG/KG	38	30	60-130	60-130
8270C TCL		BUTYL BENZYL PHTHALATE	SOIL	330		UG/KG	30	30	56-130	56-130
8270C TCL		CAPROLACTAM	SOIL	330		UG/KG	26	30	40-150	40-150
8270C TCL		CARBAZOLE	SOIL	330		UG/KG	25	30	51-130	51-130
8270C TCL		CHRYSENE	SOIL	330		UG/KG	28	30	49-122	32-131
8270C TCL		DIBENZO(A,H)ANTHRACENE	SOIL	330		UG/KG	29	30	23-140	23-140
8270C TCL		DIBENZOFURAN	SOIL	330		UG/KG	27	30	42-130	42-130
8270C TCL		DIETHYLPHTHALATE	SOIL	330		UG/KG	29	30	62-130	62-130
8270C TCL		DIMETHYL PHTHALATE	SOIL	330		UG/KG	32	30	61-130	61-130
8270C TCL		DI-N-BUTYLPHTHALATE	SOIL	330		UG/KG	33	30	62-130	62-130
8270C TCL		DI-N-OCTYL PHTHALATE	SOIL	330		UG/KG	40	30	59-130	59-130
8270C TCL		FLUORANTHENE	SOIL	330		UG/KG	36	30	42-124	33-125
8270C TCL		FLUORENE	SOIL	330		UG/KG	34	30	36-128	33-121
8270C TCL	*	HEXACHLOROBENZENE	SOIL	330		UG/KG	21	30	56-116	56-116
8270C TCL		HEXACHLOROBUTADIENE	SOIL	330		UG/KG	23	30	10-104	10-104
8270C TCL		HEXACHLOROCYCLOPENTADIENE	SOIL	330		UG/KG	18	30	9-102	9-102
8270C TCL		HEXACHLOROETHANE	SOIL	330		UG/KG	28	30	10-107	10-107
8270C TCL		INDENO(1,2,3-CD)PYRENE	SOIL	330		UG/KG	28	30	41-127	35-129
8270C TCL		ISOPHORONE	SOIL	330		UG/KG	27	30	50-130	50-130
8270C TCL	*	NAPHTHALENE	SOIL	330		UG/KG	20	30	38-116	25-120
8270C TCL	*	NITROBENZENE	SOIL	330		UG/KG	21	30	32-130	32-130
8270C TCL	*	N-NITROSO-DI-N-PROPYLAMINE	SOIL	330		UG/KG	26	30	45-117	34-122
8270C TCL		N-NITROSODIPHENYLAMINE	SOIL	330		UG/KG	24	30	54-116	54-116
8270C TCL	*	PENTACHLOROPHENOL	SOIL	1700		UG/KG	340	30	21-131	13-128
8270C TCL	*	PHENANTHRENE	SOIL	330		UG/KG	43	30	48-130	28-130
8270C TCL	*	PHENOL	SOIL	330	670	UG/KG	160	30	34-118	26-122
8270C TCL	*	PYRENE	SOIL	330		UG/KG	41	30	53-130	34-130

ROCHESTER ORGANIC QC LIMITS

METHOD		ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
8270C TCL		2,4,6-TRIBROMOPHENOL -SURR	SOIL	NA		UG/KG	NA	NA	33-139	33-139
8270C TCL		2-FLUOROBIPHENYL -SURR	SOIL	NA		UG/KG	NA	NA	32-130	32-130
8270C TCL		2-FLUOROPHENOL -SURR	SOIL	NA		UG/KG	NA	NA	10-130	10-130
8270C TCL		NITROBENZENE-d5 -SURR	SOIL	NA		UG/KG	NA	NA	27-130	27-130
8270C TCL		PHENOL-d6 -SURR	SOIL	NA		UG/KG	NA	NA	10-133	10-133
8270C TCL		TERPHENYL-d14 -SURR	SOIL	NA		UG/KG	NA	NA	48-131	48-131
8270C ADDITIONAL COMPOUNDS BY REQUEST										
8270C		1,2,4,5-TETRACHLOROBENZENE	SOIL	330		UG/KG	35	30	40-150	40-150
8270C	*	1,2,4-TRICHLOROBENZENE	SOIL	330		UG/KG	22	30	42-130	34-130
8270C		1,2-DICHLOROBENZENE	SOIL	330		UG/KG	19	30	45-130	45-130
8270C		1,2-DIPHENYLHYDRAZINE	SOIL	330		UG/KG	34	30	10-136	10-136
8270C		1,3,5-TRINITROBENZENE	SOIL	330		UG/KG	62	30	40-150	40-150
8270C		1,3-DICHLOROBENZENE	SOIL	330		UG/KG	18	30	43-130	43-130
8270C	*	1,4-DICHLOROBENZENE	SOIL	330		UG/KG	16	30	20-112	18-107
8270C		1,4-NAPHTHOQUINONE	SOIL	1700		UG/KG	160	30	40-150	40-150
8270C		1-METHYLNAPHTHALENE	SOIL	330		UG/KG	26	30	40-150	40-150
8270C		1-NAPHTHYLAMINE	SOIL	1700		UG/KG	110	30	40-150	40-150
8270C		2,3,4,6-TETRACHLOROPHENOL	SOIL	330		UG/KG	38	30	40-150	40-150
8270C		2,6-DICHLOROPHENOL	SOIL	330		UG/KG	40	30	40-150	40-150
8270C		2-ACETYLAMINOFLUORENE	SOIL	330		UG/KG	60	30	40-150	40-150
8270C		2-NAPHTHYLAMINE	SOIL	1700		UG/KG	110	30	40-150	40-150
8270C		2-PICOLINE	SOIL	330		UG/KG	140	30	40-150	40-150
8270C		3,3'-DIMETHYLBENZINE	SOIL	1700		UG/KG	400	30	40-150	40-150
8270C		3-METHYLCHOLANTHRENE	SOIL	330		UG/KG	64	30	40-150	40-150
8270C		4-AMINOBIPHENYL	SOIL	1700		UG/KG	71	30	40-150	40-150
8270C		4-NITROQUINOLINE-1-OXIDE	SOIL	1700		UG/KG	590	30	40-150	40-150
8270C		5-NITRO-O-TOLUIDINE	SOIL	330		UG/KG	62	30	40-150	40-150
8270C		7,12-DIMETHYLBENZ(a)ANTHRACENE	SOIL	330		UG/KG	51	30	40-150	40-150
8270C		aa-DIMETHYLPHENETHYLAMINE	SOIL	1700		UG/KG	850	30	40-150	40-150
8270C		ANILINE	SOIL	330		UG/KG	42	30	10-130	10-130
8270C		ARAMITE	SOIL	1700		UG/KG	85	30	40-150	40-150
8270C		BENZIDINE	SOIL	3300	6700	UG/KG	1,200	30	30-130	30-130
8270C		BENZOIC ACID	SOIL	1700	3300	UG/KG	880	30	30-130	30-130
8270C		BENZYL ALCOHOL	SOIL	330		UG/KG	31	30	38-106	38-106
8270C		CHLOROBENZILATE	SOIL	330		UG/KG	52	30	40-150	40-150
8270C		DIALLATE	SOIL	330		UG/KG	55	30	40-150	40-150
8270C		DIMETHOATE	SOIL	1700		UG/KG	49	30	40-150	40-150
8270C		DINOSEB	SOIL	1700		UG/KG	44	30	40-150	40-150
8270C		DIPHENYLAMINE	SOIL	330		UG/KG	24	30	40-150	40-150
8270C		DISULFOTON	SOIL	330		UG/KG	190	30	40-150	40-150
8270C		ETHYL METHANESULFONATE	SOIL	330		UG/KG	46	30	40-150	40-150
8270C		ETHYL PARATHION	SOIL	330		UG/KG	49	30	40-150	40-150
8270C		HEXACHLOROPHENE	SOIL	17000		UG/KG	6,800	30	40-150	40-150
8270C		HEXACHLOROPROPENE	SOIL	330		UG/KG	36	30	40-150	40-150
8270C		ISODRIN	SOIL	330		UG/KG	50	30	40-150	40-150
8270C		ISOSAFROLE	SOIL	330		UG/KG	42	30	40-150	40-150
8270C		m-DINITROBENZINE	SOIL	330		UG/KG	37	30	40-150	40-150
8270C		METHAPYRILENE	SOIL	1700		UG/KG	680	30	40-150	40-150
8270C		METHYL METHANESULFONATE	SOIL	330		UG/KG	44	30	40-150	40-150
8270C		METHYL PARATHION	SOIL	330		UG/KG	47	30	40-150	40-150
8270C		N-NITROSODIETHYLAMINE	SOIL	330		UG/KG	37	30	40-150	40-150
8270C		N-NITROSODIMETHYLAMINE	SOIL	330		UG/KG	29	30	38-130	38-130
8270C		N-NITROSODI-N-BUTYLAMINE	SOIL	330		UG/KG	72	30	40-150	40-150
8270C		N-NITROSOMETHYLETHYLAMINE	SOIL	330		UG/KG	89	30	40-150	40-150
8270C		N-NITROSOMORPHOLINE	SOIL	330		UG/KG	56	30	40-150	40-150
8270C		N-NITROSOPIPERIDINE	SOIL	330		UG/KG	53	30	40-150	40-150
8270C		N-NITROSOPYRROLIDINE	SOIL	330		UG/KG	70	30	40-150	40-150
8270C		ooo-TRIETHYL PHOSPHOROTHIOATE	SOIL	330		UG/KG	57	30	40-150	40-150
8270C		o-TOLUIDINE	SOIL	330		UG/KG	76	30	40-150	40-150
8270C		p-DIMETHYLAMINOAZOBENZENE	SOIL	330		UG/KG	55	30	40-150	40-150
8270C		PENTACHLOROBENZENE	SOIL	330		UG/KG	48	30	40-150	40-150
8270C		PENTACHLOROETHANE	SOIL	330		UG/KG	26	30	40-150	40-150
8270C		PENTACHLORONITROBENZENE	SOIL	330		UG/KG	59	30	40-150	40-150
8270C		PHENACETIN	SOIL	330		UG/KG	45	30	40-150	40-150
8270C		PHORATE	SOIL	330		UG/KG	120	30	40-150	40-150

ROCHESTER ORGANIC QC LIMITS

METHOD		ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
8270C		p-PHENYLENEDIAMINE	SOIL	1700		UG/KG	590	30	40-150	40-150
8270C		PRONAMIDE	SOIL	330		UG/KG	51	30	40-150	40-150
8270C		PYRIDINE	SOIL	1700		UG/KG	50	30	28-130	28-130
8270C		SAFROLE	SOIL	330		UG/KG	40	30	40-150	40-150
8270C		SULFOTEPP	SOIL	330		UG/KG	73	30	40-150	40-150
8270C		THIONAZIN	SOIL	330		UG/KG	50	30	40-150	40-150

ROCHESTER ORGANIC QC LIMITS

METHOD		ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
8270C LVI		ACENAPHTHENE	WATER	0.20		UG/L	0.022	30	44-112	44-112
8270C LVI		ACENAPHTHYLENE	WATER	0.20		UG/L	0.025	30	51-115	51-115
8270C LVI		ANTHRACENE	WATER	0.20		UG/L	0.019	30	51-119	51-119
8270C LVI		BENZO(A)ANTHRACENE	WATER	0.10		UG/L	0.028	30	58-115	58-115
8270C LVI		BENZO(A)PYRENE	WATER	0.20		UG/L	0.016	30	36-119	36-119
8270C LVI		BENZO(B)FLUORANTHENE	WATER	0.20		UG/L	0.027	30	45-121	45-121
8270C LVI		BENZO(G,H,I)PERYLENE	WATER	0.20		UG/L	0.023	30	39-122	39-122
8270C LVI		BENZO(K)FLUORANTHENE	WATER	0.20		UG/L	0.019	30	47-119	47-119
8270C LVI		CHRYSENE	WATER	0.20		UG/L	0.022	30	55-113	55-113
8270C LVI		DIBENZO(A,H)ANTHRACENE	WATER	0.20		UG/L	0.025	30	47-116	47-116
8270C LVI		FLUORANTHENE	WATER	0.20		UG/L	0.035	30	59-117	59-117
8270C LVI		FLUORENE	WATER	0.20		UG/L	0.021	30	38-121	38-121
8270C LVI		INDENO(1,2,3-CD)PYRENE	WATER	0.20		UG/L	0.016	30	47-119	47-119
8270C LVI		NAPHTHALENE	WATER	0.20		UG/L	0.042	30	33-121	33-121
8270C LVI		PHENANTHRENE	WATER	0.20		UG/L	0.025	30	54-114	54-114
8270C LVI		PYRENE	WATER	0.20		UG/L	0.011	30	55-115	55-115
8270C LVI		2-FLUOROBIPHENYL -SURR	WATER	NA		UG/L	NA	NA	27-114	27-114
8270C LVI		NITROBENZENE-d5 -SURR	WATER	NA		UG/L	NA	NA	22-124	22-124
8270C LVI		TERPHENYL-d14 -SURR	WATER	NA		UG/L	NA	NA	23-139	23-139
8270C LVI ADDITIONAL COMPOUNDS BY REQUEST										
8270C LVI		1,4-DIOXANE	WATER	0.20		UG/L	0.075	30	31-80	31-80
8270C LVI		1-METHYLNAPHTHALENE	WATER	0.20		UG/L	0.031	30	62-102	50-150
8270C LVI		2-METHYLNAPHTHALENE	WATER	0.10		UG/L	0.023	30	42-130	42-130
8270C LVI		BIS(2-ETHYLHEXYL)PHTHALATE	WATER	2.0		UG/L	0.19	30	55-130	55-130
8270C LVI		CARBAZOLE	WATER	1.0		UG/L	0.032	30	40-150	40-150
8270C LVI		DIBENZOFURAN	WATER	0.20		UG/L	0.027	30	50-150	50-150
8270C LVI		HEXACHLOROBENZENE	WATER	0.20		UG/L	0.027	30	47-108	47-108
8270C LVI		NITROBENZENE	WATER	0.20		UG/L	0.032	30	50-150	50-150

ROCHESTER ORGANIC QC LIMITS

METHOD	ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
8270C LVI	2,6-DIMETHYLNAPHTHALENE	SOIL	6.6		UG/KG	0.78	30	50-150	50-150
8270C LVI	ACENAPHTHENE	SOIL	6.6		UG/KG	1.8	30	39-130	39-130
8270C LVI	ACENAPHTHYLENE	SOIL	6.6		UG/KG	2.0	30	44-130	44-130
8270C LVI	ANTHRACENE	SOIL	6.6		UG/KG	2.5	30	49-130	49-130
8270C LVI	BENZO(A)ANTHRACENE	SOIL	3.3		UG/KG	2.7	30	47-116	47-116
8270C LVI	BENZO(A)PYRENE	SOIL	6.6		UG/KG	2.5	30	27-124	27-124
8270C LVI	BENZO(B)FLUORANTHENE	SOIL	6.6		UG/KG	2.5	30	19-132	19-132
8270C LVI	BENZO(G,H,I)PERYLENE	SOIL	6.6		UG/KG	2.4	30	24-128	24-128
8270C LVI	BENZO(K)FLUORANTHENE	SOIL	6.6		UG/KG	2.9	30	41-123	41-123
8270C LVI	CHRYSENE	SOIL	6.6		UG/KG	2.1	30	45-117	45-117
8270C LVI	DIBENZO(A,H)ANTHRACENE	SOIL	6.6		UG/KG	1.9	30	29-129	29-129
8270C LVI	FLUORANTHENE	SOIL	6.6		UG/KG	4.0	30	51-124	51-124
8270C LVI	FLUORENE	SOIL	6.6		UG/KG	1.8	30	40-130	40-130
8270C LVI	INDENO(1,2,3-CD)PYRENE	SOIL	6.6		UG/KG	2.3	30	40-122	40-122
8270C LVI	NAPHTHALENE	SOIL	6.6		UG/KG	2.7	30	44-130	44-130
8270C LVI	PHENANTHRENE	SOIL	6.6		UG/KG	5.0	30	51-130	51-130
8270C LVI	PYRENE	SOIL	6.6		UG/KG	3.5	30	33-123	33-123
8270C LVI	2-FLUOROBIPHENYL -SURR	SOIL	NA		UG/KG	NA	NA	23-120	23-120
8270C LVI	NITROBENZENE-d5 -SURR	SOIL	NA		UG/KG	NA	NA	18-125	18-125
8270C LVI	TERPHENYL-d14 -SURR	SOIL	NA		UG/KG	NA	NA	19-145	19-145
8270C LVI ADDITIONAL COMPOUNDS BY REQUEST									
8270C LVI	1,4-DIOXANE	SOIL	67		UG/KG	1.4	30	31-80	31-80
8270C LVI	1-METHYLNAPHTHALENE	SOIL	6.6		UG/KG	2.0	30	50-150	50-150
8270C LVI	2-METHYLNAPHTHALENE	SOIL	3.3		UG/KG	2.8	30	42-130	50-150
8270C LVI	BIS(2-ETHYLHEXYL)PHTHALATE	SOIL	67		UG/KG	7.8	30	50-150	50-150
8270C LVI	CARBAZOLE	SOIL	33		UG/KG	1.8	30	40-150	40-150
8270C LVI	DIBENZOFURAN	SOIL	6.6		UG/KG	1.9	30	50-150	50-150
8270C LVI	HEXACHLOROBENZENE	SOIL	6.6		UG/KG	2.6	30	50-150	50-150
8270C LVI	NITROBENZENE	SOIL	6.6		UG/KG	1.8	30	50-150	50-150
8310	NAPHTHALENE	WATER	0.080		UG/L	0.020	30	50-150	50-150
8310	ACENAPHTHYLENE	WATER	0.080		UG/L	0.048	30	50-150	50-150
8310	FLUORENE	WATER	0.080		UG/L	0.013	30	50-150	50-150
8310	ACENAPHTHENE	WATER	0.080		UG/L	0.029	30	50-150	50-150
8310	PHENANTHRENE	WATER	0.080		UG/L	0.017	30	50-150	50-150
8310	ANTHRACENE	WATER	0.080		UG/L	0.016	30	50-150	50-150
8310	FLUORANTHENE	WATER	0.080		UG/L	0.015	30	50-150	50-150
8310	PYRENE	WATER	0.080		UG/L	0.016	30	50-150	50-150
8310	BENZO(A)ANTRACENE	WATER	0.080		UG/L	0.013	30	50-150	50-150
8310	CHRYSENE	WATER	0.080		UG/L	0.015	30	50-150	50-150
8310	BENZO(B)FLUORANTHENE	WATER	0.080		UG/L	0.016	30	50-150	50-150
8310	BENZO(K)FLUORANTHENE	WATER	0.080		UG/L	0.017	30	50-150	50-150
8310	BENZO(A)PYRENE	WATER	0.080		UG/L	0.024	30	50-150	50-150
8310	DIBENZO(A,H)ANTHRACENE	WATER	0.080		UG/L	0.019	30	50-150	50-150
8310	INDENO(1,2,3-CD)PYRENE	WATER	0.080		UG/L	0.011	30	50-150	50-150
8310	BENZO(G,H,I)PERYLENE	WATER	0.080		UG/L	0.022	30	50-150	50-150
8310	O-TERPHENYL -SURR	WATER	NA		UG/L	NA	NA	50-150	50-150

ROCHESTER ORGANIC QC LIMITS

METHOD		ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
8315A		FORMALDEHYDE	WATER	8.0		UG/L	1.1	30	59-136	59-153
8315A		FORMALDEHYDE	SOIL	1000		UG/KG	230	30	70-130	50-150
8330		1,3,5-TRINITROBENZENE	SOIL	2000		UG/KG	160	30	70-130	70-130
8330		1,3-DINITROBENZENE	SOIL	2000		UG/KG	150	30	70-130	70-130
8330		2,4,6-TRINITROTOLUENE (TNT)	SOIL	2000		UG/KG	170	30	70-130	70-130
8330		2,4-DINITROTOLUENE	SOIL	2000		UG/KG	150	30	70-130	70-130
8330		2,6-DINITROTOLUENE	SOIL	2000		UG/KG	160	30	70-130	70-130
8330		2-AMINO-4,6-DINITROTOLUENE	SOIL	2000		UG/KG	180	30	70-130	70-130
8330		2-NITROTOLUENE	SOIL	2000		UG/KG	150	30	70-130	70-130
8330		3-NITROTOLUENE	SOIL	2000		UG/KG	150	30	70-130	70-130
8330		4-AMINO-2,6-DINITROTOLUENE	SOIL	2000		UG/KG	190	30	70-130	70-130
8330		4-NITROTOLUENE	SOIL	2000		UG/KG	160	30	70-130	70-130
8330		HMX (OCTAHYDRO-1,3,5,7-TETRANITRO-	SOIL	2000		UG/KG	180	30	70-130	70-130
8330		NITROBENZENE	SOIL	2000		UG/KG	150	30	70-130	70-130
8330		NITROGLYCERIN	SOIL	2000		UG/KG	860	30	70-130	70-130
8330		PETN	SOIL	2000		UG/KG	420	30	70-130	70-130
8330		RDX (HEXAHYDRO-1,3,5-TRINITRO-1,3,	SOIL	2000		UG/KG	170	30	70-130	70-130
8330		TETRYL (METHYL-2,4,6-TRINITROPHENY	SOIL	2000		UG/KG	530	30	70-130	70-130
8330		1,2-DINITROBENZENE - SURR	SOIL	NA		UG/KG	NA	NA	50-150	50-150
HPLC-DoDPerchlorate		PERCHLORATE	WATER	0.2		UG/L	0.051	15	80-120	80-120
HPLC-DoDPerchlorate		PERCHLORATE	SOIL	2.0		UG/KG	0.031	15	85-115	75-125

