REMEDIAL ACTION WORK PLAN

BLOCK OF WASHINGTON, E. SECOND & PARK
DUNKIRK, CHAUTAUQUA COUNTY, NEW YORK
NYSDEC SITE NO. C907042

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ACRONYMS

AAR	Alternative Analysis Report
ACM	Asbestos Containing Material
ASTM	American Society for Testing and Materials
ADA	Americans with Disabilities Act
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
BE3	Brydges Engineering in Energy and Environment
BER	Business Environmental Risk
CAMP	Community Air Monitoring Program
CERP	Community and Environmental Response Plan
COC	Contaminants of Concern
CP	Commissioner Policy
DER	Division of Environmental Remediation
DFR	Daily Field Report
E&SC	Erosion and Sediment Control
EC	Engineering Control
ECMC	Erie County Medical Center
EE	Environmental Easement
EIFS	Exterior Insulation and Finish System
EPA	Environmental Protection Agency
ESA	Environmental Site Assessment
EWP	Excavation Work Plan
FER	Final Engineering Report
FSP	Field Sampling Plan
GPR	Ground Penetrating Radar
GPS	Global Positioning System
GSF	Gross Square Feet
GSR	Green and Sustainable Remediation
HASP	Health and Safety Plan
IC	Institutional Control
LBP	Lead Based Paint
NYCRR	New York Codes, Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOT	New York State Department of Transportation
NYSHCR	New York State Homes and Community Renewal
OSHA	Occupational Safety Health Administration
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PDI	Pre-Remedial Design Investigation
PFAS	Per- and Polyfluoroalkyl Substances
PFOS	Perfluorooctane Sulfonate
PID	Photoionization Detector
PPE	Personal Protective Equipment
QA/QC	Quality Assurance/Quality Control
RA	Remedial Action
RAO	Remedial Action Objective

RAWP	Remedial Action Work Plan
REC	Recognized Environmental Condition
RI	Remedial Investigation
RIWP	Remedial Investigation Work Plan
SCG	Standards, Criteria, and Guidance
SCO	Soil Cleanup Objective
SMP	Site Management Plan
SVOC	Semi-Volatile Organic Compound
SWMR	Stormwater Management Report
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Protocol
TIC	Tentatively Identified Compound
TOGS	Technical and Operational Guidance Series
UST	Underground Storage Tank
VOC	Volatile Organic Compound

1.0 INTRODUCTION

Regan Development Corporation has obtained an executed Brownfield Cleanup Agreement (BCA) with the New York State Department of Environmental Conservation (NYSDEC) as a Volunteer for the property located at Block of Washington, E. Second & Park, City of Dunkirk, Chautauqua County, New York (the "Site"). The Site is enrolled in the Brownfield Cleanup Program (BCP) under BCP Site No. C907042 and is approximately 1.360 acres in size. A Site Location Map is provided as **Figure 1**, and the Boundary Survey Map is included as **Figure 2**.

This RAWP was completed in accordance with NYSDEC Department of Environmental Remediation (DER)-10, Technical Guidance for Site Investigation and Remediation, specifically Section 5.3, Preparation of a Remedial Action Work Plan.

The RA will achieve NYSDEC Part 375 Restricted Residential Use (Track 4) requirements and generally includes the following: (1) demolition of the existing buildings and concrete slab/foundations, (2) excavation/removal of impacted fill/soils and off-site landfill disposal, (3) development of a cover system consisting of hardscaped areas and two feet of clean imported fill meeting the provisions of NYSDEC DER-10 Subdivision 5.4(e) Appendix 5 for greenspace areas and (4) implementation of an Environmental Easement (EE) and a Site Management Plan (SMP).

Several environmental studies/investigations have been completed at the Site which concluded there are impacted fill/soils due to past uses of the Site. No groundwater impacts have been identified and soil vapor intrusion (SVI) is not a current concern at the Site. Fill/soils have primarily been impacted with semi-volatile organic compounds (SVOCs), specifically polycyclic aromatic hydrocarbons (PAHs) and metals.

1.1 SITE BACKGROUND

The 1.36-acre site is composed of eleven parcels as follows:

- 220 Washington – SBL#79.57-1-79
- 208-214 Washington – 79.57-1-81
- Park Ave. Rear - 79.57-1-80
- E. Second - 79.57-1-2
- E. Second St - 79.57-1-73
- 215 Park Ave. -79.57-1-75
- 211 Park Ave. - 79.57-1-74
- Park Ave. - 79.57-1-72
- 207 Park Ave. - 79.57-1-71
- E. Second St - 79.57-1-70
- E. Second St. - 79.57-1-69

Only two of the 11 parcels have buildings. 220 Washington Avenue (SBL #79.57-1-79) and 208-214 Washington Avenue (SBL #79.57-1-81) have a two and three-story former manufacturing facility respectively that share a common wall. The building historically operated as one manufacturing facility. Currently the 220 Washington Avenue property is occupied by a former fence and sign storage facility. The 208-214 Washington Avenue facility is vacant, condemned and not safely accessible. The remaining parcels within the Site boundary are composed of vacant undeveloped land or contain parking/walk areas (approximately 80% of total site area) supporting off-site residential units within the same block along East second Street.

A review of historical records, including street directories and Sanborn Maps, established that the Site has a history of manufacturing component parts for automobiles (springs, drive shafts, and rubber tires) and later of manufacturing car bodies and dinners. Other parcels within the Site were associated with coal storage and rail use as well as other commercial uses.

The Site is generally flat and gently sloping north towards city streets and Lake Erie. Surface and shallow groundwater flow most likely has been impacted over time by the various developments and fills as well as foundations, street beds, and utility lines. Surface water is directed to adjacent streets and low spots in properties with storm drains. Based on bedrock groundwater elevations observed during the remedial investigation, bedrock groundwater on site appears to flow in a southwestern direction (See **Figure 10 and 10A**). Groundwater in the general area likely flows north towards Lake Erie.

The Site is in a commercial and mixed residential area of the City of Dunkirk, New York, about 350 yards, and two city blocks south of Lake Erie and about 0.17-miles northeast of Dunkirk City Hall (see Figure 1). The general middle of the Site is located at latitude 42º 29' 09.25" N; Longitude 79º 19' 57.78" W. The immediate area around the property is mainly mixed urban commercial use and residential.

1.2 Contemplated Use of the Site

The proposed use of the Site includes development of multi-family apartment units, an associated parking area and recreational/greenspace. It should be noted that the existing buildings on Site will be removed as part of the new development and the planned remedial track is Track 4 - Restricted Residential Use.

2.0 PREVIOUS ENVIRONMENTAL ASSESSMENTS

Various previous environmental assessments/investigations have occurred on the Site which have been utilized to formulate this RAWP.

2.1 Pre-Demolition Asbestos Inspection

A Pre-Demolition Asbestos Inspection report was conducted by AMD Environmental in April 2025 for the two-story brick building located at 220 Washington Avenue and the rear barn storage building located at 211 Park Avenue. The brick building located at 208 Washington has been condemned and deemed unsafe to enter. The inspection identified asbestos containing materials (ACM) above 1% in materials that were sampled. ACM is present on site primarily in mastics, window glazing, and roof components.

2.2 Previous Phase I & II Environmental Site Assessments

A Phase I ESA (2010) and Phase II ESA (2012) were performed by TurnKey Environmental at the 208-214 Washington Avenue parcel only. The Phase I ESA identified the following recognized environmental conditions (RECs) at the 208-214 Washington Avenue parcel:

- The Site was formerly occupied by the Mulholland Company from the 1880s through at least the 1930s; historic uses include the manufacturing of various items such as wagon springs, carriages, automobile bodies, and dining cars. During that time, uses also included blacksmith shops, wood shops, printing, painting and machine shops. Environmental concerns associated with these types of past uses include use and/or storage of various petroleum products, chemicals and heavy metals.

The subsequent Phase II ESA investigation included five (5) surface soil samples, nine (9) subsurface soil borings and three (3) temporary wells. The following conclusions were made:

- Surface soil samples had elevated concentrations of PAHs, PCBs, arsenic, lead, and mercury above NYSDEC Part 375 Soil Cleanup Objectives (SCOs).
- Subsurface soil samples had elevated concentrations of several PAHs, arsenic, barium, lead, and mercury above NYSDEC Part 375 SCOs.
- VOC analytes were not detected above their respective NYSDEC Groundwater Quality Standards (GWQS) from groundwater samples collected.

A Phase I ESA was then completed at the entire Site by BE3 in 2022. The assessment identified the following RECs:

- Manufacturing of component parts for automobiles (springs, drive shafts, and rubber tires) and later manufacturing car bodies and diners at the 208-204-220 Washington Avenue parcels.
- Coal storage, possible refining and rail use as well as other commercial uses on some of the eleven parcels.
- Identification of fill materials across most of the properties.

A follow up Phase II ESA was completed at the entire Site by BE3 in 2023. The results of the investigation revealed the following:

- Fill exists at shallow depths across the properties to about 2-5 feet in most locations.
- The fill contains elevated levels of metals and SVOCs (mostly PAHs).
- No significant VOCs were detected in shallow subsurface soil or in the temporary shallow well.
- VOC analytes were not detected above their respective NYSDEC Groundwater Quality Standards (GWQS) from the one groundwater sample collected.

See **Table 5** for a summary of analytical results and **Figure 3** for sampling locations from previous Phase II ESAs.

2.3 Remedial Investigation/Alternative Analysis Report

The fieldwork portion of the Remedial Investigation/Alternative Analysis Report (RI/AAR) was completed by BE3 in May, June, and August 2025, in conformance with the approved Remedial Investigation Work Plan (RIWP) and all approved deviations. RI activities generally included the following:

- A soil assessment was conducted which included twenty-one soil borings, two of which were located within on-site buildings, eight surface samples, and sixteen step-out borings. A total of sixty-three soil samples were collected including associated quality assurance/quality control (QA/QC) samples.
- A groundwater assessment was conducted which involved the installation of five overburden groundwater monitoring wells and three bedrock monitoring wells. Only one of the five overburden wells were found to have appreciable groundwater for sampling while the others were dry. As a result, a total of 1 groundwater sample was taken from the overburden well and 3 groundwater samples were taken from the bedrock wells (i.e., one from each productive well).
- A soil vapor assessment was performed which involved the installation of eight vapor points and the collection of eight soil vapor samples.

Soil samples were analyzed as follows:

Soil samples RI-BH-1 through RI-BH-16 and RI-MW-1 through RI-MW-5 were analyzed for the full Part 375 Brownfields constituent list which includes the following:

- Target Compound List (TCL) volatile organic compounds (VOCs) + Tentatively Identified Compounds (TICs) – Environmental Protection Agency (EPA) Method 8260
- TCL SVOCs + TICs – EPA Method 8270
- Target Analyte List (TAL) Metals (Including mercury and total cyanide) – EPA Method 6010/7470/7471
- PCBs – EPA Method 8280
- TCL Pesticides – EPA Method 8081
- 1,4-dioxane – EPA Method 8270SIM
- Per- and Polyfluoroalkyl Substances (PFAS) – EPA Method 1633

Surface soil samples were analyzed per the RIWP and as follows:

- SS-1, SS-3 and SS-4 – TAL Metals & TCL SVOCs + TICs
- SS-5 – TAL Metals
- SS-2, SS-6, SS-7 and SS-8 – TAL Metals, TCL SVOCs/TICs, PCBs, Pesticides, 1,4-dioxane and PFAS

Step-Out soil samples were analyzed only for TAL Metals.

All groundwater samples were analyzed for the full Part 375 Brownfields constituent list which includes the following:

- TCL VOCs and TICs – EPA Method 8260
- TCL SVOCs – EPA Method 8270
- TAL Metals + cyanide – EPA Method 6010/7470/7471
- PCBs – EPA Method 8280
- Pesticides – EPA Method 8081
- 1,4-dioxane – EPA Method 8270SIM
- PFAS – EPA Method 1633

Soil vapor samples were analyzed for TCL VOCs by EPA Method TO-15.

2.3.1 Summary of Results by Media

Soil Results Summary

The results of the RI indicate that metals and PAHs are present in all Site soils above NYSDEC unrestricted use and/or restricted residential SCOs. To a lesser extent pesticides, PFAS and VOCs are present in all Site soils above only NYSDEC unrestricted use SCOs. No PCBs were detected in Site soils. See **Tables 1 and 2 and Figures 5, 5A, 6, and 6A.**

The primary contaminants of concern in Site soils are metals and SVOCs (PAHs). Specific contaminants include arsenic, lead, mercury, chromium, copper, barium, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and ideno(1,2,3-cd)pyrene.

Groundwater Results Summary

No SVOCs or PCBs were detected in site groundwater samples. Sodium, Manganese and iron were detected above guidance values; however, these metals can be naturally occurring and are not considered contaminants of concern. The VOC benzene was noted in one well only slightly above its TOGs Guidance Value (1.1 ppb versus 1 ppb) and the VOC m,p-Xylene was also noted in one well at its TOGs Guidance value of 5 ppb. PFOS and PFOA slightly exceeded groundwater standards in only the RI-MW-2 sample. These exceedances are considered minimum and therefore, no contaminants of concern were considered in the groundwater. See **Table 3 and Figure 7B** for results and **Table 7** for groundwater elevations**.**

Soil Vapor Results Summary

All soil vapor samples were collected in accordance with the Guidance for Evaluating Soil Vapor Intrusion in the State of New York-Amended May 2017 and updated Feb. 2024. A total of Eight soil vapor samples were analyzed for TCL VOCs by EPA method TO-15. Numerous detections of volatile organic compounds were found in the soil vapor samples. Specific contaminants of concern include chlorinated volatile organic compounds and petroleum hydrocarbons. I.e., detections of VOCs included methyl ethyl ketone (2-Butanone) concentrations ranging from 130 ug/m3 to 17,000 ug/m3; n-heptane ranging from 44 ug/m3 to 3,600 ug/m3 and n-hexane ranging from 58 to 3,000 ug/m3; TCE detections in the soil vapor ranged from Not Detected to 5.5 micrograms per cubic meter (ug/m3); PCE detections in the soil vapor ranged from Not Detected to 140 ug/m3.

