Remedial Action Work Plan

225 Louisiana Street Site
Buffalo, New York
BCP Site No. C915350

Revised June 2021 B0305-018-001

Prepared For:

Barcalo Buffalo LLC

Prepared By:

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TURNKEY ENVIRONMENTAL RESTORATION, LLC

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BCP SITE NUMBER: C915350
BUFFALO, NEW YORK

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Prepared for:

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Prepared By:

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2558 Hamburg Turnpike, Suite 300
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In Association With:

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2558 Hamburg Turnpike, Suite 300
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Certification

I, Thomas H. Forbes, certify that I am currently a NYS registered professional engineer and that this June 2021 Remedial Action Work Plan (RAWP) for the 225 Louisiana Street Site (C915350) was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

SEAL 

7-1-21
Date

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225 Louisiana Street Site
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APPENDICES

1.0 INTRODUCTION

Benchmark Environmental Engineering and Science, PLLC (Benchmark), in association with TurnKey Environmental Restoration, LLC (TurnKey), referred to herein as Benchmark-TurnKey, has prepared this Remedial Action Work Plan (RAWP) on behalf of Barcalo Buffalo LLC. This RAWP presents the proposed scope of work and implementation procedures for completion of remedial activities at the 225 Louisiana Street Site, Brownfield Cleanup Program (BCP) Site C915350, located at 175, 177, 225, and 245 Louisiana Street and 96 Kentucky Street, Buffalo, New York (Site).

The remedial activities will be completed by Barcalo Buffalo LLC, and their designated remedial contractors and subcontractors, with oversight provided by Benchmark-TurnKey. The work will be completed in accordance with 6NYCRR Part 375 and New York State Department of Environmental Conservation (NYSDEC) DER-10 guidelines.

1.1 Background and History

The ±4.23-acre Site consists of five (5) tax parcels as follows:

- 175 Louisiana Street: SBL No. 122.47-4-28, 0.06 acres
- 177 Louisiana Street: SBL No. 122.47-4-2, 0.33 acres
- 225 Louisiana Street: SBL No. 122.47-1-1, 2.17 acres
- 245 Louisiana Street: SBL No. 122.40-9-1, 1.61 acres
- 96 Kentucky Street: SBL No. 122.47-4-3, 0.06 acres

The Site is developed with one (1) structure located on the 225 Louisiana Street parcel. The existing building is currently occupied by several tenants and is primarily used as a distribution facility. The existing building also includes vacant space and storage areas. The Site also includes asphalt/gravel parking lots and green areas. The Site is located in the City of Buffalo, Erie County, New York (see Figures 1 and 2).

The Site is bound by Mackinaw Street to the north, residential property to the south, Louisiana Street to the west, and Kentucky Street to the east with commercial and residential property beyond. The surrounding land-use is mixed use, including residential, commercial, and industrial. Properties adjacent to the Site include primarily residential, commercial, and vacant use.

The northern portion of the Site was occupied by an oil works company with bulk oil storage prior to 1889. The central and northern portions of the Site were used as a lumber

yard from at least 1889 to the 1920s. The central portion of the Site was used for heavy industrial/factory purposes from the 1920s to the 1990s. Operations included manufacturing, a foundry, nickel plating, machine shops, iron works, spray booths/painting, annealing, a forge shop with 17 oil furnaces and dipping with dip tanks. An auto repair shop was also identified on the northwestern portion of the Site during this time. Railroad tracks, residential properties, storefronts, and a warehouse were identified on the southern end of the Site from at least 1889 to prior to 1981. The Site has been used as a warehousing/distribution facility, parking lot, and storage area since the 1990s.

The Site has an extensive tank history estimated at eight underground storage tanks (USTs) located on-Site between 1940 and 1992. The only UST removal record was a municipal document indicating removal of one 15,000-gallon fuel oil UST from the Site in 1992. Registered Chemical Bulk Storage (CBS) aboveground storage tanks (ASTs) were also identified.

1.2 Summary of Environmental Conditions

Benchmark-TurnKey completed and submitted to NYSDEC a Remedial Investigation Alternatives Analysis (RI/AA) Report, dated May 2021, on behalf of Barcalo Buffalo LLC. The RI/AA report included a detailed review of previous studies completed by Benchmark. The RI was completed in accordance with the approved RI Work Plan dated September 2020.

The purpose of the RI was to define the nature and extent of contamination on the BCP Site, and to collect data of sufficient quantity and quality to perform the remedial alternatives evaluation. The RI was completed across the BCP Site to supplement previous environmental data and to delineate or identify areas requiring remediation. On-site field activities included excavation of test pits (TPs), advancement of soil borings (SBs); groundwater monitoring well (MW) installation; soil vapor intrusion (SVI) sampling; surface soil/fill sampling; subsurface soil/fill sampling; groundwater sampling; sumps/pits sampling; geophysical survey at 245 Louisiana Street; and, collection of field and hydrogeologic data.

Based on the data and analyses obtained during the RI and the Phase II completed by Benchmark, the following environmental conditions exist at the Site.

1.2.1 Geology

The shallow overburden is generally described as fill with varying amounts of asphalt/subbase, brick, concrete, metal debris, ash, and wood ranging in depth from the

surface to 5 feet below ground surface (fbgs), with the exception of SB-18, where fill was identified up to 8.5 fbgs. Underlying native soils were described as tan/brown to dark grey mostly fine sand and reddish brown to grey sandy lean clay with varying silt and clay present to depths up to 16 fbgs. Bedrock was not encountered during the RI.

1.2.2 Hydrogeology

Based on the findings of the RI, monitoring well water levels ranged from 1.2-5.5 fbgs. The estimated hydraulic gradient was calculated to range from 0.010 ft/ft (MW-5 to MW-4) to 0.0045 ft/ft (MW-3 to MW-4). The RI data indicates a westerly gradient across the majority of the Site, with the exception of the northern property where MW-1 has a high-water level condition that identifies groundwater flowing east towards MW-2.

1.2.3 Contamination

1.2.3.1 Surface Soil/Fill

Surface soil/fill is impacted by semi-volatile organic compounds (SVOCs), specifically polycyclic aromatic hydrocarbons (PAHs). PAHs were detected exceeding 6 NYCRR Part 375 Restricted-Residential Soil Cleanup Objectives (RRSCO), which are the applicable Soil Cleanup Objectives (SCOs) based on planned Site reuse, at seven surface soil locations across the Site (SS-1 through SS-4 and SS-6 through SS-8). The highest concentrations of these parameters are as follows: benzo(a) anthracene exceeding its RRSCO (1 mg/kg) at SS-6 (5.2 mg/kg), benzo(a)pyrene, exceeding its Commercial SCO (CSCO, 1 mg/kg) at SS-6 (5.7 mg/kg), benzo(b)fluoranthene, exceeding its CSCO (5.6 mg/kg) at SS-6 (7.2 mg/kg), chrysene exceeding its RRSCO (3.9 mg/kg) at SS-7 (5.1 mg/kg), dibenzo(a,h)anthracene exceeding its CSCO (0.56 mg/kg) at SS-7 (1 mg/kg), and indeno(1,2,3-cd)pyrene exceeding its RRSCO (0.5 mg/kg) at SS-6 (3.8 mg/kg). No other SVOCs were identified exceeding Part 375 RRSCOs. SVOC tentatively identified compounds (TICs) were either non-detect or at minimal concentrations. SVOCs did not exceed 500 ppm at any location.

Arsenic exceeded its CSCO (16 mg/kg) at SS-7 (19.3 mg/kg) and lead exceeded its RRSCO (400 mg/kg) at SS-7 (598 mg/kg). No other metals were identified exceeding Part 375 RRSCOs.

No polychlorinated biphenyls (PCBs), pesticides, or herbicides were identified at concentrations exceeding RRSCOs; such were either not detected at concentrations above

laboratory detection limits or concentrations were slightly above Unrestricted SCOs (USCOs).

1.2.3.2 Subsurface Soil/Fill

During the Phase II, one orphan UST, noted in poor condition, was encountered at TP-3. Visually impacted media (i.e., black stained soils and a sheen on groundwater) and elevated photoionization detector (PID) readings were identified proximate to the orphan UST. The NYSDEC was notified and Spill No. 1810137 was assigned to 245 Louisiana Street. Black stained soils were also observed west of the orphan UST area at TP-4. In addition, a slight sheen was observed on groundwater at TP-16 and TP-17 and petroleum-like odors were noted at TP-13. During the RI, petroleum odors and elevated PID readings and odors were identified at two locations, SB-9 and TP-19 from 5 to 7 fbgs. Slight chemical odor and elevated PID readings were noted at SB-17 from 0.5 to 4 fbgs.

Analytical results from TP-3 indicate one volatile organic compound (VOC), 1,2,4-Trimethylbenzene, exceeding its RRSCO (52 mg/kg) with a concentration of 71 mg/kg. VOCs were not detected above RRSCOs at any other location sampled during the Phase II or RI. Total VOC TICs were less than 0.5 ppm with the exception of SB-9 (89.2 ppm) and TP-19 (7.72 ppm)

SVOCs, specifically PAHs including benzo(a)anthracene, benzo(b)fluoranthene, benzo(k) fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene exceeded their respective RRSCOs at SB-4, SB-7, TP-2, TP-8, TP-11, TP-16, TP-18, SB-10, SB-17 (0.5-2 feet), TP-21, TP-22, and TP-23. The highest concentrations of these parameters were identified at TP-2 and are as follows: benzo(a) anthracene (12 mg/kg) exceeding its CSCO (5.6 mg/kg), benzo(a)pyrene (9.6 mg/kg) exceeding its CSCO (1 mg/kg) , benzo(b)fluoranthene (13 mg/kg) exceeding its CSCO (5.6 mg/kg), benzo(k)fluoranthene (4.3 mg/kg) exceeding its RRSCO (3.9 mg/kg), chrysene (11 mg/kg) exceeding its RRSCO (3.9 mg/kg), dibenzo(a,h)anthracene (1.8 mg/kg) exceeding its CSCO (0.56 mg/kg), and indeno(1,2,3-cd)pyrene (6.3 mg/kg) exceeding its CSCO (5.6 mg/kg). No other SVOCs were detected above RRSCOs. Total SVOC TICs were less than 50 mg/kg at all locations except for SB-10 (352.6 ppm) and SB-15 (156.9 ppm). Total SVOCs were less than 500 ppm at all locations.

Several metals exceeded their respective RRSCOs at subsurface soil investigation locations during the Phase II and RI. Arsenic exceeded its CSCO (16 mg/kg) at SB-1 (136 mg/kg), TP-9 (21.7 mg/kg), SB-10 (27.6 mg/kg), SB-14 (19.1 mg/kg), SB-15 (28.3 mg/kg),

and TP-24 (20.4 mg/kg). Barium exceeded its CSCO (400 mg/kg) at SB-2 (435 mg/kg), TP-2 (633 mg/kg), SB-10 (456 mg/kg) and SB-15 (1,190 mg/kg). Cadmium exceeded its CSCO (9.3 mg/kg) at SB-1 (23.9 mg/kg). Copper exceeded its CSCO (270 mg/kg) at SB-10 (316 mg/kg) and SB-18 (289 mg/kg). Lead exceeded its RRSCO (400 mg/kg) at TP-11 (724 mg/kg), TP-17 (563 mg/kg), SB-14 (870 mg/kg), TP-20 (589 mg/kg), TP-23 (448 mg/kg) and its CSCO (1,000 ppm) at SB-1 (5,680 mg/kg), TP-8 (1,080 mg/kg), TP-21 (1,310 mg/kg) and TP-24 (1,080 mg/kg). Manganese exceeded its RRSCO (2,000 mg/kg) at SB-19 (2,720 mg/kg) and TP-23 (4,800 mg/kg). Mercury exceeded its RRSCO (0.81 mg/kg) at SB-1 (2 mg/kg), TP-3 (1 mg/kg), TP-11 (1.3 mg/kg), SB-11 (1 mg/kg), SB-16 (0.91 mg/kg), TP-23 (1.3 mg/kg), and TP-24 (0.89 mg/kg) and its CSCO (2.8 mg/kg) at SB-5 (8.3 mg/kg), SB-7 (6.7 mg/kg), TP-9 (3.2 mg/kg), SB-14 (4.3 mg/kg) and TP-21 (3.1 mg/kg). All other metal results were below RRSCOs.

Analytical results for deeper native sands sampled during the RI ranging from 4-9 fbgs showed no elevated VOCs or SVOCs above RRSCOs.

PCBs, pesticides, herbicides, and per-and polyfluoroalkyl substances (PFAS) were not detected above RRSCOs.

1.2.3.3 Groundwater

No VOCs, SVOCs (including 1,4-dioxane), PCBs, pesticides, or herbicides were detected above their respective TOGS 1.1.1 Groundwater Quality Standards/Guidance Values (GWQS) or NYSDEC recommended action levels, with the exception of the pesticide alpha-BHC which slightly exceeded its GWQS/GV(0.01 ug/L) at MW-6 (0.013 J ug/L), which was an estimated concentration. Total and dissolved metals detected above GWQS/GV are naturally occurring minerals.

NYSDEC recommended action levels were slightly exceeded for PFAS including perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) at MW-6 and PFOA at MW-7. The soil sample from SB-17/MW-6 (0.5-2 fbgs) was analyzed for PFAS, and no exceedance of Restricted-Residential NYSDEC Guidance Values for PFAS in soil were detected. Soil samples from TP-22, TP-23 and TP-24, all proximate to SB-19/MW-7, were analyzed for PFAS. No exceedances of Restricted-Residential NYSDEC Guidance Values for PFAS in soil were identified at any of the above locations.

1.2.3.4 Soil Vapor

Analytical results in comparison to the New York State Department of Health (NYSDOH) Decision Matrices indicate that mitigation is required within the northern and eastern portion of the building at 225 Louisiana Street due to elevated trichloroethene (TCE), carbon tetrachloride, and cis-1,2-dichloroethene concentrations identified in sub-slab vapor. The southeastern portion of the building is slated to be a grade level parking garage However, the northern portion of the building will be apartments and office space; therefore, this portion will be retrofitted with an active sub-slab depressurization (ASD) system.

1.2.3.5 Building Investigation

Drums and Residual Materials

Various residual materials including paint, paint thinner, paint primer, mineral spirits, empty containers, miscellaneous containers, flower nutrients, used spray paint, a gas powered hydraulic lift, sheet rock, calcium sulfate dihydrate, gasoline oil, motor oil, tractor hydraulic fluid, used oil, acetone, a fire extinguisher containing sodium bicarbonate, batteries, turpentine oil, debris drums containing brick/concrete, unknown drums/containers, unknown oil, and unknown liquid were identified in the building located at 225 Louisiana Street as detailed in the RI/AA Report.

Sump/Pit Sampling

One VOC, chloroform, was detected at a concentration slightly above its GWQS/GV in the liquid sample collected from the elevator sump at Pit-1. Three PAHs (benzo(a)anthracene, chrysene, and bis(2-ethylhexyl)phthalate), and one metal (iron) slightly exceeded their respective GWQS/GV in the liquid sample collected from Sump-1. Regarding the sediment sample collected from Sump-2, individual PAHs (benzo(b)fluoranthene, and indeno(1,2,3-cd)pyrene) and metals (barium and copper) were identified at concentrations exceeding their respective RRSCOs. Based on the analytical data associated with the liquid/sediment samples collected from sumps/pits within the building, such will be cleaned out during interior redevelopment activities.

Transformer Room

Previous investigations conducted at the Site identified a transformer room with five transformers, one of which appeared inactive. One soil/fill sample was collected from beneath the concrete foundation in the transformer room (TR-1). PCBs were not identified above laboratory detection limits from the soil/fill sample.

1.2.3.6 Geophysical Survey Results

The results of the Geophysical survey completed by Maddan Geophysics LLC indicated one (1) major anomaly, named "Anomaly A". Anomaly A was described as an elongated anomaly in the north-south direction and was identified as a relatively high area of conductivity (up to 300 mV) compared to background values. The report noted that Anomaly A is approximately the size and amplitude frequently observed for USTs. However, the report also noted that anomalies such as Anomaly A could also represent remnants of USTs and associated appurtenances, other items of potential environmental significance, and miscellaneous buried metal. However, as the anomaly is in the location of the orphan UST previously identified at TP-3, the UST is likely the source of the anomaly. A linear anomaly was also identified extending from Anomaly A, toward the northwest. This anomaly is likely related to the UST, possibly piping, and will be investigated and removed along with the UST and surrounding petroleum-impacted soils. No other anomalies of concern were identified during the Geophysical survey.

1.2.3.7 Contamination Summary/Hot Spots

While soil/fill materials with elevated PAHs and metals above RRSCOs were identified across the Site, ten (10) distinct "hot spots" were identified and designated: Building interior hot spots (SB-1 Metal Hot Spot, SB-2 Metal Hot Spot, SB-5/SB-14/MW-5 Metal Hot Spot, SB-7 Metal Hot Spot, SB-15 Metal Hot Spot , and SB-18 Metal Hot Spot), Orphan UST Area Petroleum Hot Spot, TP-2 & SB-10/MW-2 Metal Hot Spot, TP-8 & TP-9 Metal Hot Spot and TP-21 Metal Hot Spot, as further described below:

- Building Interior Hot Spots – located underlying the building at 225 Louisiana Street. Metals exceeding CSCOs were identified below the building slab at the following locations:
    - SB-1 – Arsenic (136 mg/kg) was identified exceeding its site-specific action level (SSAL), and cadmium (23.9 mg/kg) and lead (5,680 mg/kg) were identified exceeding CSCOs between 0 and 2 feet below slab.

  - SB-2 – Barium (435 mg/kg) was identified exceeding its CSCO between 0 and 2 feet below slab.
  - SB-5/SB-14/MW-5 – Mercury was identified exceeding its CSCO at SB-14/MW-5 (4.3 mg/kg) and at SB-5 (8.3 mg/kg) between 0 and 2.5 feet below slab.
  - SB-7 – Mercury (6.7 mg/kg) was identified exceeding CSCOs between 0 and 2 feet below slab.
  - SB-15 – Arsenic (28.3 mg/kg) was identified exceeding its SSAL, and barium (1,190 mg/kg) was identified exceeding its CSCO between 0 and 2 feet below slab.
  - SB-18 – Copper (289 mg/kg) was identified exceeding its CSCO between 0 and 2 feet below slab.

- Orphan UST Area Petroleum Hot Spot – located on the northwestern portion of 245 Louisiana Street surrounding an existing orphan UST. Field evidence of gross contamination including visual impacts (black staining, sheen on water), olfactory impacts (petroleum odor), and elevated PID readings (up to 500 ppm) was identified at TP-3, TP-4, and TP-19 between 3 and 8 fbgs.
- TP-2 & SB-10/MW-2 Metal Hot Spot – located on the northeastern portion of 245 Louisiana Street. Barium (633 mg/kg) was identified exceeding its CSCO at TP-2; arsenic (27.6 mg/kg) was identified exceeding its SSAL, and barium (456 mg/kg) and copper (316 mg/kg) were identified exceeding CSCOs at SB-10/MW-2. Exceedances were identified between 0 and 2 fbgs.
- TP-8 & TP-9 Metal Hot Spot – located in the central portion of 245 Louisiana Street. Lead (1,080 mg/kg) was identified exceeding its CSCO at TP-8 and mercury (3.2 mg/kg) was identified exceeding its CSCO at TP-9. Exceedances were identified between 0 and 2 fbgs.
- TP-21 Metal Hot Spot – located in the southern portion of 245 Louisiana Street. Lead (1,310 mg/kg) and mercury (3.1 mg/kg) were identified exceeding CSCOs between 0 and 2 fbgs.

1.3 Primary Constituents of Concern (COCs)

Based on the historic use of the Site as well as results of the Phase II investigation and RI activities, the COCs are presented below:

- ***Soil/Fill:*** Petroleum-related VOCs, PAHs, and metals

1.4 Site Specific Action Levels (SSALs)

SSALs were developed for the Site. These SSALs will be applicable to soil/fill that greatly exceed RRSCOs, have the potential to impact groundwater, or otherwise represent an unacceptable risk to public health or the environment in the context of reasonably anticipated future use and a Track 4 cleanup and therefore require corrective action. These SSALs were developed based on the treatment and/or removal of source areas, including areas that have a greater potential for contaminant migration, and the feasibility of achieving the SSALs based on the nine factors outlined in 6NYCRR Part 375-1.8(f). The SSALs only apply to a Track 4 cleanup with a cover system to be installed over all areas with remaining soil/fill concentrations above RRSCOs, a Site Management Plan (SMP), and Environmental Easement. The following SSALs were developed and used to designate soil/fill areas requiring remediation:

- Total PAHs > 500 mg/kg; this alternative Soil Cleanup Level was employed in lieu of individual restricted residential, commercial, or industrial SCOs, per NYSDEC Commissioner Policy on Soil Cleanup Guidance (CP-51).
- Total Arsenic > 25 mg/kg; this arsenic SSAL was selected based on the arsenic SSALs established for other Track 4 Restricted Residential and Commercial BCP sites in the City of Buffalo, this SSAL appears appropriate for the Site.

1.5 Remedial Action Objectives

The remedial actions for the 225 Louisiana Street Site must satisfy Remedial Action Objectives (RAOs). RAOs are site-specific statements that convey the goals for minimizing substantial risks to public health and the environment. For the 225 Louisiana Street Site, appropriate RAOs have been defined as:

Soil

RAOs for Public Health Protection

• Prevent ingestion/direct contact with contaminated soil.

RAOs for Environmental Protection

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

Groundwater

RAOs for Public Health Protection

• Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards

RAOs for Environmental Protection

• Restore groundwater aquifer to pre-disposal/pre-release conditions, to the extent practicable.

Soil Vapor

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

1.6 Project Organization and Responsibilities

The remedial actions will be completed by remedial construction specialty contractors under contract to Barcalo Buffalo LLC and/or Benchmark-TurnKey. The NYSDEC Division of Environmental Remediation will monitor the activities, in consultation with the NYSDOH, to verify that the work is performed in accordance with the Brownfield Cleanup Agreement (BCA), the approved RAWP, 6NYCRR Part 375, and NYSDEC DER-10 guidance.

2.0 PREPARATION TASKS

The following tasks were or will be completed in preparation of remedial action activities:

2.1 Utility Clearance

Prior to intrusive activities, Dig Safely New York (Call 811) will be contacted by the site contractor at a minimum of three (3) business days in advance of the work and informed of the intent to perform exaction work at the Site.

2.2 Erosion and Sedimentation Control

A Master Erosion Control Plan (MECP) for the Site is included in Appendix A. Erosion control measures (i.e., silt sock, hay bales, silt fence) will be put in place to ensure no potentially contaminated stormwater is discharged from the Site.

Asphalt paved roadways/areas exist on-Site; however, haul roads may be installed, as necessary, to allow truck access for remedial activities.

Bioretention ponds will be installed on the 175 Louisiana Street and 96 Kentucky Street parcels as permanent control measures.

2.3 Health and Safety Plan Development

A Health and Safety Plan (HASP) has previously been prepared in conjunction with the Remedial Investigation Work Plan and it will be enforced by the remediation contractor in accordance with the requirements of 29 CFR 1910.120. The Benchmark-TurnKey HASP covers on-site remedial activities. Benchmark-TurnKey will be responsible for site control and for the health and safety of its authorized site workers. Benchmark-TurnKey's HASP is provided in Appendix B. If a remediation contractor other than Benchmark-TurnKey is used, they will be required to develop a HASP at least as stringent as Benchmark-TurnKey's HASP.

2.3.1 Dust Monitoring and Controls

A Community Air Monitoring Plan (CAMP), which is included in Attachment C of the HASP and in Appendix C of this work plan, will be implemented during intrusive activities. If community air monitoring indicates the need for dust suppression, the contractor will apply a water spray across the excavation and surrounding areas, and on-site haul roads as necessary to mitigate airborne dust formation and migration. Potable water will

either be obtained from a public hydrant, provided by an off-site water service or provided via a water truck with water from an off-site source. Other dust suppression techniques that may be used to supplement the water spray include:

- Hauling materials in properly tarped containers or vehicles.
- Restricting vehicle speeds on-Site.
- Hydro-seeding of final grades.

2.4 Waste Characterization

Waste characterization samples will be collected in accordance with landfill analytical disposal requirements. Pre-characterization of the soil/fill will allow for direct loading and off-site transportation at the time of the impacted soil/fill excavation. Based on the results of the waste characterization sampling, impacted soil will be managed according to all federal, state, and local waste disposal regulations.

3.0 REMEDIAL ACTION ACTIVITIES

The NYSDEC will be notified at least 5 business days in advance of any planned remedial activities. Waste characterization sampling, excavation, post-excavation confirmatory sampling, and backfilling/site grading/cover placement activities will be performed in accordance with this work plan.

3.1 UST Excavation Activities

Remedial Contractor will excavate, uncover, and inspect the orphan UST located in the northwestern portion of 245 Louisiana Street to determine proper handling of any residual contents. If residual contents are discovered, a properly licensed vacuum truck operator will be employed to remove the contents of the UST and clean the interior of the UST. All UST contents and residual cleaning materials will be properly characterized and disposed of off-site at a licensed disposal or recycling facility. Once contents are removed, the UST will be removed from the ground, cleaned of residual contents (interior) and soil (exterior), and transported off-site for disposal or recycled as scrap. Any appurtenant piping will be removed during tank excavation and handled in a similar manner.

3.2 Remedial Soil Excavation Activities

Remedial work will be documented by an experienced Benchmark-TurnKey professional, which will involve excavation to the approximate horizontal and vertical limits identified below. Remedial activities will include:

- Building interior – Excavation of metals-impacted soil exceeding CSCOs and/or SSALs underlying the building located at 225 Louisiana Street, followed by off-site disposal at a commercial sanitary landfill at the following locations: SB-1, SB-2, SB-5/SB-14/MW-5, SB-7, SB-15, and SB-18.
- Excavation of petroleum impacted soil/fill proximate to the orphan UST located in the northwestern portion of 245 Louisiana Street followed by off-site disposal at a commercial sanitary landfill.
- Excavation of metals-impacted soil/fill exceeding CSCOs and/or SSALs from the area surrounding TP-2 and SB-10/MW-2 followed by off-site disposal at a commercial sanitary landfill.