ROCHESTER ORGANIC QC LIMITS

METHOD		ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
VOA OLM4.2/4.3		1,1,1-TRICHLOROETHANE	WATER	10		UG/L	0.35			
VOA OLM4.2/4.3		1,1,2,2-TETRACHLOROETHANE	WATER	10		UG/L	0.56			
VOA OLM4.2/4.3		1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE (FREON 113)	WATER	10		UG/L	0.79			
VOA OLM4.2/4.3		1,1,2-TRICHLOROETHANE	WATER	10		UG/L	0.31			
VOA OLM4.2/4.3		1,1-DICHLOROETHANE	WATER	10		UG/L	0.49			
VOA OLM4.2/4.3	*	1,1-DICHLOROETHENE	WATER	10		UG/L	0.80	14	61-145	61-145
VOA OLM4.2/4.3		1,2,4-TRICHLOROBENZENE	WATER	10		UG/L	0.41			
VOA OLM4.2/4.3		1,2-DIBROMO-3-CHLOROPROPANE	WATER	10		UG/L	0.40			
VOA OLM4.2/4.3		1,2-DIBROMOETHANE	WATER	10		UG/L	0.57			
VOA OLM4.2/4.3		1,2-DICHLOROBENZENE	WATER	10		UG/L	0.39			
VOA OLM4.2/4.3		1,2-DICHLOROETHANE	WATER	10		UG/L	0.32			
VOA OLM4.2/4.3		1,2-DICHLOROPROPANE	WATER	10		UG/L	0.58			
VOA OLM4.2/4.3		1,3-DICHLOROBENZENE	WATER	10		UG/L	0.35			
VOA OLM4.2/4.3		1,4-DICHLOROBENZENE	WATER	10		UG/L	0.41			
VOA OLM4.2/4.3		2-BUTANONE	WATER	10		UG/L	0.72			
VOA OLM4.2/4.3		2-HEXANONE	WATER	10		UG/L	1.4			
VOA OLM4.2/4.3		4-METHYL-2-PENTANONE	WATER	10		UG/L	1.2			
VOA OLM4.2/4.3		ACETONE	WATER	10		UG/L	2.3			
VOA OLM4.2/4.3	*	BENZENE	WATER	10		UG/L	0.45	11	76-127	76-127
VOA OLM4.2/4.3		BROMODICHLOROMETHANE	WATER	10		UG/L	0.36			
VOA OLM4.2/4.3		BROMOFORM	WATER	10		UG/L	0.44			
VOA OLM4.2/4.3		BROMOMETHANE	WATER	10		UG/L	0.53			
VOA OLM4.2/4.3		CARBON DISULFIDE	WATER	10		UG/L	0.34			
VOA OLM4.2/4.3		CARBON TETRACHLORIDE	WATER	10		UG/L	0.42			
VOA OLM4.2/4.3	*	CHLOROBENZENE	WATER	10		UG/L	0.36	13	75-130	75-130
VOA OLM4.2/4.3		CHLOROETHANE	WATER	10		UG/L	0.41			
VOA OLM4.2/4.3		CHLOROFORM	WATER	10		UG/L	0.37			
VOA OLM4.2/4.3		CHLOROMETHANE	WATER	10		UG/L	0.72			
VOA OLM4.2/4.3		CIS-1,2-DICHLOROETHENE	WATER	10		UG/L	0.59			
VOA OLM4.2/4.3		CIS-1,3-DICHLOROPROPENE	WATER	10		UG/L	0.50			
VOA OLM4.2/4.3		CYCLOHEXANE	WATER	10		UG/L	0.46			
VOA OLM4.2/4.3		DIBROMOCHLOROMETHANE	WATER	10		UG/L	0.56			
VOA OLM4.2/4.3		DICHLORODIFLUOROMETHANE	WATER	10		UG/L	0.43			
VOA OLM4.2/4.3		ETHYLBENZENE	WATER	10		UG/L	0.46			
VOA OLM4.2/4.3		ISOPROPYLBENZENE	WATER	10		UG/L	0.44			
VOA OLM4.2/4.3		M+P-XYLENE	WATER	10		UG/L	0.60			
VOA OLM4.2/4.3		METHYL ACETATE	WATER	10		UG/L	0.49			
VOA OLM4.2/4.3		METHYL TERT-BUTYL ETHER	WATER	10		UG/L	0.31			
VOA OLM4.2/4.3		METHYLCYCLOHEXANE	WATER	10		UG/L	0.71			
VOA OLM4.2/4.3		METHYLENE CHLORIDE	WATER	10		UG/L	0.48			
VOA OLM4.2/4.3		O-XYLENE	WATER	10		UG/L	0.37			
VOA OLM4.2/4.3		STYRENE	WATER	10		UG/L	0.27			
VOA OLM4.2/4.3		TETRACHLOROETHENE	WATER	10		UG/L	0.60			
VOA OLM4.2/4.3	*	TOLUENE	WATER	10		UG/L	0.54	13	76-125	76-125
VOA OLM4.2/4.3		TRANS-1,2-DICHLOROETHENE	WATER	10		UG/L	0.41			
VOA OLM4.2/4.3		TRANS-1,3-DICHLOROPROPENE	WATER	10		UG/L	0.26			
VOA OLM4.2/4.3	*	TRICHLOROETHENE	WATER	10		UG/L	0.57	14	71-120	71-120
VOA OLM4.2/4.3		TRICHLOROFLUOROMETHANE	WATER	10		UG/L	0.44			
VOA OLM4.2/4.3		VINYL CHLORIDE	WATER	10		UG/L	0.42			
VOA OLM4.2/4.3		BROMOFLUOROBENZENE -SURR	WATER	NA		UG/L	NA	NA	86-115	86-115
VOA OLM4.2/4.3		1,2-DICHLOROETHANE-D4 -SURR	WATER	NA		UG/L	NA	NA	76-114	76-114
VOA OLM4.2/4.3		TOLUENE-D8 -SURR	WATER	NA		UG/L	NA	NA	88-110	88-110

ROCHESTER ORGANIC QC LIMITS

METHOD		ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
VOA OLM4.2/4.3		1,1,1-TRICHLOROETHANE	SOIL	10		UG/KG	0.53			
VOA OLM4.2/4.3		1,1,2,2-TETRACHLOROETHANE	SOIL	10		UG/KG	0.27			
VOA OLM4.2/4.3		1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE (	SOIL	10		UG/KG	0.62			
VOA OLM4.2/4.3		1,1,2-TRICHLOROETHANE	SOIL	10		UG/KG	0.45			
VOA OLM4.2/4.3		1,1-DICHLOROETHANE	SOIL	10		UG/KG	0.41			
VOA OLM4.2/4.3	*	1,1-DICHLOROETHENE	SOIL	10		UG/KG	0.72	22	59-172	59-172
VOA OLM4.2/4.3		1,2,4-TRICHLOROBENZENE	SOIL	10		UG/KG	0.94			
VOA OLM4.2/4.3		1,2-DIBROMO-3-CHLOROPROPANE	SOIL	10		UG/KG	0.85			
VOA OLM4.2/4.3		1,2-DIBROMOETHANE	SOIL	10		UG/KG	0.45			
VOA OLM4.2/4.3		1,2-DICHLOROBENZENE	SOIL	10		UG/KG	0.52			
VOA OLM4.2/4.3		1,2-DICHLOROETHANE	SOIL	10		UG/KG	0.66			
VOA OLM4.2/4.3		1,2-DICHLOROPROPANE	SOIL	10		UG/KG	0.46			
VOA OLM4.2/4.3		1,3-DICHLOROBENZENE	SOIL	10		UG/KG	0.50			
VOA OLM4.2/4.3		1,4-DICHLOROBENZENE	SOIL	10		UG/KG	0.73			
VOA OLM4.2/4.3		2-BUTANONE	SOIL	10		UG/KG	2.2			
VOA OLM4.2/4.3		2-HEXANONE	SOIL	10		UG/KG	1.3			
VOA OLM4.2/4.3		4-METHYL-2-PENTANONE	SOIL	10		UG/KG	1.4			
VOA OLM4.2/4.3		ACETONE	SOIL	10		UG/KG	3.1			
VOA OLM4.2/4.3	*	BENZENE	SOIL	10		UG/KG	0.38	21	66-142	66-142
VOA OLM4.2/4.3		BROMODICHLOROMETHANE	SOIL	10		UG/KG	0.37			
VOA OLM4.2/4.3		BROMOFORM	SOIL	10		UG/KG	0.37			
VOA OLM4.2/4.3		BROMOMETHANE	SOIL	10		UG/KG	0.59			
VOA OLM4.2/4.3		CARBON DISULFIDE	SOIL	10		UG/KG	0.51			
VOA OLM4.2/4.3		CARBON TETRACHLORIDE	SOIL	10		UG/KG	0.33			
VOA OLM4.2/4.3	*	CHLOROBENZENE	SOIL	10		UG/KG	0.33	21	60-133	60-133
VOA OLM4.2/4.3		CHLOROETHANE	SOIL	10		UG/KG	0.23			
VOA OLM4.2/4.3		CHLOROFORM	SOIL	10		UG/KG	0.50			
VOA OLM4.2/4.3		CHLOROMETHANE	SOIL	10		UG/KG	0.55			
VOA OLM4.2/4.3		CIS-1,2-DICHLOROETHENE	SOIL	10		UG/KG	0.69			
VOA OLM4.2/4.3		CIS-1,3-DICHLOROPROPENE	SOIL	10		UG/KG	0.35			
VOA OLM4.2/4.3		CYCLOHEXANE	SOIL	10		UG/KG	0.91			
VOA OLM4.2/4.3		DIBROMOCHLOROMETHANE	SOIL	10		UG/KG	0.20			
VOA OLM4.2/4.3		DICHLORODIFLUOROMETHANE	SOIL	10		UG/KG	0.83			
VOA OLM4.2/4.3		ETHYLBENZENE	SOIL	10		UG/KG	1.7			
VOA OLM4.2/4.3		ISOPROPYLBENZENE	SOIL	10		UG/KG	0.77			
VOA OLM4.2/4.3		M+P-XYLENE	SOIL	10		UG/KG	1.6			
VOA OLM4.2/4.3		METHYL ACETATE	SOIL	10		UG/KG	0.81			
VOA OLM4.2/4.3		METHYL TERT-BUTYL ETHER	SOIL	10		UG/KG	0.44			
VOA OLM4.2/4.3		METHYLCYCLOHEXANE	SOIL	10		UG/KG	0.80			
VOA OLM4.2/4.3		METHYLENE CHLORIDE	SOIL	10		UG/KG	1.0			
VOA OLM4.2/4.3		O-XYLENE	SOIL	10		UG/KG	0.53			
VOA OLM4.2/4.3		STYRENE	SOIL	10		UG/KG	0.36			
VOA OLM4.2/4.3		TETRACHLOROETHENE	SOIL	10		UG/KG	0.62			
VOA OLM4.2/4.3	*	TOLUENE	SOIL	10		UG/KG	0.40	21	59-139	59-139
VOA OLM4.2/4.3		TRANS-1,2-DICHLOROETHENE	SOIL	10		UG/KG	0.42			
VOA OLM4.2/4.3		TRANS-1,3-DICHLOROPROPENE	SOIL	10		UG/KG	0.41			
VOA OLM4.2/4.3	*	TRICHLOROETHENE	SOIL	10		UG/KG	0.68	24	62-137	62-137
VOA OLM4.2/4.3		TRICHLOROFLUOROMETHANE	SOIL	10		UG/KG	0.53			
VOA OLM4.2/4.3		VINYL CHLORIDE	SOIL	10		UG/KG	0.65			
VOA OLM4.2/4.3		BROMOFLUOROBENZENE -SURR	SOIL	NA		UG/KG	NA	NA	59-113	59-113
VOA OLM4.2/4.3		1,2-DICHLOROETHANE-D4 -SURR	SOIL	NA		UG/KG	NA	NA	70-121	70-121
VOA OLM4.2/4.3		TOLUENE-D8 -SURR	SOIL	NA		UG/KG	NA	NA	84-138	84-138

ROCHESTER ORGANIC QC LIMITS

METHOD		ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
BNA OLM4.2/4.3		1,1'-BIPHENYL	WATER	10		UG/L	0.28			
BNA OLM4.2/4.3		2,2'-OXYBIS(1-CHLOROPROPANE)	WATER	10		UG/L	1.2			
BNA OLM4.2/4.3		2,4,5-TRICHLOROPHENOL	WATER	25		UG/L	1.8			
BNA OLM4.2/4.3		2,4,6-TRICHLOROPHENOL	WATER	10		UG/L	1.2			
BNA OLM4.2/4.3		2,4-DICHLOROPHENOL	WATER	10		UG/L	0.73			
BNA OLM4.2/4.3		2,4-DIMETHYLPHENOL	WATER	10		UG/L	0.36			
BNA OLM4.2/4.3		2,4-DINITROPHENOL	WATER	25		UG/L	2.0			
BNA OLM4.2/4.3	*	2,4-DINITROTOLUENE	WATER	10		UG/L	1.8	38	24-96	24-96
BNA OLM4.2/4.3		2,6-DINITROTOLUENE	WATER	10		UG/L	1.3			
BNA OLM4.2/4.3		2-CHLORONAPHTHALENE	WATER	10		UG/L	0.18			
BNA OLM4.2/4.3	*	2-CHLOROPHENOL	WATER	10		UG/L	0.53	40	27-123	27-123
BNA OLM4.2/4.3		2-METHYLNAPHTHALENE	WATER	10		UG/L	0.33			
BNA OLM4.2/4.3		2-METHYLPHENOL	WATER	10		UG/L	2.2			
BNA OLM4.2/4.3		2-NITROANILINE	WATER	25		UG/L	1.5			
BNA OLM4.2/4.3		2-NITROPHENOL	WATER	10		UG/L	1.3			
BNA OLM4.2/4.3		3,3'-DICHLOROBENZIDINE	WATER	10		UG/L	0.86			
BNA OLM4.2/4.3		3-NITROANILINE	WATER	25		UG/L	0.78			
BNA OLM4.2/4.3		4,6-DINITRO-2-METHYLPHENOL	WATER	25		UG/L	1.4			
BNA OLM4.2/4.3		4-BROMOPHENYL-PHENYLETHER	WATER	10		UG/L	0.11			
BNA OLM4.2/4.3	*	4-CHLORO-3-METHYLPHENOL	WATER	10		UG/L	0.36	42	23-97	23-97
BNA OLM4.2/4.3		4-CHLOROANILINE	WATER	10		UG/L	0.46			
BNA OLM4.2/4.3		4-CHLOROPHENYL-PHENYLETHER	WATER	10		UG/L	0.75			
BNA OLM4.2/4.3		4-METHYLPHENOL	WATER	10		UG/L	0.85			
BNA OLM4.2/4.3		4-NITROANILINE	WATER	25		UG/L	0.94			
BNA OLM4.2/4.3	*	4-NITROPHENOL	WATER	25		UG/L	1.6	50	10-80	10-80
BNA OLM4.2/4.3	*	ACENAPHTHENE	WATER	10		UG/L	0.53	31	46-118	46-118
BNA OLM4.2/4.3		ACENAPHTHYLENE	WATER	10		UG/L	0.74			
BNA OLM4.2/4.3		ACETOPHENONE	WATER	10		UG/L	0.96			
BNA OLM4.2/4.3		ANTHRACENE	WATER	10		UG/L	0.46			
BNA OLM4.2/4.3		ATRAZINE	WATER	10		UG/L	1.3			
BNA OLM4.2/4.3		BENZALDEHYDE	WATER	10		UG/L	0.86			
BNA OLM4.2/4.3		BENZO(A)ANTHRACENE	WATER	10		UG/L	0.16			
BNA OLM4.2/4.3		BENZO(A)PYRENE	WATER	10		UG/L	0.53			
BNA OLM4.2/4.3		BENZO(B)FLUORANTHENE	WATER	10		UG/L	2.7			
BNA OLM4.2/4.3		BENZO(G,H,I)PERYLENE	WATER	10		UG/L	2.5			
BNA OLM4.2/4.3		BENZO(K)FLUORANTHENE	WATER	10		UG/L	0.66			
BNA OLM4.2/4.3		BIS(-2-CHLOROETHOXY)METHANE	WATER	10		UG/L	0.69			
BNA OLM4.2/4.3		BIS(-2-CHLOROETHYL)ETHER	WATER	10		UG/L	1.1			
BNA OLM4.2/4.3		BIS(2-ETHYLHEXYL)PHTHALATE	WATER	10		UG/L	0.40			
BNA OLM4.2/4.3		BUTYL BENZYL PHTHALATE	WATER	10		UG/L	1.4			
BNA OLM4.2/4.3		CAPROLACTAM	WATER	10		UG/L	0.91			
BNA OLM4.2/4.3		CARBAZOLE	WATER	10		UG/L	0.56			
BNA OLM4.2/4.3		CHRYSENE	WATER	10		UG/L	0.07			
BNA OLM4.2/4.3		DIBENZ(A,H)ANTHRACENE	WATER	10		UG/L	2.09			
BNA OLM4.2/4.3		DIBENZOFURAN	WATER	10		UG/L	0.21			
BNA OLM4.2/4.3		DIETHYLPHTHALATE	WATER	10		UG/L	0.38			
BNA OLM4.2/4.3		DIMETHYL PHTHALATE	WATER	10		UG/L	0.54			
BNA OLM4.2/4.3		DI-N-BUTYLPHTHALATE	WATER	10		UG/L	0.35			
BNA OLM4.2/4.3		DI-N-OCTYL PHTHALATE	WATER	10		UG/L	2.5			
BNA OLM4.2/4.3		FLUORANTHENE	WATER	10		UG/L	0.76			
BNA OLM4.2/4.3		FLUORENE	WATER	10		UG/L	0.63			
BNA OLM4.2/4.3		HEXACHLOROBENZENE	WATER	10		UG/L	1.4			
BNA OLM4.2/4.3		HEXACHLOROBUTADIENE	WATER	10		UG/L	0.48			
BNA OLM4.2/4.3		HEXACHLOROCYCLOPENTADIENE	WATER	10		UG/L	1.6			
BNA OLM4.2/4.3		HEXACHLOROETHANE	WATER	10		UG/L	0.74			
BNA OLM4.2/4.3		INDENO(1,2,3-CD)PYRENE	WATER	10		UG/L	2.5			
BNA OLM4.2/4.3		ISOPHORONE	WATER	10		UG/L	0.45			
BNA OLM4.2/4.3		NAPHTHALENE	WATER	10		UG/L	0.14			
BNA OLM4.2/4.3		NITROBENZENE	WATER	10		UG/L	0.90			
BNA OLM4.2/4.3	*	N-NITROSO-DI-N-PROPYLAMINE	WATER	10		UG/L	0.64	38	41-116	41-116
BNA OLM4.2/4.3		N-NITROSODIPHENYLAMINE	WATER	10		UG/L	1.1			
BNA OLM4.2/4.3	*	PENTACHLOROPHENOL	WATER	25		UG/L	3.0	50	9-103	9-103
BNA OLM4.2/4.3		PHENANTHRENE	WATER	10		UG/L	0.56			
BNA OLM4.2/4.3	*	PHENOL	WATER	10		UG/L	0.37	42	12-110	12-110
BNA OLM4.2/4.3	*	PYRENE	WATER	10		UG/L	1.6	31	26-127	26-127