See **Table 4 and Figure 7A.**

Figure 4 outlines RI boring, monitoring well and vapor point locations, while **Table 6** provides precise global positioning system (GPS) coordinates.

3.0 SUMMARY OF REMEDIAL OBJECTIVES AND REMEDY

3.1 REMEDIAL ACTION OBJECTIVES

The final remedial measures for the Site must satisfy Remedial Action Objectives (RAOs), which are site-specific statements that convey the goals for minimizing or eliminating substantial risks to human health and the environment. No RAOs were identified in relation to groundwater or soil vapor. The primary RAOs identified in relation to Site soils are the following:

Soil

Public Health Protection RAOs

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation exposure to contaminants volatilizing from soil.

Environmental Protection RAOs

- Prevent migration of contaminants in Site soil that would result in groundwater or surface water contamination.
- Prevent impacts to biota from ingestion/direct contact with soil causing toxicity or impacts from bioaccumulation through the terrestrial food chain..

Soil Vapor

Public Health Protection RAOs

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

Groundwater

Public Health Protection RAOs

- Prevent ingestion of groundwater containing contaminant levels exceeding drinking water standards.

3.2 Identification of Standards, Criteria and Guidance

SCGs are promulgated requirements ("standards" and "criteria") and non-promulgated guidance ("guidance") that govern activities that may affect the environment and are used by the NYSDEC at various stages in the investigation and remediation of a site. The following are the primary SCGs for this project:

- NYSDEC 6 NYCRR Part 375 Environmental Remediation Programs, Revised 12/31/2025
- NYSDEC DER-10 Technical Guidance for Site Investigations and Remediation, updated 2019
- NYSDEC TOGS 1.1.1 Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, June 1998
- NYSDEC Commissioner Policy (CP)-51 Soil Cleanup Guidance, October 2010
- NYSDEC Sampling, Analysis, and Assessment of PFAS, April 2023
- NYSDEC 6 NYCRR 360 Solid Waste Management Facilities General Requirements, August 2020
- New York State Department of Health (NYSDOH) Guidance for Evaluating Soil Vapor Intrusion, May 2017 and updated February 2024
- NYSDEC DER-31 Green Remediation, August 2010
- NYSDEC 6 NYCRR Part 217 Motor Vehicle Emissions, December 2021

3.3 Remedy

The Remedial Action (RA) for the Site is a Track 4 (Restricted Residential) cleanup. Removal includes all soils above final grade requirements and an additional 2 feet of removal in non-hardscaped areas. The hardscaped areas (i.e., building footprint, parking lot and sidewalks) will be composed of approximately one foot of material which will function as a component of the cover system. All non-hardscaped/greenspace areas will be covered with 2 feet of clean imported fill meeting the provisions of NYSDEC DER-10 Subdivision 5.4, as outlined in **Appendix E**. See **Appendix H** for specific means and methods of the implementation of the remedy. Details of this alternative include the following:

1. Concrete slabs and other hardscape are to be removed within the BCP boundary to accommodate new development. The top two feet of surface soils beneath the removed slabs/hardscape and in the remaining open areas that are not otherwise to be covered by components of the new development (e.g. buildings, pavement) shall not exceed Restricted Residential SCOs. Soils beneath the areas of proposed new development buildings and hardscape shall be removed to the depth of new building foundations/slabs or hardscape to meet new development grades (See **Figure 8**). All removed impacted soils, building materials and hardscape will be disposed offsite at an approved disposal and/or recycling facility. All intrusive work will be performed in accordance with a site-specific HASP and CAMP provided in **Appendix A** and **Appendix B** respectively. CAMP data will be submitted to NYSDEC and NYSDOH on at least a weekly basis during ground-intrusive activities, and any exceedances of CAMP action levels and corrective measures taken will be reported to the Departments within 24 hours. Approximately 6,000 tons of material will be excavated and removed from the site.
2. Future greenspace areas of the Site will be backfilled with a minimum of two foot of clean fill. Clean fill constitutes material which complies with DER-10 Appendix 5 Allowable Constituent Levels for Imported Fill restricted residential SCOs or comes from an approved virgin source. One foot of hardscape (concrete sidewalks, asphalt parking, building foundations) and subbase will be placed

over the remainder of the Site as part of the new development. A total of approximately 3,700 cubic yards of material will be imported to the site as backfill. Back fill material will consist of approximately 3200 cubic yards of quarried “2 stone and approximately 500 cubic yards of virgin top soil. At this time, on-site material is not planned to be reused on-site as backfill.

3. Confirmatory samples will be taken in previously identified hot spot locations. These areas may require over excavation. Perimeter samples will also be taken along the property boundary and submitted to the NYSDEC for informational purposes. See Section 4.1.4 for further detail.
4. During RI sampling, specific borings were identified that did not appear to have Restricted Residential SCO exceedances. The general areas around these borings are delineated on **Figure 8**. Although unlikely due to the observed urban fill layer found across the site ranging from 0 to 5 feet bgs, soils excavated in this area may be suitable for reuse. Final determination will be made during excavation by the onsite QEP in accordance with 6 NYCRR Parts 360 and 375. See section 4.1.2 for the procedures that will be followed to assess soil reusability on site.
5. After the construction of the building as part of the new development, when the entire building is completely enclosed with an active HVAC system, an SVI investigation will be performed during the heating seasons, with a preference being right before occupancy, to assess potential soil vapor intrusion concerns.
6. Construction fencing will be placed just beyond the entire BCP site boundary to secure the site. Fencing will be put up throughout the duration of remediation and may be put up earlier if the demolition of on-site buildings occurs prior to remediation.
7. Upon completion of remediation, provisions for managing the Site will be provided through an Environmental Easement (EE) which outlines Institutional Controls (ICs) and Engineering Controls (ECs).

   Imposition of an IC in the form of an EE for the controlled party includes the following:
   a. The remedial part or site owner must complete and submit a periodic certification of IC/EC in accordance with NYSDEC Part 375-1.8(h)(3).
   b. Allows the use and development of the controlled property for restricted residential, commercial, and industrial uses as defined by Part 375-1.8(g)., although land use is subject to local zoning laws.
   c. Restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or County DOH.
   d. Monitoring of sub-slab vapor extraction, if required, for a set period of time.
   e. Requires compliance with the approved Site Management Plan. An SMP is required that includes the following:

   An SMP is required that includes the following:

   a. An IC/EC plan that identifies all use restrictions and ECs for the Site and details the steps and media specific requirements necessary to ensure the IC and/or ECs remain in place and effective. The ICs are as discussed above, and the only EC is a soil cover system.
   b. An Excavation Plan which details provisions for management of future excavations in areas of remaining contamination.
   c. Descriptions of the provisions of the EE including any land use or groundwater use restrictions.
   d. Provisions for the management and inspection of the identified ECs.
   e. Maintaining site access controls and NYSDEC notifications.
   f. The steps necessary for the periodic reviews and certifications of the IC/ECs.

Figure 8 provides an overview of the remedy (Track 4 – Restricted Residential)).

4.0 REMEDIAL APPROACH

4.1 SOIL REMOVAL AND REPLACEMENT

4.1.1 Soil Sampling for Disposal Purposes

Prior to excavation of any Site soils, the contractor will, at the request and direction of the approved landfill for soil disposal, collect soil samples from excavation areas. These samples will be submitted for analysis as requested by the landfill to determine acceptability for disposal at their facility to meet their permit requirements. At a minimum, a landfill typically requests analysis of Part 375 and Toxicity Characteristic Leaching Protocol (TCLP) analysis for certain constituents to determine if any of the compound concentrations fall into the hazardous waste category. The number of soil samples is indeterminate at this time and will be based on the total quantity of soils to be landfilled. Results of the soil sampling must be provided to the Site representative prior to excavation and removal. The planned landfill is the Chautauqua County Landfill located at 3889 Towerville Road, Jamestown, NY.

4.1.2 Soil/Building Foundation Excavation

Prior to excavation activities at the Site, an underground utility location service will be contacted by the remediation contractor to obtain utility clearances.

The contractor's erosion and sediment controls shall be in place before any excavation begins to prevent contaminated materials from leaving the Site and rainwater from entering excavations. These practices are outlined in the Site-Specific Remedial Work Plan provided in **Appendix H.**

The onsite buildings will be demolished and floor slabs/foundations removed and sent to either a landfill or recycler. The planned recycler is S St George Enterprises Inc., located at 3689 Webster Road, Fredonia, NY. It is important to note that the City of Dunkirk has officially condemned the 208 Washington Ave 3-story building and it will be demolished with asbestos containing materials in place. All open areas across the Site will be cleared and grubbed including existing asphalt surface areas, as necessary. All surface material will be disposed of off-site at an approved landfill. The RI and previous investigations indicate the Site is underlain by fill materials primarily impacted by metals and SVOCs which were likely sourced off-site. All contaminated soils/fill across the Site above final grade requirements and an additional 2 feet of material in non-hardscape/greenspace areas will be removed and disposed of at an approved landfill. All non-hardscaped/greenspace areas will then be covered with 2 feet of clean imported fill meeting the provisions of NYSDEC DER-10 Subdivision 5.4(e) Appendix 5. The remaining hardscaped areas (i.e., building footprint, parking lot and sidewalks) will be composed of approximately one foot of material which will function as the remaining component of the cover system. A demarcation layer will be placed below the 2-feet of clean cover in areas where hardscape does not exist.

Buried utilities for the new development will be installed during remediation. Based on analytical results obtained during the RI, excavated material from utility trenches is assumed contaminated and will require off-site disposal. All utility trenches will be backfilled with clean stone or other approved fill material, including a minimum of one foot below and around utility lines. It is understood that material removed from below the required clean cover distance (i.e., 1-foot in hardscape areas and 2-feet in greenspace areas) will not be included as part of the remedy. Approximate utility locations and minimum depths are included in **Appendix H** Exhibit C.

Impacted soil will be directly loaded to trucks for off-site disposal at a NYSDEC approved landfill. If impacted soil needs to be stockpiled for any reason before off-site transport, the soils will be placed on a minimum of 6-mil plastic sheeting and covered with 6-mil plastic upon completion of stockpiling. All trucks utilized for transport will be New York State Department of Transportation (NYSDOT) 9-A approved permitted trucks which allows for hauling of non-hazardous waste.

The excavations will be surveyed by the contractor to determine excavation and fill quantities which will be needed for inclusion in the Final Engineering Report (FER).

Potential unimpacted fill identified through visual, olfactory and PID screening process will be stockpiled on site on 6-mil plastic sheeting for potential reuse on the Site as clean fill. The material will then be sampled and analyzed for Part 375 constituents to assess reusability in accordance with applicable reuse criteria and applicable SCOs. If the fill material meets clean fill criteria, it may be used to meet any future redevelopment design/construction or cover requirements. This material will be covered with 6-mil plastic sheeting and ballasted with clean fill to prevent wind and rain erosion.

Dust, VOC and odor control measures with air monitoring will be implemented during all intrusive activities to minimize inhalation exposures and create a public record. The requirements of NYSDOH Community Air Monitoring Plan (CAMP) and the NYSDEC Fugitive Dust Suppression and Particulate Monitoring Program will be implemented for VOCs, odors and particulates during all work activities that involve the excavation and handling of Site soils. The Health and Safety Plan (HASP) is provided as **Appendix A**, the CAMP as **Appendix B** and the Community and Environmental Response Plan (CERP) as **Appendix F**.

If rainwater is encountered in any excavation areas the contractor will pump and containerize the water into drums or a frac tank, depending on quantity. The contractor will have any collected water sampled/characterized either for disposal at an approved off-site facility or possible onsite treatment (carbon filtered, etc.) and discharge to the local municipal sewer system. In order for containerized water to be discharged to the municipal sewer system, the contractor will perform all required testing by the municipality and secure appropriate permits for discharge.

An additional characterization sample will be taken under the slab of the previously inaccessible condemned building on the northwestern portion of the site. The area will be investigated and sampled using test trenching procedures. The sample will be analyzed for the full Part 375 Brownfields constituent list. See **Figure 11** for the test trench location.

As a previous site wide investigation was completed in accordance with the approved RIWP for this site, additional characterization samples during remediation are not planned or warranted.

4.1.3 Fill Material

All imported fill materials used to backfill excavations, establish site grades or compose the cover system shall be obtained from virgin sources and be tested to ensure they meet imported soil requirements outlined in DER-10 Appendix 5 – Allowable Constituent Levels for Imported Fill, as provided in **Appendix E**. The owner's environmental consultant and NYSDEC will approve all backfill material and sources before being brought to the Site. Stone/gravel from a permitted/ approved NYSDOT/NYSDEC quarry may be used for backfill without analytical testing, provided the material contains less than 10 percent by weight of material which would pass through a size 100 sieve.

On-site fill material may also be sampled and analyzed for Part 375 constituents to assess reusability in accordance with applicable reuse criteria and applicable SCOs. If the fill material meets clean fill criteria, it may be used to meet any future redevelopment design/construction or cover requirements.

Fill material will be placed in maximum one-foot lifts and compacted with suitable approved vibratory compaction equipment, or as directed by the owner's engineer.

4.1.4 Confirmation Sampling

During the RI, there were three areas identified as hot spots that will require over excavation (STP-1, STP-4, and RI-BH-7). Confirmatory soil samples will be collected from the excavation bottoms and sidewalls in each previously identified hot spot. The dimensions of each excavation area may change depending on conditions encountered in the field; however, all excavations will extend a minimum of 5 feet to the north, south, west and east centered around the hot spot. The depths of each excavation will be to native soil which is approximately 4 to 5 feet bgs. All confirmation soil samples from the excavations will be collected in conformance with DER-10 Section 5.4(b) 2 through 5 to determine final frequency and sample locations. Confirmation soil samples will be analyzed for the following:

- STP-1 – TAL Metals, TCL SVOCs, and TCL VOCs
- STP-4 – TAL Metals. TCL SVOCs, and TCL VOCs
- RI-BH-7 – TAL Metals, TCL SVOCs, and TCL VOCs

Where the sidewalls of the hot spot excavations are at the property boundary, confirmation soil samples will be collected and analyzed as noted above to assess if soils exceeding applicable SCOs extend off-site. Six perimeter sidewall samples will also be taken along the property boundary. Perimeter sidewall samples will be analyzed for TAL Metals, TCL VOCs, and TCL SVOCs. Note that this will not affect the completion of the remedy but will be used by NYSDEC for information and future assessment purposes only.