- Excavation of metals-impacted soil/fill exceeding CSCOs from the area surrounding TP-8 and TP-9 followed by off-site disposal at a commercial sanitary landfill.
- Excavation of asphalt and metals-impacted soil/fill exceeding CSCOs from the area surrounding TP-21 followed by off-site disposal at a commercial sanitary landfill.

Additional information relative to each respective hot spot is provided below:

3.2.1 Building Interior

3.2.1.1 SB-1 Metals-Impacted Hotspot

- Remedial Contractor will excavate the designated SB-1 area to a target depth of 2 ft below slab estimated at approximately 50 tons. These soils will be removed for off-Site disposal at a permitted sanitary landfill facility.
- Post-excavation samples will be collected by the Engineer at a frequency up to one per 900 square feet at the bottom of the excavation and up to one per 30-feet along perimeter sidewalls. Samples will be analyzed for arsenic, cadmium, and lead.
- In the event remaining soils exceed 25 mg/kg for arsenic and/or CSCOs for cadmium and lead, Remedial Contractor will excavate, transport and dispose additional soils at the direction of the Engineer, and Engineer will collect additional post-excavation soil samples.
- Following excavation, the Remedial Contractor will backfill the SB-1 area with of NYSDEC-approved imported stone or gravel.

3.2.1.2 SB-2 Metals-Impacted Hotspot

- Remedial Contractor will excavate the designated SB-2 area to a target depth of 2 ft below slab estimated at approximately 50 tons. These soils will be removed for off-Site disposal at a permitted sanitary landfill facility.
- Post-excavation samples will be collected by the Engineer at a frequency up to one per 900 square feet at the bottom of the excavation and up to one per 30-feet along perimeter sidewalls. Samples will be analyzed for barium.
- In the event remaining soils exceed CSCOs, Remedial Contractor will excavate, transport and dispose additional soils at the direction of the Engineer, and Engineer will collect additional post-excavation soil samples.
- Following excavation, the Remedial Contractor will backfill the SB-2 area with NYSDEC-approved imported stone or gravel.

3.2.1.3 SB-5/SB-14/MW-5 Metals-Impacted Hotspot

- Remedial Contractor will excavate the designated SB-5/SB-14/MW-5 area to a target depth of 2.5 ft below slab estimated at approximately 60 tons. These

soils will be removed for off-Site disposal at a permitted sanitary landfill facility.

- Post-excavation samples will be collected by the Engineer at a frequency up to one per 900 square feet at the bottom of the excavation and up to one per 30-feet along perimeter sidewalls. Samples will be analyzed for mercury.
- In the event remaining soils exceed CSCOs, Remedial Contractor will excavate, transport and dispose additional soils at the direction of the Engineer, and Engineer will collect additional post-excavation soil samples.
- Following excavation, the Remedial Contractor will backfill the SB-5/SB-14/MW-5 area with NYSDEC-approved imported stone or gravel.

3.2.1.4 SB-7 Metals-Impacted Hotspot

- Remedial Contractor will excavate the designated SB-7 area to a target depth of 2 ft below slab estimated at approximately 50 tons. These soils will be removed for off-Site disposal at a permitted sanitary landfill facility.
- Post-excavation samples will be collected by the Engineer at a frequency up to one per 900 square feet at the bottom of the excavation and up to one per 30-feet along perimeter sidewalls. Samples will be analyzed for mercury.
- In the event remaining soils exceed CSCOs, Remedial Contractor will excavate, transport and dispose additional soils at the direction of the Engineer, and Engineer will collect additional post-excavation soil samples.
- Following excavation, the Remedial Contractor will backfill the SB-7 area with NYSDEC-approved imported stone or gravel.

3.2.1.5 SB-15 Metals-Impacted Hotspot

- Remedial Contractor will excavate the designated SB-15 area to a target depth of 2 ft below slab estimated at approximately 50 tons. These soils will be removed for off-Site disposal at at a permitted sanitary landfill facility.
- Post-excavation samples will be collected by the Engineer at a frequency up to one per 900 square feet at the bottom of the excavation and up to one per 30-feet along perimeter sidewalls. Samples will be analyzed for arsenic and barium.
- In the event remaining soils exceed 25 mg/kg for arsenic and/or CSCOs for barium, Remedial Contractor will excavate, transport and dispose additional soils at the direction of the Engineer, and Engineer will collect additional post-excavation soil samples.
- Following excavation, the Remedial Contractor will backfill the SB-15 area with NYSDEC-approved imported stone.

3.2.1.6 SB-18 Metals-Impacted Hotspot

- Remedial Contractor will excavate the designated SB-18 area to a target depth of 2 ft below slab estimated at approximately 50 tons. These soils will be

removed for off-Site disposal at a permitted sanitary landfill facility.

- Post-excavation samples will be collected by the Engineer at a frequency up to one per 900 square feet at the bottom of the excavation and up to one per 30-feet along perimeter sidewalls. Samples will be analyzed for copper.
- In the event remaining soils exceed CSCOs, Remedial Contractor will excavate, transport and dispose additional soils at the direction of the Engineer, and Engineer will collect additional post-excavation soil samples.
- Following excavation, the Remedial Contractor will backfill the SB-18 area with NYSDEC-approved imported stone.

3.2.2 Orphan UST Area Petroleum Hot Spot

- Remedial Contractor will excavate the designated Orphan UST area to a target depth of approximately 8 fbgs estimated at approximately 5,200 tons. These soils will be removed for off-Site disposal at a permitted sanitary landfill facility.
- Post-excavation samples will be collected by the Engineer at a frequency up to one per 900 square feet at the bottom of the excavation and up to one per 30-feet along perimeter sidewalls. Samples will be inspected for PID, visual, and olfactory impacts and analyzed for VOCs plus tentatively identified compounds (TICs) and SVOCs plus TICs.
- In the event remaining soils exceed VOCs and/or field evidence of petroleum impacts remain, Remedial Contractor will excavate, transport and dispose additional soils at the direction of the Engineer, and Engineer will collect additional post-excavation soil samples.
- Following excavation, the Remedial Contractor will backfill the Orphan UST area with excavated non-impacted, on-site soil/fill and NYSDEC-approved imported soil and/gravel.

3.2.3 TP-2 & SB-10/MW-2 Metal Hot Spot

- Remedial Contractor will excavate the TP-2 & SB-10/MW-2 area to a target depth of 2 fbgs estimated at approximately 980 tons. These soils will be removed for off-Site disposal at a permitted sanitary landfill facility.
- Post-excavation samples will be collected by the Engineer at a frequency up to one per 900 square feet at the bottom of the excavation and up to one per 30-feet along perimeter sidewalls. Samples will be analyzed for arsenic, barium, and copper.
- In the event remaining soils exceed 25 mg/kg for arsenic and/or CSCOs for barium and copper, Remedial Contractor will excavate, transport and dispose additional soils at the direction of the Engineer, and Engineer will collect additional post-excavation soil samples.
- Following excavation, the Remedial Contractor will backfill the TP-2 & SB-10/MW-2 area with NYSDEC-approved imported soil and/or gravel.

3.2.4 TP-8 & TP-9 Metal Hot Spot

- Remedial Contractor will excavate the designated TP-8 & TP-9 area to a target depth of 2 fbgs estimated at approximately 1,600 tons. These soils will be removed for off-Site disposal at a permitted sanitary landfill facility.
- Post-excavation samples will be collected by the Engineer at a frequency up to one per 900 square feet at the bottom of the excavation and up to one per 30-feet along perimeter sidewalls. Samples will be analyzed for lead and mercury.
- In the event remaining soils exceed CSCOs, Remedial Contractor will excavate, transport and dispose additional soils at the direction of the Engineer, and Engineer will collect additional post-excavation soil samples.
- Following excavation, the Remedial Contractor will backfill the TP-8 & TP-9 area with NYSDEC-approved imported soil and/or gravel.

3.2.5 TP-21 Metal Hot Spot

- Remedial Contractor will excavate the designated TP-21 area to a target depth of 2 fbgs estimated at approximately 50 tons. These soils will be removed for off-Site disposal at a permitted sanitary landfill facility.
- Post-excavation samples will be collected by the Engineer at a frequency up to one per 900 square feet at the bottom of the excavation and up to one per 30-feet along perimeter sidewalls. Samples will be analyzed for lead and mercury.
- In the event remaining soils exceed CSCOs, Remedial Contractor will excavate, transport and dispose additional soils at the direction of the Engineer, and Engineer will collect additional post-excavation soil samples.
- Following excavation, the Remedial Contractor will backfill the TP-1 area with NYSDEC-approved imported stone or gravel.

Final volumes will be determined through post-excavation confirmatory sampling.

The Contractor will strive to achieve a 1:1 (45°) slope for excavations to mitigate sloughing; however, a minimum 1:3 (18°) slope will be maintained for excavations where the Contractor requires access to enter the excavation (e.g., to reach the required remedial depths). As with any remedial excavation, actual site conditions (e.g., visual and/or confirmatory sample analytical results) will dictate final excavation limits. Final excavation limits will be surveyed with a handheld Trimble GeoXH GPS unit and average excavation depths will be manually measured in the field. Horizontal limits and locations of final remedial excavations will be presented on the Site Map in the Final Engineering Report (FER).

Care will be taken to minimize dust formation during excavation and loading and to prevent any dust or mud from being tracked off-Site. The excavation equipment will have sufficient boom length to allow for placement of soil/fill directly into the truck bed if ground surface conditions are conducive to truck traffic (e.g. dry and firm). Side dumping (i.e., with a front-end loader) will only be permitted if ground conditions are not conducive to truck traffic and fugitive dust can be consistently controlled within the Community Air Monitoring Plan action limits.

3.3 Excavation Verification Sampling

Post-excavation confirmation samples will be collected from the remedial excavation areas. A minimum of one sample per 30 linear feet of sidewall and one sample for each 900 square feet of excavation bottom will be used to confirm the excavation limits meet CSCOs and/or SSALs.

Confirmatory samples will be collected for the contaminants of concern from each area. Specifically, soil/fill samples will be analyzed for the following parameters.

- Building Interior:
    - SB-1 Metals-Impacted Hotspot – Total arsenic, total cadmium, and total lead via Environmental Protection Agency (EPA) Method 6010
    - SB-2 Metals-Impacted Hotspot – Total barium via EPA Method 6010
    - SB-5/SB-14/MW-5 Metals-Impacted Hotspot – Total mercury via EPA method 6010
    - SB-7 Metals-Impacted Hotspot – Total mercury via EPA Method 6010
    - SB-15 Metals-Impacted Hotspot – Total arsenic and total barium via EPA Method 6010
    - SB-18 Metals-Impacted Hotspot – Total copper via EPA Method 6010
- Orphan UST Area Petroleum Hot Spot – VOCs plus TICs and SVOCs plus TICs via EPA Methods 8260 and 8270; will additionally be inspected for PID, visual, and olfactory impacts.
- TP-2 & SB-10/MW-2 Metal Hot Spot – Total arsenic, total barium, and total copper via EPA Method 6010
- TP-8 & TP-9 Metal Hot Spot – Total lead and total mercury via EPA Method 6010
- TP-21 Metal Hot Spot – Total lead and total mercury via EPA Method 6010

An equivalent Category B deliverables package will be furnished with the data to allow data evaluation and preparation of a Data Usability Summary Report (DUSR) by an independent, third party data validation expert. Expedited turnaround times may be requested for the analytical results to minimize the time that the excavation(s) remains open. Quality Assurance (QA) samples will be collected to support the verification sample data evaluation. The QA samples will include a minimum of one matrix spike, one matrix spike duplicate, and one blind duplicate per 20 verification samples. Dedicated equipment will be used to avoid the need for equipment blanks.

3.4 Excavation Backfill

Following NYSDEC concurrence that the remedial excavation is complete, the excavations will be backfilled with non-impacted, on-site material and/or approved backfill material in accordance with DER-10.

Backfill material may consist of the following materials:

- Gravel, rock, or stone, consisting of virgin material, from a permitted mine or quarry may be imported, without chemical testing, if it meets the requirements of DER-10, or as otherwise approved by NYSDEC.
- Recycled concrete or brick from a NYSDEC-registered construction and demolition debris processing facility may be imported, without chemical testing, if it meets the requirements of DER-10, or as otherwise approved by NYSDEC.
- Imported soil/fill originating from known off-site sources having no evidence of disposal or releases of hazardous substances, hazardous, toxic or radioactive wastes, or petroleum, and which meets the chemical criteria for Restricted-Residential Use Sites in DER-10, Appendix 5. No off-site materials meeting the definition of a solid waste as defined in 6NYCRR, Part 360-1.2(a) shall be used as backfill.
- Re-use of on-site soil/fill, including excavated overburden soil/fill removed to access impacted soil/fill located on-site; these materials will only be utilized below the soil cover system.

Imported soil/fill material will be subject to characterization requirements in accordance with DER-10 Table 5.4(e)10, or as otherwise approved by NYSDEC prior to import to the Site. Characterization testing will be performed by an independent, NYSDOH Environmental Laboratory Approval Program (ELAP) approved laboratory. An equivalent Category B deliverables package will be furnished with the data to allow data evaluation and

preparation of a Data Usability Summary Report by an independent, third party data validation expert. QA samples will be collected to support the data evaluation. The QA samples will include a minimum of one matrix spike, one matrix spike duplicate, and one blind duplicate per 20 verification samples.

3.5 Groundwater Management

Water removed from excavations and/or surface water run-in to excavations during the impacted soil removal will be handled on-site prior to discharge to the municipal sewer. In general, water removed from excavations will be stored/settled in a portable storage tank, and if deemed necessary, will be pumped through a bag or cartridge filter prior to treatment using granular activated carbon (GAC). Following completion of excavation work, settled solids remaining in the tank and spent filter bags will be disposed of off-site.

If the accumulated waters required treatment, the spent GAC will be characterized and regenerated off-site, or disposed at a permitted disposal facility in accordance with applicable federal and state regulations. The storage tank will be decontaminated via pressure washing. Benchmark-TurnKey or the Site owner will coordinate with the municipal sanitary sewer to obtain any necessary temporary sewer discharge permits.

3.6 Cover System

A cover system will be installed across the Site to prevent direct contact with underlying soil. The planned cover system includes different cover types, including vegetated soil cover, bioretention areas, and hardscaped (asphalt/concrete) areas. Soils/stone imported for use as cover will be subject to NYSDEC approval. Existing asphalt pavement is present at the southern end of the 245 Louisiana Street property and on the entire 177 Louisiana Street property. The existing asphalt and the underlying one (1) foot of soil will be removed and replaced with NYSDEC-approved imported stone subbase and a new asphalt paving. Green areas will be covered with two (2) feet of clean imported soil and seeded to provide a vegetated soil cover system. Excavation areas within the building will be backfilled with NYSDEC-approved stone or gravel and new concrete. A planned cover system layout is provided on Figure 4. Where soil cover system transitions to hardscape, and/or at the limits of the BCP property, the cover will be keyed-in as necessary to achieve the minimum 2 feet of approved backfill material without tapering as shown on Cover System Details provided in Figure 4.

3.7 Active Sub-slab Depressurization (ASD) System

Based on the SVI results from the RI, an ASD system will be required within the footprint of a portion of the building located at 225 Louisiana Street. The southeastern portion of the building is slated to be a grade-level parking garage and not occupied. However, the northern portion of the building will be apartments and office space; therefore, this portion will be retrofitted with an ASD system. Figure 5 identifies the portion of the building that will require depressurization via the ASD system. An ASD system creates a low-pressure zone beneath a building slab using a powered fan connected via piping to create negative pressure beneath the building foundation. The low-pressure field prevents soil gas from entering the building. In general, the essential components of an ASD will include:

- installation of suction pits and/or subsurface piping beneath the slab to adequately provide negative pressure beneath the entire basement footprint;
- installation of a vent stack from the suction pits and/or subsurface piping that will extend above the roof line for discharge;
- installation of continuous operation fan(s) equipped with a pressure gauge to assure the system is under negative pressure; and,
- sealing major slab and foundation penetrations, including joints, cracks and utility and pipe penetrations.

A formal ASD System Work Plan (ASDWP) will be submitted prior to the installation of the ASD system, which will occur prior to building occupancy. The ASDWP will include the results of planned pre-installation communication testing, which will be used to determine the radius of influence below the slab(s), number of required suction points and/or subsurface piping locations, and number and types of fans to adequately provide negative pressure under the building slab. The ASD will be designed in general accordance with the EPA design document entitled "Radon Prevention in the Design and Construction of Schools and Other Large Buildings" Third Printing with Addendum, June 1994 and the NYSDOH "Guidance for Evaluating Soil Vapor Intrusion in the State of New York" dated October 2006.

3.8 Redevelopment Remediation Activities

3.8.1 Utility Replacement/Installation and Handling of Soil/Fill

During redevelopment utilities will be replaced and/or installed under the building. As part of that work, the concrete floor will be saw cut and the surrounding soils will be excavated and disposed at a permitted sanitary landfill facility. Utilities will be installed, the excavation will be backfilled with NYSDEC-approved soil/fill, gravel or stone and the concrete will be replaced.

Some areas of concrete within the building, unrelated to the utility corridors will also require repair or removal. Figure 6 includes utility corridor locations and areas of concrete cover repair/replacement.

3.8.2 Drums and Residual Materials Removal

Oil and liquids stored in various drums and containers inside the building will be characterized and properly disposed. Any contents of unknown drums/containers will also be characterized and properly disposed, and the drums/containers will be cleaned and recycled at a permitted recycling facility. Remaining identified materials will either be properly disposed at a commercial landfill or reused.

3.8.3 Sump/Pit Clean-out

VOCs, PAHs, and/or metals including iron, barium, and copper were detected in sediment and water samples collected from sumps/pits within the building located at 225 Louisiana Street exceeding RRSCOs and GWQS/GV, respectively. The sumps/pits will be cleaned out during redevelopment and, if not intended for future use, will be closed during building redevelopment activities.

3.8.4 Transformer Removal

There are utility-owned transformers located within a room on the east side of the building. The Site owner will arrange to have the transformers removed by National Grid. Previous sampling shows that PCBs were not detected in a soil sample beneath that room. Based on the elevation of the floor in that area, a new concrete floor will be poured over the existing floor to raise the elevation of the floor to match the surrounding area.

4.0 REMEDIAL ACTIVITIES SUPPORT DOCUMENTS

4.1 Health and Safety Protocols

Benchmark-TurnKey has prepared a HASP for use by our employees in accordance with 40 CFR 300.150 of the NCP and 29 CFR 1910.120. The HASP, provided in Appendix B, includes the following site-specific information:

- A hazard assessment.
- Training requirements.
- Definition of exclusion, contaminant reduction, and other work zones.
- Monitoring procedures for Site operations.
- Safety procedures.
- Personal protective clothing and equipment requirements for various field operations.
- Disposal and decontamination procedures.

The HASP also includes a contingency plan that addresses potential site-specific emergencies, and a Community Air Monitoring Plan as described above.

Health and safety activities will be monitored throughout the remedial field activities. A member of the field team will be designated to serve as the Site Safety and Health Officer (SSHO). The SSHO will report directly to the Project Manager and the Corporate Health and Safety Coordinator. The HASP will be subject to revision as necessary, based on new information that is discovered during the field investigation and/or remedial activities.

4.1.1 Community Air Monitoring

Real-time community air monitoring will be performed during remedial activities at the Site. A Community Air Monitoring Plan (CAMP) is included in Attachment C of Benchmark-TurnKey's HASP and in Appendix C of this work plan. Particulate and VOC monitoring will be performed along the downwind perimeter of the work area during subgrade excavation, grading, and soil/fill handling activities in accordance with this plan. The CAMP is consistent with the requirements for community air monitoring at remediation sites as established by the NYSDOH and NYSDEC. Accordingly, it follows procedures and practices outlined under DER-10 Appendix 1A (NYSDOH's Generic Community Air Monitoring Plan) and Appendix 1B (Fugitive Dust and Particulate Monitoring).

Visual impacts, olfactory impacts, and elevated PID readings were identified within the Orphan UST Area Petroleum Hot Spot. Due to the proximity to off-site residential properties and Conway Park, a permanent CAMP station will be located at the corner of Louisiana Street and Mackinaw Street regardless of wind direction during excavation and backfilling activities in this area. Furthermore, the contractor will have odor suppressant on-site and ready for use during excavation and backfilling activities, if needed.

4.2 Citizen Participation Activities and Fact Sheets

NYSDEC will coordinate and lead community relations throughout the course of the project with support from Benchmark-TurnKey as requested. A Citizen Participation (CP) Plan has previously been prepared as a separate document and submitted to the NYSDEC. A copy of the approved CP Plan was placed at the designated document repository.

The NYSDEC, with input from Benchmark-TurnKey and Barcalo Buffalo LLC, will issue project-related fact sheets to keep the public informed of BCP activities.

5.0 REPORTING AND SCHEDULE

Benchmark-TurnKey environmental professionals will be on-site full-time during all major remedial activities to monitor and document: construction stake-out; record drawings; daily reports of remediation activities; community air monitoring results; post-excavation sampling and analysis; and progress photographs and sketches. Full details of the remedial activities will be included in the Final Engineering Report (FER).

Work will commence upon NYSDEC approval of the work plan, anticipated May 2021.

6.0 REMEDIAL ACTIVITIES REPORTING

6.1 Construction Monitoring

A Benchmark-TurnKey scientist or engineer will be on-site on a full-time basis to document remedial activities. Such documentation will include, at minimum, daily reports of Remedial Action activities, community air monitoring results, photographs and sketches. Appendix D contains sample project documentation forms.

The completed reports will be available on-site and submitted to the NYSDEC as part of the FER. The NYSDEC will be promptly notified of problems requiring modifications to this Work Plan prior to proceeding or completion of the construction item.

Photo documentation of the remedial activities will be prepared by a field representative throughout the duration of the project as necessary to convey typical work activities, changed conditions, and/or special circumstances. If determined to be necessary, periodic on-site construction progress meetings will be held to which NYSDEC will receive an invitation.

6.2 Final Engineering Report

A FER will be prepared at the conclusion of remedial activities. The FER will include the following information and documentation, consistent with the NYSDEC's DER-10 Technical Guidance for Site Remediation:

- Introduction and background.
- Planimetric map showing the areas remediated, including significant site features.
- Map showing the lateral limits of any excavations and/or treatment areas.
- Tabular summaries of unit quantities including: volume of soil excavated and/or treated and disposition of excavated/treated soil; and, origin and volume of imported soil.
- Planimetric map showing location of all verification and other sampling locations with sample identification labels/codes.
- Tabular comparison of verification and other sample analytical results to SCOs and SSALs. An explanation shall be provided for any results exceeding acceptance criteria.
- Documentation on the disposition of impacted soil removed.
- Documentation of the cover system, including survey elevations.

- Copies of daily inspection reports and, if applicable, problem identification and corrective measure reports.
- Photo documentation of remedial activities.
- Text describing the remedial activities performed; a description of any deviations from the Work Plan and associated corrective measures taken; and other pertinent information necessary to document that the Site activities were carried out in accordance with this Work Plan.

In addition, Barcalo Buffalo LLC, will subcontract for third-party data review of post-excavation verification data by a qualified, independent data validation expert. Specifically, a Data Usability Summary Report (DUSR) will be prepared, with appropriate data qualifiers added to the results. The DUSR format will follow the NYSDEC's September 1997 DUSR guidelines and draft DER-10 guidance. The DUSR and any necessary qualifications to the data will be appended to the FER.

6.3 Site Management Plan

For any BCP site not cleaned up to NYSDEC Part 375 USCOs, preparation of a SMP that describes site-specific Institutional Controls and/or Engineering Controls (IC/EC) is a required component of the final remedy. Therefore, as part of the final remedy, a SMP will be prepared. Consistent with NYSDEC BCP requirements, the SMP will include the following components:

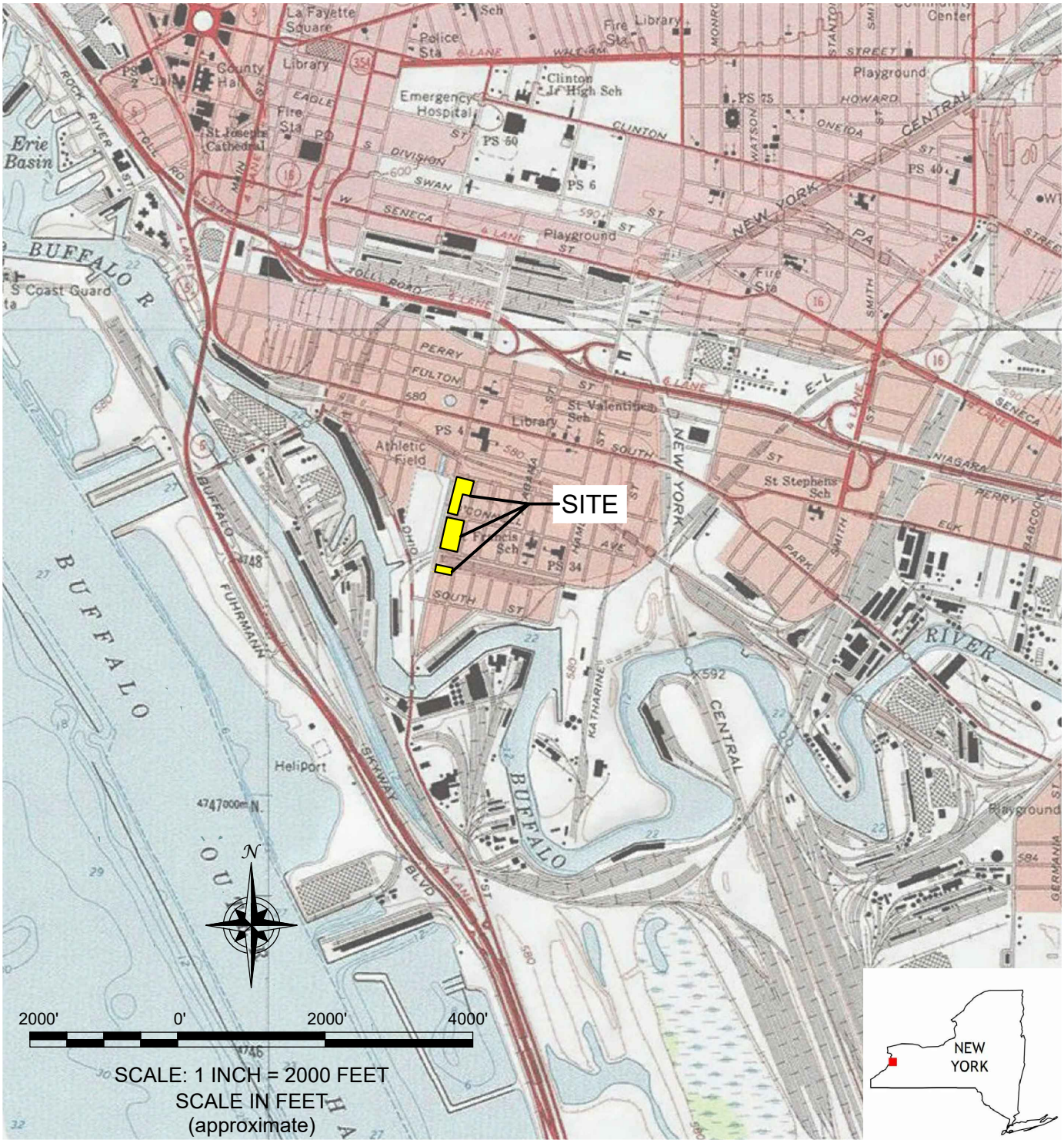
- **Engineering and Institutional Controls Plan**. Engineering controls include any physical barrier or method employed to actively or passively contain, stabilize, or monitor contaminants; restrict the movement of contaminants; or eliminate potential exposure pathways to contaminants. Institutional controls at the site will include groundwater use restrictions and use restrictions of the site to commercial or industrial purposes.
- **Operation and Maintenance Plan** that describes the measures necessary to operate, monitor, and maintain the soil cover system.
- **Excavation Work Plan** to assure that post-remediation intrusive activities and soil/fill handling at the Property related to redevelopment, operation, and maintenance are completed in a safe and environmentally responsible manner.
- **Site Monitoring Plan** that includes provisions for a groundwater monitoring plan and a Property-wide inspection program to assure that the IC/ECs remain effective.
- **Environmental Easement** filed with Erie County.