ROCHESTER ORGANIC QC LIMITS

METHOD		ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
BNA OLM4.2/4.3		TERPHENYL-D14 -SURR	WATER	NA		UG/L	NA	NA	33-141	33-141
BNA OLM4.2/4.3		2-CHLOROPHENOL-D4 -SURR (adviso	WATER	NA		UG/L	NA	NA	33-110	33-110
BNA OLM4.2/4.3		1,2-DICHLOROBENZENE-D4 -SURR (ad	WATER	NA		UG/L	NA	NA	16-110	16-110
BNA OLM4.2/4.3		NITROBENZENE-D5 -SURR	WATER	NA		UG/L	NA	NA	35-114	35-114
BNA OLM4.2/4.3		PHENOL-D6 -SURR	WATER	NA		UG/L	NA	NA	10-110	10-110
BNA OLM4.2/4.3		2-FLUOROBIPHENYL -SURR	WATER	NA		UG/L	NA	NA	43-116	43-116
BNA OLM4.2/4.3		2-FLUOROPHENOL -SURR	WATER	NA		UG/L	NA	NA	21-110	21-110
BNA OLM4.2/4.3		2,4,6-TRIBROMOPHENOL -SURR	WATER	NA		UG/L	NA	NA	10-123	10-123
BNA OLM4.2/4.3 additional compounds upon request										
BNA OLM4.2/4.3		1,3-DICHLOROBENZENE	WATER	10		UG/L	0.51			
BNA OLM4.2/4.3		1,2-DICHLOROBENZENE	WATER	10		UG/L	0.86			
BNA OLM4.2/4.3		1,4-DICHLOROBENZENE	WATER	10		UG/L	0.53			
BNA OLM4.2/4.3		1,1'-BIPHENYL	SOIL	330		UG/KG	9.3			
BNA OLM4.2/4.3		2,2'-OXYBIS(1-CHLOROPROPANE)	SOIL	330		UG/KG	41			
BNA OLM4.2/4.3		2,4,5-TRICHLOROPHENOL	SOIL	800		UG/KG	61			
BNA OLM4.2/4.3		2,4,6-TRICHLOROPHENOL	SOIL	330		UG/KG	41			
BNA OLM4.2/4.3		2,4-DICHLOROPHENOL	SOIL	330		UG/KG	24			
BNA OLM4.2/4.3		2,4-DIMETHYLPHENOL	SOIL	330		UG/KG	12			
BNA OLM4.2/4.3		2,4-DINITROPHENOL	SOIL	800		UG/KG	66			
BNA OLM4.2/4.3	*	2,4-DINITROTOLUENE	SOIL	330		UG/KG	59	47	28-89	28-89
BNA OLM4.2/4.3		2,6-DINITROTOLUENE	SOIL	330		UG/KG	44			
BNA OLM4.2/4.3		2-CHLORONAPHTHALENE	SOIL	330		UG/KG	6.0			
BNA OLM4.2/4.3	*	2-CHLOROPHENOL	SOIL	330		UG/KG	18	50	25-102	25-102
BNA OLM4.2/4.3		2-METHYLNAPHTHALENE	SOIL	330		UG/KG	11			
BNA OLM4.2/4.3		2-METHYLPHENOL	SOIL	330		UG/KG	73			
BNA OLM4.2/4.3		2-NITROANILINE	SOIL	800		UG/KG	50			
BNA OLM4.2/4.3		2-NITROPHENOL	SOIL	330		UG/KG	42			
BNA OLM4.2/4.3		3,3'-DICHLOROBENZIDINE	SOIL	330		UG/KG	29			
BNA OLM4.2/4.3		3-NITROANILINE	SOIL	800		UG/KG	26			
BNA OLM4.2/4.3		4,6-DINITRO-2-METHYLPHENOL	SOIL	800		UG/KG	47			
BNA OLM4.2/4.3		4-BROMOPHENYL-PHENYLETHER	SOIL	330		UG/KG	3.7			
BNA OLM4.2/4.3	*	4-CHLORO-3-METHYLPHENOL	SOIL	330		UG/KG	12	33	26-103	26-103
BNA OLM4.2/4.3		4-CHLOROANILINE	SOIL	330		UG/KG	15			
BNA OLM4.2/4.3		4-CHLOROPHENYL-PHENYLETHER	SOIL	330		UG/KG	25			
BNA OLM4.2/4.3		4-METHYLPHENOL	SOIL	330		UG/KG	28			
BNA OLM4.2/4.3		4-NITROANILINE	SOIL	800		UG/KG	31			
BNA OLM4.2/4.3	*	4-NITROPHENOL	SOIL	800		UG/KG	54	50	11-114	11-114
BNA OLM4.2/4.3	*	ACENAPHTHENE	SOIL	330		UG/KG	18	19	31-137	31-137
BNA OLM4.2/4.3		ACENAPHTHYLENE	SOIL	330		UG/KG	25			
BNA OLM4.2/4.3		ACETOPHENONE	SOIL	330		UG/KG	32			
BNA OLM4.2/4.3		ANTHRACENE	SOIL	330		UG/KG	15			
BNA OLM4.2/4.3		ATRAZINE	SOIL	330		UG/KG	42			
BNA OLM4.2/4.3		BENZALDEHYDE	SOIL	330		UG/KG	29			
BNA OLM4.2/4.3		BENZO(A)ANTHRACENE	SOIL	330		UG/KG	5.3			
BNA OLM4.2/4.3		BENZO(A)PYRENE	SOIL	330		UG/KG	18			
BNA OLM4.2/4.3		BENZO(B)FLUORANTHENE	SOIL	330		UG/KG	88			
BNA OLM4.2/4.3		BENZO(G,H,I)PERYLENE	SOIL	330		UG/KG	82			
BNA OLM4.2/4.3		BENZO(K)FLUORANTHENE	SOIL	330		UG/KG	22			
BNA OLM4.2/4.3		BIS(-2-CHLOROETHOXY)METHANE	SOIL	330		UG/KG	23			
BNA OLM4.2/4.3		BIS(-2-CHLOROETHYL)ETHER	SOIL	330		UG/KG	37			
BNA OLM4.2/4.3		BIS(2-ETHYLHEXYL)PHTHALATE	SOIL	330		UG/KG	13			
BNA OLM4.2/4.3		BUTYL BENZYL PHTHALATE	SOIL	330		UG/KG	46			
BNA OLM4.2/4.3		CAPROLACTAM	SOIL	330		UG/KG	30			
BNA OLM4.2/4.3		CARBAZOLE	SOIL	330		UG/KG	19			
BNA OLM4.2/4.3		CHRYSENE	SOIL	330		UG/KG	2.3			
BNA OLM4.2/4.3		DIBENZ(A,H)ANTHRACENE	SOIL	330		UG/KG	70			
BNA OLM4.2/4.3		DIBENZOFURAN	SOIL	330		UG/KG	7.0			
BNA OLM4.2/4.3		DIETHYLPHTHALATE	SOIL	330		UG/KG	13			
BNA OLM4.2/4.3		DIMETHYL PHTHALATE	SOIL	330		UG/KG	18			
BNA OLM4.2/4.3		DI-N-BUTYLPHTHALATE	SOIL	330		UG/KG	12			
BNA OLM4.2/4.3		DI-N-OCTYL PHTHALATE	SOIL	330		UG/KG	82			
BNA OLM4.2/4.3		FLUORANTHENE	SOIL	330		UG/KG	25			
BNA OLM4.2/4.3		FLUORENE	SOIL	330		UG/KG	21			
BNA OLM4.2/4.3		HEXACHLOROBENZENE	SOIL	330		UG/KG	45			
BNA OLM4.2/4.3		HEXACHLOROBUTADIENE	SOIL	330		UG/KG	16			

ROCHESTER ORGANIC QC LIMITS

METHOD		ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
BNA OLM4.2/4.3		HEXACHLOROCYCLOPENTADIENE	SOIL	330		UG/KG	53			
BNA OLM4.2/4.3		HEXACHLOROETHANE	SOIL	330		UG/KG	25			
BNA OLM4.2/4.3		INDENO(1,2,3-CD)PYRENE	SOIL	330		UG/KG	82			
BNA OLM4.2/4.3		ISOPHORONE	SOIL	330		UG/KG	15			
BNA OLM4.2/4.3		NAPHTHALENE	SOIL	330		UG/KG	4.7			
BNA OLM4.2/4.3		NITROBENZENE	SOIL	330		UG/KG	30			
BNA OLM4.2/4.3	*	N-NITROSO-DI-N-PROPYLAMINE	SOIL	330		UG/KG	21	38	41-126	41-126
BNA OLM4.2/4.3		N-NITROSODIPHENYLAMINE	SOIL	330		UG/KG	35			
BNA OLM4.2/4.3	*	PENTACHLOROPHENOL	SOIL	800		UG/KG	99	47	17-109	17-109
BNA OLM4.2/4.3		PHENANTHRENE	SOIL	330		UG/KG	19			
BNA OLM4.2/4.3	*	PHENOL	SOIL	330		UG/KG	12	35	26-90	26-90
BNA OLM4.2/4.3	*	PYRENE	SOIL	330		UG/KG	53	36	35-142	35-142
BNA OLM4.2/4.3		TERPHENYL-D14 -SURR	SOIL	NA		UG/KG	NA	NA	18-137	18-137
BNA OLM4.2/4.3		2-CHLOROPHENOL-D4 -SURR (advisor	SOIL	NA		UG/KG	NA	NA	20-130	20-130
BNA OLM4.2/4.3		1,2-DICHLOROBENZENE-D4 -SURR (a	SOIL	NA		UG/KG	NA	NA	20-130	20-130
BNA OLM4.2/4.3		NITROBENZENE-D5 -SURR	SOIL	NA		UG/KG	NA	NA	23-120	23-120
BNA OLM4.2/4.3		PHENOL-D6 -SURR	SOIL	NA		UG/KG	NA	NA	24-113	24-113
BNA OLM4.2/4.3		2-FLUOROBIPHENYL -SURR	SOIL	NA		UG/KG	NA	NA	30-115	30-115
BNA OLM4.2/4.3		2-FLUOROPHENOL -SURR	SOIL	NA		UG/KG	NA	NA	25-121	25-121
BNA OLM4.2/4.3		2,4,6-TRIBROMOPHENOL -SURR	SOIL	NA		UG/KG	NA	NA	19-122	19-122
BNA OLM4.2/4.3 additional compounds by request										
BNA OLM4.2/4.3		1,3-DICHLOROBENZENE	SOIL	330		UG/KG	17			
BNA OLM4.2/4.3		1,2-DICHLOROBENZENE	SOIL	330		UG/KG	29			
BNA OLM4.2/4.3		1,4-DICHLOROBENZENE	SOIL	330		UG/KG	18			

ROCHESTER ORGANIC QC LIMITS

METHOD		ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
P/PCB OLM4.2/4.3		AROCLOR-1016	WATER	1.0		UG/L	0.48			
P/PCB OLM4.2/4.3		AROCLOR-1221	WATER	2.0		UG/L	0.68			
P/PCB OLM4.2/4.3		AROCLOR-1232	WATER	1.0		UG/L	0.79			
P/PCB OLM4.2/4.3		AROCLOR-1242	WATER	1.0		UG/L	0.36			
P/PCB OLM4.2/4.3		AROCLOR-1248	WATER	1.0		UG/L	0.27			
P/PCB OLM4.2/4.3		AROCLOR-1254	WATER	1.0		UG/L	0.073			
P/PCB OLM4.2/4.3		AROCLOR-1260	WATER	1.0		UG/L	0.19			
P/PCB OLM4.2/4.3	*	ALDRIN	WATER	0.050		UG/L	0.0026	22	40-120	40-120
P/PCB OLM4.2/4.3		ALPHA-BHC	WATER	0.050		UG/L	0.0084			
P/PCB OLM4.2/4.3		BETA-BHC	WATER	0.050		UG/L	0.0041			
P/PCB OLM4.2/4.3		DELTA-BHC	WATER	0.050		UG/L	0.0035			
P/PCB OLM4.2/4.3	*	GAMMA-BHC (LINDANE)	WATER	0.050		UG/L	0.0076	15	56-123	56-123
P/PCB OLM4.2/4.3		ALPHA-CHLORDANE	WATER	0.050		UG/L	0.0057			
P/PCB OLM4.2/4.3		GAMMA-CHLORDANE	WATER	0.050		UG/L	0.0025			
P/PCB OLM4.2/4.3		4,4'-DDD	WATER	0.10		UG/L	0.0091			
P/PCB OLM4.2/4.3		4,4'-DDE	WATER	0.10		UG/L	0.0049			
P/PCB OLM4.2/4.3	*	4,4'-DDT	WATER	0.10		UG/L	0.0034	27	38-127	38-127
P/PCB OLM4.2/4.3	*	DIELDRIN	WATER	0.10		UG/L	0.014	18	52-126	52-126
P/PCB OLM4.2/4.3		ENDOSULFAN I	WATER	0.050		UG/L	0.0056			
P/PCB OLM4.2/4.3		ENDOSULFAN II	WATER	0.10		UG/L	0.011			
P/PCB OLM4.2/4.3		ENDOSULFAN SULFATE	WATER	0.10		UG/L	0.0074			
P/PCB OLM4.2/4.3	*	ENDRIN	WATER	0.10		UG/L	0.014	21	56-121	56-121
P/PCB OLM4.2/4.3		ENDRIN ALDEHYDE	WATER	0.10		UG/L	0.006			
P/PCB OLM4.2/4.3		ENDRIN KETONE	WATER	0.10		UG/L	0.009			
P/PCB OLM4.2/4.3	*	HEPTACHLOR	WATER	0.050		UG/L	0.0081	20	40-131	40-131
P/PCB OLM4.2/4.3		HEPTACHLOR EPOXIDE	WATER	0.050		UG/L	0.0024			
P/PCB OLM4.2/4.3		METHOXYCHLOR	WATER	0.50		UG/L	0.031			
P/PCB OLM4.2/4.3		TOXAPHENE	WATER	5.0		UG/L	1.0			
P/PCB OLM4.2/4.3		DECACHLOROBIPHENYL (DCB) -SURR	WATER	NA		UG/L	NA	NA	30-150	30-150
P/PCB OLM4.2/4.3		TETRACHLORO-META-XYLENE (TCMX) -SU	WATER	NA		UG/L	NA	NA	30-150	30-150
P/PCB OLM4.2/4.3		AROCLOR-1016	SOIL	33		UG/KG	16			
P/PCB OLM4.2/4.3		AROCLOR-1221	SOIL	67		UG/KG	23			
P/PCB OLM4.2/4.3		AROCLOR-1232	SOIL	33		UG/KG	26			
P/PCB OLM4.2/4.3		AROCLOR-1242	SOIL	33		UG/KG	12			
P/PCB OLM4.2/4.3		AROCLOR-1248	SOIL	33		UG/KG	9.2			
P/PCB OLM4.2/4.3		AROCLOR-1254	SOIL	33		UG/KG	2.4			
P/PCB OLM4.2/4.3		AROCLOR-1260	SOIL	33		UG/KG	6.3			
P/PCB OLM4.2/4.3	*	ALDRIN	SOIL	1.7		UG/KG	0.10	43	40-120	34-132
P/PCB OLM4.2/4.3		ALPHA-BHC	SOIL	1.7		UG/KG	0.27			
P/PCB OLM4.2/4.3		BETA-BHC	SOIL	1.7		UG/KG	0.13			
P/PCB OLM4.2/4.3		DELTA-BHC	SOIL	1.7		UG/KG	0.13			
P/PCB OLM4.2/4.3	*	GAMMA-BHC (LINDANE)	SOIL	1.7		UG/KG	0.27	50	56-123	46-127
P/PCB OLM4.2/4.3		ALPHA-CHLORDANE	SOIL	1.7		UG/KG	0.20			
P/PCB OLM4.2/4.3		GAMMA-CHLORDANE	SOIL	1.7		UG/KG	0.10			
P/PCB OLM4.2/4.3		4,4'-DDD	SOIL	3.3		UG/KG	0.30			
P/PCB OLM4.2/4.3		4,4'-DDE	SOIL	3.3		UG/KG	0.17			
P/PCB OLM4.2/4.3	*	4,4'-DDT	SOIL	3.3		UG/KG	0.10	50	38-127	23-134
P/PCB OLM4.2/4.3	*	DIELDRIN	SOIL	3.3		UG/KG	0.47	38	52-126	31-134
P/PCB OLM4.2/4.3		ENDOSULFAN I	SOIL	1.7		UG/KG	0.20			
P/PCB OLM4.2/4.3		ENDOSULFAN II	SOIL	3.3		UG/KG	0.37			
P/PCB OLM4.2/4.3		ENDOSULFAN SULFATE	SOIL	3.3		UG/KG	0.23			
P/PCB OLM4.2/4.3	*	ENDRIN	SOIL	3.3		UG/KG	0.47	45	56-121	42-139
P/PCB OLM4.2/4.3		ENDRIN ALDEHYDE	SOIL	3.3		UG/KG	0.20			
P/PCB OLM4.2/4.3		ENDRIN KETONE	SOIL	3.3		UG/KG	0.30			
P/PCB OLM4.2/4.3	*	HEPTACHLOR	SOIL	1.7		UG/KG	0.27	31	40-131	35-130
P/PCB OLM4.2/4.3		HEPTACHLOR EPOXIDE	SOIL	1.7		UG/KG	0.070			
P/PCB OLM4.2/4.3		METHOXYCHLOR	SOIL	17		UG/KG	1.0			
P/PCB OLM4.2/4.3		TOXAPHENE	SOIL	170		UG/KG	34			
P/PCB OLM4.2/4.3		DECACHLOROBIPHENYL (DCB) -SURR	SOIL	NA		UG/KG	NA	NA	30-150	30-150
P/PCB OLM4.2/4.3		TETRACHLORO-META-XYLENE (TCMX) -SU	SOIL	NA		UG/KG	NA	NA	30-150	30-150

ROCHESTER ORGANIC QC LIMITS

METHOD		ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
MAVPH		BENZENE	WATER	0.5		UG/L	0.17	50	70-130	70-130
MAVPH		METHYL-TERT-BUTYL ETHER	WATER	5.0		UG/L	0.64	50	70-130	70-130
MAVPH		C9-C10 AROMATICS	WATER	10		UG/L	1.7	50	70-130	70-130
MAVPH		C9-C12 ALIPHATICS	WATER	20		UG/L	4.8	50	70-130	70-130
MAVPH		C5-C8 ALIPHATICS	WATER	15		UG/L	8.8	50	70-130	70-130
MAVPH		ETHYLBENZENE	WATER	1.0		UG/L	0.19	50	70-130	70-130
MAVPH		NAPHTHALENE	WATER	5.0		UG/L	0.51	50	70-130	70-130
MAVPH		TOLUENE	WATER	1.0		UG/L	0.46	50	70-130	70-130
MAVPH		M+P-XYLENE	WATER	1.0		UG/L	0.70	50	70-130	70-130
MAVPH		O-XYLENE	WATER	1.0		UG/L	0.50	50	70-130	70-130
MAVPH		1,4-DIFLUOROBENZENE (FID) -SURR	WATER	NA		UG/L	NA	NA	70-130	70-130
MAVPH		1,4-DIFLUOROBENZENE (PID) -SURR	WATER	NA		UG/L	NA	NA	70-130	70-130
MAVPH		BENZENE	SOIL	25		UG/KG	8.6	50	70-130	70-130
MAVPH		METHYL-TERT-BUTYL ETHER	SOIL	250		UG/KG	32	50	70-130	70-130
MAVPH		C9-C10 AROMATICS	SOIL	500		UG/KG	85	50	70-130	70-130
MAVPH		C9-C12 ALIPHATICS	SOIL	1000		UG/KG	240	50	70-130	70-130
MAVPH		C5-C8 ALIPHATICS	SOIL	750		UG/KG	440	50	70-130	70-130
MAVPH		ETHYLBENZENE	SOIL	50		UG/KG	9.7	50	70-130	70-130
MAVPH		NAPHTHALENE	SOIL	250		UG/KG	26	50	70-130	70-130
MAVPH		TOLUENE	SOIL	50		UG/KG	23	50	70-130	70-130
MAVPH		M+P-XYLENE	SOIL	50		UG/KG	35	50	70-130	70-130
MAVPH		O-XYLENE	SOIL	50		UG/KG	25	50	70-130	70-130
MAVPH		1,4-DIFLUOROBENZENE (FID) -SURR	SOIL	NA		UG/KG	NA	NA	70-130	70-130
MAVPH		1,4-DIFLUOROBENZENE (PID) -SURR	SOIL	NA		UG/KG	NA	NA	70-130	70-130
MAEPH		ACENAPHTHENE	WATER	0.50		UG/L		50	40-140	40-140
MAEPH		ACENAPHTHYLENE	WATER	0.50		UG/L		50	40-140	40-140
MAEPH		ANTHRACENE	WATER	0.50		UG/L		50	40-140	40-140
MAEPH		BENZO(A)ANTHRACENE	WATER	0.50		UG/L		50	40-140	40-140
MAEPH		BENZO(A)PYRENE	WATER	0.20		UG/L		50	40-140	40-140
MAEPH		BENZO(B)FLUORANTHENE	WATER	0.50		UG/L		50	40-140	40-140
MAEPH		BENZO(G,H,I)PERYLENE	WATER	0.50		UG/L		50	40-140	40-140
MAEPH		BENZO(K)FLUORANTHENE	WATER	0.50		UG/L		50	40-140	40-140
MAEPH		C9-C18 ALIPHATIC HYDROCARBONS	WATER	100		UG/L	NA	50	40-140	40-140
MAEPH		UNADJUSTED C11-C22 AROMATIC HYDROC	WATER	100		UG/L	NA	50	40-140	40-140
MAEPH		C11-C22 AROMATICS	WATER	100		UG/L	NA	50	40-140	40-140
MAEPH		C19-C36 ALIPHATIC HYDROCARBONS	WATER	100		UG/L	NA	50	40-140	40-140
MAEPH		INDENO(1,2,3-CD)PYRENE	WATER	0.50		UG/L		50	40-140	40-140
MAEPH		CHRYSENE	WATER	0.50		UG/L		50	40-140	40-140
MAEPH		DIBENZ(A,H)ANTHRACENE	WATER	0.50		UG/L		50	40-140	40-140
MAEPH		FLUORANTHENE	WATER	0.50		UG/L		50	40-140	40-140
MAEPH		FLUORENE	WATER	0.50		UG/L		50	40-140	40-140
MAEPH		2-METHYLNAPHTHALENE	WATER	0.50		UG/L		50	40-140	40-140
MAEPH		NAPHTHALENE	WATER	0.50		UG/L		50	40-140	40-140
MAEPH		PHENANTHRENE	WATER	0.50		UG/L		50	40-140	40-140
MAEPH		PYRENE	WATER	0.50		UG/L		50	40-140	40-140
MAEPH		2-BROMONAPHTHALENE -SURR	WATER	NA		UG/L	NA	NA	40-140	40-140
MAEPH		2-FLUOROBIPHENYL -SURR	WATER	NA		UG/L	NA	NA	40-140	40-140
MAEPH		1-CHLORO-OCTADECANE -SURR	WATER	NA		UG/L	NA	NA	40-140	40-140
MAEPH		O-TERPHENYL -SURR	WATER	NA		UG/L	NA	NA	40-140	40-140