See **Figure 11** for confirmatory sample locations. See **Appendix D** for soil sampling procedures.

4.2 Green Remediation

Green and Sustainable Remediation (GSR) techniques have been evaluated as described in NYSDEC DER-31 Green Remediation. It is anticipated that, at a minimum, the following techniques will be used at the Site:

- Reduce vehicle idling – all vehicles, both on and off road (including construction equipment) will be shut off when not in use for more than 5 minutes, consistent with 6 NYCRR Part 217 Motor Vehicle Emissions, Subpart 217-3 Idling Prohibition For Heavy Duty Vehicles
- Design cover systems, to the extent possible, to be usable for alternate uses such as habitat or passive recreation, require minimal maintenance (e.g. less mowing), allow for infiltration of storm water and/or be integrated with the next use of the Site
- Minimize hardscape cover systems as much as practical to reduce the carbon footprint and replace with natural vegetated green space
- Beneficially recycle/reuse materials that would otherwise be considered a waste including recycled crushed clean concrete as base or fill, scrap metal to metal recycler or recycling of used petroleum products

4.3 Monitoring Wells

During the RI, five overburden groundwater monitoring wells and three bedrock monitoring wells were installed on site. As there are no contaminants of concern in on site groundwater, all wells will be decommissioned in accordance with NYSDEC CP-43: Groundwater Monitoring Well Decommissioning Policy.

The decommissioning procedure for all bedrock wells will follow NYSDEC CP-43 Section 3.1 – Bedrock Wells and will include grouting in-place. The general procedure is as follows:

- Remove the protective concrete and/or road box associated with each bedrock well, using care not to break the PVC riser.
- Perforate the bottom of the PVC casing.
- Prior to grouting, the depth of the well will be measured and recorded to determine if any silt or debris has plugged the well. If plugging has occurred, all reasonable attempts to clear it will be made before grouting.
- Prepare the grout mixture consisting of Type I Portland Cement with a bentonite content of four percent by weight. The standard mixture provided in CP-43 Section 6.1 – Standard Grout Mixture is anticipated. The standard mixture includes one 94-pound bag of Type I Portland cement, 3.9 pounds of powdered bentonite, and 7.8 gallons of potable water.
- Grout the well from the bottom to the top by means of a tremie hose or pipe extending from the grout supply to the bottom of the well in accordance with CP-43 Section 6.4 – Grout Placement.
- Grout will be introduced in each well as the PVC casing is removed using suitable equipment.
- Fill the well with grout to a level of five feet below the land surface.
- Cut the steel well casing at the five-foot depth and remove the top portion of the steel casing and associated well materials from the ground. Fill the remaining five feet of the borehole with material physically similar to the natural soils or imported fill used during BCP remedial activities in accordance with Section 7.0 – Backfilling and Restoration of CP-43.
- The surface of the borehole will be restored to the condition of the surrounding area.

The decommissioning procedure for all overburden wells will follow NYSDEC CP-43 Section 2.1 – Grouting In-Place and will include the following procedures:

- Remove the protective concrete and/or road box associated with each well, using care not to break the PVC riser.
- Perforate the bottom of the PVC casing.
- Prior to grouting, the depth of the well will be measured and recorded to determine if any silt or debris has plugged the well. If plugging has occurred, all reasonable attempts to clear it will be made before grouting.
- Prepare the grout mixture consisting of Type I Portland Cement with a bentonite content of four percent by weight. The standard mixture with the maximum allowable water content provided in Section 6.1 – Standard Grout Mixture is anticipated. This mix will be used to penetrate the wells screen slots and surrounding sand pack. The mixture will include one 94-pound bag of Type I Portland cement, 3.9 pounds of powdered bentonite, and 7.8 gallons of potable water. Slightly more water will be added to reach the desired consistency for penetration while maintaining bonding properties in accordance with CP-43 Section 6.1. Water will be added in 0.1 gallon increments until desired consistency is met.
- Grout the well from the bottom to the top by means of a tremie hose or pipe extending from the grout supply to the bottom of the well in accordance with Section 6.4 – Grout Placement of CP-43.
- Fill the well with grout until it visually appears near the land surface.
- Upon completion of grouting, ensure that the final grout is approximately five feet below land surface.
- Cut the well casing at the five-foot depth and remove the top portion of the casing and associated well materials from the ground. Fill the remaining five feet of the borehole with material physically similar to the natural soils or imported fill used during BCP remedial activities in accordance with Section 7.0 – Backfilling and Restoration of CP-43.
- The surface of the borehole will be restored to the condition of the surrounding area.

The following will be completed for all wells during and before decommissioning:

- Complete Monitoring Well Field Inspection Logs and Well Decommissioning Records and submit to NYSDEC.
- All solid waste materials generated during the decommissioning process will be scraped clean of soil and properly recycled and/or disposed of as municipal trash.
- An additional round of groundwater elevation data collection

4.4 POTENTIAL SLAG

If slag is identified on site during remediation, a gamma walkover/radiological survey may be required. In this event, a separate survey plan will be submitted prior to any subsurface work where the slag was identified. The survey plan will be prepared in accordance with NYSDEC Program Policy, Division of Materials Management (DMM)-5 (Management of Soils Contaminated with Technologically Enhance Naturally Occurring Radioactive Materials [TENORM]).

5.0 OVERSIGHT AND REPORTING

As required by BCP regulations, the owner's remedial engineer will provide construction oversight services during all construction activities detailed in the work plan. An FER will be completed at the end of construction in the NYSDEC template format. The FER will describe all construction details and include copies of contractor submittals, disposal records and daily field reports (DFRs). All DFRs will be submitted to NYSDEC and NYSDOH no later than the end of the following business day. DFRs will consist of a description of activities performed, photolog, site figure showing the work zone and Community Air Monitoring Program (CAMP) station locations, wind direction, and 15-minute rolling averages for each CAMP station. As requested by NYSDOH, there will be 5 CAMP stations during remediation as follows: two permanent stations between the site and the two northern apartment buildings, one permanent station between the site and the commercial/residential building northwest of the site, one permanent station between the site and the eastern site boundary, and one downwind station. A certification that all work was completed in conformance with the approved work plan will be signed and stamped by a professional engineer licensed in the State of New York (i.e., the remedial engineer). All reports will be provided electronically in a format deemed acceptable to NYSDEC and NYSDOH.

6.0 WORK PLAN CERTIFICATION

I, Jason M. Brydges, certify that I am currently a NYS registered professional engineer as defined in 6 NYCRR Part 375 and that this Remedial Action Work Plan 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).



Jason M. Brydges, P.E.