7.0 REFERENCES

1. New York State Department of Environmental Conservation. *DER-10 Technical Guidance for Site Investigation and Remediation.* May 2010.
2. New York State Department of Environmental Conservation. *6 NYCRR Part 375 Environmental Remediation Programs Subparts 375-1 to 375-4 and 375-6.* Effective December 14, 2006.
3. New York State Department of Environmental Conservation Division of Water Technical and Operational Guidance (TOGS). *1.1.1 Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations*. June 1998.
4. New York State Department of Health. *Guidance for Evaluating Soil Vapor Intrusion in the State of New York*. October 2006.
5. Benchmark Environmental Engineering & Science, PLLC. *Phase I Environmental Site Assessment (ESA), 225 Louisiana Street and Associated Parcels, Buffalo, New York.* November 2018.
6. Benchmark Environmental Engineering & Science, PLLC. *Phase II Environmental Investigation Report, 225 Louisiana Street and Associated Parcels, Buffalo, New York.* February 2019.
7. Benchmark Environmental Engineering & Science, PLLC. *Remedial Investigation Work Plan, 225 Louisiana Street Site, BCP Site No. C915350, Buffalo, New York.* September 2020.
8. Maddan Geophysics LLC. *Geophysical Survey Results, 245 Louisiana Street, Buffalo, NY*. April 29, 2021.
9. Benchmark Environmental Engineering & Science, PLLC in association with TurnKey Environmental Restoration, LLC. *Remedial Investigation Alternatives Analysis Report, 225 Louisiana Street Site, Buffalo, New York, BCP Site No. C915350.* Revised May 2021.

FIGURES

FIGURE 1



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PROJECT NO.: B0305-018-001

DATE: APRIL 2021

DRAFTED BY: CMS

SITE LOCATION AND VICINITY MAP

REMEDIAL ACTION WORK PLAN

225 LOUISIANA STREET SITE
BUFFALO, NEW YORK

PREPARED FOR

BARCALO BUFFALO LLC

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DATE: APRIL 2021
DRAFTED BY: CCB

FIGURE 2

SITE PLAN (AERIAL)

REMEDIAL ACTION WORK PLAN

225 LOUISIANA STREET SITE
BUFFALO, NEW YORK

PREPARED FOR
BARCALO BUFFALO LLC

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC
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JOB NO.: B0305-018-001

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DATE: APRIL 2021
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LEGEND:

- PROPERTY BOUNDARY
- PARCEL BOUNDARY
- SB-1 — PHASE II BORING LOCATION
- TP-18 — PHASE II TEST PIT LOCATION
- TR-1 — TRANSFORMER ROOM BORING LOCATION
- SS-1 — RI SURFACE SOIL LOCATION
- TP-19 — RI TEST PIT LOCATION
- MW-1/SB-9 — RI SOIL BORING/MONITORING WELL LOCATION
- SB-17/MW-6 — RI SOIL BORING/MONITORING WELL (1") LOCATION
- SB-13 — RI SOIL BORING LOCATION
- ARSENIC EXCEEDS SSAL (25 MG/KG)
- BARIUM EXCEEDS CSCO (400 MG/KG)
- CADMIUM EXCEEDS CSCO (9.3 MG/KG)
- COPPER EXCEEDS CSCO (270 MG/KG)
- LEAD EXCEEDS CSCO (1,000 MG/KG)
- MERCURY EXCEEDS CSCO (2.8 MG/KG)
- METALS EXCAVATION AREA
- PETROLEUM EXCAVATION AREA

NOTE:
1. FINAL EXCAVATION EXTENTS WILL BE DETERMINED BASED ON CONFIRMATORY SAMPLE RESULTS. CONFIRMATORY SAMPLES WILL BE COLLECTED AT A FREQUENCY UP TO ONE PER 900 SQUARE FEET AT THE BOTTOM OF THE EXCAVATION AND UP TO ONE PER 30 FEET ALONG PERIMETER SIDEWALLS.

DEFINITIONS:
SSAL = SITE-SPECIFIC ACTION LEVEL
CSCO = 6 NYCRR PART 375 COMMERCIAL SOIL CLEANUP OBJECTIVES

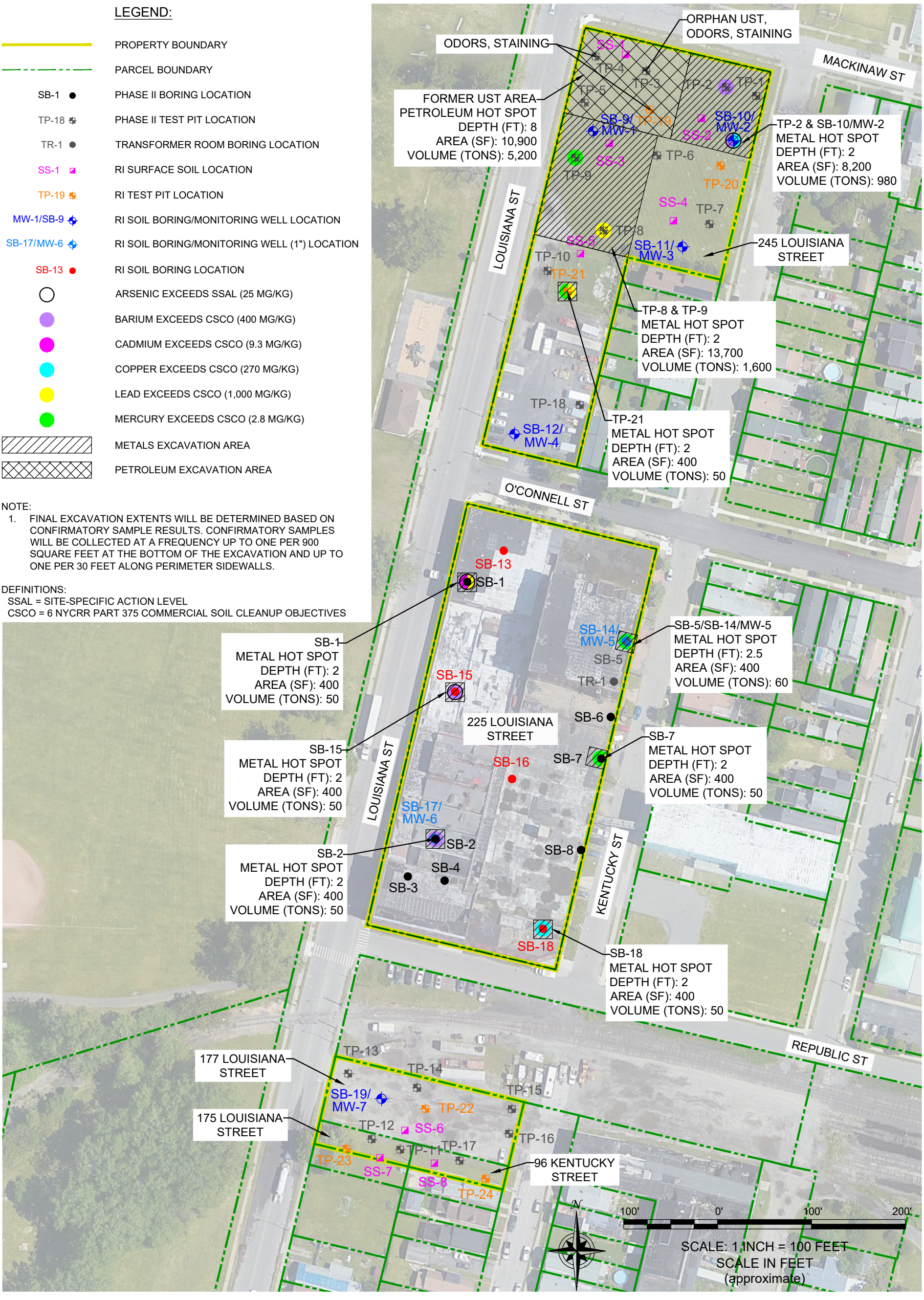

FIGURE 3

HOT SPOT REMEDIAL AREAS

REMEDIAL ACTION WORK PLAN

225 LOUISIANA STREET SITE
BUFFALO, NEW YORK

PREPARED FOR
BARCALO BUFFALO LLC

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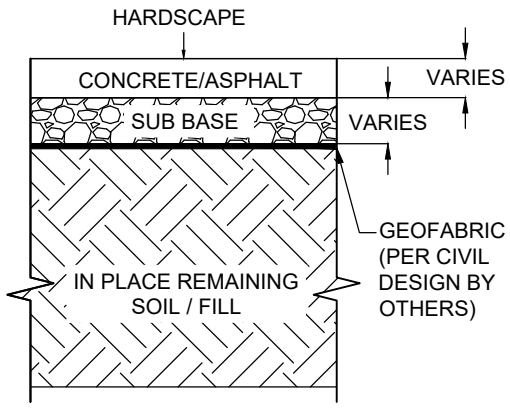
F:\CAD\Benchmark\Frizlen\Louisiana Street Parcels\RAWP\Figure 4; Cover System Layout and Detail_REVJun21.dwg, 6/22/2021 3:10:28 PM, DWG To PDF.pc3

DATE: APRIL 2021
DRAFTED BY: CMS/CCB/CNK

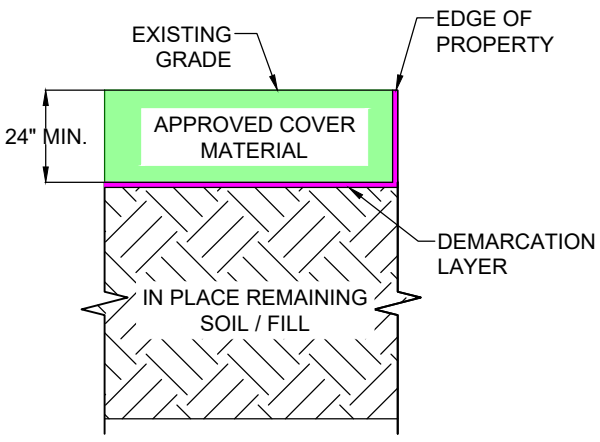
LEGEND:

- PROPERTY BOUNDARY
- PARCEL BOUNDARY
- HARDSCAPE
- GREENSPACE
- EXISTING BUILDING

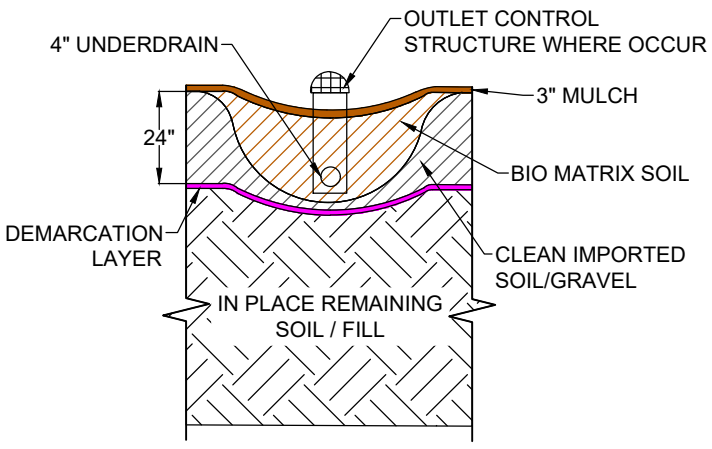


A

NOTE A: THICKNESS VARIES BY COVER TYPE AND DESIGNATED USE PER CIVIL CONSTRUCTION DETAILS (BY OTHERS);

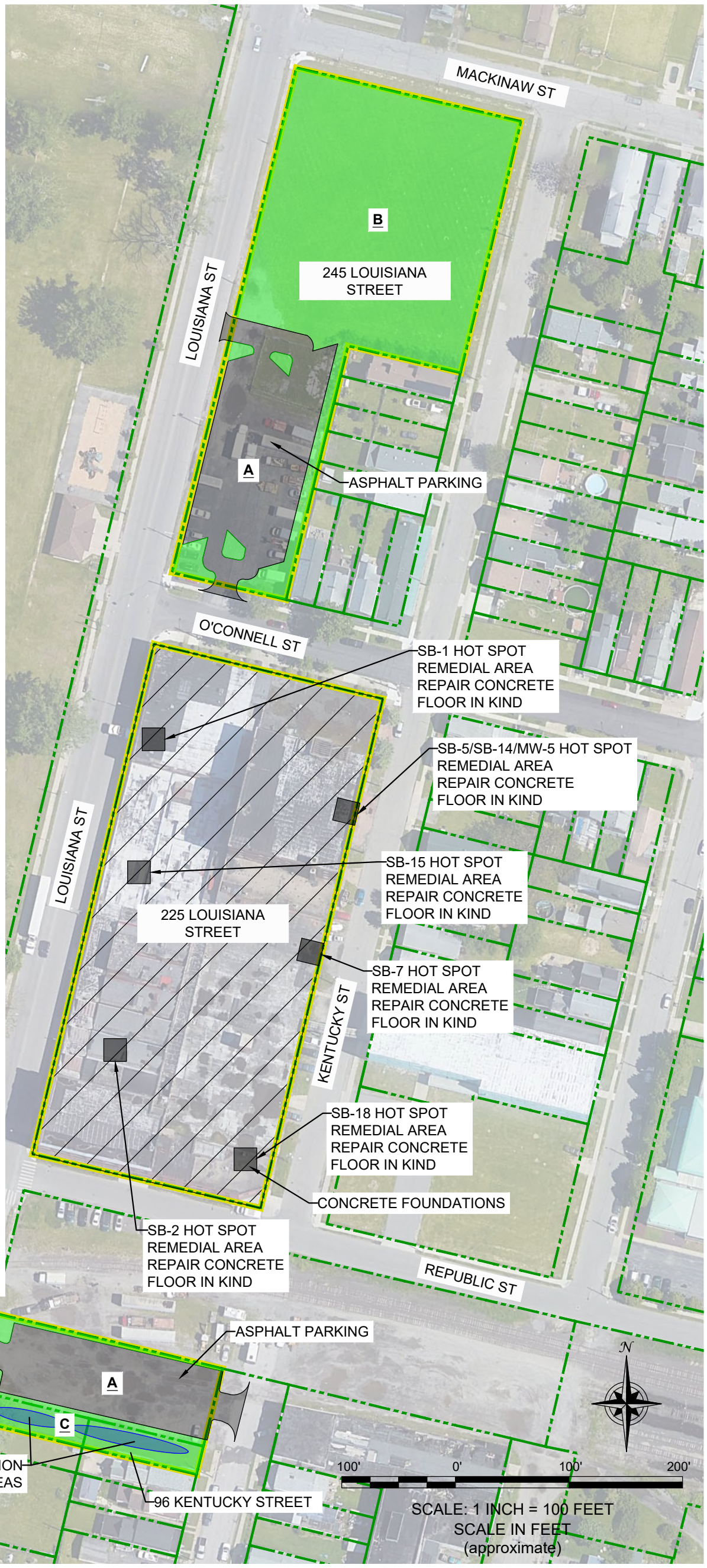


B



C

NOTE C: OUTLET STRUCTURE DESIGN PER THE FRIZLEN GROUP ARCHITECTS DRAWING C400.



COVER SYSTEM LAYOUT AND DETAIL

REMEDIAL ACTION WORK PLAN

225 LOUISIANA STREET SITE
BUFFALO, NEW YORK

PREPARED FOR
BARCALO BUFFALO LLC

FIGURE 4

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC
2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0599

JOB NO.: B0305-018-001

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DATE: APRIL 2021
DRAFTED BY: CCB/CNK

LEGEND:

- PROPERTY BOUNDARY
- PARCEL BOUNDARY
- SSV-1/IA-1 (SV) — RI SUB-SLAB VAPOR/INDOOR AIR LOCATION
- ACTIVE SUB-SLAB DEPRESSURIZATION (ASD) TREATMENT AREA
- NO FURTHER ACTION REQUIRED FOR ANY PARAMETER
- MONITORING OR MITIGATION REQUIRED FOR AT LEAST ONE PARAMETER

NOTE:
1. CONSTITUENTS MONITORED UNDER NYSDOH VAPOR/INDOOR AIR QUALITY STANDARDS (MATRICES A,B,C - UPDATED MAY 2017).

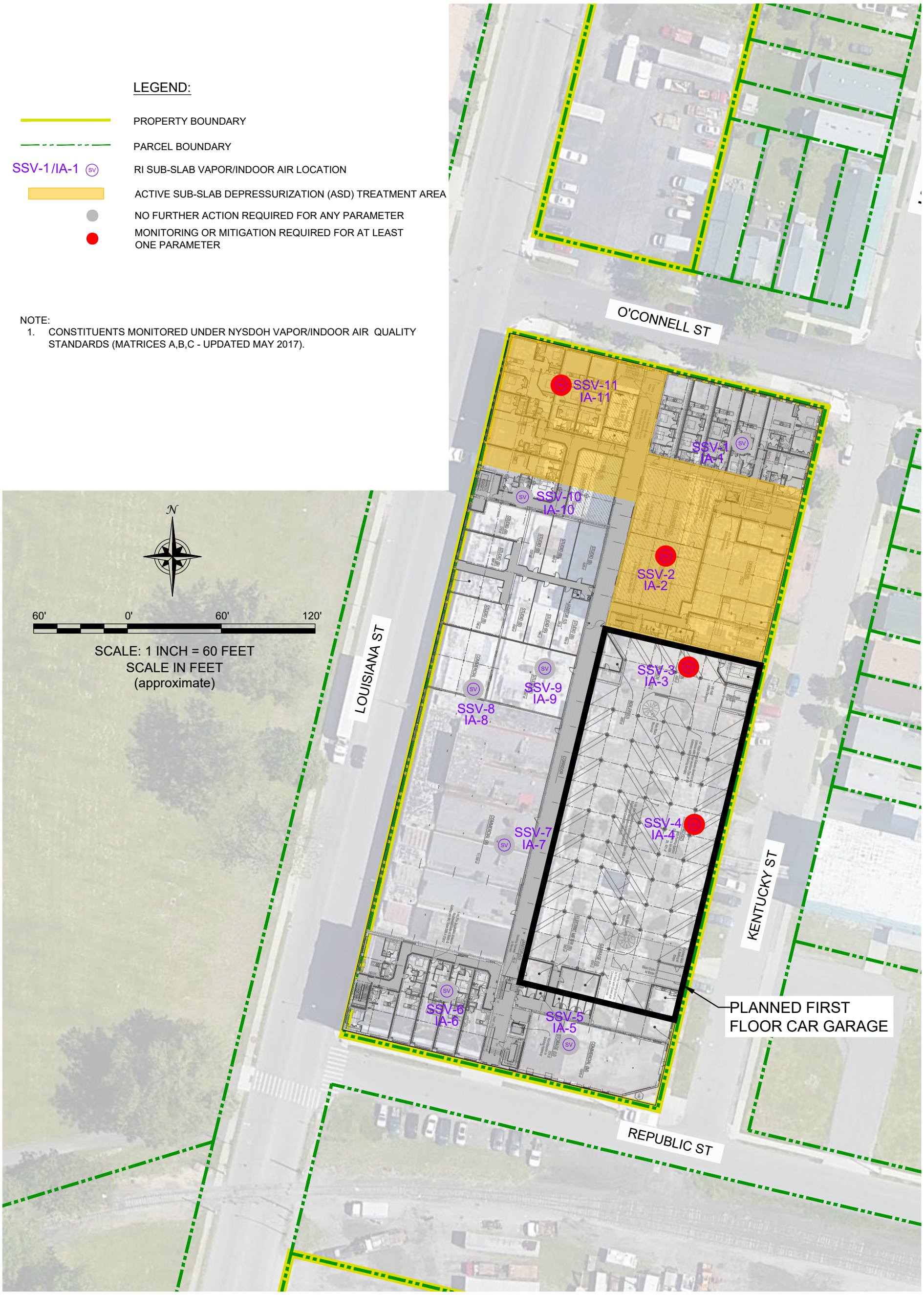

FIGURE 5

ACTIVE SUB-SLAB DEPRESSURIZATION TREATMENT AREA

REMEDIAL ACTION WORK PLAN

225 LOUISIANA STREET SITE
BUFFALO, NEW YORK

PREPARED FOR
BARCALO BUFFALO LLC

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC
2558 HAMBURG TURNPIKE
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F:\CAD\Benchmark\Frizlen\Louisiana Street Parcels\RAWP\Figure 6; Subgrade Utility Corridors and Concrete Removal-Replacement Areas.dwg, 5/18/2021 4:40:39 PM

DATE: MAY 2021
DRAFTED BY: CNK

LEGEND:

PROPERTY BOUNDARY

PARCEL BOUNDARY

AREA OF CONCRETE REMOVAL/REPLACEMENT

N

60' 0' 60' 120'

SCALE: 1 INCH = 60 FEET
SCALE IN FEET
(approximate)

O'CONNELL ST

LOUISIANA ST

UTILITY CORRIDORS

KENTUCKY ST

REPUBLIC ST

SUBGRADE UTILITY CORRIDORS AND CONCRETE REMOVAL/REPLACEMENT AREAS

REMEDIAL ACTION WORK PLAN

225 LOUISIANA STREET SITE
BUFFALO, NEW YORK

PREPARED FOR
BARCALO BUFFALO LLC

FIGURE 6

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC
2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0599

JOB NO.: B0305-018-001

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APPENDIX A

MASTER EROSION CONTROL PLAN (MECP)

MASTER EROSION CONTROL PLAN

225 LOUISIANA STREET SITE
BCP SITE NO. C915350
BUFFALO, NEW YORK

May 2021 B0305-018-001

Prepared for:
Barcalo Buffalo LLC

Prepared By:

Benchmark Environmental Engineering & Science, PLLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0599

In Association With:

TurnKey Environmental Restoration, LLC
2558 Hamburg Turnpike, Suite 300
Buffalo, NY 14218
(716) 856-0635

TABLE OF CONTENTS

LIST OF ATTACHMENTS

1.0 INTRODUCTION

1.1 Background

The BCP property is situated in a residential, commercial and industrial zoned area of the City of Buffalo, Erie County, New York and consists of five (5) parcels measuring approximately 4.23-acres as follows:

- 175 Louisiana Street: SBL No. 122.47-4-28, 0.06 acres
- 177 Louisiana Street: SBL No. 122.47-4-2, 0.33 acres
- 225 Louisiana Street: SBL No. 122.47-1-1, 2.17 acres
- 245 Louisiana Street: SBL No. 122.40-9-1, 1.61 acres
- 96 Kentucky Street: SBL No. 122.47-4-3, 0.06 acres

The Site is developed with one (1) structure located on the 225 Louisiana Street parcel. The existing building is currently occupied by several tenants and is primarily used as a distribution facility. The existing building also includes vacant space and storage areas. The Site also includes asphalt/gravel parking lots and green areas.

The northern portion of the Site was occupied by an oil works company with bulk oil storage prior to 1889. The central and northern portions of the Site were used as a lumber yard from at least 1889 to the 1920s. The central portion of the Site was used for heavy industrial/factory purposes from the 1920s to the 1990s. Operations included manufacturing, a foundry, nickel plating, machine shops, iron works, spray booths/painting, annealing, a forge shop with 17 oil furnaces and dipping with dip tanks. An auto repair shop was also identified on the northwestern portion of the Site during this time. Railroad tracks, residential properties, storefronts, and a warehouse were identified on the southern end of the Site from at least 1889 to prior to 1981. The Site has been used as a warehousing/distribution facility, parking lot, and storage area since the 1990s.

The Site has an extensive tank history estimated at eight underground storage tanks (USTs) located on-Site between 1940 and 1992. The only UST removal record was a municipal

document indicating removal of one 15,000-gallon fuel oil UST from the Site in 1992. Registered Chemical Bulk Storage (CBS) aboveground storage tanks (ASTs) were also identified.

1.2 Purpose and Scope

This Master Erosion Control Plan (MECP) was prepared to provide guidance during remedial action activities since erosion control will be a critical component of preventing the potential migration of contaminants off-site during excavation activities.