ROCHESTER ORGANIC QC LIMITS

METHOD		ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
MAEPH		ACENAPHTHENE	SOIL	330		UG/KG	29	50	40-140	40-140
MAEPH		ACENAPHTHYLENE	SOIL	330		UG/KG	28	50	40-140	40-140
MAEPH		ANTHRACENE	SOIL	330		UG/KG	195	50	40-140	40-140
MAEPH		BENZO(A)ANTHRACENE	SOIL	330		UG/KG	43	50	40-140	40-140
MAEPH		BENZO(A)PYRENE	SOIL	330		UG/KG	79	50	40-140	40-140
MAEPH		BENZO(B)FLUORANTHENE	SOIL	330		UG/KG	44	50	40-140	40-140
MAEPH		BENZO(G,H,I)PERYLENE	SOIL	330		UG/KG	39	50	40-140	40-140
MAEPH		BENZO(K)FLUORANTHENE	SOIL	330		UG/KG	67	50	40-140	40-140
MAEPH		C9-C18 ALIPHATIC HYDROCARBONS	SOIL	660		UG/KG	NA	50	40-140	40-140
MAEPH		UNADJUSTED C11-C22 AROMATIC HYDROC	SOIL	660		UG/KG	NA	50	40-140	40-140
MAEPH		C11-C22 AROMATICS	SOIL	660		UG/KG	NA	50	40-140	40-140
MAEPH		C19-C36 ALIPHATIC HYDROCARBONS	SOIL	660		UG/KG	NA	50	40-140	40-140
MAEPH		INDENO(1,2,3-CD)PYRENE	SOIL	330		UG/KG	54	50	40-140	40-140
MAEPH		CHRYSENE	SOIL	330		UG/KG	93	50	40-140	40-140
MAEPH		DIBENZ(A,H)ANTHRACENE	SOIL	330		UG/KG	81	50	40-140	40-140
MAEPH		FLUORANTHENE	SOIL	330		UG/KG	83	50	40-140	40-140
MAEPH		FLUORENE	SOIL	330		UG/KG	28	50	40-140	40-140
MAEPH		2-METHYLNAPHTHALENE	SOIL	660		UG/KG	33	50	40-140	40-140
MAEPH		NAPHTHALENE	SOIL	330		UG/KG	41	50	40-140	40-140
MAEPH		PHENANTHRENE	SOIL	330		UG/KG	162	50	40-140	40-140
MAEPH		PYRENE	SOIL	330		UG/KG	50	50	40-140	40-140
MAEPH		2-BROMONAPHTHALENE -SURR	SOIL	NA		UG/KG	NA	NA	40-140	40-140
MAEPH		2-FLUOROBIPHENYL -SURR	SOIL	NA		UG/KG	NA	NA	40-140	40-140
MAEPH		1-CHLORO-OCTADECANE -SURR	SOIL	NA		UG/KG	NA	NA	40-140	40-140
MAEPH		O-TERPHENYL -SURR	SOIL	NA		UG/KG	NA	NA	40-140	40-140
TO-15		1,1,1-TRICHLOROETHANE	AIR	0.50		ppbv	0.013	25	70-130	NA
TO-15		1,1,2,2-TETRACHLOROETHANE	AIR	0.50		ppbv	0.023	25	70-130	NA
TO-15		FREON-113	AIR	0.50		ppbv	0.015	25	70-130	NA
TO-15		1,1,2-TRICHLOROETHANE	AIR	0.50		ppbv	0.017	25	70-130	NA
TO-15		1,1-DICHLOROETHANE	AIR	0.50		ppbv	0.026	25	70-130	NA
TO-15		1,1-DICHLOROETHENE	AIR	0.50		ppbv	0.028	25	70-130	NA
TO-15		1,2,4-TRICHLOROBENZENE	AIR	0.50		ppbv	0.046	25	70-130	NA
TO-15		1,2,4-TRIMETHYLBENZENE	AIR	0.50		ppbv	0.013	25	70-130	NA
TO-15		1,2-DIBROMOETHANE	AIR	0.50		ppbv	0.024	25	70-130	NA
TO-15		1,2-DICHLOROBENZENE	AIR	0.50		ppbv	0.025	25	70-130	NA
TO-15		DICHLORODIFLUOROMETHANE	AIR	0.50		ppbv	0.015	25	70-130	NA
TO-15		1,2-DICHLOROETHANE	AIR	0.50		ppbv	0.021	25	70-130	NA
TO-15		1,2-DICHLOROPROPANE	AIR	0.50		ppbv	0.019	25	70-130	NA
TO-15		1,3,5-TRIMETHYLBENZENE	AIR	0.50		ppbv	0.015	25	70-130	NA
TO-15		1,3-BUTADIENE	AIR	0.50		ppbv	0.029	25	70-130	NA
TO-15		1,3-DICHLOROBENZENE	AIR	0.50		ppbv	0.026	25	70-130	NA
TO-15		1,4-DICHLOROBENZENE	AIR	0.50		ppbv	0.024	25	70-130	NA
TO-15		4-ETHYLTOLUENE	AIR	0.50		ppbv	0.021	25	70-130	NA
TO-15		ACETONE	AIR	1.00		ppbv	0.45	25	70-130	NA
TO-15		BENZENE	AIR	0.50		ppbv	0.013	25	70-130	NA
TO-15		BENZYL CHLORIDE	AIR	0.50		ppbv	0.031	25	70-130	NA
TO-15		BROMODICHLOROMETHANE	AIR	0.50		ppbv	0.015	25	70-130	NA
TO-15		BROMOFORM	AIR	0.50		ppbv	0.021	25	70-130	NA
TO-15		BROMOMETHANE	AIR	0.50		ppbv	0.025	25	70-130	NA
TO-15		CARBON DISULFIDE	AIR	0.50		ppbv	0.010	25	70-130	NA
TO-15		CARBON TETRACHLORIDE	AIR	0.50		ppbv	0.017	25	70-130	NA
TO-15		CHLOROBENZENE	AIR	0.50		ppbv	0.013	25	70-130	NA
TO-15		CHLOROETHANE	AIR	0.50		ppbv	0.032	25	70-130	NA
TO-15		CHLOROFORM	AIR	0.50		ppbv	0.025	25	70-130	NA
TO-15		CHLOROMETHANE	AIR	0.50		ppbv	0.015	25	70-130	NA
TO-15		CIS-1,2-DICHLOROETHENE	AIR	0.50		ppbv	0.015	25	70-130	NA
TO-15		CIS-1,3-DICHLOROPROPENE	AIR	0.50		ppbv	0.015	25	70-130	NA
TO-15		CYCLOHEXANE	AIR	0.50		ppbv	0.028	25	70-130	NA
TO-15		DIBROMOCHLOROMETHANE	AIR	0.50		ppbv	0.015	25	70-130	NA
TO-15		FREON-114	AIR	0.50		ppbv	0.013	25	70-130	NA
TO-15		ETHYL ACETATE	AIR	0.50		ppbv	0.057	25	70-130	NA
TO-15		ETHYLBENZENE	AIR	0.50		ppbv	0.017	25	70-130	NA
TO-15		HEPTANE	AIR	0.50		ppbv	0.015	25	70-130	NA
TO-15		HEXACHLOROBUTADIENE	AIR	0.50		ppbv	0.029	25	70-130	NA
TO-15		HEXANE	AIR	0.50		ppbv	0.021	25	70-130	NA

ROCHESTER ORGANIC QC LIMITS

METHOD		ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
TO-15		M+P-XYLENE	AIR	1.0		ppbv	0.010	25	70-130	NA
TO-15		2-HEXANONE	AIR	0.50		ppbv	0.061	25	70-130	NA
TO-15		2-BUTANONE	AIR	0.50		ppbv	0.060	25	70-130	NA
TO-15		4-METHYL-2-PENTANONE	AIR	0.50		ppbv	0.056	25	70-130	NA
TO-15		METHYL TERT-BUTYL ETHER	AIR	0.50		ppbv	0.015	25	70-130	NA
TO-15		METHYLENE CHLORIDE	AIR	0.50		ppbv	0.024	25	70-130	NA
TO-15		O-XYLENE	AIR	0.50		ppbv	0.010	25	70-130	NA
TO-15		PROPYLENE	AIR	0.50		ppbv	0.027	25	70-130	NA
TO-15		STYRENE	AIR	0.50		ppbv	0.017	25	70-130	NA
TO-15		TETRACHLOROETHENE	AIR	0.50		ppbv	0.019	25	70-130	NA
TO-15		TETRAHYDROFURAN	AIR	0.50		ppbv	0.033	25	70-130	NA
TO-15		TOLUENE	AIR	0.50		ppbv	0.010	25	70-130	NA
TO-15		TRANS-1,2-DICHLOROETHENE	AIR	0.50		ppbv	0.010	25	70-130	NA
TO-15		TRANS-1,3-DICHLOROPROPENE	AIR	0.50		ppbv	0.015	25	70-130	NA
TO-15		TRICHLOROETHENE	AIR	0.50		ppbv	0.028	25	70-130	NA
TO-15		TRICHLOROFLUOROMETHANE	AIR	0.50		ppbv	0.010	25	70-130	NA
TO-15		VINYL ACETATE	AIR	0.50		ppbv	0.15	25	70-130	NA
TO-15		VINYL CHLORIDE	AIR	0.50		ppbv	0.030	25	70-130	NA
TO-15		BROMOFLUOROBENZENE-SURR	AIR	NA		ppbv	NA	NA	70-140	NA

Method Reporting Limits for isomers reported as "total,"
are a summation of each isomer's MRL.

* Subset of compounds used to control the acceptablitily of the QC sample for the batch. All targets are monitored against the limits provided, however outlying compounds outside of this subset may not stop analysis based upon the judgement of the analyst.

** The DOD LoQ is the same as the MRL unless there is a value in the DoD LoQ column. DoD LoQ is required to be at least 3 times the MDL. Only populated for DoD Scope of Work. DoD requires use of DoD LCS and MS limits where available. See SOPs or DoD QSM.

EPA SOW OLM 04.3 does not require LCS analysis, limits are guidance for EPA and required for NYS ASP .

Limits for TCLP extracts are the same as the determinative method for the water matrix.

MDL = Method Detection Limit.
LOD = Limit of Detection
TCL = Target Compound List
LVI = Large Volume Injector
-SURR = Surrogate Compound

WETCHEM QC LIMITS

Columbia Analytical Services Rochester, NY

METHOD			ANALYTE	MATRIX	UNITS	MRL	MDL	DUP		MS		LCS		ICV/CCV
EPA	SM	Other						(RPD)	Freq	(% REC)	Freq	(% Rec)	Frequency	
305.1	2310B		Acidity	Water	mg/L	10.0	2.86	20	1/10	61-136	1/10	61-136	1/10	90-110
310.1	2320B		Alkalinity, Total, Carbonate, Bicarb	Water	mg/L	2.00	0.689	20	1/10	80-121	0.1	93-111	1/20	90-110
350.1			Ammonia	Water	mg/L	0.050	0.00955	20	1/10	59-129	0.1	90-110	1/20	90-110
350.1			Ammonia - Low Level	Water	mg/L	0.010	0.00955	20	1/10	59-129	0.1	90-110	1/20	90-110
350.1 M			Ammonia	Soil	mg/Kg	5.00	0.339	30	1/10	48-149	0.1	90-110	1/20	90-110
		D482	Ash, Percent	Non-Aq	%	0.10	NA	10	1/10	NA	NA	61-134	1/20	NA
405.1	5210B		BOD/CBOD	Water	mg/L	2.00	NA	20	1/20	47-141	1/20	85-115	1/20	NA
300.0/9056			Bromide by IC	Water	mg/L	0.10	0.0020	20	1/10	71-122	0.1	90-110	1/20	90-110
300.0M/9056			Bromide by IC	Soil	mg/Kg	10.0	0.385	30	1/10	71-127	0.1	90-110	1/20	90-110
5050/9056			Bromide for total halogens	NonAq/Soil	mg/kg	30.0		20	1/20	NA	NA	50-150	1/20	90-110
		D4809	BTU	Non-Aq	BTU	500	NA	20	1/20	NA	1/20	90-110	1/20	NA
9081			Cation Exchange Capacity	Soil	meqNa/100g	1.0	NA	30	1/20	NA	NA	NA	NA	NA
410.4			Chemical Oxygen Demand - LL	Water	mg/L	5.00	3.31	20	1/10	41-142	1/10	75-116	1/20	85-115
410.4 M			Chemical Oxygen Demand	Soil	mg/Kg	100	49.9	30	1/10	10-170	1/10	10-170	1/20	85-115
325.2	4500-Cl^- E		Chloride - Colorimetric	Water	mg/L	1.00	0.567	20	1/10	65-125	1/10	90-112	1/20	90-110
300.0/9056			Chloride by IC	Water	mg/L	0.200	0.029	20	1/10	72-118	1/10	90-110	1/20	90-110
300.0M/9056			Chloride by IC	Soil	mg/Kg	30.0	4.69	30	1/10	72-119	1/10	90-110	1/20	90-110
5050/9056			Chlorine, Percent	Non-Aq	%	0.01	NA	20	1/10	33-141	NA	33-141	1/20	NA
5050/9056			Chloride - for total halogens	NonAq/Soil	mg/kg	60.0		20	1/20	NA	NA	50-150	1/20	90-110
	409A		Chlorine Demand	Water	mg/L	5.00	NA	20	1/20	NA	NA	NA	NA	NA
330.4	4500-Cl F		Chlorine Residual (Free)	Water	mg/L	0.100	NA	20	1/10	50-150	1/20	50-150	1/20	NA
330.4	4500-Cl F		Chlorine Residual (Total)	Water	mg/L	0.100	0.0446	20	1/10	66-129	1/20	87-113	1/20	NA
110.2	2120B		Color (True)	Water	CU	5.0	NA	+/-5units	1/10	NA	NA	NA	NA	NA
120.1			Conductivity	Water	umhos/cm	NA	NA	20	1/20	NA	NA	90-110	1/10	NA
7196A	3500-Cr B		CR+6 Hexavalent Chromium	Water	mg/L	0.010	0.0011	20	1/10	85-115	1/10	90-109	1/20	90-110
218.6			CR+6 Hexavalent Chromium	Water	mg/L	0.010	0.0031	20	1/20	90-110	1/10	90-110	1/20	95-105
7199			CR+6 Hexavalent Chromium	Water	mg/L	0.010	0.0031	20	1/20	70-130	1/20	80-120	1/20	90-110
3060/7196A			CR+6 Hexavalent Chromium	Soil	mg/Kg	4.00	2.00	20	1/20	75-125	1/10	80-120	1/20	90-110
3060/7199			CR+6 Hexavalent Chromium	Soil	mg/Kg	0.40	0.101	20	1/20	75-125	1/20	80-120	1/20	90-110
		ILM05.3	Cyanide, Total	Water	mg/L	0.010		20	1/20	75-125	1/20	85-115	1/20	85-115
		ILM05.3	Cyanide, Total	Soil	mg/Kg	1.00		20	1/20	30-162	1/20	85-115	1/20	85-115
335.2/335.4			Cyanide, Total	Water	mg/L	0.010	0.0031	20	1/10	10-171	1/10	90-110	IL & LL 1/2	90-110
9012A			Cyanide, Total	Water	mg/L	0.010	0.0031	20	1/10	27-153	1/10	85-115	IL & LL 1/2	85-115
9012A			Cyanide, Total	Soil	mg/Kg	1.00	0.218	30	1/10	30-162	1/10	85-115	IL & LL 1/2	85-115
S. 7.3 SW846			Cyanide, Reactivity	Water	mg/Kg	20.0	0.082	20	1/20	1-100	1/20	1-100	1/20	85-115
S. 7.3 SW846			Cyanide, Reactivity	Soil	mg/Kg	20.0	0.082	30	1/20	1-100	1/20	1-100	1/20	85-115
D1298			Density / Specific Gravity	non-aq	kg/m3	NA	NA	10	1/10	NA	NA	0.002units	20/hydromet	NA
NYSDEC 89-9			Ethylene Glycol	Water	mg/L	1.0	0.0526	20	1/20	70-130	1/20	80-120	1/20	90-110
3500-FE D			Ferrous Iron	Water	mg/L	0.10	0.0417	20	1/10	82-123	1/10	86-114	1/20	90-110
3500-FE D			Ferrous Iron	Soil	mg/kg	10.0	2.5	30	1/10	30-161	1/10	81-120	1/20	90-110
340.2			Fluoride by ISE	Water	mg/L	0.100	0.0115	20	1/20	82-116	1/20	82-116	1/20	90-110
300.0/9056			Fluoride by IC	Water	mg/L	0.100	0.0060	20	1/10	85-129	1/10	90-110	1/20	90-110

WETCHEM QC LIMITS

Columbia Analytical Services Rochester, NY

METHOD			ANALYTE	MATRIX	UNITS	MRL	MDL	DUP		MS		LCS		ICV/CCV
EPA	SM	Other						(RPD)	Freq	(% REC)	Freq	(% Rec)	Frequency	
300.0M/9056			Fluoride by IC	Soil	mg/Kg	20.0	0.609	30	1/10	70-130	1/10	90-110	1/20	90-110
5050/9056			Fluoride for total halogens	NonAq/Soil	mg/kg	30.0		20	1/20	NA	NA	50-150	1/20	90-110
130.2	2340C		Hardness, Total	Water	mg/L	2.00	0.311	20	1/10	84-113	1/10	93-107	1/10	NA
1010			IGN- Pensky Martens Closed Cup	Water	degree C	NA	NA	10	1/20	NA	NA	24.3-29.7 C	1/20	NA
D92/ 1010.CC			IGN - Cleveland Open Cup	Soil	degree C	NA	NA	30	1/20	NA	NA	NA	NA	NA
300.0/9056			Iodide	Water	mg/L	0.20	0.041	20	1/10	70-130	1/10	90-110	1/20	90-110
5050/9056			Iodide - for total Halogens	NonAq/Soil	mg/kg	60		20	1/20	NA	NA	30-150	1/20	90-110
300.0/9056			Nitrate as N by IC	Water	mg/L	0.050	0.008	20	1/10	79-111	1/10	90-110	1/20	90-110
300.0M/9056			Nitrate as N by IC	Soil	mg/Kg	5.00	0.359	30	1/10	79-113	1/10	90-110	1/20	90-110
353.2			Nitrate/Nitrite as N	Water	mg/L	0.050	0.00284	20	1/10	69-123	1/10	90-110	1/20	90-110
300.0/9056			Nitrite as N by IC	Water	mg/L	0.050	0.001	20	1/10	70-130	1/10	90-110	1/20	90-110
353.2			Nitrite as N	Water	mg/L	0.010	0.00776	20	1/10	73-126	1/10	90-110	1/20	90-110
351.2			Nitrogen, Total Kjeldahl	Water	mg/L	0.200	0.075	20	1/10	70-117	1/10	72-108	1/20	-110(I)85-115(
351.2-M			Nitrogen, Total Kjeldahl	Soil	mg/Kg	20.0	12.1	30	1/10	13-162	1/10	13-162	1/20	-110(I)85-115(
351.2 LL			Nitrogen, Total Kjeldahl-LL	Water	mg/L	0.080	0.075	20	1/10	70-117	1/10	76-124	1/20	-110(I)85-115(
1664A			Oil and Grease by 1664A	Water	mg/L	5.00	0.84	20	1/20	78-114	1/20	78-114	1/20	NA
365.1			Othophosphate -LL	Water	mg/L	0.0020	0.0018	20	1/10	33-150	1/10	90-110	1/20	90-110
365.1			Orthophosphate	Water	mg/L	0.010	0.0026	20	1/10	33-150	1/10	90-110	1/20	90-110
9095			Paint Filter test	Sludge	mg/Kg	NA	NA	30	1/20	NA	NA	NA	NA	NA
E203			Percent Water	Waste	%	0.1	0.0112	20	1/20	NA	NA	(MeOH)86-132	1/10	NA
150.1	$4500-H^+$ B		pH	Water	SU	NA	NA	±0.10	1/10	NA	NA	NA	NA	±0.05
9040/9045.			pH / Corrosivity	Water	SU	NA	NA	±0.10	1/20	NA	NA	NA	NA	±0.05
9040/9045.			pH / Corrosivity	Soil	SU	NA	NA	±0.10	1/20	NA	NA	NA	NA	±0.05
420.4			Phenolics, Total LL	Water	mg/L	0.002	0.00044	20	1/10	70-123	1/10	85-113	1/20	85-115
420.4			Phenolics, Total	Water	mg/L	0.005	0.00044	20	1/10	70-123	1/10	85-113	1/20	85-115
420.4			Phenolics, Manual Distillation	Water	mg/L	0.005		20	1/10	68-118	1/10	68-118	1/20	85-115
9066			Phenolics, Total	Water	mg/L	0.005	0.00044	20	1/10	70-123	1/10	85-113	1/20	85-115
9066			Phenolics, Total	Soil	mg/Kg	0.100	0.0177	30	1/10	66-108	1/10	75-112	1/20	85-115

METHOD			ANALYTE	MATRIX	UNITS	MRL	MDL	DUP		MS		LCS		ICV/CCV
EPA	SM	Other						(RPD)	Freq	(% REC)	Freq	(% Rec)	Frequency	
365.1 M			Phosphorus, Total - LL	Water	mg/L	0.003	0.0009	20	1/10	51-148	1/10	84-114	1/20	90-110
365.1			Phosphorus, Total	Water	mg/L	0.050	0.0158	20	1/10	51-148	1/10	90-110	1/20	90-110
365.1-M			Phosphorus, Total	Soil	mg/Kg	5.00	1.02	30	1/20	16-184	1/10	16-184	1/20	90-110
GEN-SILICON			Silicon, Percent	Soil/nonAq	%	0.0467		10	1/10	NA	NA	80-120	1/20	NA
370.1		I-2700-85	Silica, Dissolved	Water	mg/L	0.010	0.0031	20	1/10	80-117	1/10	90-117	1/20	90-110
160.3M			Solids, Dry Weight Percent (DWPS)	Soil	mg/Kg	1.0	NA	30	1/10	NA	NA	NA	NA	NA
160.5			Solids, Settleable	Water	mg/L	0.100	NA	20	1/20	NA	NA	NA	NA	NA
160.3	2540B		Solids, Total (TS)	Water	mg/L	10.0	NA	20	1/10	NA	NA	80-120	1/20	NA
160.1	2540C		Solids, Total Dissolved (TDS)	Water	mg/L	10.0	3.6	20	1/10	NA	NA	80-120	1/20	NA
160.2	2540D		Solids, Total Suspended (TSS)	Water	mg/L	1.00	NA	20	1/10	NA	NA	80-120	1/20	NA
160.4			Solids, Total Volatile (TVS)	Water	mg/L	10.0	NA	20	1/10	NA	NA	80-120	NA	NA
160.4D			Solids, Volatile Dissolved (VDS)	Water	mg/L	10.0	NA	20	1/10	NA	NA	NA	NA	NA
160.4S			Solids, Volatile Suspended (VSS)	Water	mg/L	1.00	NA	20	1/10	NA	NA	NA	NA	NA
	2540G		Solids, Percent Volatile	Soil	%	NA	NA	20	1/10	NA	NA	NA	NA	NA
375.4	426C		Sulfate, Turbidimetric	Water	mg/L	5.00	0.528	20	1/10	72-129	1/10	72-129	1/20	NA
300.0/9056			Sulfate by IC	Water	mg/L	0.200	0.007	20	1/10	61-128	1/10	90-110	1/20	90-110
300.0M/0956			Sulfate by IC	Soil	mg/Kg	30.0	0.518	30	1/10	25-151	1/10	90-110	1/20	90-110
AVS			Sulfide, Acid Volatile (AVS)	Soil	umoles/g	1.00	0.614	30	1/20	56-196	1/20	56-196	1/20	NA
S. 7.3 SW846			Sulfide Reactivity	Water	mg/Kg	100	65.2	20	1/20	0-235	NA	84-224	1/20	NA
S. 7.3 SW846			Sulfide Reactivity	Soil	mg/Kg	100	65.2	30	1/20	14-235	NA	14-235	1/20	NA
9030B			Sulfide, Acid Soluble	Water	mg/L	1.00	0.981	20	1/20	26-122	1/20	61-111	1/20	NA
9030B			Sulfide, Acid Soluble	Soil	mg/Kg	20.0	17.9	30	1/20	10-153	1/20	53-116	1/20	NA
376.1	4500-S F		Sulfide, Total	Water	mg/L	1.00	0.146	20	1/10	61-140	1/20	61-140	1/20	NA
300M			Sulfur- Alkaline Digestion	Soil	mg/kg	6.68	2.75	30	1/20	62-124	1/20	62-124	1/20	NA
425.1	5540C		Surfactants	Water	mg/L	0.02	0.00813	20	1/20	58-139	NA	58-139	1/20 HL	NA
415.1			TIC	Water	mg/L	1.00	0.0573	20	1/10	82-127	1/10	82-127	1/20	85-115
415.1	5310C		TOC - LL	Water	mg/L	0.05	0.0457	20	1/10	56-139	1/10	87-120	1/20	85-115
9060			TOC - LL	Water	mg/L	0.10	0.0457	20	1/10	56-139	1/10	87-120	1/20	85-115
415.1M/9060	5310C		TOC - RL	Water	mg/L	1.00	0.306	20	1/10	56-139	1/10	87-120	1/20	85-115
TOCLK			TOC - Lloyd Kahn	Soil	mg/Kg	300	39.8	30	1/20	29-163	1/20	55-133	1/20	85-115
TOCWB			TOC - Walkley-Black	Soil	mg/Kg	0.10	0.0262	30	1/20	69-105	1/20	83-98	1/10	NA
1664A			TPH by 1664A	Water	mg/L	5.00	1.43	20	1/20	64-132	1/20	64-132	1/20	NA
180.1			Turbidity	Water	NTU	0.10	0.035	10	1/20	NA	NA	90-110	3@run start	90-110