Tables

TABLE 1
SOIL SAMPLE ANALYTICAL RESULTS

Analyte	Sample Identification, Sample Depth and Sample Collection Date															NYSDEC Part 375 Soil Cleanup Objectives (SCOs)				
	RI-BH-1	RI-BH-1	RI-BH-2	RI-BH-2	RI-BH-3	RI-BH-4	RI-BH-5	RI-BH-6	RI-BH-6	RI-BH-7	RI-BH-7	RI-BH-8	RI-BH-8	RI-BH-9	RI-BH-9	Unrestricted	Residential	Restricted Residential	Commercial	Industrial
	0-3'	6-9'	1-4'	5-8'	1-4'	1-4'	2-4'	0-3'	6-9'	0-3'	6-10'	0-3'	4-6'	1-3'	6-10'					
	6/3/2025				5/30/2025		8/11/2025	5/30/2025				6/3/2025		5/30/2025						
METALS (ppm)																				
Aluminum	3300 J+`	7440 J+	5150 J+	20400 J+	3100	19700	4070 J-	4800	18200	6660	17600	2670 J+	11900 J+	17000	9660	NS	NS	NS	NS	NS
Antimony	1.2 J	1.3 J	4.1 J	1.2 J	0.79 J-	1.5 J	ND	2.0 J+	0.86 J-	39.4 J-	1.5 J-	2.3 J	0.78 J	3.3 J-	2.1 J-	NS	NS	NS	NS	NS
Arsenic	9.5	9.2	16.2	6.9	6.0	15.5	2 J	8.9	7.0	93.8	7.7	9.2	6.0	16.5	17.7	13	16	16	16	16
Barium	25.9 J-	95.7 J-	109 J-	117 J-	17.4	216	15.2	162 J+	178	121 J+	145 J+	45.5 J-	105 J-	97.5 J+	270 J+	410	410	410	410	10000
Beryllium	0.62 J-	0.50 J-	0.87 J-	1.0 J-	0.18 J	0.85	0.38 J-	0.37	0.85	0.85	0.94	0.21 J-	0.59 J-	0.69	0.80	4.4	8.8	43	640	750
Cadmium	0.22	0.33	0.24	0.23	0.14 J	0.63	0.12 J	0.58	0.55	1.0	0.40	0.37	0.27	0.28	0.35	2.5	2.5	2.5	3.7	4.4
Calcium	1520 J	6300 J	5200 J	16700	5750 J-	3330 J-	1460	7160 J	1330 J-	2370 J	5400 J	3080 J	11800 J	57700 J-	15300 J	NS	NS	NS	NS	NS
Chromium	8.2	10.6	9.2	28.5	4.3	24.5	3.9	15.7	22.3	19.5	23.4	16.2	15.6	30.5	16.9	1	1	1	11	11
Cobalt	3.3	6.8	8.0	13.7	4.4	13.6	4.0	4.7	13.4	23.2	19.8	6.0	8.7	5.4	7.8	NS	NS	NS	NS	NS
Copper	13.0	50.0	302	25.0	12.1	22.0	26.4	26.1	14.1	1050	27.5	265	25.2	23.8	95.9	50	280	280	280	10000
Iron	14500 J	19800 J	31300 J	29800 J	8400	35700	5930	37400	26800	107000	32600 J	53400 J	20300 J	120000 J	24900 J	NS	NS	NS	NS	NS
Lead	40.3	105	123	14.3	17.6 J-	108 J-	4.4	157	18.8 J-	658 J	29.0	58.9	60.3	31.6	711	63	400	400	1000	3900
Magnesium	291 J-	2300 J-	771 J-	8470 J-	2110	3760	520 J+	1540	3630	1020	4570	312 J-	3120 J-	1110	2240	NS	NS	NS	NS	NS
Manganese	180 J-	249 J-	188	373 J-	157 J	716 J	202	282 J+	271 J	475 J+	414 J+	643 J-	244 J-	4130 J+	307 J+	1600	2000	2000	10000	10000
Nickel	7.7 J-	17.0 J-	17.5	37.9 J-	8.6 J-	24.6 J-	3.3 J	14.7 J-	23.9 J-	35.1 J-	33.9 J-	15.5 J-	20.5	13.8 J-	16.4 J-	30	87	320	320	5900
Potassium	617	1440	656	4440	771	3010 J-	514	821 J+	2790 J+	860 J+	3100	337 J-	2360	1880 J+	2040	NS	NS	NS	NS	NS
Selenium	ND	ND	0.99 J	ND	ND	ND	ND	ND	1.3	1.9 J	1.2 J	ND	ND	1.8 J	1.8 J	3.9	22	110	1700	2000
Silver	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.33 J-	ND	ND	ND	0.70 J-	0.32 J-	2	22	110	1700	2000
Sodium	ND	110 J	209	166 J	76.7 J	97.5 J	91.7 J	130 J	ND	119 J	94.7 J	ND	86.1 J	435 J-	321	NS	NS	NS	NS	NS
Thallium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
Vanadium	11.9	15.3	18.7	33.9	7.5	36.5	7.9	14.9	33.4	28.8	32.6	22.5	23.1	55.5	19.1	NS	NS	NS	NS	NS
Zinc	34.2 J-	109 J-	48.8 J-	68.5 J-	45.9 J-	120 J-	19.4 J-	126 J-	95.6 J-	258 J-	81.2 J-	71.2 J-	71.3 J-	33.0 J-	218 J-	109	1300	6600	10000	10000
Cyanide, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.58 J	ND	ND	ND	2.3	2.6	13	22	240
Mercury	0.028	0.77	0.36	0.014	0.37 J-	1.4 J-	ND	0.020 J-	0.049 J-	0.24 J-	0.099 J-	0.095	0.31	0.16 J-	0.24 J-	0.18	0.3	0.3	1.1	1.1
ORGANOCHLORINE PESTICIDES (ppm)																				
4,4'-DDD	ND	0.0013 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0033	1.2	5	33	33
4,4'-DDE	ND	ND	ND	ND	ND	0.006 R	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0033	0.78	3.4	22	22
4,4'-DDT	0.0016 J	ND	ND	0.0012 J	0.0017 U	0.0058 U	ND	0.0018 U	0.0019 U	0.0075 U	0.0018 U	0.0071 J-	0.002 J	0.0016 U	ND	0.0033	0.78	3.8	27	27
alpha-BHC	ND	ND	ND	ND	ND	0.0012 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.02	0.042	0.18	1.2	1.2
beta-BHC	ND	ND	ND	ND	ND	0.00092 R	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.021	0.042	0.18	1.8	2.9
delta-BHC	ND	ND	ND	ND	ND	0.0013 J+	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.04	100	100	500	1000
Endosulfan II	ND	ND	ND	ND	ND	0.0058 JN	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.3	8.4	35	360	580
Endrin	0.00094 J-	0.0023 J+	ND	ND	0.0014 J-	0.004 JN	ND	ND	ND	0.0059 J	ND	ND	0.0013 J	0.0012 J+	ND	0.014	1.2	5.3	55	87
Endrin aldehyde	ND	ND	ND	ND	ND	0.0017 R	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
Endrin ketone	ND	ND	ND	ND	ND	0.013 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
Methoxychlor	ND	0.001 R	0.01 R	ND	0.00087 R	0.0098 R	ND	0.00098 R	ND	ND	0.0012 R	ND	0.0011 R	ND	ND	NS	NS	NS	NS	NS
PER- & POLYFLUOROALKYL SUBSTANCES (PFAS) (ppt)																				
Perfluorodecanoic acid (PFDA)	ND	ND	ND	ND	ND	ND	ND	0.060 J	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
Perfluorononanoic acid (PFNA)	0.079 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
Perfluorooctanesulfonic acid (PFOS)	1.0	ND	ND	ND	ND	ND	ND	0.76	ND	ND	ND	0.75	ND	0.16 J	ND	0.88	8.8	44	440	440
Perfluorooctanoic acid (PFOA)	0.13 J	ND	ND	ND	ND	ND	ND	0.15 J	ND	ND	ND	0.22	ND	ND	ND	0.66	6.6	33	500	600
POLYCHLORINATED BIPHENYLS (PCBS) (ppm)																				
Total PCBs	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	1	1	1	25
SEMIVOLITALE ORGANIC COMPOUNDS (SVOCS) (ppm)																				
2-Methylnaphthalene	0.13 J	0.14 J	0.48	ND	0.051 J	ND	ND	0.048 J	ND	0.38	ND	0.53 J	0.13 J	0.089 J	ND	NS	NS	NS	NS	NS
Acenaphthene	ND	0.064 J	0.47	ND	ND	0.071 J	ND	ND	ND	0.3	ND	ND	ND	ND	ND	20	100	100	500	1000
Acenaphthylene	ND	ND	ND	ND	ND	0.062 J	ND	ND	ND	0.039 J	ND	ND	ND	ND	ND	100	100	100	500	1000
Anthracene	ND	0.22	0.6	ND	0.051 J	0.22 J	ND	ND	ND	0.72	ND	0.39 J	0.067 J	ND	ND	100	100	100	500	1000
Benzo[a]anthracene	ND	0.51	2.8	ND	0.16 J	0.52 J-	ND	0.083 J	ND	1.7	ND	0.75	0.19 J	ND	ND	1	1	1.4	37	37
Benzo[a]pyrene	ND	0.52	3.9	ND	0.11 J	0.44	ND	0.065 J	ND	1.5	ND	ND	0.18 J	ND	ND	1	1	1	3.7	3.7
Benzo[b]fluoranthene	0.051 J	0.66	5.3	ND	0.13 J	0.52	ND	0.093 J	ND	1.9	ND	0.89 J	0.22	ND	0.032 J	1	1	1.4	37	37
Benzo[g,h,i]perylene	0.038 J	0.36	4.3	ND	0.068 J	0.19 J	ND	0.057 J	ND	1.1	ND	0.59 J	0.13 J	ND	ND	0.64	1.2	4.9	47	78
Benzo[k]fluoranthene	ND	0.27	2.4	ND	0.055 J	0.3	ND	0.078 J	ND	0.92	ND	0.65 J	0.083 J	ND	ND	0.8	1.2	4.9	47	78
Bis(2-ethylhexyl) phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.098 J	ND	ND	ND	ND	NS	NS	NS	NS	NS
Carbazole	ND	0.11 J	0.43	ND	ND	0.048 J	ND	ND	ND	0.35	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
Chrysene	ND	0.55	3.7	ND	0.15 J	0.52	ND	0.088 J	ND	1.9	ND	0.6 J	0.25	ND	ND	1	1.2	4.9	47	78
Dibenz(a,h)anthracene	ND	0.11 J	1.2	ND	ND	0.085 J	ND	ND	ND	0.32	ND	ND	0.045 J	ND	ND	0.33	0.33	0.33	3.7	3.7
Dibenzofuran	ND	0.07 J	ND	ND	ND	0.044 J	ND	ND	ND	0.25	ND	ND	0.047 J	ND	ND	2.1	4.2	18	180	290
Fluoranthene	0.081 J	1.1	4.3	ND	0.26	0.96 J-	ND	0.14 J	ND	4.4	0.051 J	1.5 J	0.36	0.039 J	0.065 J	85	100	100	500	1000
Fluorene	ND	0.063 J	0.26	ND	ND	0.069 J	ND	ND	ND	0.28	ND	ND	ND	ND	ND	30	100	100	500	1000
Indeno[1,2,3-cd]pyrene	ND	0.3	3.2	ND	0.058 J	0.2 J	ND	0.057 J	ND	0.97	ND	0.54	0.093 J	ND	ND	0.5	0.5	1.4	37	37
Naphthalene	0.066 J	ND	0.75	ND	ND	ND	ND	0.034 J	ND	0.25	ND	ND	0.09 J	ND	ND	12	84	100	500	1000
Phenanthrene	0.12 J	0.88	2.9	ND	0.29	0.78	ND	0.11 J	ND	3.4	0.048 J	1.4 J	0.33	ND	ND	1.1	1.2	4.9	47	78
Pyrene	0.081 J	0.9	3.8	ND	0.25	0.9	ND	0.14 J	ND	3.5	0.052 J	1.5 J	0.32	0.034 J	0.062 J	64	100	100	500	1000
Total TICs	38.03	7.78	38.42	45.95	39.14	21	13.3	44.79	25.2	42.9	41.2	8.6	19.12	43.94	45.04	NS	NS	NS	NS	NS
VOLITALE ORGANIC COMPOUNDS (VOCS)																				
2-Butanone (MEK)	ND	ND	ND	ND	ND	ND	ND	ND	0.0085 J+	ND	0.012 J-	ND	0.0045 J-	0.0056 J-	0.014 J-	0.1`	100	100	500	1000
Acetone	0.0055 J-	ND	0.0066 J-	ND	0.0081 J-	0.0079 J-	0.0066 J	ND	0.049 J-	0.012 J-	0.059 J-	0.011 J-	0.029 J-	ND	0.068 J-	0.03	100	100	500	1000
Benzene	ND	ND	0.00043 J-	ND	ND	ND	ND	0.0009 J-	ND	ND	ND	ND	ND	0.00055 J-	ND	0.06	1.4	3.7	20	20
Chloroform	ND	ND	ND	ND	ND	ND	ND	0.00044 J-	ND	ND	ND	ND	ND	ND	0.00047 J-	0.37	4.1	24	180	180
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	0.0012 J-	ND	ND	ND	ND	ND	ND	ND	1	32	76	390	780
Methylcyclohexane	ND	ND	ND	ND	ND	0.0014 J-	ND	ND	ND	ND	0.0015 J-	ND	ND	ND	ND	NS	NS	NS	NS	NS
Methylene Chloride	ND	0.43	ND	ND	0.025	0.049 J-	ND	0.038 J-	ND	0.013 J-	0.0044 J-	ND	ND	0.0054 J-	0.011 J-	0.05	17	81	500	1000
Styrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.3	15	18	81	81
Toluene	0.00061 J-	ND	0.00049 J-	ND	0.00054 J-	ND	ND	0.0021 J-	ND	ND	ND	ND	ND	0.00055	ND	0.7	100	100	500	1000
trans-1,2-Dichloroethene	ND	ND	ND	ND	0.024 J-	0.034 J-	ND	0.026 J-	ND	0.0073 J-	0.0007 J-	ND	ND	ND	0.0026 J-	0.19	75	100	500	1000
Xylenes, Total	ND	ND	ND	ND	ND	ND	ND	0.00098 J-	ND	ND	ND	ND	ND	ND	ND	0.26	100	100	500	1000
Total TICs	0	154.10	0.00	0.00	0.00	0.00	ND	0.12	0.00	0.00	0.01	0.05	0.00	0.60	0.00	NS	NS	NS	NS	NS

Notes:
J - Lab/Data Validator Qualifier

NS - No Standard
ND Non detect

Qualifiers:
R result is rejected/unusable
J Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value
vs May be biased low
T result is a TIC and is estimated
S1+ Surrogate recovery exceeds control limits, high biased
^5- Linear range check (LRC) outside acceptance limits, biased low
E exceeds calibration range
F1 MS and/or MSD recovery exceeds control limits
F2 MS/MSD RPD exceeds control limits
S1- Surrogate recovery exceeds control limits, low biased
N presumptive evidence of material
B found in the blank and the sample
*- LCS and/or LCSD outside acceptance limits, low biased
*5+ Isotope dilution analyte outside acceptance limits, high biased
^+ CCV outside acceptance limits, high biased
^2 calibration blank outside acceptance limits
U not detected
J+ Estimated quantity, may be biased high
J- Estimated quantity, may be biased low
UJ not detected, quantitation limit may be inaccurate
X Unusable