2.0 POTENTIAL EROSION AND SEDIMENT CONTROL CONCERNS

Potential areas and items of concern during remedial action activities may include the following:

- Remediated areas or off-site properties adjacent to unremediated parcels need protection so they do not become impacted by Site operations.
- Runoff from soil stockpiles, if any, will require erosion controls.
- Surface slopes need to be minimized as much as practical to control sediment transfer.
- Soil/fill excavated will require proper handling and disposal.

3.0 EROSION AND SEDIMENT CONTROL MEASURES

3.1 Background

Standard soil conservation practices need to be incorporated into remedial activities to mitigate soil erosion damage, off-site sediment migration, and water pollution from erosion. These practices combine vegetative and structural measures, many of which will be permanent in nature and become part of the completed project (i.e., grading). Other measures will be temporary and serve only during the construction stage. Selected erosion and sediment control measures will meet the following criteria:

- Incorporate temporary and permanent erosion control measures.
- Remove sediment from sediment-laden storm water before it leaves the Site.

3.2 Temporary Measures

Temporary erosion and sedimentation control measures and facilities will be used during construction. These temporary measures will be installed and maintained until they are either no longer needed or until such time as permanent measures are installed and become effective. Erosion and sediment controls shall be installed in accordance with the standards and specifications presented in Attachment A-1. At a minimum, the following temporary measures will be used:

- Stabilized Construction Entrance
- Silt fencing, tubular silt socks
- Cautious placement, compaction and grading of stockpiles

3.2.1 Stabilized Construction Entrance

Prior to initiation of construction activities, stabilized temporary construction entrances will be established, allowing trucks to access the Site.

3.2.2 Silt Fencing

Remedial activities may result in surface water flow to drainage ditches and adjacent properties. Silt fencing or tubular silt socks will be the primary sediment control measure used in these areas. Prior to extensive soil excavation or grading activities, silt fences or silt socks

will be installed along the perimeter of all construction areas. The orientation of the fencing will be adjusted as necessary as the work proceeds to accommodate changing site conditions.

If necessary, intermediate fencing/socks will be used upgradient of the perimeter fencing/socks to help lower surface water runoff velocities and reduce the volume of sediment to perimeter fencing/socks. Stockpiles will also be surrounded with silt fencing/socks.

As sediment collects, the silt fences/socks will be cleaned as necessary to maintain their integrity. Removed sediment will be used elsewhere on-site as general fill. All perimeter silt fences/socks will remain in place until construction activities in an area are completed and vegetative cover has been established.

3.2.3 Cautious Placement of Stockpiles

Excavation activities may produce stockpiles of soil and subgrade soil/fill materials. Careful placement and construction of stockpiles will be required to control erosion. Stockpiles will be placed no closer than 50 feet from storm water inlets and parcel boundaries. Additionally, stockpiles will be graded and compacted as necessary for positive surface water runoff and dust control.

3.3 Permanent Control Measures during Site Redevelopment

Permanent erosion and sedimentation control measures and structures will be installed as soon as practical during construction for long-term erosion protection. Examples of permanent erosion control measures could include:

- Minimizing the potential contact with, and migration of, subsurface soil/fill through the placement of a "clean" slag cover system in all areas not covered with structures, roads, parking areas, sidewalks, etc.
- Installation of bioretention ponds where appropriate.
- Planting and maintaining vegetation.
- Limiting runoff flow velocities to the extent practical.

4.0 CONSTRUCTION MANAGEMENT PRACTICES

4.1 General

The following general construction practices should be evaluated for erosion and sedimentation control purposes during remedial activities:

- Clearing and grading only as much area as is necessary to accommodate the construction needs to minimize disturbance of areas subject to erosion (i.e., phasing the work).
- Covering exposed or disturbed areas of the Site as quickly as practical.
- Installing erosion and sediment control measures before disturbing the Site subgrade.
- Minimizing both on-site and off-site tracking of soil by vehicles by using routine entry/exit routes.

4.2 Monitoring, Inspection and Maintenance

All erosion and sedimentation controls described in this Plan will be inspected by a qualified representative of the Site Owner within 24 hours of a heavy rainfall event (defined as more than 0.5 inches of precipitation in a 24-hour period) and repaired or modified as necessary to effectively control erosion or turbidity problems. Inspections should include areas under construction, stockpile areas, erosion control devices (i.e., silt fences, silt socks, storm drain inlet protection, etc.) and locations where vehicles enter and leave the site. Routine inspections of the entire Site should also be made on a weekly basis during development.

If inspections indicate problems, corrective measures should be implemented within 24 hours. A report summarizing the scope of the inspection, name of the inspector, date, observations made, and a description of the corrective actions taken should be completed. Attachment A-2 includes the Inspection and Maintenance Report Form.

4.2.1 Implementation

Erosion controls and features shall, at all times, be properly constructed, operated, and maintained in accordance with regulatory requirements and good engineering and construction practices. Erosion control measures and activities will be conducted in accordance with currently accepted Best Management Practices (BMPs).

Erosion control monitoring, inspection, and maintenance are an integral part of Site storm water and erosion control. The key elements of the monitoring effort include the following:

- Site inspections and maintenance
- BMPs monitoring
- Recordkeeping
- Review and modifications
- Certification of compliance

4.2.2 Site Inspections and Maintenance Practices

The temporary erosion control features will be maintained until no longer needed or permanent erosion control methods are installed. Site inspections are required every seven days or within 24 hours of a rainfall of 0.5 inches or greater. All disturbed areas, areas for material storage, locations where vehicles enter or exit the site, and all of the erosion and sediment controls identified as part of this Plan must be inspected. Controls must be in good operating condition until the affected area they protect has been completely stabilized and the construction activity is complete. If a repair is necessary, it must be completed within seven days of receipt of a report or notice, if practical. Inspection for specific erosion and sediment controls will include the following:

- Silt fence/silt socks will be inspected to determine the following:
  1) Depth
  2) Condition of fabric
  3) That the fabric is attached to the posts
  4) That the fence posts are firmly in the ground
- The silt fences/silt socks will be inspected weekly and within 24 hours of a 0.5 inch or greater storm event.
- Temporary and permanent seeding and planting will be inspected for bare spots, washouts, and other potential erosion control problems.
- The Contractor shall designate individual(s) that will be responsible for erosion control, maintenance, and repair activities. The designated individual will also be responsible for inspecting the site and filling out the inspection and maintenance report.

- Personnel selected for inspection and maintenance responsibilities will receive training as directed by the Engineer. They will be trained in all the inspection and maintenance practices necessary for keeping the erosion and sediment controls used on-site in good working order.

The individual inspecting the Site must record any damages or deficiencies on the Inspection and Maintenance Report Form in Attachment A-2. This form can be used to request maintenance and repair and to document inspection and maintenance activities. Damages or deficiencies must be corrected as soon as possible after the inspection. Any changes that may be required to correct deficiencies in this Plan should also be made as soon as possible, but in no case later than seven days after the inspection.

4.2.3 Recordkeeping

A copy of the MECP and inspection and maintenance records must be kept at the Site from the time construction activities begins until the Site is stabilized. These documents will be made available upon request to regulatory agency representatives or members of the public.

4.2.4 Modifications to the Storm Water Management and Erosion Control Plan

During the course of construction, unanticipated changes may occur that affect this MECP such as schedule changes, phasing changes, staging area modifications, off-site drainage impacts, and repeated failures of designed controls. Any changes to the activities and controls identified in this Plan must be documented and the Plan revised accordingly. Certification of revisions to this plan shall be included at the end of the document.

ATTACHMENT A-1

EROSION CONTROL DETAILS

FINAL

New York State Standards and Specifications for Erosion and Sediment Control

November 2016

NEW YORK STATE OF OPPORTUNITY
Department of Environmental Conservation

STANDARD AND SPECIFICATIONS FOR STABILIZED CONSTRUCTION ACCESS

Definition & Scope

A stabilized pad of aggregate underlain with geotextile located at any point where traffic will be entering or leaving a construction site to or from a public right-of-way, street, alley, sidewalk, or parking area. The purpose of stabilized construction access is to reduce or eliminate the tracking of sediment onto public rights-of-way or streets.

Conditions Where Practice Applies

A stabilized construction access shall be used at all points of construction ingress and egress.

Design Criteria

See Figure 2.1 on page 2.31 for details.

Aggregate Size: Use a matrix of 1-4 inch stone, or reclaimed or recycled concrete equivalent.

Thickness: Not less than six (6) inches.

Width: 12-foot minimum but not less than the full width of points where ingress or egress occurs. 24-foot minimum if there is only one access to the site.

Length: As required, but not less than 50 feet (except on a single residence lot where a 30 foot minimum would apply).

Geotextile: To be placed over the entire area to be covered with aggregate. Filter cloth will not be required on a single-family residence lot. Piping of surface water under entrance shall be provided as required. If piping is impossible, a mountable berm with 5:1 slopes will be permitted.

Criteria for Geotextile: The geotextile shall be woven or nonwoven fabric consisting only of continuous chain polymeric filaments or yarns of polyester. The fabric shall be inert to commonly encountered chemicals, hydro-carbons, mildew, rot resistant, and conform to the fabric properties as shown:

Fabric Properties[3]	Light Duty[1] Roads Grade Subgrade	Heavy Duty[2] Haul Roads Rough Graded	Test Method
Grab Tensile Strength (lbs)	200	220	ASTM D1682
Elongation at Failure (%)	50	60	ASTM D1682
Mullen Burst Strength (lbs)	190	430	ASTM D3786
Puncture Strength (lbs)	40	125	ASTM D751 Modified
Equivalent	40-80	40-80	US Std Sieve
Opening Size			CW-02215
Aggregate Depth	6	10	-

[1]Light Duty Road: Area sites that have been graded to subgrade and where most travel would be single axle vehicles and an occasional multi-axle truck. Acceptable materials are Trevira Spunbond 1115, Mirafi 100X, Typar 3401, or equivalent.

[2]Heavy Duty Road: Area sites with only rough grading, and where most travel would be multi-axle vehicles. Acceptable materials are Trevira Spunbond 1135, Mirafi 600X, or equivalent.

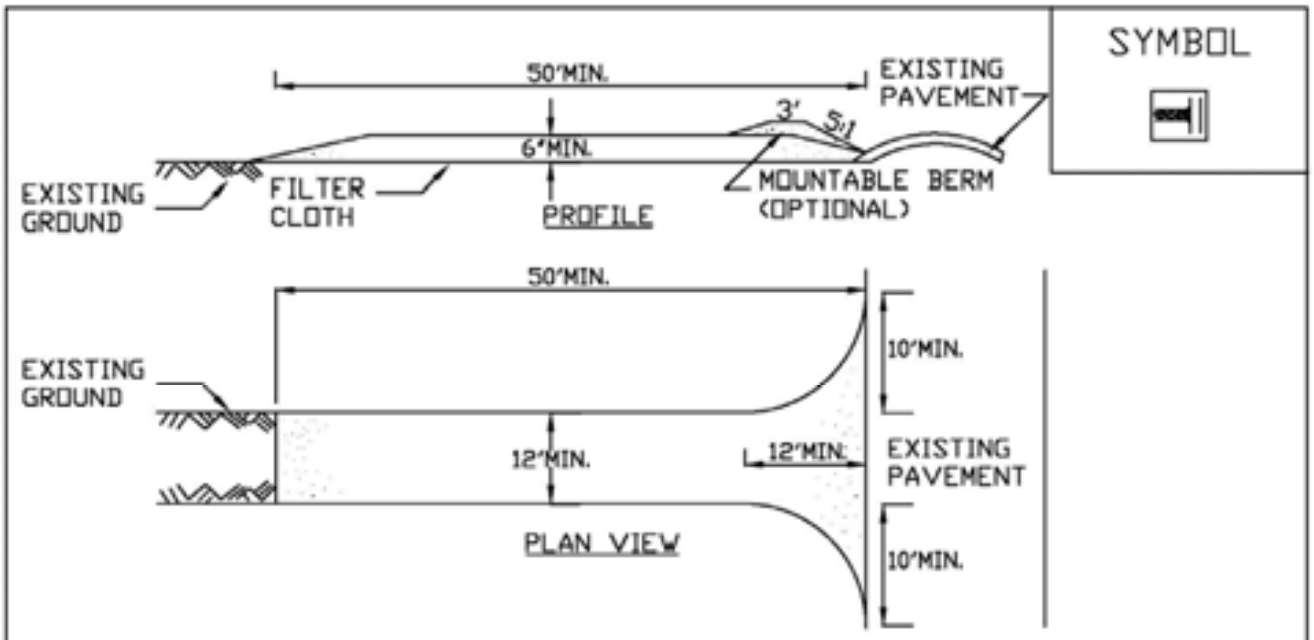
[3]Fabrics not meeting these specifications may be used only when design procedure and supporting documentation are supplied to determine aggregate depth and fabric strength.

Maintenance

The access shall be maintained in a condition which will prevent tracking of sediment onto public rights-of-way or streets. This may require periodic top dressing with additional aggregate. All sediment spilled, dropped, or washed onto public rights-of-way must be removed immediately.

When necessary, wheels must be cleaned to remove sediment prior to entrance onto public rights-of-way. When washing is required, it shall be done on an area stabilized with aggregate, which drains into an approved sediment-trapping device. All sediment shall be prevented from entering storm drains, ditches, or watercourses.

Figure 2.1
Stabilized Construction Access



CONSTRUCTION SPECIFICATIONS

1. STONE SIZE - USE 1-4 INCH STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH - NOT LESS THAN 50 FEET (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY).
3. THICKNESS - NOT LESS THAN SIX (6) INCHES.
4. WIDTH - TWELVE (12) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. TWENTY-FOUR (24) FOOT IF SINGLE ENTRANCE TO SITE.
5. GEOTEXTILE - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ACCESS SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY, ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON A AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS, NEW YORK STATE DEPARTMENT OF TRANSPORTATION, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE

STABILIZED CONSTRUCTION ACCESS

STANDARD AND SPECIFICATIONS FOR SILT FENCE

Definition & Scope

A **temporary** barrier of geotextile fabric installed on the contours across a slope used to intercept sediment laden runoff from small drainage areas of disturbed soil by temporarily ponding the sediment laden runoff allowing settling to occur. The maximum period of use is limited by the ultraviolet stability of the fabric (approximately one year).

Conditions Where Practice Applies

A silt fence may be used subject to the following conditions:

1. Maximum allowable slope length and fence length will not exceed the limits shown in the Design Criteria for the specific type of silt fence used ; and
2. Maximum ponding depth of 1.5 feet behind the fence; and
3. Erosion would occur in the form of sheet erosion; and
4. There is no concentration of water flowing to the barrier; and
5. Soil conditions allow for proper keying of fabric, or other anchorage, to prevent blowouts.

Design Criteria

1. Design computations are not required for installations of 1 month or less. Longer installation periods should be designed for expected runoff.
2. All silt fences shall be placed as close to the disturbed area as possible, but at least 10 feet from the toe of a slope steeper than 3H:1V, to allow for maintenance and roll down. The area beyond the fence must be undisturbed or stabilized.
3. The type of silt fence specified for each location on the plan shall not exceed the maximum slope length and maximum fence length requirements shown in the following table:

		Slope Length/Fence Length (ft.)		
Slope	Steepness	Standard	Reinforced	Super
<2%	< 50:1	300/1500	N/A	N/A
2-10%	50:1 to 10:1	125/1000	250/2000	300/2500
10-20%	10:1 to 5:1	100/750	150/1000	200/1000
20-33%	5:1 to 3:1	60/500	80/750	100/1000
33-50%	3:1 to 2:1	40/250	70/350	100/500
>50%	> 2:1	20/125	30/175	50/250

Standard Silt Fence (SF) is fabric rolls stapled to wooden stakes driven 16 inches in the ground.
Reinforced Silt Fence (RSF) is fabric placed against welded wire fabric with anchored steel posts driven 16 inches in the ground.
Super Silt Fence (SSF) is fabric placed against chain link fence as support backing with posts driven 3 feet in the ground.

4. Silt fence shall be removed as soon as the disturbed area has achieved final stabilization.

The silt fence shall be installed in accordance with the appropriate details. Where ends of filter cloth come together, they shall be overlapped, folded and stapled to prevent sediment bypass. Butt joints are not acceptable. A detail of the silt fence shall be shown on the plan. See Figure 5.30 on page 5.56 for Reinforced Silt Fence as an example of details to be provided.

Criteria for Silt Fence Materials

1. Silt Fence Fabric: The fabric shall meet the following specifications unless otherwise approved by the appropriate erosion and sediment control plan approval authority. Such approval shall not constitute statewide acceptance.

Fabric Properties	Minimum Acceptable Value	Test Method
Grab Tensile Strength (lbs)	110	ASTM D 4632
Elongation at Failure (%)	20	ASTM D 4632
Mullen Burst Strength (PSI)	300	ASTM D 3786
Puncture Strength (lbs)	60	ASTM D 4833
Minimum Trapezoidal Tear Strength (lbs)	50	ASTM D 4533
Flow Through Rate (gal/ min/sf)	25	ASTM D 4491
Equivalent Opening Size	40-80	US Std Sieve ASTM D 4751
Minimum UV Residual (%)	70	ASTM D 4355

2. Fence Posts (for fabricated units): The length shall be a minimum of 36 inches long. Wood posts will be of sound quality hardwood with a minimum cross sectional area of 3.5 square inches. Steel posts will be standard T and U section weighing not less than 1.00 pound per linear foot. Posts for super silt fence shall be standard chain link fence posts.

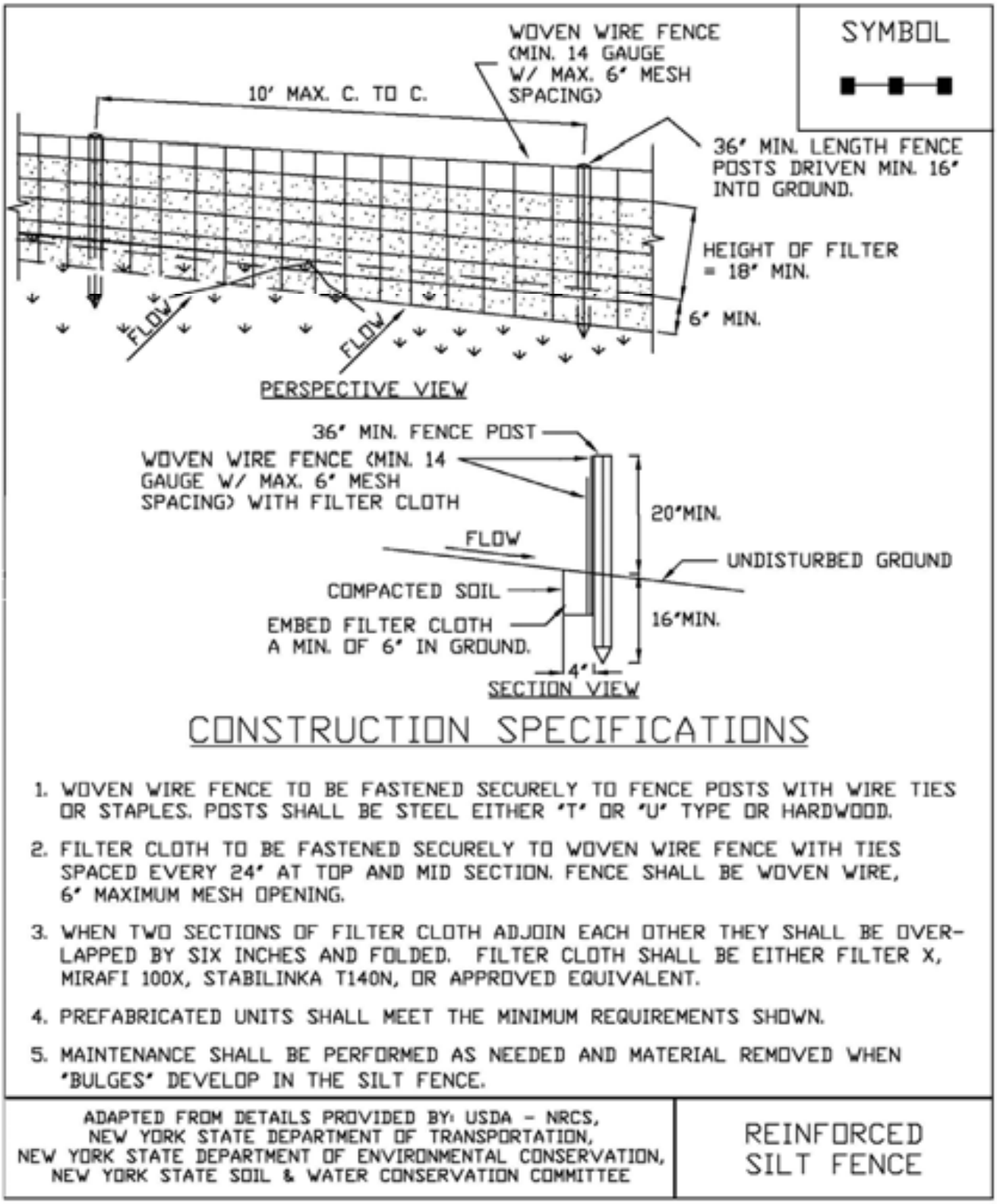
3. Wire Fence for reinforced silt fence: Wire fencing shall be a minimum 14 gage with a maximum 6 in. mesh opening, or as approved.

4. Prefabricated silt fence is acceptable as long as all material specifications are met.

Super Silt Fence

Reinforced Silt Fence

Figure 5.30
Reinforced Silt Fence



STANDARD AND SPECIFICATIONS FOR COMPOST FILTER SOCK

Definition & Scope

A **temporary** sediment control practice composed of a degradable geotextile mesh tube filled with compost filter media to filter sediment and other pollutants associated with construction activity to prevent their migration offsite.

Condition Where Practice Applies

Compost filter socks can be used in many construction site applications where erosion will occur in the form of sheet erosion and there is no concentration of water flowing to the sock. In areas with steep slopes and/or rocky terrain, soil conditions must be such that good continuous contact between the sock and the soil is maintained throughout its length. For use on impervious surfaces such as road pavement or parking areas, proper anchorage must be provided to prevent shifting of the sock or separation of the contact between the sock and the pavement. Compost filter socks are utilized both at the site perimeter as well as within the construction areas. These socks may be filled after placement by blowing compost into the tube pneumatically, or filled at a staging location and moved into its designed location.

Design Criteria

1. Compost filter socks will be placed on the contour with both terminal ends of the sock extended 8 feet upslope at a 45 degree angle to prevent bypass flow.

2. Diameters designed for use shall be 12" – 32" except that 8" diameter socks may be used for residential lots to control areas less than 0.25 acres.

3. The flat dimension of the sock shall be at least 1.5 times the nominal diameter.

4. The **Maximum Slope Length** (in feet) above a compost filter sock shall not exceed the following limits:

Dia. (in.)	Slope %						
	2	**5**	**10**	**20**	**25**	**33**	**50**
8	225*	200	100	50	20	—	—
12	250	225	125	65	50	40	25
18	275	250	150	70	55	45	30
24	350	275	200	130	100	60	35
32	450	325	275	150	120	75	50
* Length in feet							

5. The compost infill shall be well decomposed (matured at least 3 months), weed-free, organic matter. It shall be aerobically composted, possess no objectionable odors, and contain less than 1%, by dry weight, of man-made foreign matter. The physical parameters of the compost shall meet the standards listed in Table 5.2 - Compost Standards Table. **Note: All biosolids compost produced in New York State (or approved for importation) must meet NYS DEC's 6 NYCRR Part 360 (Solid Waste Management Facilities) requirements. The Part 360 requirements are equal to or more stringent than 40 CFR Part 503 which ensure safe standards for pathogen reduction and heavy metals content. When using compost filter socks adjacent to surface water, the compost should have a low nutrient value.**

6. The compost filter sock fabric material shall meet the

7. Compost filter socks shall be anchored in earth with 2" x 2" wooden stakes driven 12" into the soil on 10 foot centers on the centerline of the sock. On uneven terrain, effective ground contact can be enhanced by the placement of a fillet of filter media on the disturbed area side of the compost sock.

8. All specific construction details and material specifications shall appear on the erosion and sediment control constructions drawings when compost filter socks are included in the plan.

Maintenance

1. Traffic shall not be permitted to cross filter socks.

2. Accumulated sediment shall be removed when it reaches half the above ground height of the sock and disposed of in accordance with the plan.

3. Socks shall be inspected weekly and after each runoff event. Damaged socks shall be repaired in the manner required by the manufacturer or replaced within 24 hours of inspection notification.

4. Biodegradable filter socks shall be replaced after 6 months; photodegradable filter socks after 1 year. Polypropylene socks shall be replaced according to the manufacturer's recommendations.

5. Upon stabilization of the area contributory to the sock, stakes shall be removed. The sock may be left in place and vegetated or removed in accordance with the stabilization plan. For removal the mesh can be cut and the compost spread as an additional mulch to act as a soil supplement.