METALS ANALYSES QC LIMITS 2005									
Method	**Analyte**	**Matrix**	**Method Reporting Limit (MRL)**	**Method Detection Limit (MDL)**	**Precision (RPD)**	**Matrix Spike Accuracy (%REC)**	**LCS Accuracy (%REC)**	**ICV (%REC)**	**CCV (%REC)**
200.7 (ICP) (ug/L)	Aluminum	Water	100	20.4	20	70-130	85-115	95-105	90-110
	Antimony		60 (LL 10)	32.6 (3.23)	20	70-130	85-115	95-105	90-110
	Arsenic		100 (LL 10)	39.1 (3.56)	20	70-130	85-115	95-105	90-110
	Barium		20	3.41	20	70-130	85-115	95-105	90-110
	Beryllium		5.0	0.238	20	70-130	85-115	95-105	90-110
	Boron		200	19.5	20	70-130	85-115	95-105	90-110
	Cadmium		5.0	3.36	20	70-130	85-115	95-105	90-110
	Calcium		500	15.4	20	70-130	85-115	95-105	90-110
	Chromium		10	1.87	20	70-130	85-115	95-105	90-110
	Cobalt		50	2.43	20	70-130	85-115	95-105	90-110
	Copper		20	10.0	20	70-130	85-115	95-105	90-110
	Iron		100	10.95	20	70-130	85-115	95-105	90-110
	Lead		50 (LL 5.0)	27.9 (1.39)	20	70-130	85-115	95-105	90-110
	Lithium		100	28.39	20	70-130	85-115	95-105	90-110
	Magnesium		500	18.13	20	70-130	85-115	95-105	90-110
	Manganese		10	0.382	20	70-130	85-115	95-105	90-110
	Molybdenum		25	7.79	20	70-130	85-115	95-105	90-110
	Nickel		40	4.25	20	70-130	85-115	95-105	90-110
	Potassium		2000	48.8	20	70-130	85-115	95-105	90-110
	Selenium		100 (LL 10)	54.5 (4.23)	20	70-130	85-115	95-105	90-110
	Silicon		1000	17.39	20	70-130	85-115	95-105	90-110
	Silver		10	0.915	20	70-130	85-115	95-105	90-110
	Sodium		500	452	20	70-130	85-115	95-105	90-110
	Strontium		100	1.06	20	70-130	85-115	95-105	90-110
	Thallium		10	4.39	20	70-130	85-115	95-105	90-110
	Tin		500	19.5	20	70-130	85-115	95-105	90-110
	Titanium		50	0.336	20	70-130	85-115	95-105	90-110
	Vanadium		50	6.52	20	70-130	85-115	95-105	90-110
	Zinc		20	5.24	20	70-130	85-115	95-105	90-110
1631 (CVAF) ng/L	Mercury	Water	1.00	0.084	20	70-130	80-120	80-120	80-120
245.1 (CVAA) ug/L	Mercury	Water	0.300	0.008	20	70-130	85-115	95-105	90-110
206.2 (GFAA) ug/L	Arsenic	Water	10.0	1.711	20	75-125	85-115	90-110	90-110
239.2 (GFAA) ug/L	Lead	Water	5.00	0.814	20	75-125	85-115	90-110	90-110
239.2 (GFAA) ug/L	Lead - DW	Water	1.00	0.384	20	75-125	85-115	90-110	90-110
270.2 (GFAA) ug/L	Selenium	Water	5.00	1.504	20	75-125	85-115	90-110	90-110
279.2 (GFAA) ug/L	Thallium	Water	10.0	2.975	20	75-125	85-115	90-110	90-110
6010B (ICP) (ug/L)	Aluminum	Water	100	20.4	20	75-125	80-120	90-110	90-110
	Antimony		60 (LL 10)	32.6 (3.23)	20	75-125	80-120	90-110	90-110
	Arsenic		100 (LL 10)	39.1 (3.56)	20	75-125	80-120	90-110	90-110
	Barium		20	3.41	20	75-125	80-120	90-110	90-110
	Beryllium		5.0	0.238	20	75-125	80-120	90-110	90-110
	Boron		200	19.5	20	75-125	80-120	90-110	90-110
	Cadmium		5.0	3.36	20	75-125	80-120	90-110	90-110
	Calcium		500	15.4	20	75-125	80-120	90-110	90-110
	Chromium		10	1.87	20	75-125	80-120	90-110	90-110
	Cobalt		50	2.43	20	75-125	80-120	90-110	90-110
	Copper		20	10.0	20	75-125	80-120	90-110	90-110
	Iron		100	10.95	20	75-125	80-120	90-110	90-110
	Lead		50 (LL 5.0)	27.9 (1.39)	20	75-125	80-120	90-110	90-110
	Lithium		100	28.39	20	75-125	80-120	90-110	90-110
	Magnesium		500	18.13	20	75-125	80-120	90-110	90-110
	Manganese		10	0.382	20	75-125	80-120	90-110	90-110
	Molybdenum		25	7.79	20	75-125	80-120	90-110	90-110

METALS ANALYSES QC LIMITS 2005									
Method	**Analyte**	**Matrix**	**Method Reporting Limit (MRL)**	**Method Detection Limit (MDL)**	**Precision (RPD)**	**Matrix Spike Accuracy (%REC)**	**LCS Accuracy (%REC)**	**ICV (%REC)**	**CCV (%REC)**
	Nickel		40	4.25	20	75-125	80-120	90-110	90-110
	Potassium		2000	48.8	20	75-125	80-120	90-110	90-110
	Selenium		100 (LL 10)	54.5 (4.23)	20	75-125	80-120	90-110	90-110
	Silicon		1000	17.39	20	75-125	80-120	90-110	90-110
	Silver		10	0.915	20	75-125	80-120	90-110	90-110
	Sodium		500	452	20	75-125	80-120	90-110	90-110
	Strontium		100	1.06	20	75-125	80-120	90-110	90-110
	Thallium		10	4.39	20	75-125	80-120	90-110	90-110
	Tin		500	19.5	20	75-125	80-120	90-110	90-110
	Titanium		50	0.336	20	75-125	80-120	90-110	90-110
	Vanadium		50	6.52	20	75-125	80-120	90-110	90-110
	Zinc		20	5.24	20	75-125	80-120	90-110	90-110
7470A (CVAA) ug/L	Mercury	Water	0.300	0.00806	20	75-125	80-120	90-110	80-120
7060A (GFAA) ug/L	Arsenic	Water	10	1.711	20	75-125	80-120	90-110	80-120
7421 (GFAA) ug/L	Lead	Water	5.0	0.814	20	75-125	80-120	90-110	80-120
7740 (GFAA) ug/L	Selenium	Water	5.0	1.504	20	75-125	80-120	90-110	80-120
7841 (GFAA) ug/L	Thallium	Water	10	2.975	20	75-125	80-120	90-110	80-120
6010B (ICP) (mg/Kg)	Aluminum	Soil	10	6.72	20	75-125	C of A	90-110	90-110
	Antimony		6.0 (1.0 LL)	2.61 (0.28 LL)	20	75-125	C of A	90-110	90-110
	Arsenic		10 (1.0 LL)	3.89 (0.20 LL)	20	75-125	C of A	90-110	90-110
	Barium		2.00	0.262	20	75-125	C of A	90-110	90-110
	Beryllium		0.5	0.0356	20	75-125	C of A	90-110	90-110
	Boron		20	0.988	20	75-125	C of A	90-110	90-110
	Cadmium		0.5	0.303	20	75-125	C of A	90-110	90-110
	Calcium		50	11.1	20	75-125	C of A	90-110	90-110
	Chromium		1.00	0.122	20	75-125	C of A	90-110	90-110
	Cobalt		5.0	0.249	20	75-125	C of A	90-110	90-110
	Copper		2.0	0.568	20	75-125	C of A	90-110	90-110
	Iron		10	2.11	20	75-125	C of A	90-110	90-110
	Lead		5.0 (0.5 LL)	1.66 (0.097 LL)	20	75-125	C of A	90-110	90-110
	Lithium		10	3.22	20	75-125	C of A	90-110	90-110
	Magnesium		50	1.31	20	75-125	C of A	90-110	90-110
	Manganese		1.00	0.0247	20	75-125	C of A	90-110	90-110
	Molybdenum		2.5	0.837	20	75-125	C of A	90-110	90-110
	Nickel		4.00	0.473	20	75-125	C of A	90-110	90-110
	Potassium		200	3.43	20	75-125	C of A	90-110	90-110
	Selenium		10 (1.0 LL)	3.39 (0.31 LL)	20	75-125	C of A	90-110	90-110
	Silicon		100	2.33	20	75-125	C of A	90-110	90-110
	Silver		1.00	0.078	20	75-125	C of A	90-110	90-110
	Sodium		50	34.9	20	75-125	C of A	90-110	90-110
	Strontium		10	1.64	20	75-125	C of A	90-110	90-110
	Thallium		1.00	0.397	20	75-125	C of A	90-110	90-110
	Tin		50	1.93	20	75-125	C of A	90-110	90-110
	Titanium		5.0	0.066	20	75-125	C of A	90-110	90-110
	Vanadium		5.0	0.801	20	75-125	C of A	90-110	90-110
	Zinc		2.0	0.844	20	75-125	C of A	90-110	90-110
7471A (CVAA) mg/Kg	Mercury	Soil	0.05	0.0017	35	75-125	C of A	90-110	80-120
7060A (GFAA) mg/Kg	Arsenic	Soil	1.0	0.120	35	75-125	C of A	90-110	80-120
7421 (GFAA) mg/Kg	Lead	Soil	0.5	0.043	35	75-125	C of A	90-110	80-120
7740 (GFAA) mg/Kg	Selenium	Soil	0.5	0.156	35	75-125	C of A	90-110	80-120
7841 (GFAA) mg/Kg	Thallium	Soil	1.0	0.192	35	75-125	C of A	90-110	80-120

METALS ANALYSES QC LIMITS 2005									
Method	**Analyte**	**Matrix**	**Method Reporting Limit (MRL)**	**Method Detection Limit (MDL)**	**Precision (RPD)**	**Matrix Spike Accuracy (%REC)**	**LCS Accuracy (%REC)**	**ICV (%REC)**	**CCV (%REC)**
200.7 CLP-M or ILM 4.1 (ILM 5.3) (ug/L)	Aluminum	Water	200	17	20	75-125	85-115	90-110	90-110
	Antimony		60	3.09	20	75-125	85-115	90-110	90-110
	Arsenic		10	6.06	20	75-125	85-115	90-110	90-110
	Barium		200	1.44	20	75-125	85-115	90-110	90-110
	Beryllium		5	0.168	20	75-125	85-115	90-110	90-110
	Cadmium		5	0.168	20	75-125	85-115	90-110	90-110
	Calcium		5000	24.1	20	75-125	85-115	90-110	90-110
	Chromium		10	0.938	20	75-125	85-115	90-110	90-110
	Cobalt		50	0.625	20	75-125	85-115	90-110	90-110
	Copper		25	3.23	20	75-125	85-115	90-110	90-110
	Iron		100	21.4	20	75-125	85-115	90-110	90-110
	Lead		3 (10)	1.53	20	75-125	85-115	90-110	90-110
	Magnesium		5000	3.69	20	75-125	85-115	90-110	90-110
	Manganese		15	0.283	20	75-125	85-115	90-110	90-110
	Nickel		40	0.574	20	75-125	85-115	90-110	90-110
	Potassium		5000	13.7	20	75-125	85-115	90-110	90-110
	Selenium		10 (35)		20	75-125	85-115	90-110	90-110
	Silver		10	0.536	20	75-125	85-115	90-110	90-110
	Sodium		5000	329	20	75-125	85-115	90-110	90-110
	Thallium		10 (25)	2.35	20	75-125	85-115	90-110	90-110
	Vanadium		50	0.119	20	75-125	85-115	90-110	90-110
	Zinc		20 (60)	3.81	20	75-125	85-115	90-110	90-110
200.7 CLP additional analytes upon request									
(ug/L)	Boron	Water	200	15.6	20	75-125	85-115	90-110	90-110
	Molybdenum		25	0.54	20	75-125	85-115	90-110	90-110
	Titanium		50	0.238	20	75-125	85-115	90-110	90-110
	Tin		500	18.8	20	75-125	85-115	90-110	90-110
245.1 CLP-M(CVAA) ug/L	Mercury	Water	0.2	0.0086	20	75-125	80-120	90-110	80-120
206.2 CLP-M (GFAA) ug.L	Arsenic	Water	10	1.71	20	75-125	85-115	90-110	80-120
239.2 CLP-M (GFAA) ug/L	Lead	Water	3	0.814	20	75-125	85-115	90-110	80-120
270.2 CLP-M (GFAA) ug/L	Selenium	Water	5	1.504	20	75-125	85-115	90-110	80-120
279.2 CLP-M (GFAA) ug/L	Thallium	Water	10	2.92	20	75-125	85-115	90-110	80-120
200.7 CLP-M or ILM 4.1 (ILM 5.3) (mg/Kg)	Aluminum	Soils	40 (20)	7.73	20	75-125	C of A	90-110	90-110
	Antimony		12 (6)	0.504	20	75-125	C of A	90-110	90-110
	Arsenic		2 (1)	0.371	20	75-125	C of A	90-110	90-110
	Barium		40 (20)	0.0788	20	75-125	C of A	90-110	90-110
	Beryllium		1 (0.5)	0.0307	20	75-125	C of A	90-110	90-110
	Cadmium		1 (0.5)	0.0495	20	75-125	C of A	90-110	90-110
	Calcium		1000 (500)	14.5	20	75-125	C of A	90-110	90-110
	Chromium		2 (1)	0.147	20	75-125	C of A	90-110	90-110
	Cobalt		10 (5)	0.099	20	75-125	C of A	90-110	90-110
	Copper		5 (2.5)	0.541	20	75-125	C of A	90-110	90-110
	Iron		20 (10)	2.85	20	75-125	C of A	90-110	90-110
	Lead		0.6 (1)	0.261	20	75-125	C of A	90-110	90-110
	Magnesium		1000 (500)	0.906	20	75-125	C of A	90-110	90-110
	Manganese		3 (1.5)	0.057	20	75-125	C of A	90-110	90-110
	Nickel		8 (4)	0.153	20	75-125	C of A	90-110	90-110
	Potassium		1000 (500)	3.43	20	75-125	C of A	90-110	90-110
	Selenium		1 (3.5)	0.863	20	75-125	C of A	90-110	90-110
	Silver		2 (1)	0.12	20	75-125	C of A	90-110	90-110
	Sodium		1000 (500)	52.7	20	75-125	C of A	90-110	90-110
	Thallium		2 (2.5)	0.855	20	75-125	C of A	90-110	90-110
	Vanadium		10 (5)	0.14	20	75-125	C of A	90-110	90-110
	Zinc		4 (6)	0.918	20	75-125	C of A	90-110	90-110
200.7 CLP additional analytes upon request									
(mg/Kg)	Boron	Soil	40	2.17	20	75-125	85-115	90-110	90-110
	Molybdenum		5	0.133	20	75-125	85-115	90-110	90-110
	Titanium		5	0.031	20	75-125	85-115	90-110	90-110
	Tin		100	1.67	20	75-125	85-115	90-110	90-110
245.5 CLP-M (CVAA) mg/Kg	Mercury	Soil	0.1	0.0017	20	75-125	C of A	80-120	80-120

METALS ANALYSES QC LIMITS 2005									
Method	**Analyte**	**Matrix**	**Method Reporting Limit (MRL)**	**Method Detection Limit (MDL)**	**Precision (RPD)**	**Matrix Spike Accuracy (%REC)**	**LCS Accuracy (%REC)**	**ICV (%REC)**	**CCV (%REC)**
200.8 (ICP-MS) ug/L	Aluminum	Water	10	1.6	20	70-130	85-115	90-110	90-110
	Arsenic		1.0	0.19	20	70-130	85-115	90-110	90-110
	Antimony		1.0	0.0757	20	70-130	85-115	90-110	90-110
	Barium		1.0	0.0478	20	70-130	85-115	90-110	90-110
	Beryllium		1.0	0.072	20	70-130	85-115	90-110	90-110
	Cadmium		1.0	0.0368	20	70-130	85-115	90-110	90-110
	Chromium		1.0	0.203	20	70-130	85-115	90-110	90-110
	Cobalt		1.0	0.0857	20	70-130	85-115	90-110	90-110
	Copper		1.0	0.77	20	70-130	85-115	90-110	90-110
	Lead		1.0	0.0521	20	70-130	85-115	90-110	90-110
	Manganese		1.0	0.123	20	70-130	85-115	90-110	90-110
	Molybdenum		1.0	0.067	20	70-130	85-115	90-110	90-110
	Nickel		1.0	0.281	20	70-130	85-115	90-110	90-110
	Selenium		2.0	0.307	20	70-130	85-115	90-110	90-110
	Silver		1.0	0.0452	20	70-130	85-115	90-110	90-110
	Thallium		1.0	0.0424	20	70-130	85-115	90-110	90-110
	Vanadium		1.0	0.0996	20	70-130	85-115	90-110	90-110
	Zinc		5.0	0.63	20	70-130	85-115	90-110	90-110
6020 (ICP-MS) ug/L	Aluminum	Water	10	1.6	20	75-125	80-120	90-110	90-110
	Arsenic		1.0	0.19	20	75-125	80-120	90-110	90-110
	Antimony		1.0	0.0757	20	75-125	80-120	90-110	90-110
	Barium		1.0	0.0478	20	75-125	80-120	90-110	90-110
	Beryllium		1.0	0.072	20	75-125	80-120	90-110	90-110
	Cadmium		1.0	0.0368	20	75-125	80-120	90-110	90-110
	Chromium		1.0	0.203	20	75-125	80-120	90-110	90-110
	Cobalt		1.0	0.0857	20	75-125	80-120	90-110	90-110
	Copper		1.0	0.77	20	75-125	80-120	90-110	90-110
	Lead		1.0	0.0521	20	75-125	80-120	90-110	90-110
	Manganese		1.0	0.123	20	75-125	80-120	90-110	90-110
	Molybdenum		1.0	0.067	20	75-125	80-120	90-110	90-110
	Nickel		1.0	0.281	20	75-125	80-120	90-110	90-110
	Selenium		2.0	0.307	20	75-125	80-120	90-110	90-110
	Silver		1.0	0.0452	20	75-125	80-120	90-110	90-110
	Thallium		1.0	0.0424	20	75-125	80-120	90-110	90-110
	Vanadium		1.0	0.0996	20	75-125	80-120	90-110	90-110
	Zinc		5.0	0.63	20	75-125	80-120	90-110	90-110
6020 (ICP-MS) ug/g	Aluminum	Soil	2.0	1.44	20	75-125	C of A	90-110	90-110
	Arsenic		0.1	0.0225	20	75-125	C of A	90-110	90-110
	Antimony		0.2	0.044	20	75-125	C of A	90-110	90-110
	Barium		0.1	0.0855	20	75-125	C of A	90-110	90-110
	Beryllium		0.1	0.0085	20	75-125	C of A	90-110	90-110
	Cadmium		0.1	0.005	20	75-125	C of A	90-110	90-110
	Chromium		0.1	0.0315	20	75-125	C of A	90-110	90-110
	Cobalt		0.5	0.0044	20	75-125	C of A	90-110	90-110
	Copper		4.0	0.062	20	75-125	C of A	90-110	90-110
	Lead		0.1	0.0845	20	75-125	C of A	90-110	90-110
	Manganese		0.1	0.025	20	75-125	C of A	90-110	90-110
	Molybdenum		0.2	0.0145	20	75-125	C of A	90-110	90-110
	Nickel		0.1	0.034	20	75-125	C of A	90-110	90-110
	Selenium		0.2	0.084	20	75-125	C of A	90-110	90-110
	Silver		0.1	0.0114	20	75-125	C of A	90-110	90-110
	Thallium		0.1	0.07	20	75-125	C of A	90-110	90-110
	Vanadium		0.1	0.015	20	75-125	C of A	90-110	90-110
	Zinc		4.0	3.08	20	75-125	C of A	90-110	90-110

METALS ANALYSES QC LIMITS 2005									
Method	**Analyte**	**Matrix**	**Method Reporting Limit (MRL)**	**Method Detection Limit (MDL)**	**Precision (RPD)**	**Matrix Spike Accuracy (%REC)**	**LCS Accuracy (%REC)**	**ICV (%REC)**	**CCV (%REC)**
200.8 CLP-M (ICP-MS) ILM 5.3 (ug/L)	Aluminum	Water	--	1.6	20	70-130	85-115	90-110	90-110
	Arsenic		1.0	0.19	20	70-130	85-115	90-110	90-110
	Antimony		2.0	0.0757	20	70-130	85-115	90-110	90-110
	Barium		10.0	0.0478	20	70-130	85-115	90-110	90-110
	Beryllium		1.0	0.072	20	70-130	85-115	90-110	90-110
	Cadmium		1.0	0.0368	20	70-130	85-115	90-110	90-110
	Chromium		2.0	0.203	20	70-130	85-115	90-110	90-110
	Cobalt		1.0	0.0857	20	70-130	85-115	90-110	90-110
	Copper		2.0	0.77	20	70-130	85-115	90-110	90-110
	Lead		1.0	0.0521	20	70-130	85-115	90-110	90-110
	Manganese		1.0	0.123	20	70-130	85-115	90-110	90-110
	Molybdenum		--	0.067	20	70-130	85-115	90-110	90-110
	Nickel		1.0	0.281	20	70-130	85-115	90-110	90-110
	Selenium		5.0	0.307	20	70-130	85-115	90-110	90-110
	Silver		1.0	0.0452	20	70-130	85-115	90-110	90-110
	Thallium		1.0	0.0424	20	70-130	85-115	90-110	90-110
	Vanadium		1.0	0.0996	20	70-130	85-115	90-110	90-110
	Zinc		2.0	0.63	20	70-130	85-115	90-110	90-110

LL Low Level Analysis
C of A Certificate of Analysis QC Limits Provided per manufacturer.