TABLE 1
SOIL SAMPLE ANALYTICAL RESULTS

Analyte	Sample Identification, Sample Depth and Sample Collection Date													NYSDEC Part 375 Soil Cleanup Objectives (SCOs)				
	RI-BH-10	RI-BH-10	RI-BH-11	RI-BH-11	RI-BH-12	RI-BH-12	RI-BH-13	RI-BH-13	RI-BH-14	RI-BH-14	RI-BH-15	RI-BH-15	RI-BH-16	Unrestricted	Residential	Restricted Residential	Commercial	Industrial
	0-3'	5-9'	0-3'	4-7'	0-3'	5-7'	0-3'	5-8'	1-3'	4-7'	0-3.5'	4-7'	1-3'					
	5/30/2025												8/11/2025					
METALS (ppm)																		
Aluminum	12000	15500	7240	11800	8120	12500	9850	11000	11100	19900	7780	11900	20100	NS	NS	NS	NS	NS
Antimony	1.0 J-	0.93 J-	1.1 J-	1.1 J-	2.2 J-	1.0 J-	1.7 J-	1.6 J-	1.1 J-	1.9 J-	1.9 J-	1.4 J-	ND	NS	NS	NS	NS	NS
Arsenic	10.3	6.2	7.6 J+	10.2	**19.1**	5.4	7.2	12.7	7.5	10	**13.7**	12.7	8.7	13	16	16	16	16
Barium	74.3 J+	170 J+	76.2	70.3 J+	367 J+	108 J+	90.1 J+	66.0 J+	71.6	157	366	92.2	108	410	410	410	410	10000
Beryllium	0.56	0.71	0.98	0.60	0.65	0.78	0.52	0.68	0.49	0.98	0.70	0.60	0.65 J-	4.4	8.8	43	640	750
Cadmium	0.18 J	0.71	0.31	0.44	0.31 J	0.15 J	0.23 J	0.31	0.25 J-	0.25 J-	2.2	0.45 J-	0.3	2.5	2.5	2.5	3.7	4.4
Calcium	2280 J	122000 J	4510 J	42000 J	7840	1940 J	14200 J	12200 J	2570	24400	16000 J-	37300	2890	NS	NS	NS	NS	NS
Chromium	**14.2**	**21.1**	**9.7**	**17.0**	**14.9**	**16.9**	**12.9**	**15.6**	**12.2**	**27.3**	**133**	**17.8**	**22.4**	1	1	1	11	11
Cobalt	7.9	9.7	7.6	10.4	8.0	10.4	7.8	11.1	10.6	16.4	8.2	11.0	9.9	NS	NS	NS	NS	NS
Copper	27.7	20.2	**73.0**	32.9	**57.7**	27.1	**57.3**	47.0	**71.2**	24.9	**119**	37.1	9.1	50	280	280	280	10000
Iron	20700 J	20600 J	23700 J	25200 J	31500 J	22000 J	19800 J	28000 J	22100	35000	24300	25500	33300	NS	NS	NS	NS	NS
Lead	28.9	14.9	**73.1**	17.0	**674**	20.9	**110**	30.3	**86.8 J-**	15.8 J-	**707 J-**	18.9 J-	24.9	63	400	400	1000	3900
Magnesium	2310	7960	975	7550	1210	3530	3170	5230	2860	7370	2230	7590	3130	NS	NS	NS	NS	NS
Manganese	195 J-	254 J+	231 J+	305 J+	446 J+	200 J+	297 J+	234 J+	430 J	356 J	303 J	311	1110	1600	2000	2000	10000	10000
Nickel	19.0 J-	27.4 J-	14.3 J-	**30.0 J-**	16.4 J-	26.9 J-	17.4 J-	**31.6 J-**	21.1 J-	**43.3 J-**	**95.4 J-**	**30.2 J-**	15.5	30	87	320	320	5900
Potassium	1790 J+	3960 J+	827 J+	2410 J+	1230 J+	3020 J+	1800 J+	2590 J+	1530 J+	3530	1120 J+	2410 J+	2820	NS	NS	NS	NS	NS
Selenium	1.7 J	1.7	1.6 J	1.2 J	1.1 J	1.3 J	1.0 J	1.3 J	ND	ND	1.5	ND	2.6 J	3.9	22	110	1700	2000
Silver	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.28 J-	ND	0.29 J-	2	22	110	1700	2000
Sodium	76.0 J	150	96.2 J	152 J	230	90.9 J	101	88.2 J	300	178	153 J	153 J	127	NS	NS	NS	NS	NS
Thallium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
Vanadium	21.9	27.8	16.4	23.2	26.8	21.5	22.2	21.9	18.0	33.6	23.9	24.7	42.1	NS	NS	NS	NS	NS
Zinc	65.7 J-	56.9 J-	98.3 J-	77.1 J-	**249 J-**	67.7 J-	105 J-	88.3 J-	**140 J-**	65.7 J-	**542 J-**	80.0 J-	63.3 J-	109	1300	6600	10000	10000
Cyanide, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.3	2.6	13	22	240
Mercury	**0.40 J-**	0.019 J	**0.20**	0.017 J	**0.43**	0.021 J	**0.69**	0.018 J	**0.55 J-**	0.018 J-	**0.43 J-**	0.017 J-	0.053	0.18	0.3	0.3	1.1	1.1
ORGANOCHLORINE PESTICIDES (ppm)																		
4,4'-DDD	0.0015 J+	ND	ND	ND	ND	ND	ND	ND	0.00081 R	ND	ND	ND	ND	0.0033	1.2	5	33	33
4,4'-DDE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0029 J	0.0033	0.78	3.4	22	22
4,4'-DDT	0.0017 U	0.0031 J	0.0031 J-	ND	0.0031 J	ND	0.0032 J-	ND	ND	ND	**0.034 U**	ND	0.0023 J	0.0033	0.78	3.8	27	27
delta-BHC	0.00099 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.04	100	100	500	1000
Endosulfan II	ND	ND	ND	ND	ND	ND	0.00086 J	ND	ND	ND	ND	ND	ND	4.3	8.4	35	360	580
Endosulfan sulfate	ND	ND	ND	ND	ND	ND	ND	ND	0.0014 J	0.0012 J+	ND	ND	ND	4.3	8.4	35	360	580
Endrin	0.0016 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0011 J	0.014	1.2	5.3	55	87
Endrin ketone	ND	ND	ND	ND	ND	ND	0.0027 J-	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
Methoxychlor	ND	ND	0.0032 U	ND	ND	ND	0.0061 U	0.0039 U	ND	ND	ND	ND	0.0016 J	NS	NS	NS	NS	NS
PER- & POLYFLUOROALKYL SUBSTANCES (PFAS) (ppt)																		
Perfluorobutanoic acid (PFBA)	ND	ND	ND	ND	ND	ND	0.30 J	0.32 J	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
Perfluorooctanesulfonic acid (PFOS)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.88	8.8	44	440	440
Perfluorooctanoic acid (PFOA)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.66	6.6	33	500	600
POLYCHLORINATED BIPHENYLS (PCBS) (ppm)																		
Total PCBs	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	1	1	1	25
SEMIVOLTALE ORGANIC COMPOUNDS (SVOCS) (ppm)																		
2-Methylnaphthalene	0.038 J	ND	0.19	ND	ND	ND	0.33	ND	ND	ND	0.52 J	ND	ND	NS	NS	NS	NS	NS
Acenaphthene	ND	ND	ND	ND	0.099 J	ND	ND	ND	ND	ND	ND	ND	ND	20	100	100	500	1000
Anthracene	0.048 J	ND	0.084 J	ND	0.22	ND	0.038 J	ND	ND	ND	0.96 J	ND	0.054 J	100	100	100	500	1000
Benzo[a]anthracene	0.27	ND	0.26	ND	0.44	ND	0.00086 J	ND	ND	ND	**2.1**	ND	0.12 J	1	1	1.4	37	37
Benzo[a]pyrene	0.18 J	ND	0.21	ND	0.35	ND	0.12 J	ND	ND	ND	**1.9 J**	ND	0.11- J	1	1	1	3.7	3.7
Benzo[b]fluoranthene	0.18 J	ND	0.35	ND	0.47	ND	0.22	ND	0.034 J	ND	**2.4**	ND	0.13 J	1	1	1.4	37	37
Benzo[g,h,i]perylene	0.11 J	ND	0.17 J	ND	0.2	ND	0.085 J	ND	ND	ND	**1.3 J**	ND	0.063 J	0.64	1.2	4.9	47	78
Benzo[k]fluoranthene	0.15 J	ND	0.14 J	ND	0.19 J	ND	0.068 J	ND	ND	ND	**1.4 J**	ND	0.084 J	0.8	1.2	24	47	78
Carbazole	ND	ND	ND	ND	0.054 J	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
Chrysene	0.21	ND	0.34	ND	0.46	ND	0.21	ND	ND	ND	**1.9 J**	ND	0.14 J	1	1.2	4.9	47	78
Dibenz(a,h)anthracene	ND	ND	0.048 J	ND	0.056 J	ND	ND	ND	ND	ND	**0.48 J**	ND	ND	0.33	0.33	0.33	3.7	3.7
Dibenzofuran	ND	ND	0.091 J	ND	0.051 J	ND	0.1 J	ND	ND	ND	ND	ND	ND	2.1	4.2	18	180	290
Fluoranthene	0.28	ND	0.64	ND	1	ND	0.28	ND	0.041 J	ND	5.7	ND	0.26	85	100	100	500	1000
Fluorene	ND	ND	ND	ND	0.082 J	ND	ND	ND	ND	ND	ND	ND	ND	30	100	100	500	1000
Indeno[1,2,3-cd]pyrene	0.12 J	ND	0.12 J	ND	0.15 J	ND	0.068 J	ND	ND	ND	**1.2 J**	ND	0.047 J	0.5	0.5	1.4	37	37
Naphthalene	ND	ND	0.13 J	ND	0.033 J	ND	0.21	ND	ND	ND	0.38 J	ND	ND	12	84	100	500	1000
Phenanthrene	ND	ND	0.59	ND	0.85	ND	0.39	ND	ND	ND	4.5	ND	0.25	1.1	1.2	4.9	47	78
Pyrene	0.24	ND	0.55	ND	0.84	ND	0.26	ND	0.043 J	ND	4.1	ND	0.25	64	100	100	500	1000
Total TICs	25.66	28.61	16.79	27.8	16.69	58.08	28.49	31.99	46.01	16.73	0	16.3	109.6	NS	NS	NS	NS	NS
VOLITALE ORGANIC COMPOUNDS (VOCS)																		
2-Butanone (MEK)	ND	ND	0.0097 J-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	100	100	500	1000
Acetone	ND	0.0053 J	**0.085 J-**	ND	ND	0.0089 J-	ND	0.0098 J-	0.026 J+	ND	ND	ND	ND	0.03	100	100	500	1000
Chloroform	ND	ND	ND	ND	ND	ND	ND	0.00035 J-	0.00038 J+	ND	0.00043 J+	ND	ND	0.37	4.8	24	180	180
Methylcyclohexane	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0014 J-	ND	ND	ND	NS	NS	NS	NS	NS
Methylene Chloride	0.023 J-	0.031 J-	0.007 J-	0.019 J-	ND	ND	0.0062 J-	0.032 J-	0.023 J+	0.01	0.022 J+	0.072 J-	ND	0.05	17	81	500	1000
trans-1,2-Dichloroethene	0.016 J-	0.21 J-	0.0021 J-	0.011 J-	0.0011 J-	0.0011 J-	0.0033 J-	0.018 J-	0.0097 J+	0.0078 J-	0.013 J+	0.05 J-	ND	0.19	75	100	500	1000
Total TICs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	NS	NS	NS	NS	NS

Notes:
J - Lab/Data Validator Qualifier

NS - No Standard
ND Non detect

Qualifiers:

R result is rejected/unusable
J Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value
vs May be biased low
T result is a TIC and is estimated
S1+ Surrogate recovery exceeds control limits, high biased
^5- Linear range check (LRC) outside acceptance limits, biased low
E exceeds calibration range
F1 MS and/or MSD recovery exceeds control limits
F2 MS/MSD RPD exceeds control limits
S1- Surrogate recovery exceeds control limits, low biased
N presumptive evidence of material
B found in the blank and the sample
*- LCS and/or LCSD outside acceptance limits, low biased
*5+ Isotope dilution analyte outside acceptance limits, high biased
^+ CCV outside acceptance limits, high biased
^2 calibration blank outside acceptance limits
U not detected
J+ Estimated quantity, may be biased high
J- Estimated quantity, may be biased low
UJ not detected, quantitation limit may be inaccurate
X Unusable

TABLE 1
SOIL SAMPLE ANALYTICAL RESULTS

Analyte	Sample Identification, Sample Depth and Sample Collection Date							NYSDEC Part 375 Soil Cleanup Objectives (SCOs)				
	RI-MW-1	RI-MW-2	RI-MW-2 DUP	RI-MW-3	RI-MW-3 DUP	RI-MW-4	RI-MW-5	Unrestricted	Residential	Restricted Residential	Commercial	Industrial
	8-11'	9-12'	9-12'	4-8'	4-8'	4-8'	4-8'					
	5/30/2025											
METALS (ppm)												
Aluminum	11400	13500	14800	15500	20800	10400	10400	NS	NS	NS	NS	NS
Antimony	1.3 J-	1.4 J-	0.81 J-	1.1 J-	1.4 J-	ND	1.3 J-	NS	NS	NS	NS	NS
Arsenic	7.4	10.6	8.2	8.3 J	4.3 J	8.9	**13.4**	13	16	16	16	16
Barium	127	192	191	**669 J**	303 J	97.8	73.5	410	410	410	410	10000
Beryllium	0.73	0.80	0.71	0.75	1.0	0.51	0.55	4.4	8.8	43	640	750
Cadmium	0.14 J	0.33 J-	0.38	0.30	0.32	0.38	0.41	2.5	2.5	2.5	3.7	4.4
Calcium	1250 J-	5470	12400 J-	36300 J-	2230 J-	29400 J-	17200 J-	NS	NS	NS	NS	NS
Chromium	**16.6**	**23.0**	**20.1**	**21.7**	**28.5**	**15.4**	**15.3**	1	1	1	11	11
Cobalt	11.8	12.8	12.4	12.8	16.7	11.2	12.5	NS	NS	NS	NS	NS
Copper	41.0	**81.4 J**	34.7 J	32.4 J	22.1 J	35.8	43.3	50	280	280	280	10000
Iron	19800	26800	25100	26500	29500	23200	28100	NS	NS	NS	NS	NS
Lead	26.2 J-	**70.8 J-**	50.1 J-	15.5 J-	13.3 J-	15.6 J-	25.4 J-	63	400	400	1000	3900
Magnesium	3960	3590 J	5240 J	8880 J	6110 J	8000	6420	NS	NS	NS	NS	NS
Manganese	132 J	520 J	286 J	405 J	280 J	286 J	309 J	1600	2000	2000	10000	10000
Nickel	**33.4 J-**	28.8 J-	**30.4 J-**	**34.0 J-**	**45.5 J-**	29.8 J-	**36.5 J-**	30	87	320	320	5900
Potassium	2510	2610 J+	2890 J+	3020 J+	3020 J+	2120 J+	2080 J+	NS	NS	NS	NS	NS
Selenium	2.8 J	ND	ND	ND	1.5	ND	1.2 J	3.9	22	110	1700	2000
Silver	ND	ND	ND	ND	ND	ND	ND	2	22	110	1700	2000
Sodium	72.5 J	90.1 J	113 J	175 J	121	124	91.5 J	NS	NS	NS	NS	NS
Thallium	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
Vanadium	18.5	28.0	26.7 J	29.0	33.9	20.4	19.6	NS	NS	NS	NS	NS
Zinc	75.5 J-	**124 J-**	**127 J-**	68.2 J-	73.0 J-	86.1 J-	**115 J-**	109	1300	6600	10000	10000
Cyanide, Total	ND	ND	ND	ND	ND	ND	ND	2.3	2.6	13	22	240
Mercury	0.015	**1.6 J-**	**0.49 J-**	0.012 J-	0.028 J-	0.023	0.018 J-	0.18	**0.3**	**0.3**	1.1	1.1
ORGANOCHLORINE PESTICIDES (ppm)												
4,4'-DDT	ND	0.002 U	0.0019 U	ND	ND	ND	ND	0.0033	0.78	3.8	27	27
delta-BHC	ND	ND	0.0011 J	ND	ND	ND	ND	0.04	100	100	500	1000
Endosulfan sulfate	ND	ND	ND	ND	0.0012 J	ND	ND	4.3	8.4	35	360	580
Endrin	ND	0.0017 J+	0.0014 J	ND	ND	ND	ND	0.014	1.2	5.3	55	87
Methoxychlor	ND	ND	0.0013 R	ND	ND	ND	ND	NS	NS	NS	NS	NS
PER- & POLYFLUOROALKYL SUBSTANCES (PFAS) (ppt)												
Perfluorooctanesulfonic acid (PFOS)	ND	ND	ND	ND	ND	ND	ND	0.88	8.8	44	440	440
Perfluorooctanoic acid (PFOA)	ND	ND	ND	ND	ND	ND	ND	0.66	6.6	33	500	600
POLYCHLORINATED BIPHENYLS (PCBS) (ppm)												
Total PCBs	ND	ND	ND	ND	ND	ND	ND	0.1	1	1	1	25
SEMIVOLITALE ORGANIC COMPOUNDS (SVOCS) (ppm)												
2-Methylnaphthalene	ND	0.57 J	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
4-Methylphenol	ND	0.046	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
Acenaphthene	ND	0.53 J	ND	ND	ND	ND	ND	20	100	100	500	1000
Acenaphthylene	ND	0.34 J	ND	ND	ND	ND	ND	100	100	100	500	1000
Anthracene	ND	1.5 J	ND	ND	ND	ND	ND	100	100	100	500	1000
Benzo[a]anthracene	ND	**1.9 J**	ND	ND	ND	ND	ND	1	1	1.4	37	37
Benzo[a]pyrene	ND	**1.4 J**	ND	ND	ND	ND	ND	1	1	1	3.7	3.7
Benzo[b]fluoranthene	ND	**1.7 J**	0.037 J	ND	ND	ND	ND	1	1	1.4	37	37
Benzo[g,h,i]perylene	ND	0.77 J	ND	ND	ND	ND	ND	0.64	1.2	4.9	47	78
Benzo[k]fluoranthene	ND	**0.87 J**	ND	ND	ND	ND	ND	0.8	1.2	24	47	78
Carbazole	ND	0.35 J	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
Chrysene	ND	**2 J**	ND	ND	ND	ND	ND	1	1.2	4.9	47	78
Dibenz(a,h)anthracene	ND	0.29 J	ND	ND	ND	ND	ND	0.33	0.33	0.33	3.7	3.7
Dibenzofuran	ND	0.57 J	ND	ND	ND	ND	ND	2.1	4.2	18	180	290
Fluoranthene	ND	4.1 J	0.098 J	ND	ND	ND	ND	85	100	100	500	1000
Fluorene	ND	1 J	ND	ND	ND	ND	ND	30	100	100	500	1000
Indeno[1,2,3-cd]pyrene	ND	**0.62 J**	ND	ND	ND	ND	ND	0.5	0.5	1.4	37	37
Naphthalene	ND	0.63 J	ND	ND	ND	ND	ND	12	84	100	500	1000
Phenanthrene	ND	**4.8 J**	ND	ND	ND	ND	ND	1.1	1.2	4.9	47	78
Pyrene	ND	3.3 J	0.096 J	ND	ND	ND	ND	64	100	100	500	1000
Total TICs	63.71	29.82	15.05	17.77	18.6	44.53	14.56	NS	NS	NS	NS	NS
VOLITALE ORGANIC COMPOUNDS (VOCS)												
2-Butanone (MEK)	ND	0.0047 J-	ND	0.0048 J-	ND	ND	ND	0.1	100	100	500	1000
Acetone	0.018 J-	0.02 J-	0.0057 J-	0.044 J	0.041 J-	ND	ND	0.3	100	100	500	1000
Benzene	ND	0.0042 J-	ND	ND	ND	ND	ND	0.06	1.2	3.7	20	20
Chloroform	ND	0.00046 J-	ND	ND	ND	0.00037 J-	ND	0.37	4.8	24	180	180
cis-1,2-Dichloroethene	0.0019 J-	ND	ND	ND	ND	ND	ND	0.19	8.7	41	500	590
Cyclohexane	ND	0.19 J-	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
Ethylbenzene	ND	0.02 J-	ND	ND	ND	ND	ND	1	32	76	390	780
Isopropylbenzene	ND	0.012 J-	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
Methylcyclohexane	ND	0.24 J-	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
Methylene Chloride	**0.068 J-**	0.0035 J-	**0.071 J-**	0.041 J-	0.009 J-	**0.11 J-**	**0.052 J-**	0.05	17	81	500	1000
Toluene	ND	0.044 J-	ND	ND	ND	ND	ND	0.7	100	100	500	1000
trans-1,2-Dichloroethene	0.047 J-	0.00078 J-	0.037 J-	0.032 J-	0.0051 J-	0.073 J-	0.032 J-	0.19	75	100	500	1000
Xylenes, Total	ND	0.13 J-	ND	ND	ND	ND	ND	0.26	100	100	500	1000
Total TICs	0.00	0	0.00	0.00	0.00	0.00	0.00	NS	NS	NS	NS	NS