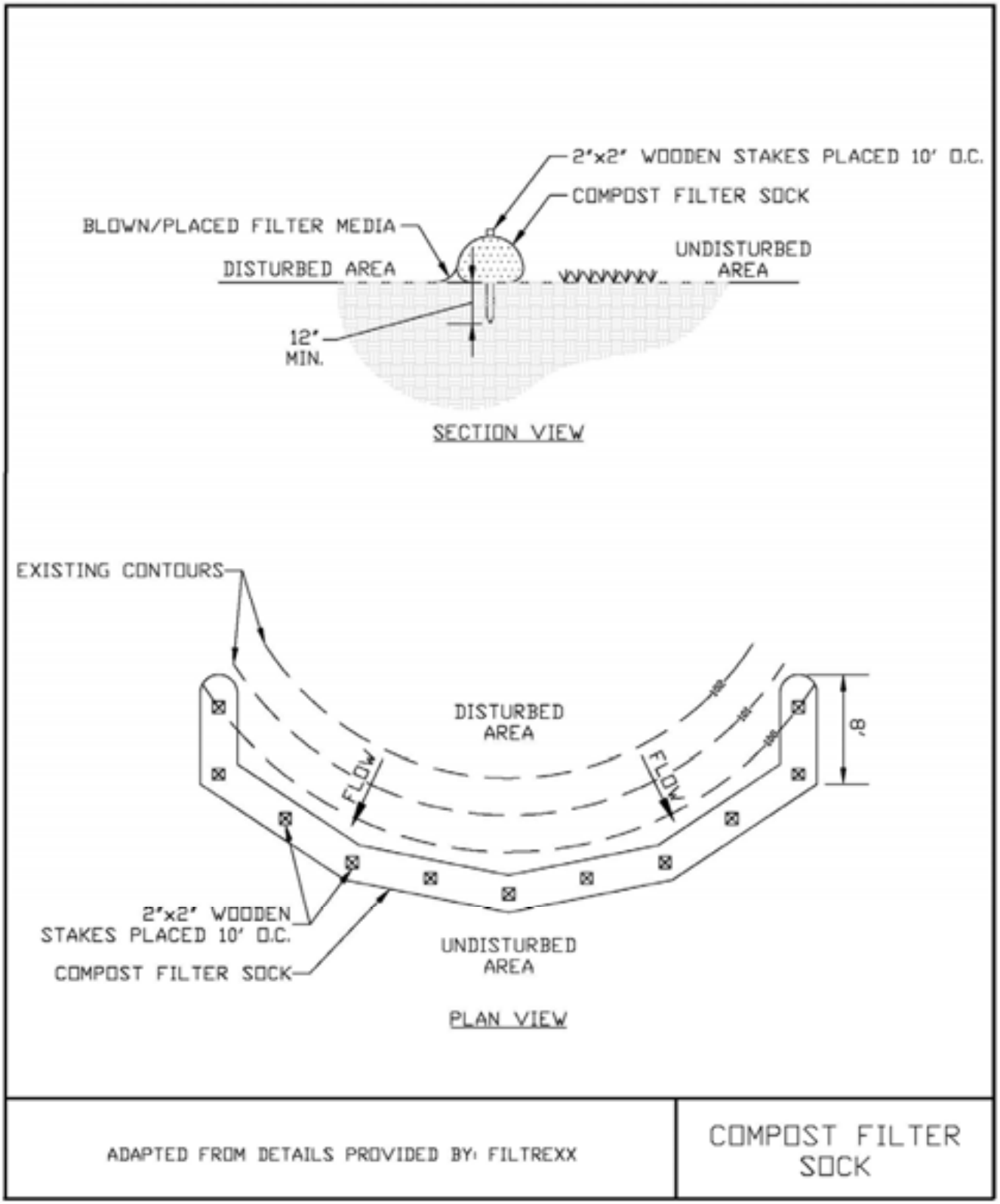
Table 5.1 - Compost Sock Fabric Minimum Specifications Table

Material Type	3 mil HDPE	5 mil HDPE	5 mil HDPE	Multi-Filament Polypropylene (MFPP)	Heavy Duty Multi-Filament Polypropylene (HDMFPP)
Material Characteristics	Photodegradable	Photodegradable	Biodegradable	Photodegradable	Photodegradable
Sock Diameters	12" 18"	12" 18" 24" 32"	12" 18" 24" 32"	12" 18" 24" 32"	12" 18" 24" 32"
Mesh Opening	3/8"	3/8"	3/8"	3/8"	1/8"
Tensile Strength		26 psi	26 psi	44 psi	202 psi
Ultraviolet Stability % Original Strength (ASTM G-155)	23% at 1000 hr.	23% at 1000 hr.		100% at 1000 hr.	100% at 1000 hr.
Minimum Functional Longevity	6 months	9 months	6 months	1 year	2 years

Table 5.2 - Compost Standards Table

Organic matter content	25% - 100% (dry weight)
Organic portion	Fibrous and elongated
pH	6.0 – 8.0
Moisture content	30% - 60%
Particle size	100% passing a 1" screen and 10 - 50% passing a 3/8" screen
Soluble salt concentration	5.0 dS/m (mmhos/cm) maximum

Figure 5.2
Compost Filter Sock



ATTACHMENT A-2

INSPECTION AND MAINTENANCE REPORT FORM

Inspection and Maintenance Report Form

To be completed every 7 days and within 24 hours of a rainfall event of 0.5 inches or more

Regular Inspector:_____Rainfall Event Inspector:_____Rainfall (inches):_____

Contractor Activities	OK	NO	N/A	Notes
Are construction onsite traffic routes, parking, and storage of equipment and supplies restricted to areas specifically designated for those uses?				
Are locations of temporary soil stock piles of construction materials in approved areas?				
Is there any evidence of spills and resulting cleanup procedures?				
General Erosion & Sediment Controls				
Are sediment and erosion BMPs installed in the proper location and according to the specifications set out in the SWM & ECP?				
Are all operational storm drain inlets protected from sediment inflow?				
Do any seeded or landscaped areas require maintenance, irrigation, fertilization, seeding or mulching?				
Is there any evidence that sediment is leaving the site?				
Is there any evidence of erosion or cut fill slopes?				
Perimeter Road Use				
Does much sediment get tracked on to the perimeter road?				
Is the gravel clean or is it filled with sediment?				
Does all traffic use the perimeter road to leave the site?				
Is maintenance or repair required for the perimeter road?				

_____ _____

Inspected by (Signature) Date

Inspection and Maintenance Report Form

To be completed every 7 days and within 24 hours of a rainfall event of 0.5 inches or more

Inspector:_____

STABILIZATION MEASURES					
Area	Date Since Last Disturbed	Date of Next Disturbance	Stabilized? Yes/No	Stabilized with	Condition

Stabilization Required: _____

_____

_____

_____

_____

_____

To be performed by: _____ On or before: _____

APPENDIX B

HEALTH AND SAFETY PLAN

SITE HEALTH AND SAFETY PLAN
for
BROWNFIELD CLEANUP PROGRAM
RA ACTIVITIES

225 LOUISIANA STREET SITE

BUFFALO, NEW YORK

June 2021 0305-018-001

Prepared for:

BARCALO BUFFALO LLC

225 LOUISIANA STREET SITE
HEALTH AND SAFETY PLAN FOR RA ACTIVITIES

ACKNOWLEDGEMENT

Plan Reviewed by (initial):

Corporate Health and Safety Director: Thomas H. Forbes, P.E.

Project Manager: Michael Lesakowski

Designated Site Safety and Health Officer: Bryan Mayback

Acknowledgement:
I acknowledge that I have reviewed the information contained in this site-specific Health and Safety Plan, and understand the hazards associated with performance of the field activities described herein. I agree to comply with the requirements of this plan.

NAME (PRINT)	SIGNATURE	DATE

225 LOUISIANA STREET SITE
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1.0 INTRODUCTION

1.1 General

In accordance with OSHA requirements contained in 29 CFR 1910.120, this Health and Safety Plan (HASP) describes the specific health and safety practices and procedures to be employed by and Benchmark Environmental Engineering & Science, PLLC and TurnKey Environmental Restoration, LLC employees (referred to hereafter as "Benchmark-TurnKey") during Remedial Action (RA) activities at the 225 Louisiana Street Site (Site) located in the City of Buffalo, Erie County, New York. This HASP presents procedures for Benchmark-TurnKey employees who will be involved with RA field activities; it does not cover the activities of other contractors, subcontractors or other individuals on the Site. These firms will be required to develop and enforce their own HASPs as discussed in Section 2.0. Benchmark-TurnKey accepts no responsibility for the health and safety of contractor, subcontractor or other personnel.

This HASP presents information on known Site health and safety hazards using available historical information, and identifies the equipment, materials and procedures that will be used to eliminate or control these hazards. Environmental monitoring will be performed during the course of field activities to provide real-time data for on-going assessment of potential hazards.

1.2 Background

The ±4.23-acre Site consists of five tax parcels as follows:

- 175 Louisiana Street: SBL No. 122.47-4-28, 0.06 acres
- 177 Louisiana Street: SBL No. 122.47-4-2, 0.33 acres
- 225 Louisiana Street: SBL No. 122.47-1-1, 2.17 acres
- 245 Louisiana Street: SBL No. 122.40-9-1, 1.61 acres
- 96 Kentucky Street: SBL No. 122.47-4-3, 0.06 acres

The Site is developed with one (1) structure. The existing building is currently occupied by several tenants and is primarily used as a storage, warehousing and distribution

facility. The existing building also includes vacant spaces and storage areas. The Site also includes asphalt and gravel parking lots and green areas to the north of south of the existing building.

The northern portion of the Site was occupied by an oil works company with bulk oil storage prior to 1889. The central and northern portions of the Site was used as a lumber yard from at least 1889 to the 1920s. The central portion of the Site was used for heavy industrial/factory purposes from the 1920s to the 1990s. Operations included manufacturing, a foundry, nickel plating, machine shops, iron works, spray booths/painting, annealing, a forge shop with 17 oil furnaces and dipping with dip tanks. An auto repair shop was also identified on the northwestern portion of the Site during this time. Railroad tracks, residential properties, a warehouse, and storefronts were identified on the southern end of the Site from at least 1889 to prior to 1981. The Site has been used as a warehousing/distribution facility, parking lot, and storage area since the 1990s.

The Site has an extensive tank history estimated at eight underground storage tanks (USTs) located on-Site between 1940 and 1992. The only UST removal record was a municipal document indicating removal of one 15,000-gallon fuel oil UST from the Site in 1992. Registered CBS ASTs were also identified.

1.3 Known and Suspected Environmental Conditions

Previous investigations have confirmed that historic industrial operations, the presence of railroad tracks, and the extensive tank history have impacted the Site, which will require remediation prior to redevelopment. Previous investigation findings include:

- Based on the historic and Remedial Investigation (RI) subsurface soil/fill findings, metals-contaminated soil/fill exceeding 6 NYCRR Soil Cleanup Objectives (SCOs), specifically Unrestricted SCOs (USCOs) was identified across the Site from approximately 0 to at least 5 fbgs. Elevated photoionization detector (PID) readings were detected at TP-3, TP-4, SB-9 and TP-19 from approximately 5 to 7 fbgs, with the highest reading of 500 ppm at TP-19. Slight chemical odor and elevated PID reading was noted at SB-17 from 0.5 to 4 fbgs, with the highest reading of 185 ppm. Elevated metals above Restricted-Residential (RRSCOs) were detected in 1 of 8 surface soil samples and 11 of 18 subsurface soil samples. Elevated polycyclic aromatic hydrocarbons (PAHs) above RRSCOs were detected in 7 of 8 surface soil samples and 5 of 18 subsurface soil samples.
- No volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), or herbicides were detected above their respective

TOGS 1.1.1 Groundwater Quality Standards/Guidance Values (GWQS/GV). One pesticide was detected above its GWQS/GV at well MW-6. Several naturally occurring metals (magnesium, manganese, and sodium), dissolved and total, were detected across the Site above their respective GWQS/GV. Emergent contaminant results from MW-6 and MW-7 slightly exceeded the New York State Department of Environmental Conservation (NYSDEC) action level limits for either Perfluorooctanoic acid (PFOA) and/or Perfluorooctanesulfonic acid (PFOS); however, no PFOA/PFOS soil concentrations exceeded their RRSCO.

- Analytical results in comparison to the New York State Department of Health (NYSDOH) Decision Matrices indicate that mitigation is required within the existing building at 225 Louisiana Street due to elevated trichloroethene (TCE), carbon tetrachloride, and cis-1,2-dichloroethene concentrations identified in sub-slab vapor in the northern and eastern portion of the building. The southeastern portion of the building is slated to be an unoccupied parking garage which eliminates the need for an active sub-slab depressurization system in that portion of the building. The northern portion of the building will be apartments and office space; therefore, an active sub-slab depressurization (ASD) system is planned for the northern portion of the building to mitigate potential sub-slab vapor intrusion.

1.4 Parameters of Interest

Based on the previous investigations, constituents of potential concern (COPCs) in soil and, potentially groundwater, at the Site include:

- **Volatile Organic Compounds (VOCs) –** VOCs present at elevated concentrations may include petroleum VOCs (1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Acetone, and Total Xylenes).
- **Semi-Volatile Organic Compounds (SVOCs) –** SVOCs present at elevated concentrations may include polycyclic aromatic hydrocarbons (PAHs), which are byproducts of incomplete combustion and impurities in petroleum products.
- **Inorganic Compounds –** The inorganic COPCs potentially present at elevated concentrations are arsenic, barium, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver, and zinc.

1.5 Overview of RA Activities

Benchmark personnel will be on-site to observe and perform remedial activities. The field activities to be completed as part of the remedial are described below.

1. Excavation of Metals-impacted soil/fill within the SB-1, SB-2, SB-5/SB-14/MW-5, SB-7, SB-15, SB-18, TP-2 & SB-10/MW-2, TP-8 & TP-9, and TP-21 areas followed by off-site disposal at a commercial sanitary landfill.
2. Excavation of petroleum-impacted soil/fill within the Former UST Area followed by off-site disposal at a commercial sanitary landfill.
3. Waste characterization sampling.
4. Post-excavation sampling.
5. Backfilling.
6. Groundwater and surface water management.
7. Soil cover placement.
8. ASD System Installation.

2.0 ORGANIZATIONAL STRUCTURE

This section of the HASP describes the lines of authority, responsibility and communication as they pertain to health and safety functions at the Site. The purpose of this chapter is to identify the personnel who impact the development and implementation of the HASP and to describe their roles and responsibilities. This chapter also identifies other contractors and subcontractors involved in work operations and establish the lines of communications among them for health and safety matters. The organizational structure described in this chapter is consistent with the requirements of 29 CFR 1910.120(b)(2). This section will be reviewed by the Project Manager and updated as necessary to reflect the current organizational structure at this Site.

2.1 Roles and Responsibilities

All Benchmark-TurnKey personnel on the Site must comply with the minimum requirements of this HASP. The specific responsibilities and authority of management, safety and health, and other personnel on this Site are detailed in the following paragraphs.

2.1.1 Corporate Health and Safety Director

The Benchmark-TurnKey Corporate Health and Safety Director is ***Mr. Thomas H. Forbes, P.E.*** The Corporate Health and Safety Director responsible for developing and implementing the Health and Safety program and policies for Benchmark Environmental Engineering & Science, PLLC and TurnKey Environmental Restoration, LLC, and consulting with corporate management to ensure adequate resources are available to properly implement these programs and policies. The Corporate Health and Safety Director coordinates Benchmark-TurnKey's Health and Safety training and medical monitoring programs and assists project management and field staff in developing site-specific health and safety plans.

2.1.2 Project Manager

The Project Manager for this Site is ***Mr. Michael Lesakowski.*** The Project Manager has the responsibility and authority to direct all Benchmark-TurnKey work operations at the Site. The Project Manager coordinates safety and health functions with the Site Safety and Health Officer and bears ultimate responsibility for proper implementation

of this HASP. He may delegate authority to expedite and facilitate any application of the program, including modifications to the overall project approach as necessary to circumvent unsafe work conditions. Specific duties of the Project Manager include:

- Preparing and coordinating the Site work plan.
- Providing Benchmark-TurnKey workers with work assignments and overseeing their performance.
- Coordinating health and safety efforts with the Site Safety and Health Officer (SSHO).
- Reviewing the emergency response coordination plan to assure its effectiveness.
- Serving as the primary liaison with Site contractors and the property owner.

2.1.3 Site Safety and Health Officer

The SSHO for this Site is ***Mr. Bryan Mayback***. The qualified alternate SSHO is ***Mr. Christopher Boron.*** The SSHO reports to the Project Manager. The SSHO is on-site or readily accessible to the Site during all work operations and has the authority to halt Site work if unsafe conditions are detected. The specific responsibilities of the SSHO are:

- Managing the safety and health functions for Benchmark-TurnKey personnel on the Site.
- Serving as the point of contact for safety and health matters.
- Ensuring that Benchmark-TurnKey field personnel working on the Site have received proper training (per 29 CFR Part 1910.120(e)), that they have obtained medical clearance to wear respiratory protection (per 29 CFR Part 1910.134), and that they are properly trained in the selection, use and maintenance of personal protective equipment, including qualitative respirator fit testing.
- Performing or overseeing Site monitoring as required by the HASP.
- Assisting in the preparation and review of the HASP.
- Maintaining site-specific safety and health records as described in this HASP.
- Coordinating with the Project Manager, Site Workers, and Contractor's SSHO as necessary for safety and health efforts.

2.1.4 Site Workers

Site workers are responsible for: complying with this HASP or a more stringent

HASP, if appropriate (i.e., Contractor and Subcontractor's HASP); using proper PPE; reporting unsafe acts and conditions to the SSHO; and following the safety and health instructions of the Project Manager and SSHO.

2.1.5 Other Site Personnel

Other Site personnel who will have health and safety responsibilities will include the Drilling Contractor, who will be responsible for developing, implementing and enforcing a Health and Safety Plan equally stringent or more stringent than Benchmark-TurnKey's HASP. Benchmark-TurnKey assumes no responsibility for the health and safety of anyone outside its direct employ. Each Contractor's HASP shall cover all non- Benchmark-TurnKey Site personnel. Each Contractor shall assign a SSHO who will coordinate with Benchmark-TurnKey's SSHO as necessary to ensure effective lines of communication and consistency between contingency plans.

In addition to Benchmark-TurnKey and Contractor personnel, other individuals who may have responsibilities in the work zone include subcontractors and governmental agencies performing Site inspection work (i.e., the New York State Department of Environmental Conservation). The Contractor shall be responsible for ensuring that these individuals have received OSHA-required training (29 CFR 1910.120(e)), including initial, refresher and site-specific training, and shall be responsible for the safety and health of these individuals while they are on-site.

3.0 HAZARD EVALUATION

Due to the presence of certain contaminants at the Site, the possibility exists that workers will be exposed to hazardous substances during field activities. The principal points of exposure would be through direct contact with and incidental ingestion of soil, and through the inhalation of contaminated particles or vapors. Other points of exposure may include direct contact with groundwater. In addition, the use of drilling and/or medium to large-sized construction equipment (e.g., excavator) will also present conditions for potential physical injury to workers. Further, since work will be performed outdoors, the potential exists for heat/cold stress to impact workers, especially those wearing protective equipment and clothing. Adherence to the medical evaluations, worker training relative to chemical hazards, safe work practices, proper personal protection, environmental monitoring, establishment work zones and Site control, appropriate decontamination procedures and contingency planning outlined herein will reduce the potential for chemical exposures and physical injuries.

3.1 Chemical Hazards

As discussed in Section 1.3, VOC, SVOC and inorganic impacts have been identified in the soil/fill material present at the Site. Table 1 lists exposure limits for airborne concentrations of the COPCs identified in Section 1.4 of this HASP. Brief descriptions of the toxicology of the prevalent COPCs and related health and safety guidance and criteria are provided below.

- **1,2,4-Trimethylbenzene (CAS #95-63-6)** is a common gasoline additive. Acute exposure predominantly results in skin irritation and inhalation causes chemical pneumonitis. Symptoms include headache, dizziness, fatigue, muscular weakness, drowsiness.

- **1,3,5-Trimethylbenzene (CAS #108-67-8)** is a common gasoline additive. Acute exposure predominantly results in skin irritation and inhalation causes chemical pneumonitis. Symptoms include headache, dizziness, fatigue, muscular weakness, drowsiness.

- **Acetone (CAS # 67-64-1)** is a colorless, flammable liquid with a strong odor. Acetone is commonly used as a solvent for industrial purposes and consumer products. Exposure can cause irritation to the eyes, nose, throat, and lungs, dizziness, and nausea. Exposure to very high concentrations of acetone may lead

to coma.

- **Xylene (o, m, and p) (CAS #95-47-6, 108-38-3, and 106-42-3)** are colorless, flammable liquids present in paint thinners and fuels. Acute exposure may cause central nervous system depression, resulting in headache, dizziness, fatigue, muscular weakness, drowsiness, and coordination loss. Repeated exposures may also cause removal of lipids from the skin, producing dry, fissured dermatitis. Exposure of high concentrations of vapor may cause eye irritation and damage, as well as irritation of the mucus membranes.

- **Polycyclic Aromatic Hydrocarbons (PAHs)** are formed as a result of the pyrolysis and incomplete combustion of organic matter such as fossil fuel. PAH aerosols formed during the combustion process disperse throughout the atmosphere, resulting in the deposition of PAH condensate in soil, water and on vegetation. In addition, several products formed from petroleum processing operations (e.g., roofing materials and asphalt) also contain elevated levels of PAHs. Hence, these compounds are widely dispersed in the environment. PAHs are characterized by a molecular structure containing three or more fused, unsaturated carbon rings. Seven of the PAHs are classified by USEPA as probable human carcinogens (USEPA Class B2). These are: benzo(a)pyrene; benzo(a)anthracene; benzo(b)fluoranthene; benzo(k)fluoranthene; chrysene; dibenzo(a,h)anthracene; and indeno(1,2,3-cd)pyrene. The primary route of exposure to PAHs is through incidental ingestion and inhalation of contaminated particulates. PAHs are characterized by an organic odor and exist as oily liquids in pure form. Acute exposure symptoms may include acne-type blemishes in areas of the skin exposed to sunlight.

- **Arsenic (CAS #7440-38-2)** is a naturally occurring element and is usually found combined with one or more elements, such as oxygen or sulfur. Inhalation is a more important exposure route than ingestion. First phase exposure symptoms include nausea, vomiting, diarrhea and pain in the stomach. Prolonged contact is corrosive to the skin and mucus membranes. Arsenic is considered a Group A human carcinogen by the USEPA. Exposure via inhalation is associated with an increased risk of lung cancer. Exposure via the oral route is associated with an increased risk of skin cancer.

- **Barium (CAS # 7440-39-3)** is a silver white metal, produced by the reduction of barium oxide. Local effects and symptoms of exposure to barium compounds, such as the hydroxide or carbonate, may include irritation of the eyes, throat, nose and skin. Systemic effects from ingestion include increased muscle contractility, reduction of heart rate/potential arrest, intestinal peristalsis, vascular constriction, and bladder contraction.

- **Cadmium (CAS #7440-43-9)** is a naturally occurring element that is generally found combined with elements such as oxygen, chloride, or sulfur. Cadmium is used in products such as batteries, pigments, metal coatings and plastics. Cadmium can cause vomiting and diarrhea when ingested, and cause lung damage when inhaled. Long term effects of cadmium include kidney damage, increased bone fragility, cancer, and death.

- **Chromium (CAS #7440-43-9)** is a natural element and is usually combined with one or more elements, such as oxygen, chloride, or sulfur. Breathing high levels of cadmium severely damages the lungs and can cause death. Ingestion of high levels of cadmium severely irritates the stomach, leading to vomiting and diarrhea. Long term exposure to lower levels of cadmium leads to a buildup of this substance in the kidneys and possible kidney disease. Other potential long-term effects are lung damage and fragile bones. Cadmium is suspected to be a human carcinogen

- **Copper (CAS #7440-50-8)** is a naturally occurring metal in the environment in rocks, soil, water and air. The most common use of copper is to make wire, pipes, and sheet metal. High levels of copper exposure may cause irritation of the nose, mouth, and eyes, vomiting, diarrhea, stomach cramps, and death.

- **Lead (CAS #7439-92-1)** can affect almost every organ and system in our bodies. The most sensitive is the central nervous system, particularly in children. Lead also damages kidneys and the immune system. The effects are the same whether it is breathed or swallowed. Lead may decrease reaction time, cause weakness in fingers, wrists, or ankles, and possibly affect memory. Lead may cause anemia.

- **Manganese (CAS #7439-96-5)** is a naturally occurring metal found in rocks and soil. Manganese is commonly used in steel production to improve hardness and strength. It may also be found as an additive in gasoline. The primary route of exposure of manganese is through ingestion. The most common health problems associated with manganese involve the nervous system.

- **Mercury (CAS #7439-97-6)** is used in industrial applications for the production of caustic and chlorine, and in electrical control equipment and apparatus. Overexposure to mercury may cause coughing, chest pains, bronchitis, pneumonia, indecision, headaches, fatigue, and salivation. Mercury is a skin and eye irritant.

- **Nickel (CAS # 7440-02-0)** is a metal, commonly used to make coins, magnets, jewelry, stainless steel, electronics, and components of industrial machines. It is

widely used in industry, primarily refining, electroplating, and welding. Nickel is a carcinogenic metal, that with chronic exposure has been connected with increased risk of lung cancer, cardiovascular disease, neurological deficits, developmental deficits in childhood, and high blood pressure.

- **Selenium (CAS #7782-49-2)** is a natural element and is usually combined with one or more elements, such as oxygen and sulfide minerals. Selenium is a common by-product of copper refining. Breathing high levels of selenium may lead to dizziness, fatigue, and bronchitis, direct contact with selenium may cause rashes on the skin, and ingestion of selenium may lead to hair and nail loss and brittleness.

- **Silver (CAS #7440-22-4)** occurs naturally in the environment and commonly combines with sulfide, chloride, nitrate, and other elements. Long term exposure to silver through ingestion or inhalation may lead to discoloration of the skin. Short term exposures to high levels of silver compounds may lead to breathing problems, lung irritation, throat irritation, stomach pains, and mild allergic reactions.

- **Zinc (CAS #7440-66-6)** occurs naturally in the environment and is found in air, soil, water, and food. Zinc is commonly mixed with other metals to make alloys including brass and bronze. Zinc commonly combines with chloride, sulfate, sulfide, and other elements and is used in manufacture of paint, rubber, dyes, wood preservatives, and ointments. Excessive intake of zinc may lead to nausea, vomiting, liver injury, jaundice, and hepatic failure. Acute inhalation exposure may cause sore throat, cough, weakness, and fever, and acute contact with eyes may cause redness.

With respect to the anticipated RA activities discussed in Section 1.5, possible routes of exposure to the above-mentioned contaminants are presented in Table 2. The use of proper respiratory equipment, as outlined in Section 7.0 of this HASP, will minimize the potential for exposure to airborne contamination, if deemed necessary. Exposure to contaminants through dermal and other routes will also be minimized through the use of protective clothing (Section 7.0), safe work practices (Section 6.0), and proper decontamination procedures (Section 12.0).