APPENDIX D

DATA QUALIFIERS

ORGANIC QUALIFIERS

U - Indicates compound was analyzed for but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture.

J - Indicates an estimated value. The flag is used either when estimating a concentration for tentatively identified compounds, or when the data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit and greater than the MDL. This flag is also used for DoD instead of "P" as indicated below.

N - Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search.

P - This flag is used for a pesticide/Aroclor target analyte when there is a greater than 40% (25% for CLP) difference for detected concentrations between the two GC columns. The concentration is reported on the Form I and flagged with a "P" ("J" for DoD).

Q - for DoD only – indicates a pesticide/Aroclor target is not confirmed. This flag is used when there is ≥ 100% difference for the detected concentrations between the two GC columns.

C - This flag applies to pesticide results where the identification has been confirmed by GC/MS.

B - This flag is used when the analyte is found in the associated blank as well as in the sample.

E - This flag identifies compounds whose concentrations exceed the calibration range of the instrument for that specific analysis.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor. If a sample or extract is re-analyzed at a higher dilution factor, as in the "E" flag above, the "DL" suffix is appended to the sample number on the Form I for the diluted sample, and ALL concentration values reported on that Form I are flagged with the "D" flag.

A - This flag indicates that a TIC is a suspected aldol-condensation product.

X - As specified in Case Narrative.

* - This flag identifies compounds associated with a quality control parameter which exceeds laboratory limits.

CAS/Rochester Lab ID # for State Certifications

NELAP Accredited
Delaware Accredited
Connecticut ID # PH0556
Florida ID # E87674
Illinois ID #200047
Maine ID #NY0032
Massachusetts ID # M-NY032
Navy Facilities Engineering Service Center Approved

Nebraska Accredited
New Jersey ID # NY004
New York ID # 10145
New Hampshire ID # 294100 A/B
Pennsylvania ID# 68-786
Rhode Island ID # 158
West Virginia ID # 292

INORGANIC QUALIFIERS

C (Concentration) qualifier –

B - if the reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but was greater than or equal to the Instrument Detection Limit (IDL). This qualifier may also be used to indicate that there was contamination above the reporting limit in the associated blank. See Narrative for details.

U - if the analyte was analyzed for, but not detected

Q qualifier - Specified entries and their meanings are as follows:

D - Spike was diluted out

E - The reported value is estimated because the serial dilution did not meet criteria.

J - Estimated Value

M - Duplicate injection precision not met.

N - Spiked sample recovery not within control limits.

S - The reported value was determined by the Method of Standard Additions (MSA).

W - Post-digestion spike for Furnace AA Analysis is out of control limits (85-115), while sample absorbance is less than 50% of spike absorbance.

* - Duplicate analysis not within control limits.

+ - Correlation coefficient for the MSA is less than 0.995.

M (Method) qualifier:

- "P" for ICP
- "A" for Flame AA
- "F" for Furnace AA
- "PM" for ICP when Microwave Digestion is used
- "AM" for Flame AA when Microwave Digestion is used
- "FM" for Furnace M when Microwave Digestion is used
- "CV" for Manual Cold Vapor AA
- "AV" for Automated Cold Vapor AA
- "AF" for Automated Cold Vapor Atomic Fluorescence Spectrometry
- "CA" for Midi-Distillation Spectrophotometric
- "AS" for Semi-Automated Spectrophotometric
- "C" for Manual Spectrophotometric
- "T" for Titrimetric
- " " where no data has been entered
- "NR" if the analyte is not required to be analyzed.

CAS/Rochester Lab ID # for State Certifications

NELAP Accredited
Delaware Accredited
Connecticut ID # PH0556
Florida ID # E87674
Illinois ID #200047
Maine ID #NY0032
Massachusetts ID # M-NY032
Navy Facilities Engineering Service Center Approved
Nebraska Accredited
New Jersey ID # NY004
New York ID # 10145
New Hampshire ID # 294100 A/B
Pennsylvania ID # 68-786
Rhode Island ID # 158
West Virginia ID # 292

APPENDIX E

PREVENTIVE MAINTENANCE PROCEDURES

Preventive Maintenance Procedures

Instrument	**Activity**	**Frequency**
Refrigerators and Coolers	Record temperatures Clean coils Check coolant	Daily As needed As needed or if temperature outside limit
Fume Hoods	Face velocity measured Sash operation	Quarterly As needed
Ovens	Clean	As needed or if temperature outside limit
Incubators	Record temperatures	Daily, morning and evening
Water Baths	Wash with disinfectant solution	When water is murky, dirty, or growth appears
Autoclave	Check temperature Clean	Every month When mold or growth appears
Top Loading Balances	Check calibration	Before every use
Analytical Balances	Check alignment Check calibration Clean pans and compartment	Before every use Before every use After every use
Dissolved Oxygen Meter	Change membrane	When fluctuations occur
pH probes	Condition probe	When fluctuations occur
UV-visible Spectrophotometer	Wavelength check	Annually
Total Organic Carbon Analyzers	Check IR zero Check digestion/condensation vessels Clean digestion chamber Clean permeation tube Clean six-port valves Clean sample pump Clean carbon scrubber Clean IR cell	Weekly Each use Every 2000 hours, or as needed Every 2000 hours, or as needed Every 200 - 2000 hours, or as needed Every 200 - 2000 hours, or as needed Every 200 - 2000 hours, or as needed Every 2000 - 4000 hours, or as needed
Total Organic Halogen Analyzers	Change cell electrolyte Change electrode fluids Change pyrolysis tube Change inlet and outlet tubes Change electrodes	Daily, or as needed Daily, or as needed As needed As needed As needed
Flow Injection Analyzer	Check valve flares Check valve ports Check pump tubing Check flow cell flares Change bulb Check manifold tubing Check T's and connectors	Monthly Monthly Daily Quarterly Every six months Every six months Every six months

Preventive Maintenance Procedures

Instrument	**Activity**	**Frequency**
Ion Chromatograph	Change column bed supports	Monthly or as needed
	Clean column	Monthly or as needed
	Change column	Every six months or as needed
	Change valve port face & hex nut	Every six months or as needed
	Clean valve slider	Every six months or as needed
	Change tubing	Annually or as needed
	Eluent pump	Annually
Atomic Absorption Spectro- photometers - FAA and CVAA	Check gases	Daily
	Clean burner head	Daily
	Check aspiration tubing	Daily
	Clean optics	Every three months
	Empty waste container	Weekly
Atomic Absorption Spectro- photometers - GFAA	Check gases	Daily
	Check argon dewar	Daily, or as needed
	Change graphite tube	Daily, or as needed
	Clean furnace windows	Monthly
ICP	Check argon dewar	Daily
	Replace peristaltic pump tubing	Daily, or as needed
	Empty waste container	Daily, or as needed
	Clean nebulizer, spray chamber, and torch	Every two weeks, or as needed
	Replace water filter	Quarterly
	Replace vacuum air filters	Monthly
Infrared Spectrophotometer, Fourier Transform	Clean sample cells	Daily, or as needed
Gel-Permeation Chromatographs	Clean and repack column	As needed
	Backflush valves	As needed
Gas Chromatographs, Semivolatiles	Check gas supplies	Daily, replace when pressure reaches 250 psi
	Change in-line filters	Quarterly or after 30 tanks of gas
	Change injection port liner	Daily or as needed
	Clip first foot of capillary column	As needed
	Change guard column	As needed
	Replace analytical column	As needed when peak resolution fails
	Check system for gas leaks	After changing columns
	Clean FID	As needed
	Leak test ECD	Annually

Preventive Maintenance Procedures

Instrument	Activity	Frequency
Gas Chromatograph/Mass Spectrometers, Semivolatiles	Check gas supplies	Daily, replace when pressure reaches 50 psi
	Change in-line filters	Quarterly or after 30 tanks of gas
	Change septum	Daily
	Change injection port liner	Weekly or as needed
	Clip first foot of capillary column	As needed
	Change guard column	As needed
	Replace analytical column	As needed when peak resolution fails
	Clean jet separator	As needed
	Clean source	As needed when tuning problems
	Change pump oil	Every six months
	Oil wick	Every six months
Purge and Trap Concentrators	Change trap	As needed
	Change transfer lines	As needed
	Clean purge vessel	Daily
Gas Chromatographs, Volatiles	Check gas supplies	Daily, replace when pressure reaches 200 psi
	Change in-line filters	Quarterly or after 30 tanks of gas
	Change septum	As needed
	Clip first foot of capillary column	As needed
	Change guard column	As needed
	Replace analytical column	As needed when peak resolution fails
	Check system for gas leaks	After changing columns or as needed
	Replenish ELCD solvents	Weekly
	Clean PID lamp	As needed
	Clean FID	As needed
	Change ion exchange resin	Quarterly
	Replace nickel tubing	Quarterly or as needed
Gas Chromatograph/Mass Spectrometers, Volatiles	Check gas supplies	Weekly, replace when pressure reaches 200 psi
	Change in-line filters	Quarterly or after 30 tanks of gas
	Change septum	Daily
	Clip first foot of capillary column	As needed
	Change guard column	As needed
	Replace analytical column	As needed when peak resolution fails
	Clean jet separator	As needed
	Clean source	As needed when tuning problems
	Change pump oil	Every six months per HP
	Oil wick	Every six months per HP

Preventive Maintenance Procedures

Instrument	Activity	Frequency
HPLC	Check gas supplies	Daily, replace when pressure reaches 200 psi
	Change guard column	As needed
	Change analytical column	As needed
	Change inlet filters	As needed
TCLP/SPLP Extractors	Monitor Room Temperature	Daily
	Monitor RPM of Rotators	Bi-weekly
	Grease fittings	As needed
	O-ring replacement	As needed

APPENDIX F

CERTIFICATIONS/ACCREDITATIONS/CONTRACTS

CAS/Rochester Certifications/Accreditations/Contracts

Federal and National Programs

- NELAP Accreditation, since January 2001.
  Primary Accreditation with New York and Florida (see below).
  Secondary Accreditation with Florida, New Jersey, New Hampshire, Pennsylvania and Illinois (see below).

- NYS DEC Analytical Services Protocol Organic and Inorganic Contract (current).

- Naval Facilities Engineering Service Center (NFESC), Approved. Expires 11/15/2007.

State and Local Programs

- State of Connecticut, Department of Health Services, Approved Public Health Laboratory.
  Certified Laboratory for Potable Water, Waste Water, Solid Waste and Soil.
  Examination for Inorganic Chemicals and Organic Chemicals. Registration No. PH-0556.
  Exp. 06/30/2008.

- The Commonwealth of Massachusetts, Department of Environmental Protection
  Certified Laboratory for Potable Water and Non-Potable Water
  Certification No. M-NY032. Exp. 06/30/2008.

- State of New Jersey, Department of Environmental Protection
  State Certified Environmental Laboratory for Drinking Water and Water Pollution.
  Certification No. NY004. Exp. 06/30/2008.

- State of New York, Department of Health, Environmental Laboratory Approval Program.
  Potable Water, Non-Potable Water, Solid and Hazardous Waste, and ASP Certification.
  Certification No. 10145. Exp. 04/01/2008.

- State of New Hampshire, Department of Environmental Services
  Full Certification for Non-Potable Water. Certification No. 294102. Exp. 10/14/2007.

- State of Rhode Island, Department of Health
  Approved for Surface Water, WasteWater, and Sewage. License No. 158. Exp. 12/30/2007.

- West Virginia Division of Environmental Protection
  Certification for TCL/TAL, GRO, DRO, and TPH parameters in WasteWater and Solid Hazardous Waste.
  Certification No.292 Call Dan Arnold 304-926-0499 for confirmation of accreditation.

- State of Delaware, Department of Natural Resources and Environmental Control. Approved for Delaware Hazardous Substance Cleanup Act.

- State of Florida, Department of Health.
  Drinking water, Wastewater, Solid Hazardous Waste, CLP. Certification No. E87674. Expires 06/30/2008.

- Pennsylvania Department of Environmental Protection.
  Non-Potable Water and Solid and Chemical Materials. Lab ID No. 68-00786. Expires 6/30/2008.

- State of Illinois, Environmental Protection Agency.
  Inorganic and Organic Hazardous and Solid Waste. Certification No. 200047. Expires 11/17/2007.

- State of Maine, Department of Health and Human Services.
  Drinking Water and Wastewater. Certification No.NY0032. Expires 11/12/2008.

CAS/Rochester Certifications/Accreditations/Contracts

Unregulated State Programs

- State of Minnesota
  Reciprocal Certification for all parameters certified under New York State.

- State of Georgia Environmental Protection Division
  Reciprocal Approval for Non-Potable/Environmental Waters and Wastes.

- State of Indiana Hazardous Waste Division
  Reciprocal Approval for Non-Potable/Environmental Waters and Wastes.

- State of Michigan - Reciprocal Approval for Non-Potable/Environmental Waters and Wastes.

- Commonwealth of Pennsylvania, Department of Environmental Resources
  Reciprocal Approval for Non-Potable/Environmental Waters and Wastes.
  PA Registration Number 68-786

- Commonwealth of Virginia, Department of General Services
  Reciprocal Approval for Non-Potable/Environmental Waters and Wastes.

- State of Mississippi - Reciprocal Approval for Non-Potable/Environmental Waters and Wastes.

- State of Maryland - Reciprocal Approval for Non-Potable/Environmental Waters and Wastes.

APPENDIX C

CONSTRUCTION DRAWINGS FOR VAPOR CONTROL SYSTEM

CONSTRUCTION DRAWINGS

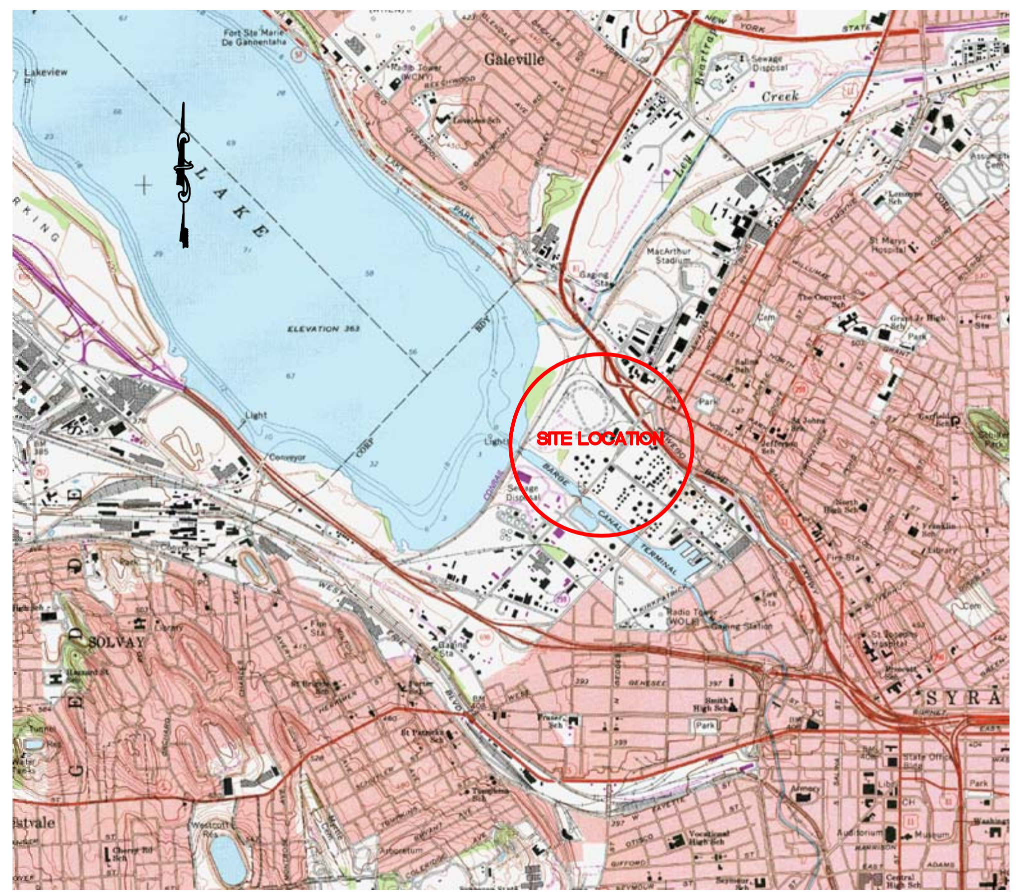
FOR

DESTINY USA SOIL VAPOR CONTROL SYSTEM

CAROUSEL CENTER

9090 CAROUSEL CENTER DRIVE

SYRACUSE, NY 13290



DRAWING NO	TITLE
1	TITLE SHEET
2	AREA 1-SLOTTED PIPE LATERALS
3	AREA 2-SLOTTED PIPE LATERALS
4	AREA 3-SLOTTED PIPE LATERALS
5	VAPOR PIPE AND MEMBRANE INSTALLATION DETAIL
6	VAPOR PIPE AND MEMBRANE CROSS-SECTION DETAIL
7	VAPOR CONTROL SYSTEM INSTALLATION DETAIL

SPECTRA ENGINEERING, ARCHITECTURE, & SURVEYING, P.C.

19 BRITISH AMERICAN BOULEVARD

LATHAM, NY 12110

PHONE (518) 782-0882

FAX (518) 782-0973

JULY 18, 2008

UNAUTHORIZED ALTERATION OR ADDITION TO THIS DRAWING IS A VIOLATION OF SECTION 7209, SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW.

NO.	DATE	REVISIONS	DRN	CKD	APPR

PROJECT	
PROJ. ENGR.:	PMA
PROJ. NO.:	06448
DESIGNED BY:	FP
DRAWN BY:	REW
CHECKED BY:	MR
APPROVED BY:	RCL
DATUM:	NA
CONTOUR INTERVAL =	FEET

0 12.5' 25' 50'

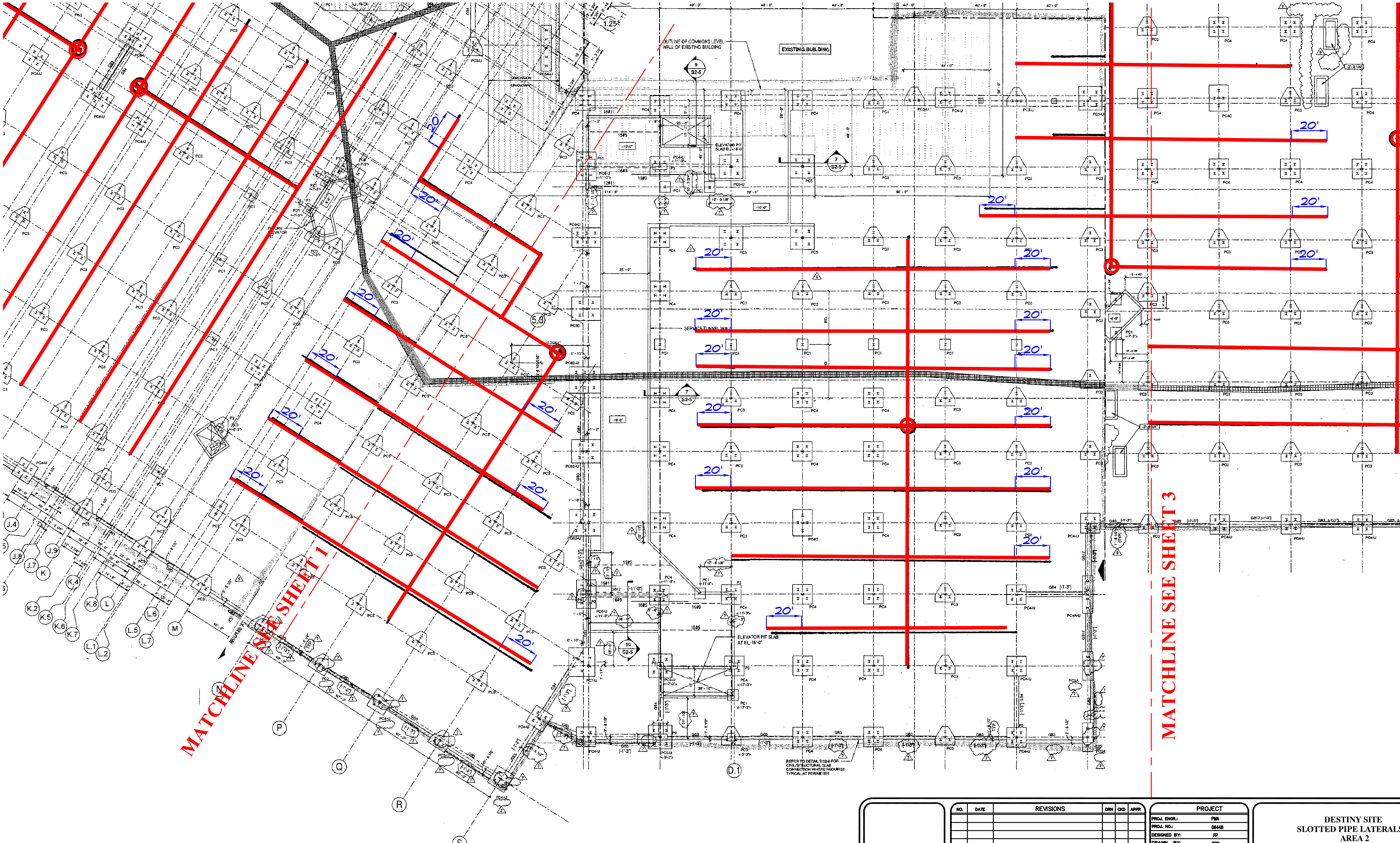
1"=50'

DESTINY SITE
SLOTTED PIPE LATERALS
AREA 1

CITY OF SYRACUSE, NEW YORK ONONDAGA COUNTY

SPECTRA ENVIRONMENTAL GROUP, INC.
19 British American Boulevard
Latham, New York 12110
TEL 518 782 0882 FAX 518 782 0973

DATE: 07/18/08 SCALE: 1"=50' DWG. NO. 06448 SHEET 2



UNAUTHORIZED ALTERATION OR ADDITION TO THIS DRAWING IS A VIOLATION OF SECTION 7209, SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW.