Notes:

J - Lab/Data Validator Qualifier

NS - No Standard

ND Non detect

Qualifiers:

R result is rejected/unusable
J Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value
vs May be biased low
T result is a TIC and is estimated
S1+ Surrogate recovery exceeds control limits, high biased
^5- Linear range check (LRC) outside acceptance limits, biased low
E exceeds calibration range
F1 MS and/or MSD recovery exceeds control limits
F2 MS/MSD RPD exceeds control limits
S1- Surrogate recovery exceeds control limits, low biased
N presumptive evidence of material
B found in the blank and the sample
*- LCS and/or LCSD outside acceptance limits, low biased
*5+ Isotope dilution analyte outside acceptance limits, high biased
^+ CCV outside acceptance limits, high biased
^2 calibration blank outside acceptance limits
U not detected
J+ Estimated quantity, may be biased high
J- Estimated quantity, may be biased low
UJ not detected, quantitation limit may be inaccurate
X Unusable

TABLE 2
SURFACE AND STEP-OUT SOIL SAMPLE ANALYTICAL RESULTS

Analyte	Sample Identification, Sample Depth and Sample Collection Date								NYSDEC Part 375 Soil Cleanup Objectives (SCOs)				
	SS-1	SS-2	SS-3	SS-4	SS-5	SS-6	SS-7	SS-8	Unrestricted	Residential	Restricted Residential	Commercial	Industrial
	0.17-0.5'	0.17-0.5'	0.17-0.5'	0.17-0.5'	0.17-0.5'	0.17-0.5'	0.17-0.5'	0.17-0.5'					
	8/7/2025												
METALS (ppm)													
Aluminum	10400	9650	9290	9330	11900	6170	11800	12800	NS	NS	NS	NS	NS
Antimony	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
Arsenic	12.6	12.7	**15.7**	9.6	10.5	6.2	8.4	**13.9**	13	16	16	16	16
Barium	130	135	80.8	117	137	39.3	127	200	410	410	410	410	10000
Beryllium	0.61 J-	0.55 J-	0.55 J-	0.6 J-	0.6 J-	0.3 J-	0.67 J-	0.64 J-	4.4	8.8	43	640	750
Cadmium	0.43	0.56	0.35	0.5	0.48	0.35	**2.7**	0.41	2.5	2.5	2.5	3.7	4.4
Calcium	1980 J-	21500	2280 J-	5090 J-	3360 J-	41000 J-	17900	4650	NS	NS	NS	NS	NS
Chromium	**22.5**	**39.8**	**23.5**	**20.1**	**22.7**	**15.1**	**19.2**	**19.8**	1	1	1	11	11
Cobalt	8.6	6.5	9.6	8.9	8.6	5.7	6.6	9.5	NS	NS	NS	NS	NS
Copper	35.8	**50.4**	**52.3**	**53.6**	36.6	18.2	36.6	43.8	50	280	280	280	10000
Iron	22700	39000	47100	28000	22800	18200	30900	26700	NS	NS	NS	NS	NS
Lead	**187**	**209**	**96.4**	**206**	**276**	21.7	**208**	**353**	63	400	400	1000	3900
Magnesium	2200	1880	1940	2160	2570	8860	1670	2520	NS	NS	NS	NS	NS
Manganese	311	**1710**	384	423	272	445	1280	648	1600	2000	2000	10000	10000
Nickel	26.9	**82.6**	29.1	24.4	25.3	22.5	22.4	25.2	30	87	320	320	5900
Potassium	1770	1290	1630	1710	2300	1210	1920	2280	NS	NS	NS	NS	NS
Selenium	ND	1.8	ND	1.1	ND	ND	1.5	0.95	3.9	22	110	1700	2000
Silver	ND	0.28 J-	ND	ND	ND	ND	0.24 J-	0.24 J-	2	22	110	1700	2000
Sodium	85.3	182	ND	87	79	96.7	183	110	NS	NS	NS	NS	NS
Thallium	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
Vanadium	20.9	31.2	18.9	21.1	22.5	15.9	26.6	26.2	NS	NS	NS	NS	NS
Zinc	**142 J-**	**175 J-**	**119 J-**	**177 J-**	**285 J-**	**118 J-**	**178 J-**	**168 J-**	109	1300	6600	10000	10000
Cyanide, Total	ND	2.2	2.2	0.69	0.54	ND	5.1	ND	2.3	2.6	13	22	240
Mercury	0.12	0.049	**0.21**	**0.21**	**0.39**	0.011	0.18	**0.59**	0.18	0.3	0.3	1.1	1.1
ORGANOCHLORINE PESTICIDES (ppm)													
4,4'-DDD	-	ND	-	-	-	ND	ND	0.0071 J	0.0033	1.2	5	33	33
4,4'-DDE	-	ND	-	-	-	ND	ND	0.015 J	0.0033	0.78	3.4	22	22
4,4'-DDT	-	ND	-	-	-	0.014 J	0.016 J	0.015 J	0.0033	0.78	3.8	27	27
alpha-BHC	-	0.015 J	-	-	-	ND	ND	ND	0.02	0.042	0.18	1.2	1.2
Endrin	-	0.029	-	-	-	0.014 J	0.013 J	ND	0.014	1.2	5.3	55	87
PER- & POLYFLUOROALKYL SUBSTANCES (PFAS) (ppt)													
Perfluorobutanoic acid (PFBA)	-	ND	-	-	-	ND	0.25 J	0.18 J	NS	NS	NS	NS	NS
Perfluorodecanesulfonic acid (PFDS)	-	ND	-	-	-	ND	ND	ND	NS	NS	NS	NS	NS
Perfluorodecanoic acid (PFDA)	-	0.13 J	-	-	-	0.050 J	0.11 J	0.061 J	NS	NS	NS	NS	NS
Perfluorododecanoic acid (PFDoA)	-	0.12 J	-	-	-	ND	ND	ND	NS	NS	NS	NS	NS
Perfluoroheptanoic acid (PFHpA)	-	ND	-	-	-	ND	0.11 J	0.099 J	NS	NS	NS	NS	NS
Perfluorohexanoic acid (PFHxA)	-	ND	-	-	-	ND	ND	0.10 J	NS	NS	NS	NS	NS
Perfluorononanoic acid (PFNA)	-	0.089 J	-	-	-	0.062 J	0.22	0.16 J	NS	NS	NS	NS	NS
Perfluorooctanesulfonic acid (PFOS)	-	0.37	-	-	-	0.25	**0.89**	0.28	0.88	8.8	44	440	440
Perfluorooctanoic acid (PFOA)	-	0.078 J	-	-	-	ND	0.38	0.17 J	0.66	6.6	33	500	600
Perfluoropentanoic acid (PFPeA)	-	ND	-	-	-	ND	ND	0.059 J	NS	NS	NS	NS	NS
Perfluorotridecanoic acid (PFTrDA)	-	0.087 J	-	-	-	ND	ND	ND	NS	NS	NS	NS	NS
Perfluoroundecanoic acid (PFUnA)	-	0.22	-	-	-	ND	0.11 J	0.052 J	NS	NS	NS	NS	NS
POLYCHLORINATED BIPHENYLS (PCBS) (ppm)													
Total PCBs	-	ND	-	-	-	ND	ND	-	0.1	1	1	1	25
SEMIVOLITALE ORGANIC COMPOUNDS (SVOCS) (ppm)													
2-Methylnaphthalene	0.49	1.3	0.95	0.75 J	-	ND	0.59 J	ND	NS	NS	NS	NS	NS
Acenaphthene	ND	ND	1	ND	-	ND	ND	ND	20	100	100	500	1000
Acenaphthylene	0.96	0.18 J	0.14 J	0.19 J	-	ND	ND	ND	100	100	100	500	1000
Acetophenone	ND	ND	0.083 J	ND	-	ND	ND	ND	NS	NS	NS	NS	NS
Anthracene	0.74	0.16 J	2.1	ND	-	ND	0.26 J	0.36 J	100	100	100	500	1000
Benzo[a]anthracene	**3.6**	0.8 J	**4.3**	0.82 J	-	0.073 J	0.71 J	0.56 J	1	1	1.4	37	37
Benzo[a]pyrene	**3**	0.91	**3.6**	0.89 J	-	0.11 J	0.84 J	0.65 J	1	1	1	3.7	3.7
Benzo[b]fluoranthene	**4**	**1.4**	**4.5**	**1.3**	-	0.18	**1.1**	0.73 J	1	1	1.4	37	37
Benzo[g,h,i]perylene	**2.1**	**0.68 J**	**2.8**	**0.77 J**	-	0.098 J	**0.7 J**	0.4 J	0.64	1.2	4.9	47	78
Benzo[k]fluoranthene	**2.8**	0.48 J	**2.4**	0.71 J	-	0.061 J	0.61 J	0.38 J	0.8	1.2	24	47	78
Carbazole	ND	ND	1.7	ND	-	ND	ND	ND	NS	NS	NS	NS	NS
Chrysene	**3.4**	**1.2**	**4.1**	**1.1**	-	0.13 J	0.84 J	0.68 J	1	1.2	4.9	47	78
Dibenz(a,h)anthracene	**0.68 J**	ND	**0.78**	ND	-	ND	ND	ND	0.33	0.33	0.33	3.7	3.7
Dibenzofuran	ND	0.33 J	0.72	0.16 J	-	ND	ND	ND	2.1	4.2	18	180	290
Fluoranthene	6.9	1.6	11 J	1.6	-	0.21	1.7	1.5	85	100	100	500	1000
Fluorene	0.27 J	ND	0.82	ND	-	ND	ND	0.17 J	30	100	100	500	1000
Indeno[1,2,3-cd]pyrene	**1.8**	**0.59 J**	**2.3**	**0.63 J**	-	0.088 J	**0.54 J**	0.37 J	0.5	0.5	1.4	37	37
Naphthalene	0.32 J	0.91	0.61	0.5 J	-	ND	ND	ND	12	84	100	500	1000
Phenanthrene	**3.4**	**1.4**	**10**	1	-	ND	1.1	**1.3**	1.1	1.2	4.9	47	78
Pyrene	5.4	1.4	8.7	1.5	-	0.18	1.4	1.1	64	100	100	500	1000
Total TICs	57.4	10.3	40.74	35.2	-	12.34	77.6	28.9	-	-	-	-	-

Notes:
J - Lab/Data Validator Qualifier

NS - No Standard
ND Non detect

Qualifiers:
R result is rejected/unusable
J Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value
vs May be biased low
T result is a TIC and is estimated
S1+ Surrogate recovery exceeds control limits, high biased
^5- Linear range check (LRC) outside acceptance limits, biased low
E exceeds calibration range
F1 MS and/or MSD recovery exceeds control limits
F2 MS/MSD RPD exceeds control limits
S1- Surrogate recovery exceeds control limits, low biased
N presumptive evidence of material
B found in the blank and the sample
*- LCS and/or LCSD outside acceptance limits, low biased
*5+ Isotope dilution analyte outside acceptance limits, high biased
^+ CCV outside acceptance limits, high biased
^2 calibration blank outside acceptance limits
U not detected
J+ Estimated quantity, may be biased high
J- Estimated quantity, may be biased low
UJ not detected, quantitation limit may be inaccurate
X Unusable