3.2 Physical Hazards

RA field activities at the 225 Louisiana Street Site may present the following physical hazards:

- The potential for physical injury during heavy construction equipment use, such as backhoes, excavators and drilling equipment.
- The potential for heat/cold stress to employees during the summer/winter months (see Section 10.0).
- The potential for slip and fall injuries due to rough, uneven terrain and/or open excavations.

These hazards represent only some of the possible means of injury that may be present during RA operations and sampling activities at the Site. Since it is impossible to list all potential sources of injury, it shall be the responsibility of each individual to exercise proper care and caution during all phases of the work.

4.0 TRAINING

4.1 Site Workers

All personnel performing RA activities at the Site (such as, but not limited to, equipment operators, general laborers, and drillers) and who may be exposed to hazardous substances, health hazards, or safety hazards and their supervisors/managers responsible for the Site shall receive training in accordance with 29 CFR 1910.120(e) before they are permitted to engage in operations in the exclusion zone or contaminant reduction zone. This training includes an initial 40-hour Hazardous Waste Site Worker Protection Course, an 8-hour Annual Refresher Course subsequent to the initial 40-hour training, and 3 days of actual field experience under the direct supervision of a trained, experienced supervisor. Additional site-specific training shall also be provided by the SSHO prior to the start of field activities. A description of topics to be covered by this training is provided below.

4.1.1 Initial and Refresher Training

Initial and refresher training is conducted by a qualified instructor as specified under OSHA 29 CFR 1910.120(e)(5) and is specifically designed to meet the requirements of OSHA 29 CFR 1910.120(e)(3) and 1910.120(e)(8). The training covers, as a minimum, the following topics:

- OSHA HAZWOPER regulations.
- Site safety and hazard recognition, including chemical and physical hazards.
- Medical monitoring requirements.
- Air monitoring, permissible exposure limits, and respiratory protection level classifications.
- Appropriate use of personal protective equipment (PPE), including chemical compatibility and respiratory equipment selection and use.
- Work practices to minimize risk.
- Work zones and Site control.

- Safe use of engineering controls and equipment.
- Decontamination procedures.
- Emergency response and escape.
- Confined space entry procedures.
- Heat and cold stress monitoring.
- Elements of a Health and Safety Plan.
- Spill containment.

Initial training also incorporates workshops for PPE and respiratory equipment use (Levels A, B and C), and respirator fit testing. Records and certification received from the course instructor documenting each employee's successful completion of the training identified above are maintained on file at Benchmark-TurnKey's Buffalo, NY office. Contractors and Subcontractors are required to provide similar documentation of training for all their personnel who will be involved in on-site work activities.

Any employee who has not been certified as having received health and safety training in conformance with 29 CFR 1910.120(e) is prohibited from working in the exclusion and contamination reduction zones, or to engage in any on-site work activities that may involve exposure to hazardous substances or wastes.

4.1.2 Site Training

Site workers are given a copy of the HASP and provided a site-specific briefing prior to the commencement of work to ensure that employees are familiar with the HASP and the information and requirements it contains. The Site briefing shall be provided by the SSHO prior to initiating field activities and shall include:

- Names of personnel and alternates responsible for Site safety and health.
- Safety, health and other hazards present on the Site.
- The site lay-out including work zones and places of refuge.

- The emergency communications system and emergency evacuation procedures.
- Use of PPE.
- Work practices by which the employee can minimize risks from hazards.
- Safe use of engineering controls and equipment on the site.
- Medical surveillance, including recognition of symptoms and signs of over-exposure as described in Chapter 5 of this HASP.
- Decontamination procedures as detailed in Chapter 12 of this HASP.
- The emergency response plan as detailed in Chapter 15 of this HASP.
- Confined space entry procedures, if required, as detailed in Chapter 13 of this HASP.
- The spill containment program as detailed in Chapter 9 of this HASP.
- Site control as detailed in Chapter 11 of this HASP.

Supplemental health and safety briefings will also be conducted by the SSHO on an as-needed basis during the course of the work. Supplemental briefings are provided as necessary to notify employees of any changes to this HASP as a result of information gathered during ongoing Site characterization and analysis. Conditions for which the SSHO may schedule additional briefings include but are not limited to: a change in Site conditions (e.g., based on monitoring results); changes in the work schedule/plan; newly discovered hazards; and safety incidents occurring during Site work.

4.2 Supervisor Training

On-site safety and health personnel who are directly responsible for or who supervise the safety and health of workers engaged in hazardous waste operations (i.e., SSHO) shall receive, in addition to the appropriate level of worker training described in Section 4.1, above, 8 additional hours of specialized supervisory training, in compliance with 29 CFR 1910.120(e)(4).

4.3 Emergency Response Training

Emergency response training is addressed in Appendix A of this HASP, Emergency Response Plan.

4.4 Site Visitors

Each Contractor's SSHO will provide a site-specific briefing to all Site visitors and other non- Benchmark-TurnKey personnel who enter the Site beyond the Site entry point. The site-specific briefing will provide information about Site hazards, the Site layout including work zones and places of refuge, the emergency communications system and emergency evacuation procedures, and other pertinent safety and health requirements as appropriate.

Site visitors will not be permitted to enter the exclusion zone or contaminant reduction zones unless they have received the level of training required for Site workers as described in Section 4.1.

5.0 MEDICAL MONITORING

Medical monitoring examinations are provided to Benchmark-TurnKey employees as stipulated under 29 CFR Part 1910.120(f). These exams include initial employment, annual and employment termination physicals for all Benchmark-TurnKey employees involved in hazardous waste site field operations. Post-exposure examinations are also provided for employees who may have been injured, received a health impairment, or developed signs or symptoms of over-exposure to hazardous substances or were accidentally exposed to substances at concentrations above the permissible exposure limits without necessary personal protective equipment. Such exams are performed as soon as possible following development of symptoms or the known exposure event.

Medical evaluations are performed by Health Works, an occupational health care provider under contract with Benchmark-TurnKey. Health Works is located in Seneca Square Plaza, 1900 Ridge Road, West Seneca, New York 14224. The facility can be reached at (716) 823-5050 to schedule routine appointments or post-exposure examinations.

Medical evaluations are conducted according to the Benchmark-TurnKey Medical Monitoring Program and include an evaluation of the workers' ability to use respiratory protective equipment. The examinations include:

- Occupational/medical history review.
- Physical exam, including vital sign measurement.
- Spirometry testing.
- Eyesight testing.
- Audio testing (minimum baseline and exit, annual for employees routinely exposed to greater than 85db).
- EKG (for employees >40 yrs age or as medical conditions dictate).
- Chest X-ray (baseline and exit, and every 5 years).
- Blood biochemistry (including blood count, white cell differential count, serum multiplastic screening).
- Medical certification of physical requirements (i.e., sight, musculoskeletal,

cardiovascular) for safe job performance and to wear respiratory protection equipment.

The purpose of the medical evaluation is to determine an employee's fitness for duty on hazardous waste sites; and to establish baseline medical data. In conformance with OSHA regulations, Benchmark-TurnKey will maintain and preserve medical records for a period of 30 years following termination of employment. Employees are provided a copy of the physician's post-exam report and have access to their medical records and analyses.

6.0 SAFE WORK PRACTICES

All Benchmark-TurnKey employees shall conform to the following safe work practices during all on-site work activities conducted within the exclusion and contamination reduction zones:

- Eating, drinking, chewing gum or tobacco, smoking, or any practice that increases the probability of hand-to-mouth contact is strictly prohibited.

- The hands and face must be thoroughly washed upon leaving the work area and prior to engaging in any activity indicated above.

- Respiratory protective equipment and clothing must be worn by all personnel entering the Site as required by the HASP or as modified by the Site safety officer. Excessive facial hair (i.e., beards, long mustaches or sideburns) that interferes with the satisfactory respirator-to-face seal is prohibited.

- Contact with surfaces/materials either suspected or known to be contaminated will be avoided to minimize the potential for transfer to personnel, cross contamination and need for decontamination.

- Medicine and alcohol can synergize the effects of exposure to toxic chemicals. Due to possible contraindications, use of prescribed drugs should be reviewed with the Benchmark-TurnKey occupational physician. Alcoholic beverage and illegal drug intake are strictly forbidden during the workday.

- All personnel shall be familiar with standard operating safety procedures and additional instructions contained in this Health and Safety Plan.

- On-site personnel shall use the "buddy" system. No one may work alone (i.e., out of earshot or visual contact with other workers) in the exclusion zone.

- Personnel and equipment in the contaminated area shall be minimized, consistent with effective Site operations.

- All employees have the obligation to immediately report and if possible, correct unsafe work conditions.

- Use of contact lenses on-site will not be permitted. Spectacle kits for insertion into full-face respirators will be provided for Benchmark-TurnKey employees, as requested and required.

The recommended specific safety practices for working around the contractor's equipment (e.g., backhoes, bulldozers, excavators, drill rigs etc.) are as follows:

- Although the Contractor and subcontractors are responsible for their equipment and safe operation of the Site, Benchmark-TurnKey personnel are also responsible for their own safety.
- Subsurface work will not be initiated without first clearing underground utility services.
- Heavy equipment should not be operated within 20 feet of overhead wires. This distance may be increased if windy conditions are anticipated or if lines carry high voltage. The Site should also be sufficiently clear to ensure the project staff can move around the heavy machinery safely.
- Care should be taken to avoid overhead wires when moving heavy-equipment from location to location.
- Hard hats, safety boots and safety glasses should be worn at all times in the vicinity of heavy equipment. Hearing protection is also recommended.
- The work Site should be kept neat. This will prevent personnel from tripping and will allow for fast emergency exit from the Site.
- Proper lighting must be provided when working at night.
- Construction activities should be discontinued during an electrical storm or severe weather conditions.
- The presence of combustible gases should be checked before igniting any open flame.
- Personnel shall stand upwind of any construction operation when not immediately involved in sampling/logging/observing activities.
- Personnel will not approach the edge of an unsecured trench/excavation closer than 2 feet.

7.0 PERSONAL PROTECTIVE EQUIPMENT

7.1 Equipment Selection

PPE will be donned when work activities may result in exposure to physical or chemical hazards beyond acceptable limits, and when such exposure can be mitigated through appropriate PPE. The selection of PPE will be based on an evaluation of the performance characteristics of the PPE relative to the requirements and limitations of the Site, the task-specific conditions and duration, and the hazards and potential hazards identified at the Site.

Equipment designed to protect the body against contact with known or suspect chemical hazards are grouped into four categories according to the degree of protection afforded. These categories designated A through D consistent with United States Environmental Protection Agency (USEPA) Level of Protection designation, are:

- **Level A:** Should be selected when the highest level of respiratory, skin and eye protection is needed.

- **Level B:** Should be selected when the highest level of respiratory protection is needed, but a lesser level of skin protection is required. Level B protection is the minimum level recommended on initial Site entries until the hazards have been further defined by on-site studies. Level B (or Level A) is also necessary for oxygen-deficient atmospheres.

- **Level C:** Should be selected when the types of airborne substances are known, the concentrations have been measured and the criteria for using air-purifying respirators are met. In atmospheres where no airborne contaminants are present, Level C provides dermal protection only.

- **Level D:** Should not be worn on any Site with elevated respiratory or skin hazards. This is generally a work uniform providing minimal protection.

OSHA requires the use of certain PPE under conditions where an immediate danger to life and health (IDLH) may be present. Specifically, OSHA 29 CFR 1910.120(g)(3)(iii) requires use of a positive pressure self-contained breathing apparatus, or positive pressure air-line respirator equipped with an escape air supply when chemical exposure levels present a substantial possibility of immediate serious injury, illness or death, or impair the ability to

escape. Similarly, OSHA 29 CFR 1910.120(g)(3)(iv) requires donning totally-encapsulating chemical protective suits (with a protection level equivalent to Level A protection) in conditions where skin absorption of a hazardous substance may result in a substantial possibility of immediate serious illness, injury or death, or impair the ability to escape.

In situations where the types of chemicals, concentrations, and possibilities of contact are unknown, the appropriate level of protection must be selected based on professional experience and judgment until the hazards can be further characterized. The individual components of clothing and equipment must be assembled into a full protective ensemble to protect the worker from site-specific hazards, while at the same time minimizing hazards and drawbacks of the personal protective gear itself. Ensemble components are detailed below for levels A/B, C, and D protection.

7.2 Protection Ensembles

7.2.1 Level A/B Protection Ensemble

Level A/B ensembles include similar respiratory protection, however Level A provides a higher degree of dermal protection than Level B. Use of Level A over Level B is determined by: comparing the concentrations of identified substances in the air with skin toxicity data, and assessing the effect of the substance (by its measured air concentrations or splash potential) on the small area of the head and neck unprotected by Level B clothing.

The recommended PPE for level A/B is:

- Pressure-demand, full-face piece self-contained breathing apparatus (MSHA/-NIOSH approved) or pressure-demand supplied-air respirator with escape self-contained breathing apparatus (SCBA).
- Chemical-resistant clothing. For Level A, clothing consists of totally-encapsulating chemical resistant suit. Level B incorporates hooded one-or two-piece chemical splash suit.
- Inner and outer chemical resistant gloves.
- Chemical-resistant safety boots/shoes.
- Hardhat.

7.2.2 Level C Protection Ensemble

Level C protection is distinguished from Level B by the equipment used to protect the respiratory system, assuming the same type of chemical-resistant clothing is used. The main selection criterion for Level C is that conditions permit wearing an air-purifying device. The device (when required) must be an air-purifying respirator (MSHA/NIOSH approved) equipped with filter cartridges. Cartridges must be able to remove the substances encountered. Respiratory protection will be used only with proper fitting, training and the approval of a qualified individual. In addition, an air-purifying respirator can be used only if: oxygen content of the atmosphere is at least 19.5% in volume; substances are identified and concentrations measured; substances have adequate warning properties; the individual passes a qualitative fit-test for the mask; and an appropriate cartridge/canister is used, and its service limit concentration is not exceeded.

Recommended PPE for Level C conditions includes:

- Full-face piece, air-purifying respirator equipped with MSHA and NIOSH approved organic vapor/acid gas/dust/mist combination cartridges or as designated by the SSHO.
- Chemical-resistant clothing (hooded, one or two-piece chemical splash suit or disposable chemical-resistant one-piece suit).
- Inner and outer chemical-resistant gloves.
- Chemical-resistant safety boots/shoes.
- Hardhat.

An air-monitoring program is part of all response operations when atmospheric contamination is known or suspected. It is particularly important that the air be monitored thoroughly when personnel are wearing air-purifying respirators. Continual surveillance using direct-reading instruments is needed to detect any changes in air quality necessitating a higher level of respiratory protection.

7.2.3 Level D Protection Ensemble

As indicated above, Level D protection is primarily a work uniform. It can be worn in areas where only boots can be contaminated, where there are no inhalable toxic substances

and where the atmospheric contains at least 19.5% oxygen.

Recommended PPE for Level D includes:

- Coveralls.
- Safety boots/shoes.
- Safety glasses or chemical splash goggles.
- Hardhat.
- Optional gloves; escape mask; face shield.

7.2.4 Recommended Level of Protection for Site Tasks

Based upon current information regarding both the contaminants suspected to be present at the Site and the various tasks that are included in the remedial activities, the minimum required levels of protection for these tasks shall be as identified in Table 3.

8.0 EXPOSURE MONITORING

8.1 General

Based on the results of historic sample analysis and the nature of the proposed work activities at the Site, the possibility exist that organic vapors and/or particulates may be released to the air during intrusive construction activities. Ambient breathing zone concentrations may at times, exceed the permissible exposure limits (PELs) established by OSHA for the individual compounds (see Table 1), in which case respiratory protection will be required. Respiratory and dermal protection may be modified (upgraded or downgraded) by the SSHO based upon real-time field monitoring data.

8.1.1 On-Site Work Zone Monitoring

Benchmark-TurnKey personnel will conduct routine, real-time air monitoring during all intrusive construction phases such as excavation, backfilling, drilling, etc. The work area will be monitored at regular intervals using a PID, combustible gas meter and a particulate meter. Observed values will be recorded and maintained as part of the permanent field record.

Additional air monitoring measurements may be made by Benchmark-TurnKey personnel to verify field conditions during subcontractor oversight activities. Monitoring instruments will be protected from surface contamination during use. Additional monitoring instruments may be added if the situations or conditions change. Monitoring instruments will be calibrated in accordance with manufacturer's instructions before use.

8.1.2 Off-Site Community Air Monitoring

In addition to on-site monitoring within the work zone(s), monitoring at the down-wind portion of the Site perimeter will be conducted. This will provide a real-time method for determination of vapor and/or particulate releases to the surrounding community as a result of ground intrusive investigation work.

Ground intrusive activities are defined in the Generic Community Air Monitoring Plan and attached as Appendix C. Ground intrusive activities include soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells. Non-intrusive activities include the collection of soil and sediment samples or the

collection of groundwater samples from existing wells. Continuous monitoring is required for ground intrusive activities and periodic monitoring is required for non-intrusive activities. Periodic monitoring consists of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring while bailing a well, and taking a reading prior to leaving a sampling location. This may be upgraded to continuous if the sampling location is in close proximity to individuals not involved in the Site activity (i.e., on a curb of a busy street). The action levels below will be used during periodic monitoring.

8.2 Monitoring Action Levels

8.2.1 On-Site Work Zone Action Levels

The PID, or other appropriate instrument(s), will be used by Benchmark-TurnKey personnel to monitor organic vapor concentrations as specified in this HASP. Combustible gas will be monitored with the "combustible gas" option on the combustible gas meter or other appropriate instrument(s). In addition, fugitive dust/particulate concentrations will be monitored during major soil intrusion (viz., well/boring installation) using a real-time particulate monitor as specified in this plan. In the absence of such monitoring, appropriate respiratory protection for particulates shall be donned. Sustained readings obtained in the breathing zone may be interpreted (with regard to other Site conditions) as follows for Benchmark-TurnKey personnel:

- Total atmospheric concentrations of unidentified vapors or gases ranging from 0 to 1 ppm above background on the PID) - Continue operations under Level D (see Appendix A).

- Total atmospheric concentrations of unidentified vapors or gases yielding sustained readings from >1 ppm to 5 ppm above background on the PID (vapors not suspected of containing high levels of chemicals toxic to the skin) - Continue operations under Level C (see Appendix A).

- Total atmospheric concentrations of unidentified vapors or gases yielding sustained readings of >5 ppm to 50 ppm above background on the PID - Continue operations under Level B (see Attachment 1), re-evaluate and alter (if possible) construction methods to achieve lower vapor concentrations.

- Total atmospheric concentrations of unidentified vapors or gases above 50 ppm on the PID - Discontinue operations and exit the work zone immediately.

The particulate monitor will be used to monitor respirable dust concentrations during all intrusive activities and during handling of Site soil/fill. Action levels based on the instrument readings shall be as follows:

- Less than 50 mg/m^3 - Continue field operations.
- 50-150 mg/m^3 - Don dust/particulate mask or equivalent
- Greater than 150 mg/m^3 - Don dust/particulate mask or equivalent. Initiate engineering controls to reduce respirable dust concentration (viz., wetting of excavated soils or tools at discretion of Site Health and Safety Officer).

Readings from the field equipment will be recorded and documented on the appropriate Project Field Forms. All instruments will be calibrated before use on a daily basis and the procedure will be documented on the appropriate Project Field Forms.

8.2.2 Community Air Monitoring Action Levels

In addition to the action levels prescribed in Section 8.2.1 for Benchmark-TurnKey personnel on-site, the following criteria shall also be adhered to for the protection of downwind receptors consistent with NYSDOH requirements (Appendix C):

- **ORGANIC VAPOR PERIMETER MONITORING:**
  - If the sustained ambient air concentration of organic vapors at the downwind perimeter of the exclusion zone exceeds 5 ppm above background for the 15-minute average, work activities will be temporarily halted and monitoring continued. If the sustained organic vapor decreases below 5 ppm over background, work activities can resume with continued monitoring.
  - If the sustained ambient air concentration of organic vapors at the downwind perimeter of the exclusion zone are greater than 5 ppm over background but less than 25 ppm for the 15-minute average, activities can resume provided that: the organic vapor level 200 feet downwind of the working site or half the distance to the nearest off-site residential or commercial structure, whichever

is less, but in no case less than 20 feet, is below 5 ppm over background; and more frequent intervals of monitoring, as directed by the Site Health and Safety Officer, are conducted.

- If the sustained organic vapor level is above 25 ppm at the perimeter of the exclusion zone for the 15-minute average, the Site Health and Safety Officer must be notified and work activities shut down. The Site Health and Safety Officer will determine when re-entry of the exclusion zone is possible and will implement downwind air monitoring to ensure vapor emissions do not impact the nearest off-site residential or commercial structure at levels exceeding those specified in the ***Organic Vapor Contingency Monitoring Plan*** below. All readings, including sustained exceedance readings, will be recorded and provided to the New York State Department of Environmental Conservation (DEC) and Department of Health (DOH) personnel to review on a weekly basis or as soon as practical.

o **ORGANIC VAPOR CONTINGENCY MONITORING PLAN:**

- If the sustained organic vapor level is greater than 5 ppm over background 200 feet downwind from the work area or half the distance to the nearest off-site residential or commercial property, whichever is less, all work activities must be halted.

- If, following the cessation of the work activities or as the result of an emergency, sustained organic levels persist above 5 ppm above background 200 feet downwind or half the distance to the nearest off-site residential or commercial property from the work area, then the air quality must be monitored within 20 feet of the perimeter of the nearest off-site residential or commercial structure (20-foot zone).

- If efforts to abate the emission source are unsuccessful and if sustained organic vapor levels approach or exceed 5 ppm above background within the 20-foot zone for more than 30 minutes, or are sustained at levels greater than 10 ppm above background for longer than one minute, then the ***Major Vapor Emission Response Plan*** (see below) will automatically be placed into effect.

o **MAJOR VAPOR EMISSION RESPONSE PLAN:**

Upon activation, the following activities will be undertaken:

1. All Emergency Response Contacts as listed in this Health and Safety Plan and the Emergency Response Plan (Appendix A) will be advised.

2. The local police authorities will immediately be contacted by the Site Health and Safety Officer and advised of the situation.

3. Frequent air monitoring will be conducted at 30-minute intervals within the 20-foot zone. If two sustained successive readings below action levels are measured, air monitoring may be halted or modified by the Site Health and Safety Officer.

The following personnel are to be notified in the listed sequence in the event that a Major Vapor Emission Plan is activated:

Responsible Person	Contact	Phone Number
SSHO	Police	911
SSHO	State Emergency Response Hotline	(800) 457-7362

Additional emergency numbers are listed in the Emergency Response Plan included as Appendix A.

- **EXPLOSIVE VAPORS:**
  - Sustained atmospheric concentrations of greater than 10% LEL in the work area - Initiate combustible gas monitoring at the downwind portion of the Site perimeter.
  - Sustained atmospheric concentrations of greater than 10% LEL at the downwind Site perimeter – Halt work and contact local Fire Department.

- **AIRBORNE PARTICULATE COMMUNITY AIR MONITORING**

Respirable (PM-10) particulate monitoring will be performed on a continuous basis at the upwind and downwind perimeter of the exclusion zone. The monitoring will be performed using real-time monitoring equipment capable of measuring PM-10 and integrating over a period of 15-minutes for comparison to the airborne particulate action levels. The equipment will be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration will be visually assessed during all work activities. All readings will be recorded and will be available for NYSDEC and NYSDOH review. Readings will be interpreted as follows:

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (ug/m^3) greater than the background (upwind perimeter) reading for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression provided that the downwind PM-10 particulate levels do not exceed 150 ug/m^3 above the upwind level and that visible dust is not migrating from the work area.

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

Pertinent emergency response information including the telephone number of the Fire Department is included in the Emergency Response Plan (Appendix A).

9.0 SPILL RELEASE/RESPONSE

This chapter of the HASP describes the potential for, and procedures related to spills or releases of known or suspected petroleum and/or hazardous substances on the Site. The purpose of this Section of the HASP is to plan appropriate response, control, counter-measures and reporting, consistent with OSHA requirements in 29 CFR 1910.120(b)(4)(ii)(J) and (j)(1)(viii). The spill containment program addresses the following elements:

- Potential hazardous material spills and available controls.
- Initial notification and evaluation.
- Spill response.
- Post-spill evaluation.

9.1 Potential Spills and Available Controls

An evaluation was conducted to determine the potential for hazardous material and oil/petroleum spills at this Site. For the purpose of this evaluation, hazardous materials posing a significant spill potential are considered to be:

- CERCLA Hazardous Substances as identified in 40 CFR Part 302, where such materials pose the potential for release in excess of their corresponding Reportable Quantity (RQ).

- Extremely Hazardous Substances as identified in 40 CFR Part 355, Appendix A, where such materials pose the potential for release in excess of their corresponding Reportable Quantity (RQ).

- Hazardous Chemicals as defined under Section 311(e) of the Emergency Planning and Community Right-To-Know Act of 1986, where such chemicals are present or will be stored in excess of 10,000 lbs.

- Toxic Chemicals as defined in 40 CFR Part 372, where such chemicals are present or will be stored in excess of 10,000 lbs.

- Chemicals regulated under 6NYCRR Part 597, where such materials pose the potential for release in excess of their corresponding Reportable Quantity (RQ).

Oil/petroleum products are considered to pose a significant spill potential whenever the following situations occur:

- The potential for a "harmful quantity" of oil (including petroleum and non-petroleum-based fuels and lubricants) to reach navigable waters of the U.S. exists (40 CFR Part 112.4). Harmful quantities are considered by USEPA to be volumes that could form a visible sheen on the water or violate applicable water quality standards.

- The potential for any amount of petroleum to reach any waters of NY State, including groundwater, exists. Petroleum, as defined by NY State in 6NYCRR Part 612, is a petroleum-based heat source, energy source, or engine lubricant/maintenance fluid.

- The potential for any release, to soil or water, of petroleum from a bulk storage facility regulated under 6NYCRR Part 612. A regulated petroleum storage facility is defined by NY State as a site having stationary tank(s) and intra-facility piping, fixtures and related equipment with an aggregate storage volume of 1,100 gallons or greater.