NO.	DATE	REVISIONS	DRN	CKD	APPR

PROJECT	
PROJ. ENGR.:	PMA
PROJ. NO.:	06448
DESIGNED BY:	FP
DRAWN BY:	REW
CHECKED BY:	MR
APPROVED BY:	RCL
DATUM:	NA
CONTOUR INTERVAL =	FEET

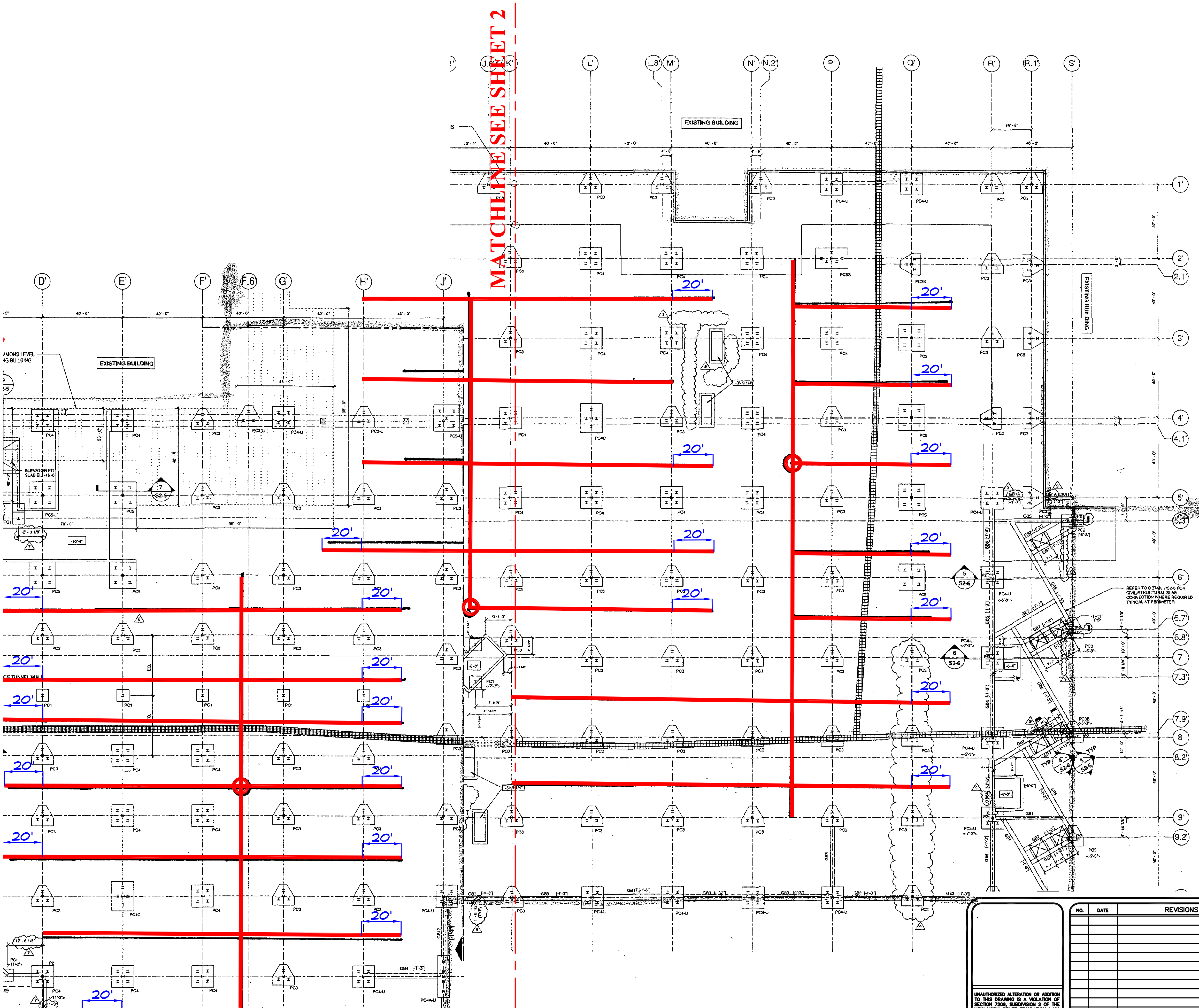
0 12.5' 25' 50'
1"=50'

DESTINY SITE
SLOTTED PIPE LATERALS
AREA 2

CITY OF SYRACUSE, NEW YORK ONONDAGA COUNTY

SPECTRA ENVIRONMENTAL GROUP, INC.
19 British American Boulevard
Latham, New York 12110
TEL 518 782 0882 FAX 518 782 0973

DATE: 07/18/08 | SCALE: 1"=50' | DWG. NO. 06448 | SHEET 3



UNAUTHORIZED ALTERATION OR ADDITION TO THIS DRAWING IS A VIOLATION OF SECTION 7209, SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW.

NO.	DATE	REVISIONS	DRN	CKD	APPR

PROJECT	
PROJ. ENGR.:	PMA
PROJ. NO.:	06448
DESIGNED BY:	FP
DRAWN BY:	REW
CHECKED BY:	MR
APPROVED BY:	RCL
DATUM:	NA
CONTOUR INTERVAL =	FEET

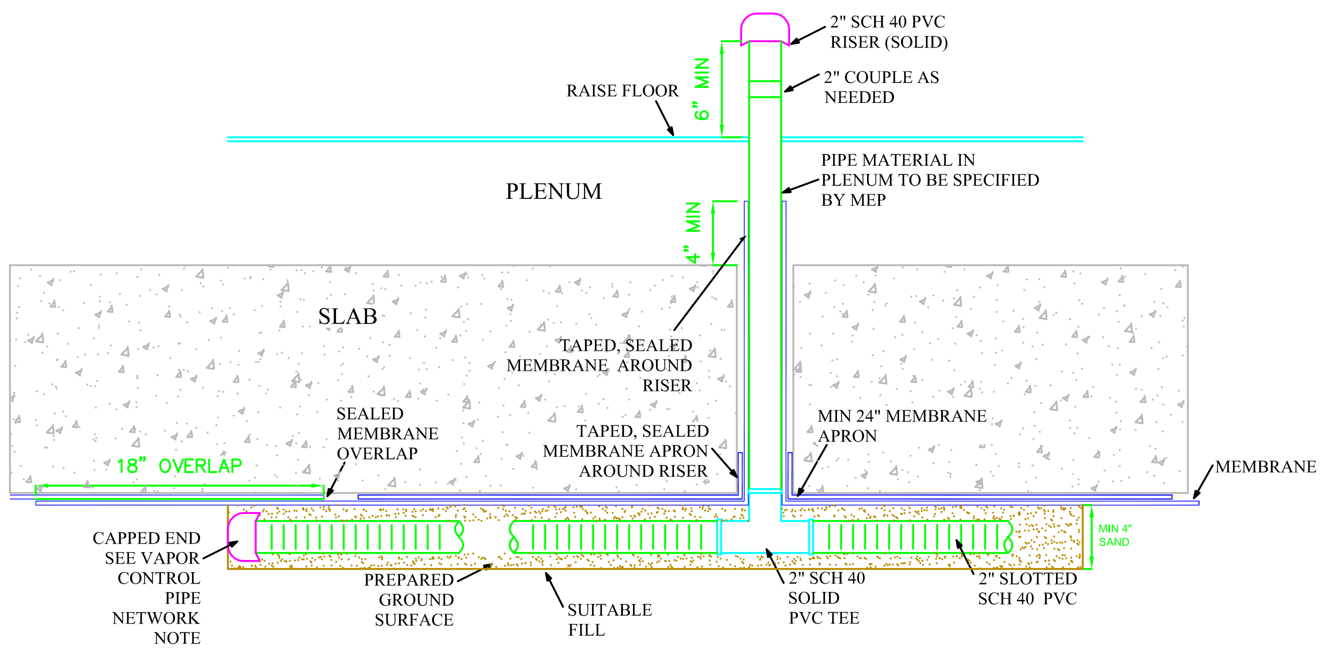
0 12.5' 25' 50'
1"=50'

DESTINY SITE
SLOTTED PIPE LATERALS
AREA 3

CITY OF SYRACUSE, NEW YORK — ONONDAGA COUNTY

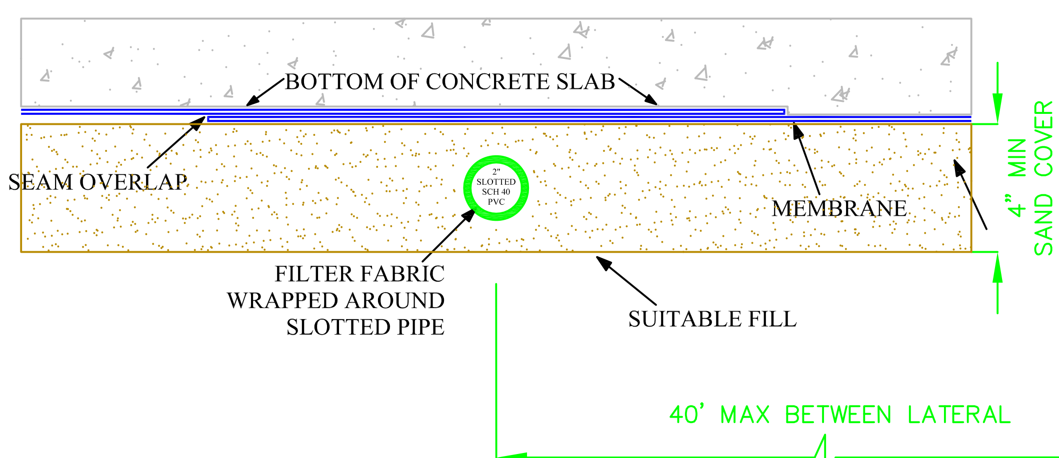
SPECTRA ENVIRONMENTAL GROUP, INC.
19 British American Boulevard
Latham, New York 12110
TEL 518 782 0882 FAX 518 782 0973

DATE: 07/18/08 | SCALE: 1"=50' | DWG. NO. 06448 | SHEET 4



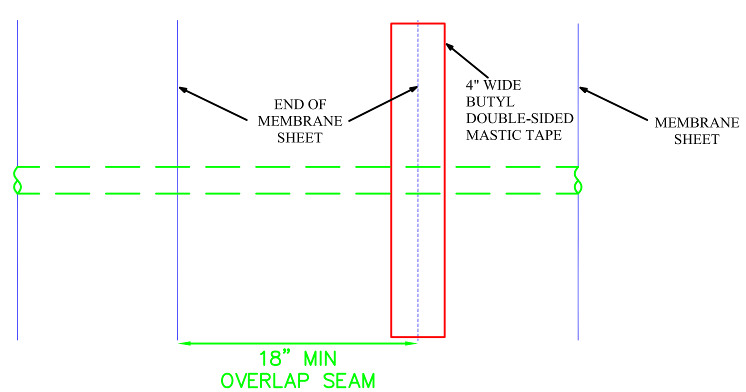
TYPICAL SIDE SECTION

SCALE: 1" = 1'



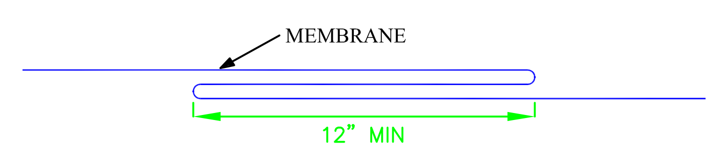
TYPICAL CROSS SECTION

SCALE: 1" = 2'



LONGITUDINAL LAP SEAL

SCALE: NTS



LONGITUDINAL LAP SEAL MAY NOT FALL WITHIN TENSION RELIEF FOLD

TYPICAL TENSION RELIEF FOLD

SCALE: NTS

VAPOR BARRIER AND PIPE NETWORK SPECIFICATIONS

AMENDED 7/11/08

THIS SPECIFICATION APPLIES TO THE CONSTRUCTION OF THE FOLLOWING ELEMENTS:

- A CONTINUOUS VAPOR BARRIER UNDER THE FLOOR SLAB,
- A SUB-FLOOR PIPE NETWORK UNDER THE VAPOR BARRIER,
- STUB RISERS TO CONNECT THE PIPE NETWORK TO A DEPRESSURIZATION CONTROL SYSTEM.

DEPRESSURIZATION WILL BE ACCOMPLISHED BY CONNECTING THE PIPE NETWORK TO A CONTROL SYSTEM OF RISERS, AIR PUMPS AND PUMP CONTROLS, TO BE CONSTRUCTED UNDER A SEPARATE SPECIFICATION.

VAPOR BARRIER CONSTRUCTION NOTES:

VAPOR BARRIER WILL BE CONSTRUCTED WITH POLYETHYLENE SHEET, 60 MIL (.060 INCH) MINIMUM THICKNESS. THINNER SHEET MAY BE USED AT CONTRACTORS DISCRETION, PROVIDED MATERIAL DAMAGED DURING HANDLING OR INSTALLATION IS PROPERLY PATCHED OR REPLACED IN ACCORDANCE WITH THESE SPECIFICATIONS, AND THE FINISHED WORK PROVIDES A CONTINOUS VAPOR BARRIER.

SHEET MATERIAL SHALL MEET OR EXCEED ASTM E-1745 CLASS B PERFORMANCE STANDARDS.

VAPOR BARRIER SHALL EXTEND FROM THE FAÇADE OF THE EXISTING BUILDING TO THE PERIMETER OF THE NEW EXPANSION, TO ESTABLISH A CONTINUOUS SEALED VAPOR BARRIER BENEATH THE CONCRETE SLAB FLOOR. OPENINGS SHALL BE ALLOWED IN ACCORDANCE WITH THE PROVISIONS BELOW FOR UTILITY CONDUITS AND PILE CAPS.

GROUND PREPARATION – REMOVE ALL PENETRATION HAZARDS (DEBRIS, SHARP OBJECTS, ANGULAR STONE) FROM AREA PRIOR TO LAYING VAPOR BARRIER. GROUND PREPARATION MAY BE ACCOMPLISHED BY PLACING SUITABLE FILL UNDER THE VAPOR BARRIER.

SUITABLE FILL IS ANY MATERIAL THAT ALLOWS CONSTRUCTION OF THE FLOOR SLAB TO BE COMPLETED WITHOUT COMPROMISING THE INTEGRITY OF THE VAPOR BARRIER.

SHEET MATERIAL SHALL BE TRANSPORTED, STORED, HANDLED AND INSTALLED IN A MANNER THAT PREVENTS DAMAGE TO THE MATERIAL.

VAPOR BARRIER CONSTRUCTION NOTES (CONTINUED):

MECHANICAL EQUIPMENT SHALL NOT BE OPERATED ON THE VAPOR BARRIER AFTER INSTALLATION.

ADJACENT SHEETS SHALL BE OVERLAPPED A MINIMUM OF 18 INCHES AND SEALED WITH A CONTINOUS STRIP OF BUTYL MASTIC DOUBLE SIDED TAPE, MIN 4 INCHES WIDE TO CREATE AN AIR TIGHT JOINT. MAY SUBSTITUTE PARALLEL STRIPS OF NARROWER TAPE MAINTAINING MINIMUM 4 INCH SEAL WIDTH.

ACTIVITY THAT MUST BE PERFORMED AFTER THE VAPOR BARRIER IS INSTALLED SHALL BE CONDUCTED IN A MANNER THAT AVOIDS PUNCTURING OR BURNING THE SHEET MATERIAL. THE VAPOR BARRIER SHALL BE PROPERLY PROTECTED FROM WELDING OPERATIONS AND OTHER BURN HAZARDS.

ALL PUNCTURES, TEARS AND PENETRATIONS SHALL BE PATCHED BEFORE POURING CONCRETE. PATCHES MUST BE CONSTRUCTED ACCORDING TO LAP SEAL REQUIREMENTS FOR SHEETS.

EXTEND MEMBRANE NO LESS THAN 12 INCHES ONTO THE TOP OF PILE CAPS. SECURE MEMBRANE TO TOP SURFACE OF PILE CAPS WITH BUTYL MASTIC DOUBLE SIDED TAPE, MIN 4 INCH WIDE AIR TIGHT SEAL.

CONDUIT BUNDLES THROUGH SLAB TO BE WRAPPED TOGETHER, EXTEND VAPOR BARRIER MIN 4 INCHES ABOVE TOP OF SLAB, SEAL OPENING WITH FOAM OR SILICON JOINT COMPOUND TO CEATE AIR TIGHT PLUG.

VAPOR BARRIER SHALL BE INSPECTED FOR PUNCTURES AND TEARS, AND FOR GAPS IN SEALED JOINTS, BEFORE POURING CONCRETE. REPAIR DAMAGE AS DESCRIBED ABOVE, AND RE-SEAL ANY INCOMPLETE JOINTS WITH BUTYL MASTIC TAPE.

VAPOR BARRIER SHALL BE LOOSELY LAID BETWEEN PILE CAPS TO PREVENT MEMBRANE TENSION.

LAY VAPOR BARRIER WITH LONGITUDINAL TENSION RELIEF FOLD (MIN 18 INCHES WIDE) BETWEEN PILE CAPS. LONGITUDINAL LAP SEAL BETWEEN SIDE-BY-SIDE SHEETS MAY NOT FALL WITHIN THE TENSION RELIEF FOLD. TENSION RELIEF FOLD MAY CROSS LAP SEAL AT ENDS OF SHEETS.

PRE-POUR INSPECTION SHALL INCLUDE LOOKING FOR TENSION IN THE MEMBRANE BETWEEN PILE CAPS. MEMBRANE TENSION SHALL BE RELIEVED BY SPLICING ADDITIONAL SHEET MATERIAL, USING THE LAP SEAL REQUIRMENTS ABOVE.

VAPOR CONTROL PIPE NETWORK

VAPOR CONTROL PIPE NETWORK SHALL BE CONSTRUCTED WITH MINIMUM 2 INCH DIAMETER SLOTTED SCHEDULE 40 PVC PIPE. PERFORATIONS SHALL BE 0.020 INCH WIDE CIRCUMFERENTIAL SLOTS, FOUR SLOTS PER ROW (STANDARD 2 INCH 20 SLOT PVC WELL SCREEN IS ACCEPTABLE). SLOTTED PIPE SHALL BE PLACED ON ONE LAYER OF FILTER FABRIC OR PIPE SHALL BE WRAPPED WITH FILTER FABRIC. PARALLEL LATERALS SHALL BE LAID NO MORE THAN 40 FEET APART ON CENTER. ENDS SHALL BE CAPPED.

ALL PIPING CONNECTIONS AND END CAPS ARE TO BE GLUED WITH A PVC CEMENT TO PREVENT SEPARATION.

RISER STUB CONSTRUCTION NOTES:

RISER STUBS SHALL BE LOCATED BY ARCHITECT WITHIN THE BUILDING FOOTPRINT, TO BE COMPATIBLE WITH ARCHITECTURAL DETAILS. RISER STUBS SHALL BE NO LESS THAN 120 FEET FROM THE PERIMETER OF THE BUILDING.RISER STUBS SHALL BE LOCATED IN AREAS WITH NO PUBLIC ACCESS (FOR EXAMPLE, UTILITY ROOMS, UTILITY SHAFTS, ELEVATOR SHAFTS OR PLUMBING RACES).

PROVIDE MINIMUM OF ONE RISER STUB FOR 40,000 SQUARE FEET OF FLOOR SPACE, MAINTAIN MAXIMUM PRACTICAL SEPARATION BETWEEN RISERS.