TABLE 2
SURFACE AND STEP-OUT SAMPLE ANALYTICAL RESULTS

Analyte	Sample Identification, Sample Depth and Sample Collection Date																NYSDEC Part 375 Soil Cleanup Objectives (SCOs)				
	STP-1 E	STP-1 N	STP-1 S	STP-1 W	STP-2 E	STP-2 N	STP-2 S	STP-2 W	STP-3 E	STP-3 N	STP-3 S	STP-3 W	STP-4 E	STP-4 N	STP-4 S	STP-4 W	Unrestricted	Residential	Restricted Residential	Commercial	Industrial
	1-2'	1-2'	1-2'	1-2'	1-2'	1-2'	1-2'	1-2'	1-2'	1-2'	1-2'	1-2'	1-2'	1-2'	1-2'	1-2'					
	8/11/2025																				
METALS (ppm)																					
Aluminum	6250	8710	10200	12700	12800	7980	19300	7430	5140	9570	4780	4970	10000	16100	16500	15200	NS	NS	NS	NS	NS
Antimony	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
Arsenic	**19**	**19.2**	9.3	**29.5**	9.2	11.9	**14.2**	**19.3**	10.7	6.9	**15.8**	11.7	9.8	12.9	**13.7**	**13.2**	13	16	16	16	16
Barium	**417**	**574**	114	150	150	103	190	144	83.1	116	80.5	56.9	**411**	**491**	**537**	403	410	410	410	410	10000
Beryllium	0.68 J-	1.6 J-	0.77 J-	1.3 J-	0.8 J-	0.61 J-	1.1 J-	0.65 J-	0.81 J-	0.49 J-	1.1 J-	0.77 J-	0.59 J-	0.97 J-	0.99 J-	1.2 J-	4.4	8.8	43	640	750
Cadmium	0.65	0.95	0.47	0.25	0.35	0.44	0.4	0.41	0.26	0.75	0.13	0.18	0.79	1.6	0.99	1.1	2.5	2.5	2.5	3.7	4.4
Calcium	4500	7110	6460	5330	10300	18000	3390	16700	4820	25500	3480	3500	9950	10900	7350	8650	NS	NS	NS	NS	NS
Chromium	**19.3**	**19.9**	**17.3**	**18.9**	**18.1**	**16.5**	**25.7**	**21.3**	**11.1**	**13.3**	**8.4**	**9.3**	**28.1**	**42.7**	**168**	**39.6**	1	1	1	11	11
Cobalt	7	9.6	11.3	8.1	8.8	6.8	13.9	6.1	7	6.4	8.2	8.1	8.2	11.8	13.4	11.6	NS	NS	NS	NS	NS
Copper	**82.8**	**80.3**	24.9	29.1	34.6	**87.8**	39.3	**202**	**74**	33.3	**60.7**	**69.9**	**56.6**	**761**	**91.4**	**107**	50	280	280	280	10000
Iron	29500	22300	31300	27800	21600	25300	31800	32700	29000	31500	31000	37800	21300	26900	37600	31600	NS	NS	NS	NS	NS
Lead	**399**	**656**	**131**	**249**	**154**	**101**	**177**	**267**	**226**	**140**	37.9	**95.9**	**1180**	**1090**	**1120**	**2460**	63	400	400	1000	3900
Magnesium	645	1110	1190	460	2460	999	4170	1230	567	2910	238	203	2110	2970	3500	3040	NS	NS	NS	NS	NS
Manganese	211	240	987	52.2	866	1520	380	1120	128	445	61.4	95.1	270	330	430	402	1600	2000	2000	10000	10000
Nickel	**61.3**	24.5	17.4	19.1	23	16.7	**39.7**	23.8	15.9	20.6	17.9	16.8	22.2	**37.7**	**39.8**	**37.9**	30	87	320	320	5900
Potassium	692	859	1420	1440	2040	1020	3530	1010	622	1110	485	339	2110	2900	3390	2950	NS	NS	NS	NS	NS
Selenium	2.3	0.93	1.3	ND	1.4	2.8	1.1	2.4	1	1.3	1.6	ND	1.1	1.4	1.3	1.8	3.9	22	110	1700	2000
Silver	ND	0.22 J-	ND	ND	0.22 J-	0.22 J-	0.35 J-	0.22 J-	ND	ND	ND	ND	0.4 J-	0.79 J-	0.85 J-	0.68 J-	2	22	110	1700	2000
Sodium	244	386	138	651	186	208	173	248	113	117	105	101	153	220	222	145	NS	NS	NS	NS	NS
Thallium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	NS
Vanadium	19	26.9	24.9	33	26.5	18.6	40.5	19.9	18.1	23.4	20.2	19	20.2	32.3	32.2	**30.5**	NS	NS	NS	NS	NS
Zinc	**435 J-**	**731 J-**	**123 J-**	56.4 J-	**146 J-**	**159 J-**	**154 J-**	**186 J-**	79.4 J-	**240 J-**	37.4 J-	47.3 J-	**595 J-**	**1180 J-**	**686 J-**	**652 J-**	109	1300	6600	10000	10000
Cyanide, Total	1.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.91	0.59	2.3	2.6	13	22	240
Mercury	**0.18**	0.17 J-	0.079	0.033	**0.19**	0.078	0.13	0.098	**0.18**	0.17	0.11	0.051	**2.4**	**0.8**	**2.3**	**1.7**	0.18	0.3	0.3	1.1	1.1

Notes:
J - Lab/ Data Validator Qualifier

NS - No Standard
ND Non detect

Qualifiers:
R result is rejected/unusable
J Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value
vs May be biased low
T result is a TIC and is estimated
S1+ Surrogate recovery exceeds control limits, high biased
^5- Linear range check (LRC) outside acceptance limits, biased low
E exceeds calibration range
F1 MS and/or MSD recovery exceeds control limits
F2 MS/MSD RPD exceeds control limits
S1- Surrogate recovery exceeds control limits, low biased
N presumptive evidence of material
B found in the blank and the sample
*- LCS and/or LCSD outside acceptance limits, low biased
*5+ Isotope dilution analyte outside acceptance limits, high biased
^+ CCV outside acceptance limits, high biased
^2 calibration blank outside acceptance limits
U not detected
J+ Estimated quantity, may be biased high
J- Estimated quantity, may be biased low
UJ not detected, quantitation limit may be inaccurate
X Unusable

TABLE 3
GROUNDWATER SAMPLE ANALYTICAL RESULTS

Parameter Tested	Sample Identification and Sample Date				NYSDEC Division of Water Technical and Operational Guidance Series (1.1.1)
	RI-MW-2	RI-BW-1	RI-BW-2	RI-BW-3	
	8/15/2025				
METALS (ug/L)					
Aluminum	ND	610	820	310	NS
Antimony	ND	ND	ND	ND	3
Arsenic	ND	ND	ND	ND	25.0
Barium	190	99	120	570	1000
Beryllium	ND	ND	ND	ND	3
Cadmium	ND	ND	ND	ND	3
Calcium	115000	161000	55000	115000	NS
Chromium	ND	1.2	ND	ND	50
Cobalt	2.9	1.2	0.65	ND	NS
Copper	3.6	2.8	1.8	1.7	200
Cyanide, Total	8	11	8	6	200
Iron	**2500 J-**	**1400**	140	**330**	300
Lead	ND	ND	ND	ND	25.0
Magnesium	9400	24000	19500	30500	35,000.0
Manganese	**590 J+**	100	350	280	300.0
Mercury	ND	ND	ND	ND	0.7
Nickel	2.5	5.4	1.3	1.7	100.0
Potassium	4600	8900	21400	4100	NS
Selenium	ND	ND	ND	9.4	10.0
Silver	ND	ND	ND	ND	50.0
Sodium	10	**130000**	**34100**	**73700**	20,000.0
Thallium	ND	ND	ND	ND	0.5
Vanadium	ND	2.3	2.4	ND	NS
Zinc	21	3.5	ND	ND	2,000.0
SVOCS (ug/L)					
1,4-Dioxane	ND	ND	0.18 J	ND	0.35
2-Methylnaphthalene	ND	ND	0.66 J	ND	NS
Total TICs	75.4	84.6	276.3	92.1	NS
VOCS (ug/L)					
Acetone	ND	ND	5.8 J	ND	50
Benzene	ND	ND	0.79 J	**1.1**	1
Cyclohexane	ND	6.5	5.9	5.7	NS
Ethylbenzene	ND	0.84 J	1.2	1	5
Methylcyclohexane	ND	7.1	5.4	6.2	NS
m,p-Xylene	ND	3.6	**5**	4.4	5
o-Xylene	ND	1.7	2.7	2.2	5
Total TICs	0	29.2	29.6	26.4	NS
Tetrachloroethene	ND	ND	ND	ND	NS
Toluene	ND	2.7	3.5	3.8	NS
PFAS (ng/L)					
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	5.5	ND	ND	ND	NS
Perfluorobutanesulfonic acid (PFBS)	2.0	ND	ND	ND	NS
Perfluorobutanoic acid (PFBA)	14	2.3 J	ND	1.6v J	NS
Perfluoroheptanoic acid (PFHpA)	3.1	ND	ND	ND	NS
Perfluorohexanoic acid (PFHxA)	33	ND	ND	ND	NS
Perfluorooctanesulfonic acid (PFOS)	**11 J**	ND	ND	ND	2.7
Perfluorooctanoic acid (PFOA)	**8.1**	ND	ND	ND	6.7
Perfluoropentanoic acid (PFPeA)	39 J	1.5 J	ND	0.94 J	NS
PCBS (ug/L)					
Total PCBs	ND	ND	ND	ND	0.09
ORGANOCHLORINE PESTICIDES (ug/L)					
4,4'-DDT	ND	0.05 UJ	ND	0.05 UJ	0.2
Heptachlor epoxide	ND	ND	0.0086 J	ND	0.03

Qualifiers:

J Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value

J- Estimated quantity, may be biased low

J+ Estimated quantity, may be biased high

U Not Detected

Notes:

ND Not Detected

NS No Standard

TICs Tentatively Identified Compounds

Exceeds TOGs

J Lab/Data Validator Qualifier

TABLE 4 - VAPOR SAMPLING RESULTS

Contaminants	Sample Identification, Type of Sample, and Date Analyzed							
	RI-VP-1	RI-VP-2	RI-VP-3	RI-VP-4	RI-VP-5	RI-VP-6	RI-VP-7	RI-VP-8
	6/5/2025							
	Volatile Organic Compounds (TO-15)							
1,2,4-Trimethylbenzene	ND	ND	ND	ND	110	110	25	69
1,3-Butadiene	12	4.8	2.7	4	1.9	1.8	ND	4.1
1,3,5-Trimethylbenzene	ND	ND	ND	ND	30	30	8	19
2,2,4-Trimethylpentane	35	ND	14	11	ND	150	28	29
4-Ethyltoluene	ND	ND	ND	ND	35	36	ND	26
4-Isopropyltoluene	ND	ND	ND	ND	7.1	9.1	ND	4.8
Acetone	53000	9200	7400	18000	5300	3100	4700	4400
Benzene	ND	5.1	3.4	ND	4.3	6.1	4.4	3.6
Carbon disulfide	ND	ND	53	ND	160	56	24	85
Cumene	ND	ND	13	ND	12	13	ND	8.9
Cyclohexane	260	55	45	35	1600	660	890	480
Ethylbenzene	23	ND	26	15	42	39	14	36
Isopropyl alcohol	1400	ND	ND	460	98	ND	ND	ND
m,p-Xylene	40	6.2	48	44	100	96	28	84
Methyl Butyl Ketone (2-Hexanone)	410	450	49	42	72	ND	ND	50
Methyl Ethyl Ketone (2-Butanone)	7400	17000	540	780	280	160	130	130
Methylene Chloride	ND	ND	ND	ND	ND	ND	ND	ND
n-Butane	730	150	2700	430	1100	190	98	1400
n-Butylbenzene	ND	ND	ND	ND	13	16	ND	9.7
n-Heptane	920	100	500	54	3600	2200	150	44
n-Hexane	2100	190	1500	150	3000	2400	58	130
n-Propylbenzene	ND	ND	ND	ND	30	29	ND	22
Naphthalene	ND	ND	ND	ND	ND	13	14	ND
o-Xylene	ND	ND	21	13	50	47	14	38
sec-Butylbenzene	ND	ND	ND	ND	11	12	ND	7
tert-Butyl alcohol	ND	ND	ND	120	ND	ND	160	ND
Tetrachloroethene	ND	21	9.3	97	10	ND	140	8.3
Toluene	68	8	63	29	68	63	27	65
Trichloroethene	ND	ND	3.4	ND	4.7	5.5	ND	ND

Notes:
(1) All values are in micrograms per cubic meter (ug/m^3)
ND Not detected
- Not applicable/no guidance value