The evaluation indicates that, based on Site history and decommissioning records, a hazardous material spill and/or a petroleum product spill is not likely to occur during RI efforts.

9.2 Initial Spill Notification and Evaluation

Any worker who discovers a hazardous substance or oil/petroleum spill will immediately notify the Project Manager and SSHO. The worker will, to the best of his/her ability, report the material involved, the location of the spill, the estimated quantity of material spilled, the direction/flow of the spill material, related fire/explosion incidents, if any, and any associated injuries. The Emergency Response Plan presented in Attachment H2 of this HASP will immediately be implemented if an emergency release has occurred.

Following initial report of a spill, the Project Manager will make an evaluation as to whether the release exceeds RQ levels. If an RQ level is exceeded, the Project Manager will notify the Site owner and NYSDEC at 1-800-457-7362 within 2 hours of spill discovery. The Project Manager will also determine what additional agencies (e.g., USEPA) are to be contacted regarding the release, and will follow-up with written reports as required by the applicable regulations.

9.3 Spill Response

For all spill situations, the following general response guidelines will apply:

- Only those personnel involved in overseeing or performing containment operations will be allowed within the spill area. If necessary, the area will be roped, ribboned, or otherwise blocked off to prevent unauthorized access.
- Appropriate PPE, as specified by the SSHO, will be donned before entering the spill area.
- Ignition points will be extinguished/removed if fire or explosion hazards exist.
- Surrounding reactive materials will be removed.
- Drains or drainage in the spill area will be blocked to prevent inflow of spilled materials or applied materials.

For minor spills, the Contractor will maintain a Spill Control and Containment Kit in the Field Office or other readily accessible storage location. The kit will consist of, at a minimum, a 50 lb. bag of "speedy dry" granular absorbent material, absorbent pads, shovels, empty 5-gallon pails and an empty open-top 55-gallon drum. Spilled materials will be absorbed, and shoveled into a 55-gallon drum for proper disposal (NYSDEC approval will be secured for on-site treatment of the impacted soils/absorbent materials, if applicable). Impacted soils will be hand-excavated to the point that no visible signs of contamination remains, and will be drummed with the absorbent.

In the event of a major release or a release that threatens surface water, a spill response contractor will be called to the Site. The response contractor may use heavy equipment (e.g., excavator, backhoe, etc.) to berm the soils surrounding the spill Site or create diversion trenching to mitigate overland migration or release to navigable waters. Where feasible, pumps will be used to transfer free liquid to storage containers. Spill control/cleanup contractors in the Western New York area that may be contacted for assistance include:

- The Environmental Service Group of NY, Inc.: (716) 695-6720
- Environmental Products and Services, Inc.: (716) 447-4700
- Op-Tech: (716) 873-7680

9.4 Post-Spill Evaluation

If a reportable quantity of hazardous material or oil/petroleum is spilled as determined by the Project Manager, a written report will be prepared as indicated in Section 9.2. The report will identify the root cause of the spill, type and amount of material released, date/time of release, response actions, agencies notified and/or involved in cleanup, and procedures to be implemented to avoid repeat incidents. In addition, all re-useable spill cleanup and containment materials will be decontaminated, and spill kit supplies/disposable items will be replenished.

10.0 HEAT/COLD STRESS MONITORING

Since some of the work activities at the Site will be scheduled for both the summer and winter months, measures will be taken to minimize heat/cold stress to Benchmark-TurnKey employees. The Site Safety and Health Officer and/or his or her designee will be responsible for monitoring Benchmark-TurnKey field personnel for symptoms of heat/cold stress.

10.1 Heat Stress Monitoring

Personal protective equipment may place an employee at risk of developing heat stress, a common and potentially serious illnesses often encountered at construction, landfill, waste disposal, industrial or other unsheltered sites. The potential for heat stress is dependent on a number of factors, including environmental conditions, clothing, workload, physical conditioning and age. Personal protective equipment may severely reduce the body's normal ability to maintain temperature equilibrium (via evaporation and convection) and require increased energy expenditure due to its bulk and weight.

Proper training and preventive measures will mitigate the potential for serious illness. Heat stress prevention is particularly important because once a person suffers from heat stroke or heat exhaustion, that person may be predisposed to additional heat related illness. To avoid heat stress, the following steps should be taken:

- Adjust work schedules.
- Modify work/rest schedules according to monitoring requirements.
- Mandate work slowdowns as needed.
- Perform work during cooler hours of the day if possible or at night if adequate lighting can be provided.
- Provide shelter (air-conditioned, if possible) or shaded areas to protect personnel during rest periods.
- Maintain worker's body fluids at normal levels. This is necessary to ensure that the cardiovascular system functions adequately. Daily fluid intake must approximately equal the amount of water lost in sweat (i.e., eight fluid ounces must be ingested for approximately every 1 lb of weight lost). The normal thirst

mechanism is not sensitive enough to ensure that enough water will be consumed to replace lost perspiration. When heavy sweating occurs, workers should be encouraged to drink more.

- Train workers to recognize the symptoms of heat related illness.

Heat-Related Illness - Symptoms:

- Heat rash may result from continuous exposure to heat or humid air.

- Heat cramps are caused by heavy sweating with inadequate electrolyte replacement. Signs and symptoms include: muscle spasms; pain in the hands, feet and abdomen.

- Heat exhaustion occurs from increased stress on various body organs including inadequate blood circulation due to cardiovascular insufficiency or dehydration. Signs and symptoms include: pale, cool, moist skin; heavy sweating; dizziness; nausea; fainting.

- Heat stroke is the most serious form of heat stress. Temperature regulation fails and the body temperature rises to critical levels. Immediate action must be taken to cool the body before serious injury and death occur. Competent medical help must be obtained. Signs and symptoms are: red, hot, usually dry skin; lack of or reduced perspiration; nausea; dizziness and confusion; strong, rapid pulse; coma.

The monitoring of personnel wearing protective clothing should commence when the ambient temperature is 70 degrees Fahrenheit or above. For monitoring the body's recuperative ability to excess heat, one or more of the following techniques should be used as a screening mechanism.

- Heart rate may be measured by the radial pulse for 30 seconds as early as possible in the resting period. The rate at the beginning of the rest period should not exceed 100 beats per minute. If the rate is higher, the next work period should be shortened by 10 minutes (or 33%), while the length of the rest periods stay the same, If the pulse rate is 100 beats per minute at the beginning of the nest rest period, the following work cycle should be further shortened by 33%.

- Body temperature may be measured orally with a clinical thermometer as early as possible in the resting period. Oral temperature at the beginning of the rest period

should not exceed 99.6 degrees Fahrenheit. If it does, the next work period should be shortened by 10 minutes (or 33%), while the length of the rest period remains the same. However, if the oral temperature exceeds 99.6 degrees Fahrenheit at the beginning of the next period, the work cycle may be further shortened by 33%. Oral temperature should be measured at the end of the rest period to make sure that it has dropped below 99.6 degrees Fahrenheit. No Benchmark-TurnKey employee will be permitted to continue wearing semi-permeable or impermeable garments when his/her oral temperature exceeds 100.6 degrees Fahrenheit.

10.2 Cold Stress Monitoring

Exposure to cold conditions may result in frostbite or hypothermia, each of which progresses in stages as shown below.

- **Frostbite** occurs when body tissue (usually on the extremities) begins to freeze. The three states of frostbite are:

  1) **Frost nip** - This is the first stage of the freezing process. It is characterized by a whitened area of skin, along with a slight burning or painful sensation. Treatment consists of removing the victim from the cold conditions, removal of boots and gloves, soaking the injured part in warm water (102 to 108 degrees Fahrenheit) and drinking a warm beverage. Do not rub skin to generate friction/ heat.

  2) **Superficial Frostbite** - This is the second stage of the freezing process. It is characterized by a whitish gray area of tissue, which will be firm to the touch but will yield little pain. The treatment is identical for Frost nip.

  3) **Deep Frostbite** - In this final stage of the freezing process the affected tissue will be cold, numb and hard and will yield little to no pain. Treatment is identical to that for Frost nip.

- **Hypothermia** is a serious cold stress condition occurring when the body loses heat at a rate faster than it is produced. If untreated, hypothermia may be fatal. The stages of hypothermia may not be clearly defined or visible at first, but generally include:

  1) Shivering
  2) Apathy (i.e., a change to an indifferent or uncaring mood)

3) Unconsciousness
4) Bodily freezing

Employees exhibiting signs of hypothermia should be treated by medical professionals. Steps that can be taken while awaiting help include:

1) Remove the victim from the cold environment and remove wet or frozen clothing. (Do this carefully as frostbite may have started.)

2) Perform active re-warming with hot liquids for drinking (Note: do not give the victim any liquid containing alcohol or caffeine) and a warm water bath (102 to 108 degrees Fahrenheit).

3) Perform passive re-warming with a blanket or jacket wrapped around the victim.

In any potential cold stress situation, it is the responsibility of the Site Health and Safety Officer to encourage the following:

- Education of workers to recognize the symptoms of frostbite and hypothermia.
- Workers should dress warmly, with more layers of thin clothing as opposed to one thick layer.
- Personnel should remain active and keep moving.
- Personnel should be allowed to take shelter in a heated area, as necessary.
- Personnel should drink warm liquids (no caffeine or alcohol if hypothermia has set in).
- For monitoring the body's recuperation from excess cold, oral temperature recordings should occur:
  - At the Site Safety Technicians discretion when suspicion is based on changes in a worker's performance or mental status.
  - At a worker's request.
  - As a screening measure, two times per shift, under unusually hazardous conditions (e.g., wind chill less than 20 degrees Fahrenheit or wind chill

less than 30 degrees Fahrenheit with precipitation).

- As a screening measure, whenever anyone worker on-site develops hypothermia.

Any person developing moderate hypothermia (a core body temperature of 92 degrees Fahrenheit) will not be allowed to return to work for 48 hours without the recommendation of a qualified medical doctor.

11.0 WORK ZONES AND SITE CONTROL

Work zones around the areas designated for construction activities will be established on a daily basis and communicated to all employees and other Site users by the SSHO. It shall be each Contractor's Site Safety and Health Officer's responsibility to ensure that all Site workers are aware of the work zone boundaries and to enforce proper procedures in each area. The zones will include:

- Exclusion Zone ("Hot Zone") - The area where contaminated materials may be exposed, excavated or handled and all areas where contaminated equipment or personnel may travel. Flagging tape will delineate the zone. All personnel entering the Exclusion Zone must wear the prescribed level of personal protective equipment identified in Section 7.

- Contamination Reduction Zone - The zone where decontamination of personnel and equipment takes place. Any potentially contaminated clothing, equipment and samples must remain in the Contamination Reduction Zone until decontaminated.

- Support Zone - The part of the site that is considered non-contaminated or "clean." Support equipment will be located in this zone, and personnel may wear normal work clothes within this zone.

In the absence of other task-specific work zone boundaries established by the SSHO, the following boundaries will apply to all investigation and construction activities involving disruption or handling of Site soils or groundwater:

- Exclusion Zone: 50-foot radius from the outer limit of the sampling/construction activity.

- Contaminant Reduction Zone: 100-foot radius from the outer limit of the sampling/construction activity.

- Support Zone: Areas outside the Contaminant Reduction Zone.

Access of non-essential personnel to the Exclusion and Contamination Reduction Zones will be strictly controlled by the SSHO. Only personnel who are essential to the

completion of the task will be allowed access to these areas and only if they are wearing the prescribed level of protection. Entrance of all personnel must be approved by the SSHO.

The SSHO will maintain a Health and Safety Logbook containing the names of Benchmark-TurnKey workers and their level of protection. The zone boundaries may be changed by the SSHO as environmental conditions warrant, and to respond to the necessary changes in work locations on-site.

12.0 DECONTAMINATION

12.1 Decontamination for Benchmark-TurnKey Employees

The degree of decontamination required is a function of a particular task and the environment within which it occurs. The following decontamination procedure will remain flexible, thereby allowing the decontamination crew to respond appropriately to the changing environmental conditions that may arise at the Site. All Benchmark-TurnKey personnel on-site shall follow the procedure below, or the Contractor's procedure (if applicable), whichever is more stringent.

Station 1 - Equipment Drop: Deposit visibly contaminated (if any) re-useable equipment used in the contamination reduction and exclusion zones (tools, containers, monitoring instruments, radios, clipboards, etc.) on plastic sheeting.

Station 2 - Boots and Gloves Wash and Rinse: Scrub outer boots and outer gloves. Deposit tape and gloves in waste disposal container.

Station 3 - Tape, Outer Boot and Glove Removal: Remove tape, outer boots and gloves. Deposit tape and gloves in waste disposal container.

Station 4 - Canister or Mask Change: If worker leaves exclusive zone to change canister (or mask), this is the last step in the decontamination procedure. Worker's canister is exchanged, new outer gloves and boot cover donned, and worker returns to duty.

Station 5 - Outer Garment/Face Piece Removal: Protective suit removed and deposited in separate container provided by Contractor. Face piece or goggles are removed if used. Avoid touching face with fingers. Face piece and/or goggles deposited on plastic sheet. Hard hat removed and placed on plastic sheet.

Station 6 - Inner Glove Removal: Inner gloves are the last personal protective equipment to be removed. Avoid touching the outside of the gloves with bare fingers. Dispose of these gloves in waste disposal container.

Following PPE removal, personnel shall wash hands, face and forearms with absorbent wipes. If field activities proceed for duration of 6 consecutive months or longer, shower facilities will be provided for worker use in accordance with OSHA 29 CFR 1910.120(n).

12.2 Decontamination for Medical Emergencies

In the event of a minor, non-life-threatening injury, personnel should follow the decontamination procedures as defined, and then administer first-aid.

In the event of a major injury or other serious medical concern (e.g., heat stroke), immediate first-aid is to be administered and the victim transported to the hospital in lieu of further decontamination efforts unless exposure to a Site contaminant would be considered "Immediately Dangerous to Life or Health."

12.3 Decontamination of Field Equipment

The Contractor in accordance with his approved Health and Safety Plan in the Contamination Reduction Zone will conduct decontamination of heavy equipment. As a minimum, this will include manually removing heavy soil contamination, followed by steam cleaning on an impermeable pad.

Benchmark-TurnKey personnel will conduct decontamination of all tools used for sample collection purposes. It is expected that all tools will be constructed of nonporous, nonabsorbent materials (i.e., metal), which will aid in the decontamination effort. Any tool or part of a tool made of porous, absorbent material (i.e., wood) will be placed into suitable containers and prepared for disposal.

Decontamination of bailers, split-spoons, spatula knives, and other tools used for environmental sampling and examination shall be as follows:

- Disassemble the equipment
- Water wash to remove all visible foreign matter.
- Wash with detergent.
- Rinse all parts with distilled-deionized water.
- Allow to air dry.
- Wrap all parts in aluminum foil or polyethylene.

13.0 CONFINED SPACE ENTRY

OSHA 29 CFR 1910.146 identifies a confined space as a space that is large enough and so configured that an employee can physically enter and do assigned work, has limited or restricted means for entry and exit, and is not intended for continuous employee occupancy. Confined spaces include, but are not limited to, trenches, storage tanks, process vessels, pits, sewers, tunnels, underground utility vaults, pipelines, sumps, wells, and excavations.

Confined space entry by Benchmark-TurnKey employees is not anticipated to be necessary to complete the RI activities identified in Section 2.0. In the event that the scope of work changes or confined space entry appears necessary, the Project Manager will be consulted to determine if feasible engineering alternatives to confined space entry can be implemented. If confined space entry by Benchmark-TurnKey employees cannot be avoided through reasonable engineering measures, task-specific confined space entry procedures will be developed, and a confined-space entry permit will be issued through Benchmark-TurnKey's corporate Health and Safety Director. Benchmark-TurnKey employees shall not enter a confined space without these procedures and permits in place.

14.0 FIRE PREVENTION AND PROTECTION

14.1 General Approach

Recommended practices and standards of the National Fire Protection Association (NFPA) and other applicable regulations will be followed in the development and application of Project Fire Protection Programs. When required by regulatory authorities, the project management will prepare and submit a Fire Protection Plan for the approval of the contracting officers, authorized representative or other designated official. Essential considerations for the Fire Protection Plan will include:

- Proper Site preparation and safe storage of combustible and flammable materials.
- Availability of coordination with private and public fire authorities.
- Adequate job-site fire protection and inspections for fire prevention.
- Adequate indoctrination and training of employees.

14.2 Equipment and Requirements

Fire extinguishers will be provided by each Contractor and are required on all heavy equipment and in each field trailer. Fire extinguishers will be inspected, serviced, and maintained in accordance with the manufacturer's instructions. As a minimum, all extinguishers shall be checked monthly and weighed semi-annually, and recharged if necessary. Recharge or replacement shall be mandatory immediately after each use.

14.3 Flammable and Combustible Substances

All storage, handling or use of flammable and combustible substances will be under the supervision of qualified persons. All tanks, containers and pumping equipment, whether portable or stationary, used for the storage and handling of flammable and combustible liquids, will meet the recommendations of the National Fire Protection Association.

14.4 Hot Work

If the scope of work necessitates welding or blowtorch operation, the hot work permit presented in Appendix B will be completed by the SSHO and reviewed/issued by the Project Manager.

15.0 EMERGENCY INFORMATION

In accordance with OSHA 29 CFR Part 1910, an Emergency Response Plan is attached to this HASP as Appendix A. The hospital route map is presented within Appendix A as Figure 1.

16.0 REFERENCES

1. New York State Department of Environmental Conservation. *DER-10; Technical Guidance for Site Investigation and Remediation.* May 2010.

TABLES

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TURNKEY ENVIRONMENTAL RESTORATION, LLC

TABLE 1

TOXICITY DATA FOR CONSTITUENTS OF POTENTIAL CONCERN

225 LOUISIANA STREET SITE

BUFFALO, NEW YORK

Parameter	Synonyms	CAS No.	Code	Concentration Limits [1]		
				PEL	TLV	IDLH
Volatile Organic Compounds (VOCs): ppm						
1,2,4-Trimethylbenzene	Pseudocumene	95-63-6	*none*	25	25	--
1,3,5-Trimethylbenzene	Mesitylene	108-67-8	*none*	25	25	--
Acetone	Propanone	67-64-1	*none*	1000	750	2500
Xylene, Total	o-, m-, p-isomers	1330-20-7	*none*	100	100	900
Semi-volatile Organic Compounds (SVOCs) [2]: ppm						
Benzo(a)anthracene	*none*	56-55-3	*none*	--	--	--
Benzo(a)pyrene	*none*	50-32-8	*none*	--	--	--
Benzo(b)fluoranthene	*none*	205-99-2	*none*	--	--	--
Benzo(k)fluoranthene	*none*	207-08-9	*none*	--	--	--
Chrysene	*none*	218 01 9	*none*	--	--	--
Dibenzo(a,h)anthracene	*none*	53-70-3	*none*	--	--	--
Indeno(1,2,3-cd)pyrene	*none*	193-39-5	*none*	--	--	--
Inorganic Compounds: mg/m [2]						
Arsenic	*none*	7440-38-2	*Ca*	0.01	0.01	5
Barium	*none*	7440-39-3	*none*	0.5	0.5	50
Cadmium	*none*	7440-43-9	*Ca*	0.005	0.01	9
Chromium	*none*	7440-47-3	*none*	1	0.5	250
Copper	*none*	7440-50-8	*none*	0.1	0.2	200
Lead	*none*	7439-92-1	*none*	0.05	0.15	100
Manganese	*none*	7439-96-5	*none*	5	5	500
Mercury	*none*	7439-97-6	C-0.1	0.1	0.05	10
Nickel	*none*	7440-02-0	*Ca*	1	1	10
Selenium	*none*	7782-49-2	*none*	0.2	0.2	1
Silver	*none*	7440-28-0	*none*	0.01	0.1	10
Zinc	*none*	7440-66-6	*none*	--	--	--

Notes:

1. Concentration limits as reported by NIOSH Pocket Guide to Chemical Hazards, February 2004 (NIOSH Publication No. 97-140, fourth printing with chages and updates.
2. " -- " = concentration limit not available; exposure should be minimized to the extent feasible through appropriate engineering controls & PPE.

Explanation:

Ca = NIOSH considers constituent to be a potential occupational carcinogen.
IDLH = Immediately Dangerous to Life or Health.
TLV = Threshold Limit Value, established by American Conference of Industrial Hygienists (ACGIH), equals the maximum exposure concentration allowable for 8 hours/day @ 40 ho
TLVs are the amounts of chemicals in the air that almost all healthy adult workers are predicted to be able to tolerate without adverse effects. There are three types.
TLV-TWA (TLV-Time-Weighted Average) which is averaged over the normal eight-hour day/forty-hour work week. (Most TLVs.)
TLV-C or Ceiling limits are the concentration that should not be exceeded during any part of the working exposure.
Unless the initials "STEL" or "C" appear in the Code column, the TLV value should be considered to be the eight-hour TLV-TWA.
PEL = Permissible Exposure Limit, established by OSHA, equals the maximium exposure conconcentration allowable for 8 hours per day @ 40 hours per week

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TURNKEY ENVIRONMENTAL RESTORATION, LLC

TABLE 2

POTENTIAL ROUTES OF EXPOSURE TO THE CONSTITUENTS OF POTENTIAL CONCERN

225 LOUISIANA STREET
BUFFALO, NEW YORK

Activity [1]	Direct Contact with Soil/Fill	Inhalation of Vapors or Dust	Direct Contact with Groundwater
Remedial Action Tasks			
1. Excavaion of Metals-Impacted Soil	x	x	
2. Excavation of Petroleum-Impacted Soil	x	x	
3. Waste Characterization Sampling	x	x	
4. Post-Excavation Sampling	x	x	
5. Backfilling	x	x	
6. Groundwater and Surface Water Management	x		x
7. Soil Cover Placement	x	x	
8. ASD System Installation			

Notes:
1. Activity as described in Section 1.5 of the Health and Safety Plan.

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

TURNKEY ENVIRONMENTAL RESTORATION, LLC

TABLE 3

REQUIRED LEVELS OF PROTECTION FOR RI TASKS

225 LOUISIANA STREET SITE BUFFALO, NEW YORK

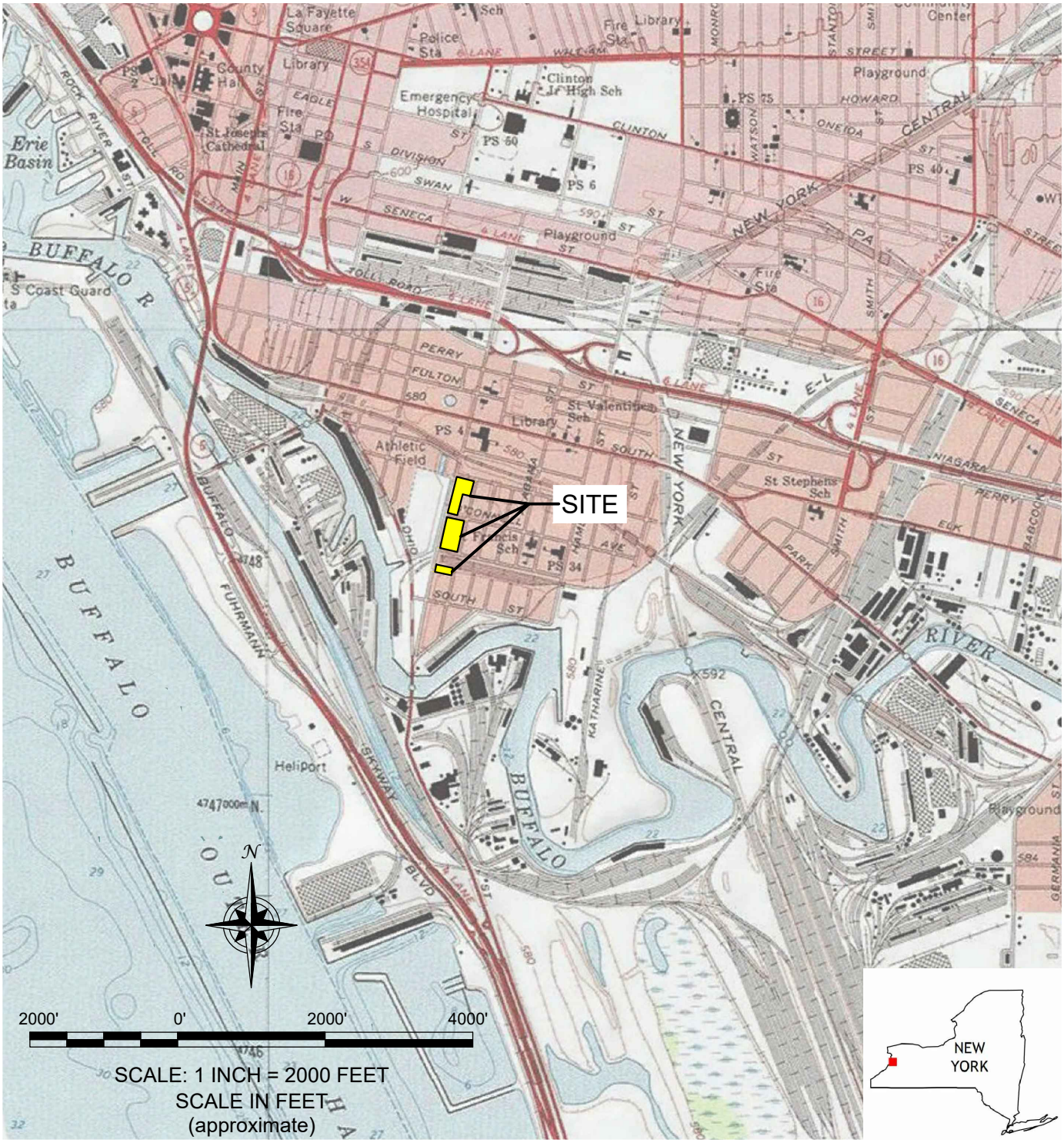
Activity	Respiratory Protection [1]	Clothing	Gloves [2]	Boots [2, 3]	Other Required PPE/Modifications [2, 4]
Remedial Action Tasks					
1. Excavaion of Metals-Impacted Soil	Level D (upgrade to Level C if necessary)	Work Uniform or Tyvek	L/N	outer: L inner: STSS	HH SGSS
2. Excavation of Petroleum-Impacted Soil	Level D (upgrade to Level C if necessary)	Work Uniform or Tyvek	L/N	outer: L inner: STSS	HH SGSS
3. Waste Characterization Sampling	Level D (upgrade to Level C if necessary)	Work Uniform or Tyvek	L/N	outer: L inner: STSS	HH SGSS
4. Post-Excavation Sampling	Level D (upgrade to Level C if necessary)	Work Uniform or Tyvek	L/N	outer: L inner: STSS	HH SGSS
5. Backfilling	Level D (upgrade to Level C if necessary)	Work Uniform or Tyvek	L/N	outer: L inner: STSS	HH SGSS
6. Groundwater and Surface Water Management	Level D (upgrade to Level C if necessary)	Work Uniform or Tyvek	L/N	outer: L inner: STSS	HH SGSS
7. Soil Cover Placement	Level D (upgrade to Level C if necessary)	Work Uniform or Tyvek	L/N	outer: L inner: STSS	HH SGSS
8. ASD System Installation	Level D (upgrade to Level C if necessary)	Work Uniform or Tyvek	L/N	outer: L inner: STSS	HH SGSS

Notes:

1. Respiratory equipment shall conform to guidelines presented in Section 7.0 of this HASP. The Level C requirement is an air-purifying respirator equiped with organic compound/acid gas/dust cartridge.
2. HH = hardhat; L= Latex; L/N = latex inner glove, nitrile outer glove; N = Nitrile; S = Saranex; SG = safety glasses; SGSS = safety glasses with sideshields; STSS = steel toe safety shoes.
3. Latex outer boot (or approved overboot) required whenever contact with contaminated materials may occur. SSHO may downgrade to STSS (steel-toed safety shoes) if contact will be limited to cover/replacement soils.
4. Dust masks shall be donned as directed by the SSHO (site safety and health officer) or site safety technician whenever potentially contaminated airborne particulates (i.e., dust) are present in significant amounts in the breathing zone. Goggles may be substituted with safety glasses w/side-shields whenever contact with contaminated liquids is not anticipated.