THE PIPE NETWORK WILL BE CONNECTED TO RISERS AT A FUTURE DATE. THE CONTRACTOR SHALL LEAVE A MINIMUM 6 INCH LENGTH OF RISER ABOVE THE FINISHED FLOOR LEVEL. THE RISER STUBS SHALL BE CONNECTED TO THE VAPOR CONTROL PIPE NETWORK WITH SCHEDULE 40 TEE FITTINGS. RISER STUBS SHALL BE CONSTRUCTED WITH SCHEDULE 40 SOLID PIPE, EXCEPT AS FOLLOWS:

WHERE RISERS PASS THROUGH RAISED ACCESS FLOOR (PLENUM), PIPE MATERIAL SHALL BE SPECIFIED BY THE MEP ENGINEER.

USE SHEET MATERIAL TO CREATE AN APRON (MIN 24 INCH WIDE) AROUND THE RISER STUB AND SEAL THE APRON TO THE RISER STUB AND TO THE GROUND SHEET WITH BUTYL MASTIC TAPE IN CONCENTRIC RINGS AROUND RISER PIPE, MIN 4 INCH WIDE AIR TIGHT SEAL.

CONTRACTOR SHALL ENSURE THAT FINISHED RISER STUBS ARE PERPENDICULAR TO THE FINISHED FLOOR. CONTRACTOR SHALL PROTECT COMPLETED RISER STUBS FROM DAMAGE DURING SUBSEQUENT CONSTRUCTION ACTIVITY. CONTRACTOR SHALL LOCATE RISER STUB LOCATIONS ON AS BUILT DRAWINGS.

QUALITY CONTROL

A) PRIOR TO LAYING VAPOR BARRIER

AREA SHALL BE INSPECTED TO VERIFY THAT ALL PENETRATION HAZARDS (DEBRIS, SHARP OBJECTS, ANGULAR STONE) HAVE BEEN REMOVED, OR THAT A CONTINUOUS LAYER OF SUITABLE VAPOR BARRIER SUPPORTING MATERIAL IS IN PLACE.

WHERE VAPOR BARRIER CROSSES ABRUBT GROUND CHANGES, GAPS OR CONCRETE EDGES, VERIFY THAT FILL IS PLACED TO FILL GAPS AND SUPPORT THE VAPOR BARRIER TO PREVENT TEARING WHILE CONCRETE IS POURED.

B) BEFORE CONCRETE POUR

VAPOR BARRIER SHALL BE INSPECTED FOR PUNCTURES, TEARS, BURNS AND ANY OTHER DAMAGE THAT WOULD COMPROMISE THE PERMEABILITY REQUIREMENT OF THE MATERIAL, AND FOR GAPS IN SEALED JOINTS. ALL PUNCTURES, TEARS AND PENETRATIONS SHALL BE PATCHED BEFORE POURING CONCRETE. PATCHES MUST BE CONSTRUCTED ACCORDING TO LAP SEAL REQUIREMENTS FOR SHEETS. RE-SEAL ANY INCOMPLETE JOINTS WITH BUTYL MASTIC TAPE. INSPECT LINER FOR TENSION IN THE MEMBRANE BETWEEN PILE CAPS. MEMBRANE TENSION SHALL BE RELIEVED BY SPLICING ADDITIONAL LINER MATERIAL, USING THE LAP SEAL REQUIRMENTS ABOVE.

RISER STUBS AND UTILITY CONDUITS SHALL BE INSPECTED FOR PROPER SEAL AROUND PIPE AND AT GROUND SHEET. RISER STUBS SHALL BE INSPECTED TO ENSURE THEY ARE PERPENDICULAR TO THE FLOOR.

C) FOLLOWING CONCRETE POUR

CONDUIT BUNDLES WILL BE INSPECTED FOR AIRTIGHT PLUG INSTALLATION. RISER STUBS WILL BE INSPECTED FOR PROPER PROTECTION AND CAPPING.

D) QUALITY CONTROL INSPECTION SHALL BE CERTIFIED BY CONTRACTOR OR CONTRACTORS REPRESENTATIVE FOR EACH POUR.

NO.	DATE	REVISIONS	DRN	CKD	APPR

PROJECT	
PROJ. ENGR.:	PMA
PROJ. NO.:	06448
DESIGNED BY:	FP
DRAWN BY:	REW
CHECKED BY:	VB
APPROVED BY:	RCL
DATUM:	NA
CONTOUR INTERVAL =	FEET

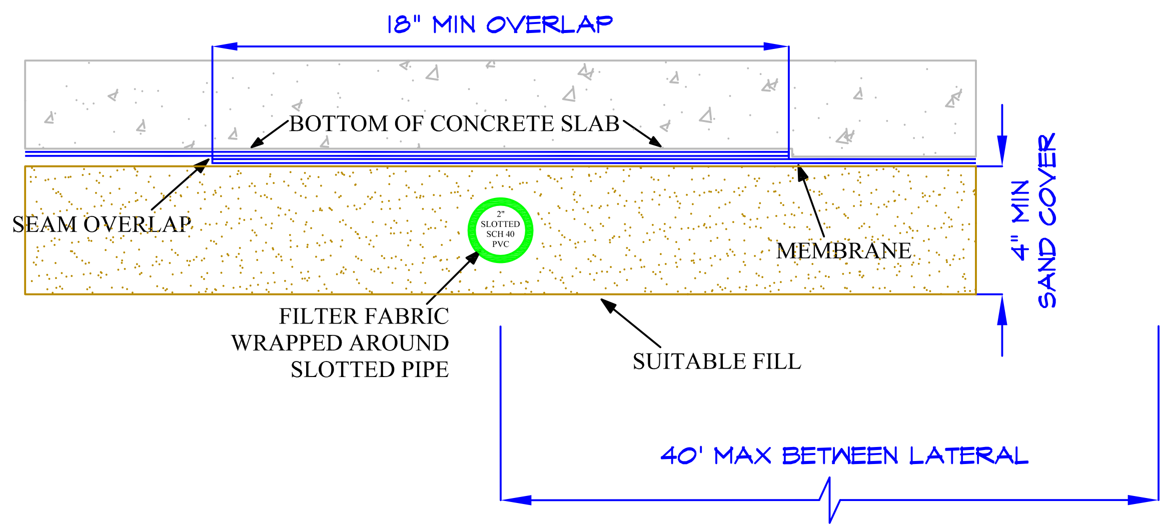
AS NOTED

DESTINY SITE
VAPOR PIPE AND MEMBRANE INSTALLATION DETAIL

CITY OF SYRACUSE, NEW YORK ONONDAGA COUNTY

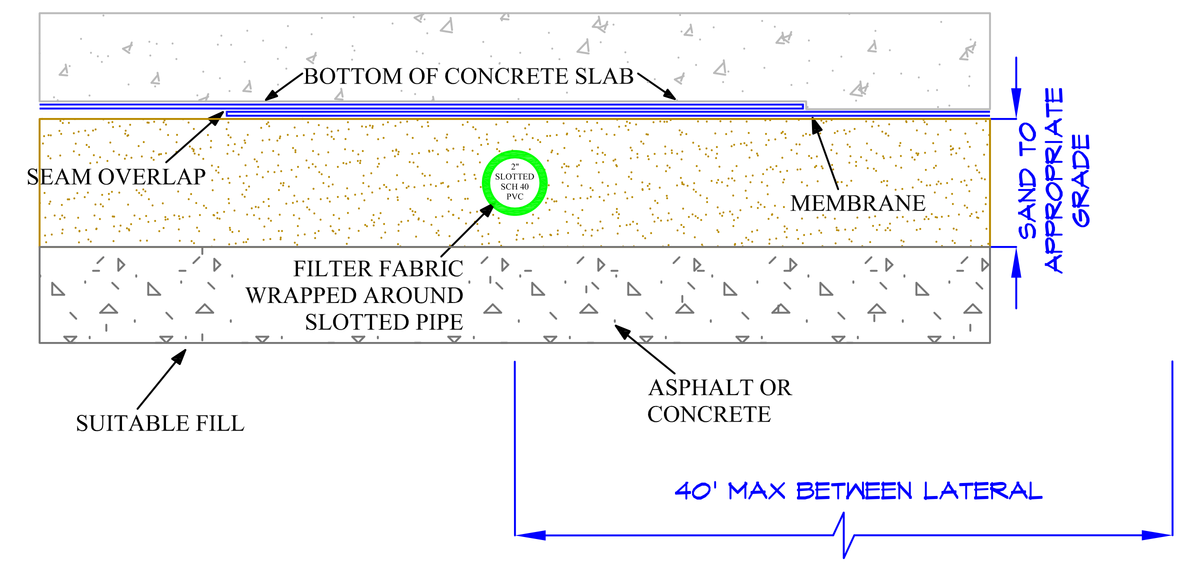
SPECTRA ENVIRONMENTAL GROUP, INC.
19 British American Boulevard
Latham, New York 12110
TEL 518 782 0882 FAX 518 782 0973

DATE: 07/15/08 | SCALE: AS NOTED | DWG. NO. 06448 | SHEET 5



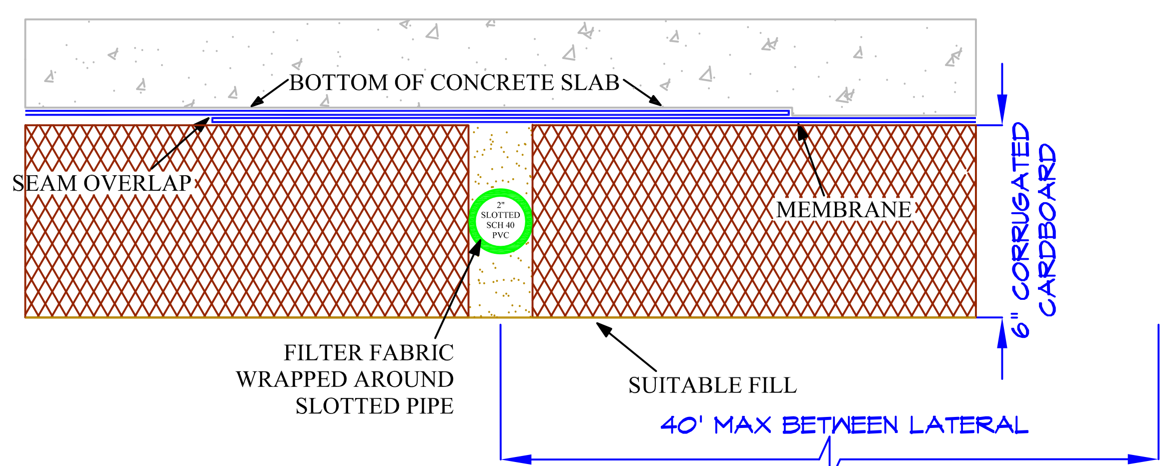
TYPICAL CROSS SECTION

SCALE: 1" = 6"



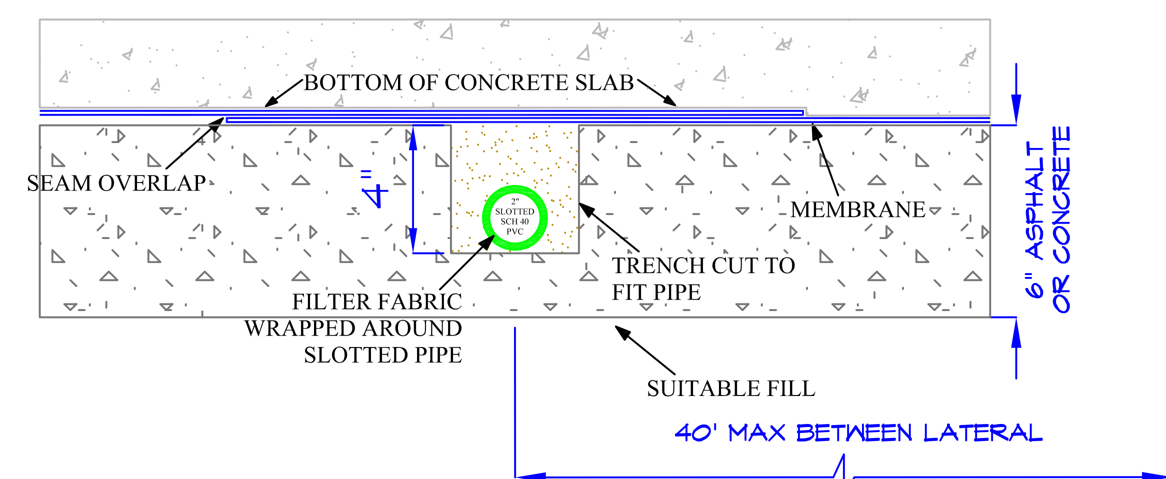
CROSS SECTION WITH SAND FILL TO APPROPRIATE GRADE

SCALE: 1" = 6"



CROSS SECTION WITH CORRUGATED CARDBOARD

SCALE: 1" = 6"



CROSS SECTION WITH ASPHALT OR CONCRETE AT GRADE

SCALE: 1" = 6"

NOTE: THE ABOVE CROSS-SECTIONS REPRESENT THE FOUR SURFACE CONDITIONS ANTICIPATED AT THE SITE. IF SITE CONDITIONS ARE ENCOUNTERED THAT ARE NOT REPRESENTED HERE, THEY SHALL BE IMMEDIATELY BROUGHT TO SPECTRA'S ATTENTION.

UNAUTHORIZED ALTERATION OR ADDITION TO THIS DRAWING IS A VIOLATION OF SECTION 7209, SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW.

NO.	DATE	REVISIONS	DRN	CKD	APPR

PROJECT	
PROJ. ENGR.:	PMA
PROJ. NO.:	06448
DESIGNED BY:	FP
DRAWN BY:	REW
CHECKED BY:	MR
APPROVED BY:	RCL
DATUM:	NA
CONTOUR INTERVAL =	FEET

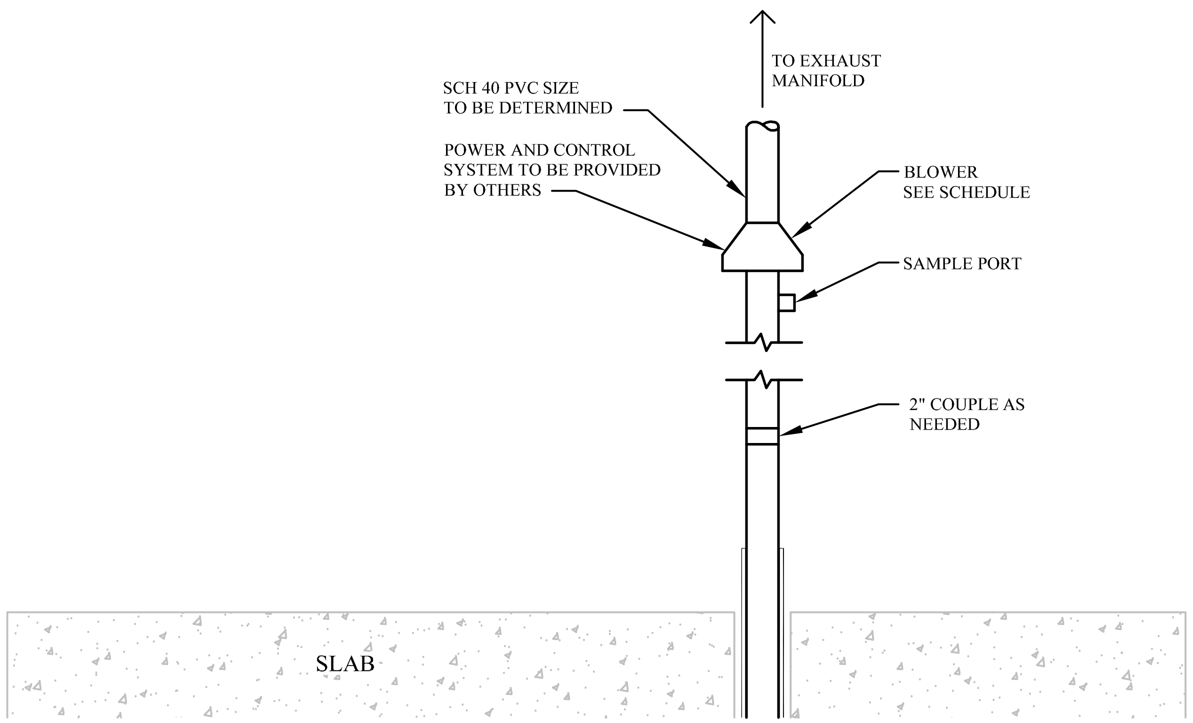
AS NOTED

DESTINY SITE
VAPOR PIPE AND MEMBRANE
CROSS-SECTIONS DETAIL

CITY OF SYRACUSE, NEW YORK — ONONDAGA COUNTY

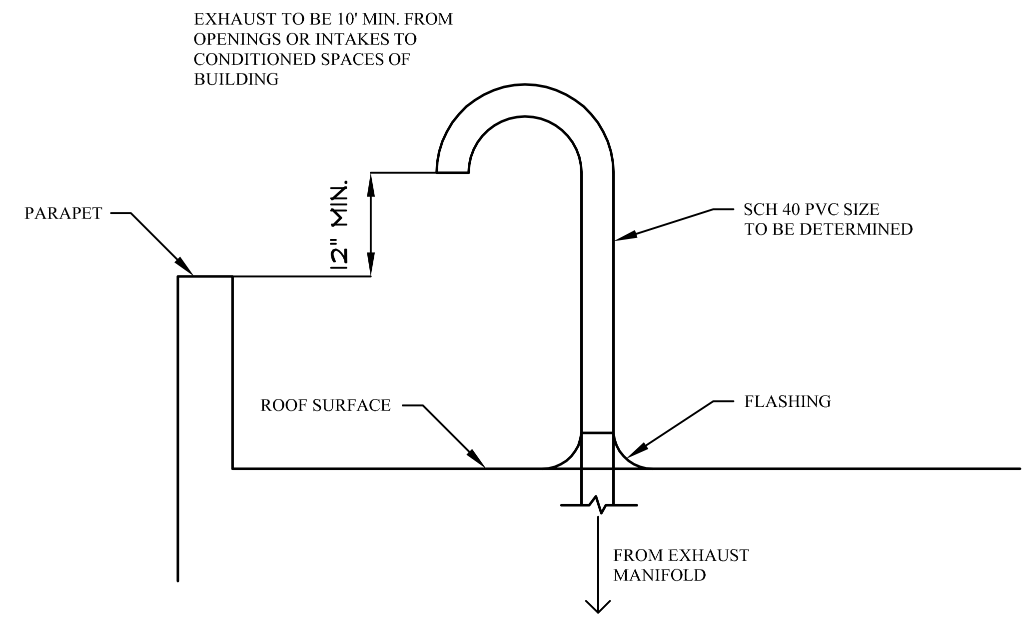
SPECTRA ENVIRONMENTAL GROUP, INC.
19 British American Boulevard
Latham, New York 12110
TEL 518 782 0882 FAX 518 782 0973

DATE: 07/18/08 | SCALE: AS NOTED | DWG. NO. 06448 | SHEET 6



BLOWER INSTALLATION DETAIL

SCALE: 1" = 1'

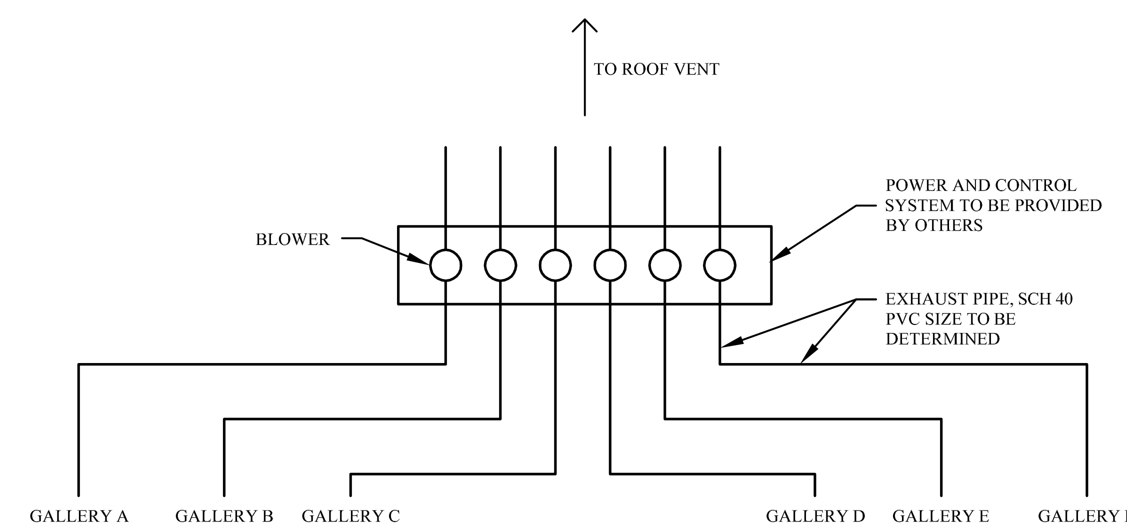


ROOF VENT DETAIL

SCALE: 1" = 1'

BLOWER SCHEDULE

COLLECTION GALLERY	MAKE/MODEL
A	TBD
B	TBD
C	TBD
D	TBD
E	TBD
F	TBD



EXHAUST MANIFOLD SCHEMATIC

SCALE: NTS

NOTE: PIPING ROUTE THROUGH BUILDING TO BE DETERMINED BY PROJECT ARCHITECT OR MEP

NO.	DATE	REVISIONS	DRN	CKD	APPR

PROJECT	
PROJ. ENGR.:	PMA
PROJ. NO.:	06448
DESIGNED BY:	AL
DRAWN BY:	YG
CHECKED BY:	MR
APPROVED BY:	RCL
DATUM:	NA
CONTOUR INTERVAL =	FEET

AS NOTED

DESTINY SITE
VAPOR CONTROL SYSTEM
INSTALLATION DETAILS

CITY OF SYRACUSE, NEW YORK — ONONDAGA COUNTY

SPECTRA ENVIRONMENTAL GROUP, INC.
19 British American Boulevard
Latham, New York 12110
TEL 518 782 0882 FAX 518 782 0973

DATE: 05/06/09 | SCALE: AS NOTED | DWG. NO. 06448 | SHEET 7

APPENDIX D

GANT CHART

SCHEDULE OF REMEDIAL ACTIVITIES

PHASE I SITE