FIGURES

FIGURE 1



BENCHMARK
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SUITE 300
BUFFALO, NY 14218
(716) 856-0599

PROJECT NO.: B0305-018-001

DATE: APRIL 2021

DRAFTED BY: CMS

SITE LOCATION AND VICINITY MAP

HEALTH AND SAFETY PLAN

225 LOUISIANA STREET SITE
BUFFALO, NEW YORK

PREPARED FOR

BARCALO BUFFALO LLC

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DATE: APRIL 2021
DRAFTED BY: CCB

SITE PLAN (AERIAL)

FIGURE 2

HEALTH AND SAFETY PLAN

225 LOUISIANA STREET SITE
BUFFALO, NEW YORK

PREPARED FOR
BARCALO BUFFALO LLC

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ATTACHMENT A

EMERGENCY RESPONSE PLAN

BENCHMARK TURNKEY

EMERGENCY RESPONSE PLAN
for
BROWNFIELD CLEANUP PROGRAM
RA ACTIVITIES

225 LOUISIANA STREET SITE
BUFFALO, NEW YORK

June 2021 0305-018-001

Prepared for:

BARCALO BUFFALO LLC

225 LOUISIANA STREET SITE
HEALTH AND SAFETY PLAN FOR RA ACTIVITIES
APPENDIX A: EMERGENCY RESPONSE PLAN

TABLE OF CONTENTS

LIST OF FIGURES

1.0 GENERAL

This report presents the site-specific Emergency Response Plan (ERP) referenced in the Site Health and Safety Plan (HASP) prepared for Remedial Action (RA) activities at the 225 Louisiana Street Site in Buffalo, New York. This appendix of the HASP describes potential emergencies that may occur at the Site; procedures for responding to those emergencies; roles and responsibilities during emergency response; and training all workers must receive in order to follow emergency procedures. This ERP also describes the provisions this Site has made to coordinate its emergency response planning with other contractors on-site and with off-site emergency response organizations.

This ERP is consistent with the requirements of 29 CFR 1910.120(l) and provides the following site-specific information:

- Pre-emergency planning.
- Personnel roles, lines of authority, and communication.
- Emergency recognition and prevention.
- Safe distances and places of refuge.
- Evacuation routes and procedures.
- Decontamination procedures.
- Emergency medical treatment and first aid.
- Emergency alerting and response procedures.
- Critique of response and follow-up.
- Emergency personal protective equipment (PPE) and equipment.

2.0 PRE-EMERGENCY PLANNING

This Site has been evaluated for potential emergency occurrences, based on site hazards, the required work tasks, the site topography, and prevailing weather conditions. The results of that evaluation indicate the potential for the following site emergencies to occur at the locations indicated.

Type of Emergency:

1. Medical, due to physical injury

Source of Emergency:

1. Slip/trip/fall

Location of Source:

1. Non-specific

3.0 ON-SITE EMERGENCY RESPONSE EQUIPMENT

Emergency procedures may require specialized equipment to facilitate worker rescue, contamination control and reduction, or post-emergency clean up. Emergency response equipment available on the Site is listed below. The equipment inventory and storage locations are based on the potential emergencies described above. This equipment inventory is designed to meet on-site emergency response needs and any specialized equipment needs that off-site responders might require because of the hazards at this Site but not ordinarily stocked.

Any additional personal protective equipment (PPE) required and stocked for emergency response is also listed in below. During an emergency, the Emergency Response Coordinator (ERC) is responsible for specifying the level of PPE required for emergency response. At a minimum, PPE used by emergency responders will comply with Section 7.0, Personal Protective Equipment, of this HASP. Emergency response equipment is inspected at regular intervals and maintained in good working order. The equipment inventory is replenished as necessary to maintain response capabilities.

Emergency Equipment	Quantity	Location
First Aid Kit	1	Site Vehicle
Chemical Fire Extinguisher	2 (minimum)	All heavy equipment and Site Vehicle

Emergency PPE	Quantity	Location
Full-face respirator	1 for each worker	Site Vehicle
Chemical-resistant suits	4 (minimum)	Site Vehicle

4.0 EMERGENCY PLANNING MAPS

An area-specific map of the Site will be developed on a daily basis during performance of field activities. The map will be marked to identify critical on-site emergency planning information, including: emergency evacuation routes, a place of refuge, an assembly point, and the locations of key site emergency equipment. Site zone boundaries will be shown to alert responders to known areas of contamination. There are no major topographical features, however the direction of prevailing winds/weather conditions that could affect emergency response planning are also marked on the map. The map will be posted at site-designated place of refuge and inside the Benchmark personnel field vehicle.

5.0 EMERGENCY CONTACTS

The following identifies the emergency contacts for this ERP.

Emergency Telephone Numbers:

Project Manager: *Michael Lesakowski*
Work: (716) 856-0599
Mobile: (716) 818-3954

Corporate Health and Safety Director: *Thomas H. Forbes*
Work: (716) 856-0599
Mobile: (716) 864-1730

Site Safety and Health Officer (SSHO): *Bryan Mayback*
Work: (716) 856-0599
Mobile: (716) 844-1699

Alternate SSHO: *Christopher Boron*
Work: (716) 856-0635
Mobile: (716) 864-2726

BUFFALO GENERAL HOSPITAL (ER):	(716) 859-5600
FIRE:	911
AMBULANCE:	911
BUFFALO POLICE:	911
STATE EMERGENCY RESPONSE HOTLINE:	(800) 457-7362
NATIONAL RESPONSE HOTLINE:	(800) 424-8802
NYSDOH:	(716) 847-4385
NYSDEC:	(716) 851-7220
NYSDEC 24-HOUR SPILL HOTLINE:	(800) 457-7252

The Site location is:

175, 177, 225 and 245 Louisiana Street and 96 Kentucky Street
Buffalo, New York 14204
Site Phone Number: Benchmark Staff Cell Phones to be used.

6.0 EMERGENCY ALERTING & EVACUATION

Internal emergency communication systems are used to alert workers to danger, convey safety information, and maintain site control. Any effective system can be employed. Two-way radio headsets or field telephones are often used when work teams are far from the command post. Hand signals and air-horn blasts are also commonly used. Every system must have a backup. It shall be the responsibility of each contractor's Site Health and Safety Officer to ensure all personnel entering the site understand an adequate method of internal communication. Unless all personnel are otherwise informed, the following signals shall be used.

1) Emergency signals by portable air horn, siren, or whistle: two short blasts, personal injury; continuous blast, emergency requiring site excavation.

2) Visual signals: hand gripping throat, out of air/cannot breathe; hands on top of head, need assistance; thumbs up, affirmative/ everything is OK; thumbs down, no/negative; grip partner's wrist or waist, leave area immediately.

If evacuation notice is given, site workers leave the worksite with their respective buddies, if possible, by way of the nearest exit. Emergency decontamination procedures detailed in Section 12.0 of the HASP are followed to the extent practical without compromising the safety and health of site personnel. The evacuation routes and assembly area will be determined by conditions at the time of the evacuation based on wind direction, the location of the hazard source, and other factors as determined by rehearsals and inputs from emergency response organizations. Wind direction indicators are located so that workers can determine a safe up wind or cross wind evacuation route and assembly area if not informed by the emergency response coordinator at the time the evacuation alarm sounds. Since work conditions and work zones within the site may be changing on daily basis, it shall be the responsibility of the construction Site Health and Safety Officer to review evacuation routes and procedures as necessary and to inform all Benchmark workers of any changes.

Personnel exiting the site will gather at a designated assembly point. To determine that everyone has successfully exited the site, personnel will be accounted for at the assembly

site. If any worker cannot be accounted for, notification is given to the SSHO (***Bryan Mayback*** or ***Christopher Boron***) so that appropriate action can be initiated. Contractors and subcontractors on this site have coordinated their emergency response plans to ensure that these plans are compatible, and that source(s) of potential emergencies are recognized, alarm systems are clearly understood, and evacuation routes are accessible to all personnel relying upon them.

7.0 EXTREME WEATHER CONDITIONS

In the event of adverse weather conditions, the Site Safety and Health Officer in conjunction with the Contractor's SSHO will determine if engineering operations can continue without sacrificing the health and safety of site personnel. Items to be considered prior to determining if work should continue include but are not limited to:

- Potential for heat/cold stress.
- Weather-related construction hazards (e.g., flooding or wet conditions producing undermining of structures or sheeting, high wind threats, etc).
- Limited visibility.
- Potential for electrical storms.
- Limited site access/egress (e.g., due to heavy snow)

8.0 EMERGENCY MEDICAL TREATMENT & FIRST AID

Personnel Exposure:

The following general guidelines will be employed in instances where health impacts threaten to occur acute exposure is realized:

- Skin Contact: Use copious amounts of soap and water. Wash/rinse affected area for at least 15 minutes. Decontaminate and provide medical attention. Eyewash stations will be provided on site. If necessary, transport to Buffalo General Hospital.

- Inhalation: Move to fresh air and, if necessary, transport to Hospital.

- Ingestion: Decontaminate and transport to Hospital.

Personal Injury:

Minor first-aid will be applied on-site as deemed necessary. In the event of a life-threatening injury, the individual should be transported to Hospital via ambulance. The Site Health and Safety Officer will supply available chemical specific information to appropriate medical personnel as requested.

First aid kits will conform to Red Cross and other applicable good health standards and shall consist of a weatherproof container with individually sealed packages for each type of item. First aid kits will be fully equipped before being sent out on each job and will be checked weekly by the SSHO to ensure that the expended items are replaced.

Directions to Buffalo General Hospital (see Figure 1):

The following directions describe the best route from the Site to Buffalo General Hospital:

- Proceed north on Louisiana Street toward Seneca Street
- Turn left onto Seneca Street toward Michigan Street
- Turn right onto Michigan Avenue
- Continue straight on Michigan Avenue for approximately 1.6 miles
- Turn left on to E. North Street
- Hospital on the left (100 High Street)
  (2.9 miles)

9.0 EMERGENCY RESPONSE CRITIQUE & RECORD KEEPING

Following an emergency, the SSHO and Project Manager shall review the effectiveness of this Emergency Response Plan (ERP) in addressing notification, control and evacuation requirements. Updates and modifications to this ERP shall be made accordingly. It shall be the responsibility of each contractor to establish and assure adequate records of the following:

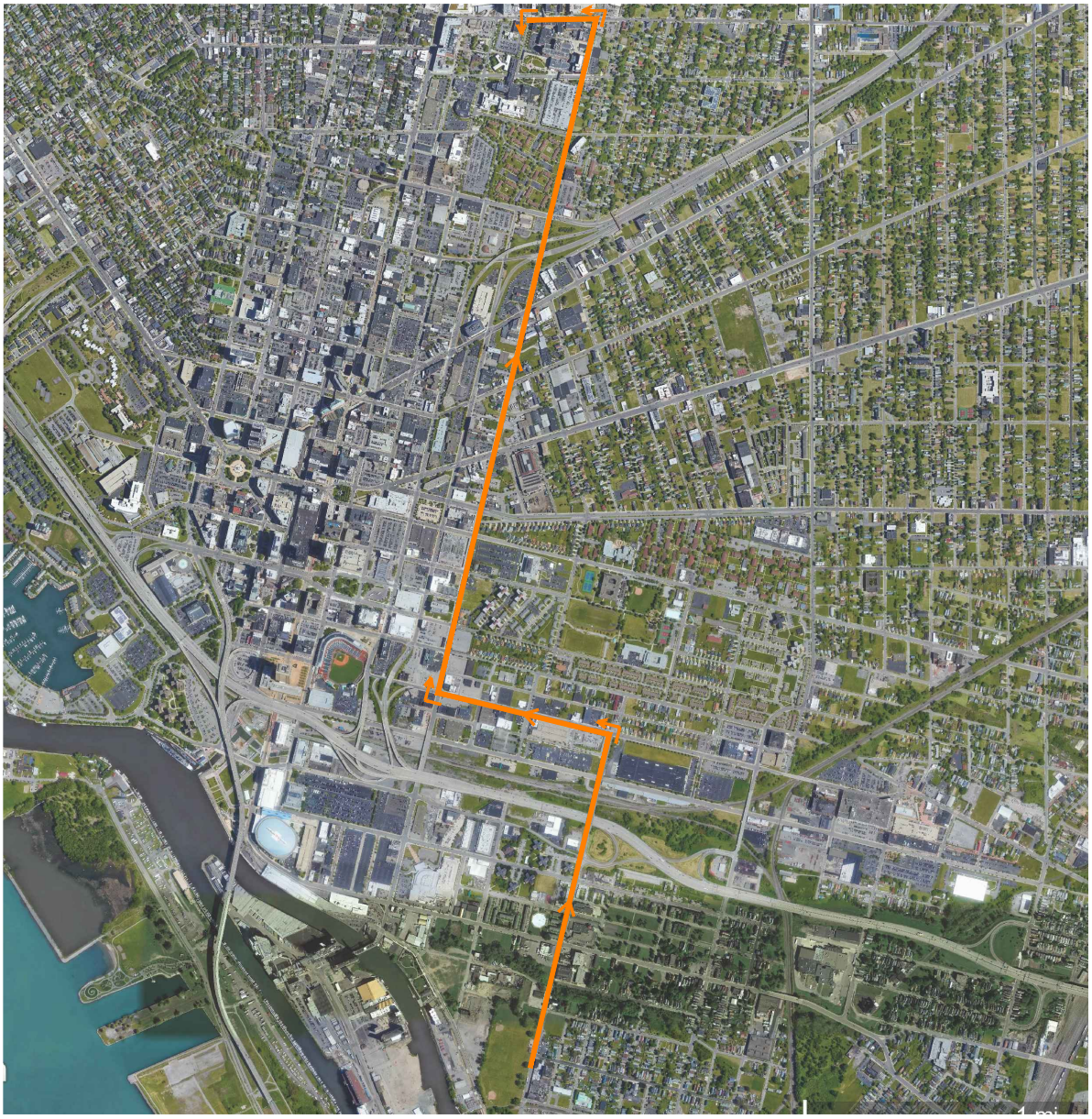
- Occupational injuries and illnesses.
- Accident investigations.
- Reports to insurance carrier or State compensation agencies.
- Reports required by the client.
- Records and reports required by local, state, federal and/or international agencies.
- Property or equipment damage.
- Third party injury or damage claims.
- Environmental testing logs.
- Explosive and hazardous substances inventories and records.
- Records of inspections and citations.
- Safety training.

10.0 EMERGENCY RESPONSE TRAINING

All persons who enter the worksite, including visitors, shall receive a site-specific briefing about anticipated emergency situations and the emergency procedures by the SSHO. Where this site relies on off-site organizations for emergency response, the training of personnel in those off-site organizations has been evaluated and is deemed adequate for response to this site.

FIGURE

FIGURE 1



N

2000' 0' 2000' 4000'

SCALE: 1 INCH = 2000 FEET
SCALE IN FEET
(approximate)

FROM SITE:
- PROCEED NORTH ON LOUISIANA STREET TOWARD SENECA STREET
- TURN LEFT ONTO SENECA STREET TOWARD MICHIGAN AVENUE
- TURN RIGHT ONTO MICHIGAN AVENUE
- CONTINUE STRAIGHT ON MICHIGAN AVENUE FOR APPROXIMATELY 1.6 MILES
- TURN LEFT ONTO E. NORTH STREET
- HOSPITAL ON THE LEFT (100 HIGH STREET - BUFFALO GENERAL HOSPITAL) - 2.9 MILE TOTAL

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PROJECT NO.: B0305-018-001

DATE: MAY 2019

DRAFTED BY: CMS

HOSPITAL ROUTE MAP

EMERGENCY RESPONSE PLAN

225 LOUISIANA STREET SITE
BUFFALO, NEW YORK

PREPARED FOR

BARCALO BUFFALO LLC

DISCLAIMER:
PROPERTY OF BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC. IMPORTANT: THIS DRAWING PRINT IS LOANED FOR MUTUAL ASSISTANCE AND AS SUCH IS SUBJECT TO RECALL AT ANY TIME. INFORMATION CONTAINED HEREON IS NOT TO BE DISCLOSED OR REPRODUCED IN ANY FORM FOR THE BENEFIT OF PARTIES OTHER THAN NECESSARY SUBCONTRACTORS & SUPPLIERS WITHOUT THE WRITTEN CONSENT OF BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC.

ATTACHMENT B

HOT WORK PERMIT FORM

BENCHMARK TURNKEY

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

HOT WORK PERMIT

PART 1 - INFORMATION

Issue Date:	
Date Work to be Performed: Start:	Finish (permit terminated):
Performed By:	
Work Area:	
Object to be Worked On:	

PART 2 - APPROVAL

(for 1, 2 or 3: mark Yes, No or NA)*

Will working be on or in:	Finish (permit terminated):	
1. Metal partition, wall, ceiling covered by combustible material?	yes	no
2. Pipes, in contact with combustible material?	yes	no
3. Explosive area?	yes	no

* = If any of these conditions exist (marked "yes"), a permit will not be issued without being reviewed and approved by Thomas H. Forbes (Corporate Health and Safety Director). Required Signature below.

PART 3 - REQUIRED CONDITIONS**

(Check all conditions that must be met)

	PROTECTIVE ACTION		PROTECTIVE EQUIPMENT
	Specific Risk Assessment Required		Goggles/visor/welding screen
	Fire or spark barrier		Apron/fireproof clothing
	Cover hot surfaces		Welding gloves/gauntlets/other:
	Move movable fire hazards, specifically		Wellintons/Knee pads
	Erect screen on barrier		Ear protection: Ear muffs/Ear plugs
	Restrict Access		B.A.: SCBA/Long Breather
	Wet the ground		Respirator: Type:
	Ensure adequate ventilation		Cartridge:
	Provide adequate supports		Local Exhaust Ventilation
	Cover exposed drain/floor or wall cracks		Extinguisher/Fire blanket
	Fire watch (must remain on duty during duration of permit)		Personal flammable gas monitor
	Issue additional permit(s):		

Other precautions:

** Permit will not be issued until these conditions are met.

SIGNATURES

Orginating Employee:	Date:
Project Manager:	Date:
Part 2 Approval:	Date:

ATTACHMENT C

NYSDOH GENERIC COMMUNITY AIR MONITORING PLAN

BENCHMARK TURNKEY

Appendix C1
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. “Periodic” monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

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

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

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

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

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

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

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009

Appendix C2
Fugitive Dust and Particulate Monitoring

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:

(a) Objects to be measured: Dust, mists or aerosols;
(b) Measurement Ranges: 0.001 to 400 mg/m3 (1 to 400,000 :ug/m3);
(c) Precision (2-sigma) at constant temperature: +/- 10 :g/m3 for one second averaging; and +/- 1.5 g/m3 for sixty second averaging;
(d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
(e) Resolution: 0.1% of reading or 1g/m3, whichever is larger;
(f) Particle Size Range of Maximum Response: 0.1-10;
(g) Total Number of Data Points in Memory: 10,000;
(h) Logged Data: Each data point with average concentration, time/date and data point number
(i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
(j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
(k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
(l) Operating Temperature: -10 to 50^{o} C (14 to 122^{o} F);
(m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

5. The action level will be established at 150 ug/m3 (15 minutes average). While conservative,

this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m3, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m3 continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM10 at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

(a) Applying water on haul roads;
(b) Wetting equipment and excavation faces;
(c) Spraying water on buckets during excavation and dumping;
(d) Hauling materials in properly tarped or watertight containers;
(e) Restricting vehicle speeds to 10 mph;
(f) Covering excavated areas and material after excavation activity ceases; and
(g) Reducing the excavation size and/or number of excavations.

Experience has shown that the chance of exceeding the 150ug/m3 action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

APPENDIX C

COMMUNITY AIR MONITORING PLAN

Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

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December 2009

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APPENDIX D

PROJECT DOCUMENTATION FORMS

BENCHMARK
ENVIRONMENTAL
ENGINEERING &
SCIENCE, PLLC

DAILY LOG	DATE			
	NO.			
	SHEET		OF	

FIELD ACTIVITY DAILY LOG

PROJECT NAME:	PROJECT NO.
PROJECT LOCATION:	CLIENT:
FIELD ACTIVITY:	

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

TIME	DESCRIPTION

VISITORS ON SITE:	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS:

WEATHER CONDITIONS:	IMPORTANT TELEPHONE CALLS:
A.M.:	
P.M.:	

PERSONNEL ON SITE:	
SIGNATURE	DATE:

BENCHMARK
ENVIRONMENTAL
ENGINEERING &
SCIENCE, PLLC

DAILY LOG	DATE			
	NO.			
	SHEET		OF	

FIELD ACTIVITY DAILY LOG
(CONTINUED)

PROJECT NAME:	PROJECT NO.

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

TIME	DESCRIPTION

SIGNATURE	DATE:

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

DAILY LOG	DATE			
	NO.			
	SHEET		OF	

FIELD ACTIVITY DAILY LOG
(CONTINUED)

PROJECT NAME:	PROJECT NO.

DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

TIME	DESCRIPTION

REFERENCED PROJECT FIELD FORMS:

☐ Aquifer Test Data Sheet	☐ Impacted Soil Excavation Log	☐ Soil Gas Survey Log
☐ Chain-of-Custody Form	☐ Impacted Soil Transportation Log	☐ Step-Drawdown Test Data Sheet
☐ Construction Sample Summary Log	☐ Monitoring Well Inspection Form	☐ Survey Elevation Log
☐ Corrective Measures Report	☐ Nuclear Densitometer Field Log	☐ Tailgate Safety Meeting Form
☐ Daily Drilling Report	☐ Photographic Log	☐ Test Pit Excavation Log
☐ Drilling Safety Checklist	☐ Pipe Leakage Testing Log	☐ Underground/Overhead Utility Checklist
☐ Equipment Calibration Log	☐ Post-Closure Field Inspection Report	☐ Variance Log
☐ Field Borehole Log	☐ Pressure Packer Testing Log	☐ Water Level Monitoring Record
☐ Field Borehole/Monitoring Well Installation Log	☐ Problem Identification Report	☐ Water Quality Field Collection Log
☐ Field Investigation Report	☐ Real-Time Air Monitoring Log	☐ Water Sample Collection Log
☐ Field Slug Test Log	☐ Record of Telecom Meeting	☐ Well Abandonment/Decomm. Log
☐ Groundwater Elevation Log	☐ Sample Summary Collection Log	☐ Well Completion Detail
☐ GW Well Development and Purge Log	☐ Sediment Sample Collection Log	☐
☐ Hot Work Permit	☐ Seep Sample Collection Log	☐
☐ IDW Container Log	☐ Seepage Meter Sample Collection Log	☐

SIGNATURE DATE:

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC

DAILY LOG	DATE			
	REPORT NO.			
	PAGE		OF	

PROBLEM IDENTIFICATION REPORT

Date:

Project:

Job No:

Location:

CQA Monitor(s):

Client:

Contractor:

Contractor's Supervisor:

WEATHER CONDITIONS:

Ambient Air Temp. - A.M.:

Ambient Air Temp. - P.M.:

Wind Direction:

Wind Speed:

Precipitation:

Problem Description:

Problem Location (reference test location, sketch on back of form as appropriate):

Problem Causes:

Suggested Corrective Measures or Variances:

Linked to Corrective Measures Report No. *or Variance Log No.*

Approvals (initial):

CQA Engineer:

Project Manager:

Signed:

CQA Representative

BENCHMARK
ENVIRONMENTAL
ENGINEERING &
SCIENCE, PLLC

DAILY LOG	DATE			
	REPORT NO.			
	PAGE		OF	

CORRECTIVE MEASURES REPORT

Date:

Project:

Job No:

Location:

CQA Monitor(s):

Client:

Contractor:

Contractor's Supervisor:

WEATHER CONDITIONS:

Ambient Air Temp. - A.M.:

Ambient Air Temp. - P.M.:

Wind Direction:

Wind Speed:

Precipitation:

Corrective Measures Undertaken (reference Problem Identification Report No.)

Retesing Location:

Suggested Method of Minimizing Re-Occurrence:

Approvals (initial):

CQA Engineer:

Project Manager:

Signed:

CQA Representative

APPENDIX E

ELECTRONIC COPY

BENCHMARK TURNKEY