TABLE 5
SUMMARY OF SOIL ANALYTICAL RESULTS
FEBRUARY 2023 PHASE II ESA

Parameter Tested	BE3 Phase II Report January 2023 - Sample Identification, Sample Depth in feet below ground surface (bgs), and Sample Date								NYSDEC Soil Cleanup Objectives (SCOs)				
	BH1 0-2	BH2 0-3	BH3 0-3	BH4 0-3	BH4 4-5	BH5 0-3	BH6 0-3	BH7 0-3	Unrestricted	Residential	Restricted Residential	Commerical	Industrial
	1/13/2023												
METALS/INORGANICS													
Arsenic	**35.3**	**17.0**	3.6	11.4	ND	**44.0**	10.2	**32.4**	13	16	16	16	16
Barium	**501**	221	39.5	73.0	ND	141.0	248	109	410	410	410	410	10,000
Beryllium	1.2	2.10	0.23 J	0.5	ND	0.89	0.78	1.10	4.4	8.8	43	670	750
Cadmium	1.2	0.7	0.094 J	0.3	ND	0.35	0.62	0.37	2.5	2.5	2.5	3.7	4.4
Chromium	22.3	18.7	6.1	28.1	ND	**78.0**	13.6	17.4	30	30	110	1,700	2,000
Copper	**114.0**	**64.5**	9.6	20.4	ND	**63.7**	**54.6**	41.0	50	280	280	280	10,000
Lead	**1200**	**245**	60.6	10.6	ND	31.6	**386**	**90**	63	400	400	1,000	3,900
Manganese	313 B	482 B	108 B	**3450.0**	ND	**6080 B**	198 B	261 B	1,600	2,000	2,000	10,000	10,000
Mercury	**0.52 B**	**0.23 B**	**0.35 B**	0.04 B	ND	0.051 B	**0.28 B**	0.16 B	0.18	0.26	0.26	1.1	1.1
Nickel	25.8	**38.0**	6.1	13.9	ND	**49.4**	16.7	23.3	30	44	210	320	3,400
Selenium	3.0 J	ND	ND	1.5 J	ND	1.3 J	1.0 J	1.1 J	4	22	110	1,700	2,000
Silver	0.54 J	ND	ND	ND	ND	0.34 J	0.34 J	ND	2	22	110	1,700	2,000
Zinc	**353**	**146**	54.4	17.1	ND	22.7	**174**	91.4	109	1,300	6,600	10,000	10,000
SEMI-VOLATILE ORGANIC COMPOUNDS (SVOCs)													
Acenaphthene	0.61 J	ND	ND	ND	ND	0.38	0.11 J	ND	20	100	100	500	1,000
Acenaphthylene	ND	ND	ND	ND	ND	ND	0.036 J	ND	100	100	100	500	1,000
Anthracene	1.2 J	1.3 J	ND	ND	ND	0.84	0.37	ND	100	100	100	500	1,000
Benzo(a)anthracene	**2.9**	**7.5**	ND	ND	ND	**1.4**	**1.3**	0.086 J	1	1	1.4	37	37
Benzo(a)pyrene	**3.2**	**7.1**	0.38 J	0.032 J	ND	**1.2**	**1.3**	0.13 J	1	1	1	3.7	3.7
Benzo(b)fluoranthene	**3.3**	**9.9**	0.47 J	0.04 J	ND	**1.2**	**1.3**	0.17 J	1	1	1.4	37	37
Benzo(g,h,i)perylene	**5.4**	**4.2**	0.31 J	0.038 J	ND	**0.83**	**0.85**	0.15 J	0.64	1.2	4.9	47	78
Benzo(k)fluoranthene	**1.4 J**	**4.3**	0.16 J	ND	ND	0.64	0.72	0.071 J	0.8	1.2	4.9	47	78
Chrysene	**3.1**	**9.1**	0.30 J	ND	ND	**1.3**	**1.4**	0.13 J	1	1.2	4.9	47	78
Dibenz(a,h)anthracene	**1.5 J**	**2.2**	ND	ND	ND	0.24	0.27	0.047 J	0.33	0.33	0.33	3.7	3.7
Dibenzofuran	0.33 J	ND	ND	ND	ND	0.22	0.074 J	ND	2.1	4.2	18	180	290
Fluoranthene	7.0	11	0.49 J	0.029 J	ND	2.9	2.2	0.14 J	85	100	100	500	1,000
Fluorene	0.55 J	0.37 J	ND	ND	ND	0.39	0.11 J	ND	30	100	100	500	1,000
Indeno(1,2,3-cd)pyrene	**2.40**	**4.4**	0.27 J	0.034 J	ND	**0.74**	**0.8**	0.11 J	0.5	0.5	1.4	37	37
Naphthalene	ND	ND	ND	ND	ND	0.13 J	0.071 J	ND	12	84	100	500	1,000
Phenanthrene	**6.0**	**4.5**	0.27 J	0.036 J	ND	**3.1**	**1.6**	0.11 J	1.1	1.2	4.9	47	78
Pyrene	6.0	8.2	0.46 J	0.037 J	ND	3.1	2.3	0.17 J	64	100	100	500	1,000

ND Analyte not detected
\- Not Applicable or sample not tested for this analyte
J Estimated Concentration
B Anaalyte detected in method blank
K Result is reported as Benzo(b)fluoranthene
E Results exceeded calibration range
T Result is Tentatively Identifies Compound and an estimated value

Analyte detected
Reported concentration greater than or equal to the NYSDEC Unrestricted SCO
Reported concentration greater than or equal to the NYSDEC Residential SCO
Reported concentration greater than or equal to the NYSDEC Restricted Residential SCO
Reported concentration greater than or equal to the NYSDEC Commercial SCO
Reported concentration greater than or equal to the NYSDEC Industrial SCO

TABLE 5
SUMMARY OF SOIL ANALYTICAL RESULTS
FEBRUARY 2023 PHASE II ESA

Parameter Tested	BE3 Phase II Report January 2023 - Sample Identification, Sample Depth in feet below ground surface (bgs), and Sample Date								NYSDEC Soil Cleanup Objectives (SCOs)				
	BH8 0-3	BH9 0-3	BH10 0-2	BH11 0-2	BH12 0-2	BH13 0-2	BH14 1-2	BH15 1-2	Unrestricted	Residential	Restricted Residential	Commerical	Industrial
	1/13/2023												
METALS/INORGANICS													
Arsenic	4.2	10.7	12.5	10.0	9.4	**15.1**	8.3	**16.9**	13	16	16	16	16
Barium	90.7	155	180.0	194	203	**633**	89.7	131	410	410	410	410	10,000
Beryllium	0.85	0.8	0.92	0.74	0.50	0.89	0.80	0.95	4.4	8.8	43	670	750
Cadmium	0.17 J	0	0.460	0.95	0.63	0.7	0.23 J	0.40	2.5	2.5	2.5	3.7	4.4
Chromium	6.5	26.8	26.6	**33.1**	16.5	28.2	11.0	12.9	30	30	110	1,700	2,000
Copper	31.8	32.1	33.2	58.6	30.9	70.8	49.0	84.5	50	280	280	280	10,000
Lead	47.9	**104.0**	**281.0**	**393.0**	**447**	**1120**	**70.6**	**192**	63	400	400	1,000	3,900
Manganese	290 B	302 B	375 B	320 B	365 B	762 B	288 B	336 B	1,600	2,000	2,000	10,000	10,000
Mercury	0.035 B	0.15 B	0.15 B	**0.32 B**	**1.0 B**	**6.7 B**	**0.44 B**	**0.27 B**	0.18	0.26	0.26	1.1	1.1
Nickel	8.4	**33.7**	**31.6**	**44.6**	15.6	**30.1**	20.7	24.6	30	44	210	320	3,400
Selenium	ND	0.65 J	ND	ND	ND	1.1 J	ND	1.4 J	4	22	110	1,700	2,000
Zinc	39.8	**105.0**	**176.0**	**261**	**284**	**438**	93.1	99	109	1,300	6,600	10,000	10,000
SEMI-VOLATILE ORGANIC COMPOUNDS (SVOCs)													
Acenaphthene	ND	ND	0.049 J	ND	0.42	ND	ND	ND	20	100	100	500	1,000
Acenaphthylene	ND	ND	ND	ND	ND	ND	0.13 J	0.028 J	100	100	100	500	1,000
Anthracene	ND	ND	0.19 J	ND	0.9	ND	ND	ND	100	100	100	500	1,000
Benzo(a)anthracene	ND	ND	0.39	ND	**1.5**	0.093 J	0.44 J	0.28	1	1	1.4	37	37
Benzo(a)pyrene	ND	0.18 J	0.38	ND	**1.2**	0.13 J	0.57 J	0.27	1	1	1	3.7	3.7
Benzo(b)fluoranthene	ND	0.21 J	0.42	ND	**1.1**	0.15 J	0.83 J	0.34	1	1	1.4	37	37
Benzo(g,h,i)perylene	ND	ND	0.26	ND	**0.740**	0.095 J	0.38 J	0.16 J	0.64	1.2	4.9	47	78
Benzo(k)fluoranthene	ND	0.14 J	0.2 J	ND	0.63	0.061 J	0.29 J	0.16 J	0.8	1.2	4.9	47	78
Chrysene	ND	ND	0.43	ND	**1.5**	0.14 J	0.52 J	0.3	1	1.2	4.9	47	78
Dibenz(a,h)anthracene	ND	ND	0.084 J	ND	0.18 J	ND	ND	0.051 J	0.33	0.33	0.33	3.7	3.7
Dibenzofuran	ND	ND	0.051 J	ND	0.16 J	ND	ND	0.03 J	2.1	4.2	18	180	290
Fluoranthene	3.5 J	0.39 J	0.8	6.3 J	2.9	0.250	0.61 J	0.31	85	100	100	500	1,000
Fluorene	ND	ND	0.064 J	ND	0.340	ND	ND	ND	30	100	100	500	1,000
Indeno(1,2,3-cd)pyrene	ND	0.13 J	0.25	ND	**0.69**	0.095 J	0.37 J	0.16 J	0.5	0.5	1.4	37	37
Naphthalene	ND	ND	0.039 J	ND	ND	ND	ND	0.041 J	12	84	100	500	1,000
Phenanthrene	ND	0.25 J	0.77	**5.8 J**	**3.6**	0.19 J	0.2 J	0.23	1.1	1.2	4.9	47	78
Pyrene	3.2 J	0.35 J	0.83	5.0 J	3.6	0.260	0.51 J	0.35	64	100	100	500	1,000

Notes: All units in parts per million (ppm)

ND Analyte not detected
- Not Applicable or sample not tested for this analyte
J Estimated Concentration
B Anaalyte detected in method blank
K Result is reported as Benzo(b)fluoranthene
E Results exceeded calibration range
T Result is Tentatively Identifies Compound and an estimated value

Analyte detected
Reported concentration greater than or equal to the NYSDEC Unrestricted SCO
Reported concentration greater than or equal to the NYSDEC Residential SCO
Reported concentration greater than or equal to the NYSDEC Restricted Residential SCO
Reported concentration greater than or equal to the NYSDEC Commercial SCO
Reported concentration greater than or equal to the NYSDEC Industrial SCO

TABLE 5
SUMMARY OF SOIL ANALYTICAL RESULTS
FEBRUARY 2023 PHASE II ESA

Parameter Tested	BE3 Phase II Report January 2023 - Sample Identification, Sample Depth in feet below ground surface (bgs), and Sample Date				NYSDEC Soil Cleanup Objectives (SCOs)				
	BH-16 0-4	BH-17 0-4							
	1/13/2023				Unrestricted	Residential	Restricted Residential	Commerical	Industrial
METALS/INORGANICS									
Arsenic	62.2	11.5			13	16	16	16	16
Barium	603	161			410	410	410	410	10,000
Beryllium	0.6	1.20			4.4	8.8	43	670	750
Cadmium	1.6	0.45			2.5	2.5	2.5	3.7	4.4
Chromium	145.0	51.9			30	30	110	1,700	2,000
Copper	114.0	37.1			50	280	280	280	10,000
Lead	714	12			63	400	400	1,000	3,900
Manganese	1910 B	9770 B			1,600	2,000	2,000	10,000	10,000
Mercury	0.30 B	0.008 J B			0.18	0.26	0.26	1.1	1.1
Nickel	44.1	22.9			30	44	210	320	3,400
Selenium	3.9 J	3.5 J			4	22	110	1,700	2,000
Zinc	376	41.7			109	1,300	6,600	10,000	10,000
SEMI-VOLATILE ORGANIC COMPOUNDS (SVOCs)									
Acenaphthene	ND	ND			20	100	100	500	1,000
Acenaphthylene	ND	ND			100	100	100	500	1,000
Anthracene	ND	ND			100	100	100	500	1,000
Benzo(a)anthracene	2.3 J	ND			1	1	1.4	37	37
Benzo(a)pyrene	3.1 J	ND			1	1	1	3.7	3.7
Benzo(b)fluoranthene	ND	ND			1	1	1.4	37	37
Benzo(g,h,i)perylene	ND	ND			0.64	1.2	4.9	47	78
Benzo(k)fluoranthene	ND	ND			0.8	1.2	4.9	47	78
Chrysene	ND	ND			1	1.2	4.9	47	78
Dibenz(a,h)anthracene	ND	ND			0.33	0.33	0.33	3.7	3.7
Dibenzofuran	ND	ND			2.1	4.2	18	180	290
Fluoranthene	6.0 J	0.027 J			85	100	100	500	1,000
Fluorene	ND	ND			30	100	100	500	1,000
Indeno(1,2,3-cd)pyrene	ND	ND			0.5	0.5	1.4	37	37
Naphthalene	ND	ND			12	84	100	500	1,000
Phenanthrene	4.8 J	ND			1.1	1.2	4.9	47	78
Pyrene	4.5 J	0.027 J			64	100	100	500	1,000

Notes: All units in parts per million (ppm)

ND Analyte not detected

\- Not Applicable or sample not tested for this analyte

J Estimated Concentration

B Analyte detected in method blank

K Result is reported as Benzo(b)fluoranthene

E Results exceeded calibration range

Analyte detected

Reported concentration greater than or equal to the NYSDEC Unrestricted SCO

Reported concentration greater than or equal to the NYSDEC Residential SCO

Reported concentration greater than or equal to the NYSDEC Restricted Residential SCO

Reported concentration greater than or equal to the NYSDEC Commercial SCO

Reported concentration greater than or equal to the NYSDEC Industrial SCO

TABLE 6

BORING-MONITORING WELL-VAPOR GPS COORDINATES

Sample Identification	Coordinates-North American Datum 1983	
	Latitude	Longitude
Borings		
RI-BH-1	42.48566	-79.33304
RI-BH-2	42.485722	-79.333383
RI-BH-3	42.485869	-79.333167
RI-BH-4	42.485936	-79.333192
RI-BH-5	42.485994	-79.332969
RI-BH-6	42.485906	-79.333086
RI-BH-7	42.485744	-79.333172
RI-BH-8	42.48565	-79.332753
RI-BH-9	42.485825	-79.332836
RI-BH-10	42.486067	-79.33275
RI-BH-11	42.485931	-79.332597
RI-BH-12	42.485675	-79.332247
RI-BH-13	42.485786	-79.332297
RI-BH-14	42.485956	-79.332456
RI-BH-15	42.486175	-79.332403
RI-BH-16	42.486017	-79.3322
Surface Samples		
SS-1	42.486108	-79.332992
SS-2	42.485986	-79.333014
SS-3	42.485931	-79.332742
SS-4	42.48575	-79.332167
SS-5	42.486189	-79.332561
SS-6	42.485794	-79.332928
SS-7	42.485767	-79.332528
SS-8	42.486028	-79.332258
Step-Out Samples		
STP-1	42.486108	-79.332992
STP-2	42.485931	-79.332742
STP-3	42.48575	-79.332167
STP-4	42.486189	-79.332561
Overburden Wells		
RI-MW-1	42.485592	-79.333025
RI-MW-2	42.485972	-79.333314
RI-MW-3	42.486156	-79.332794
RI-MW-4	42.486253	-79.332231
RI-MW-5	42.485753	-79.332147

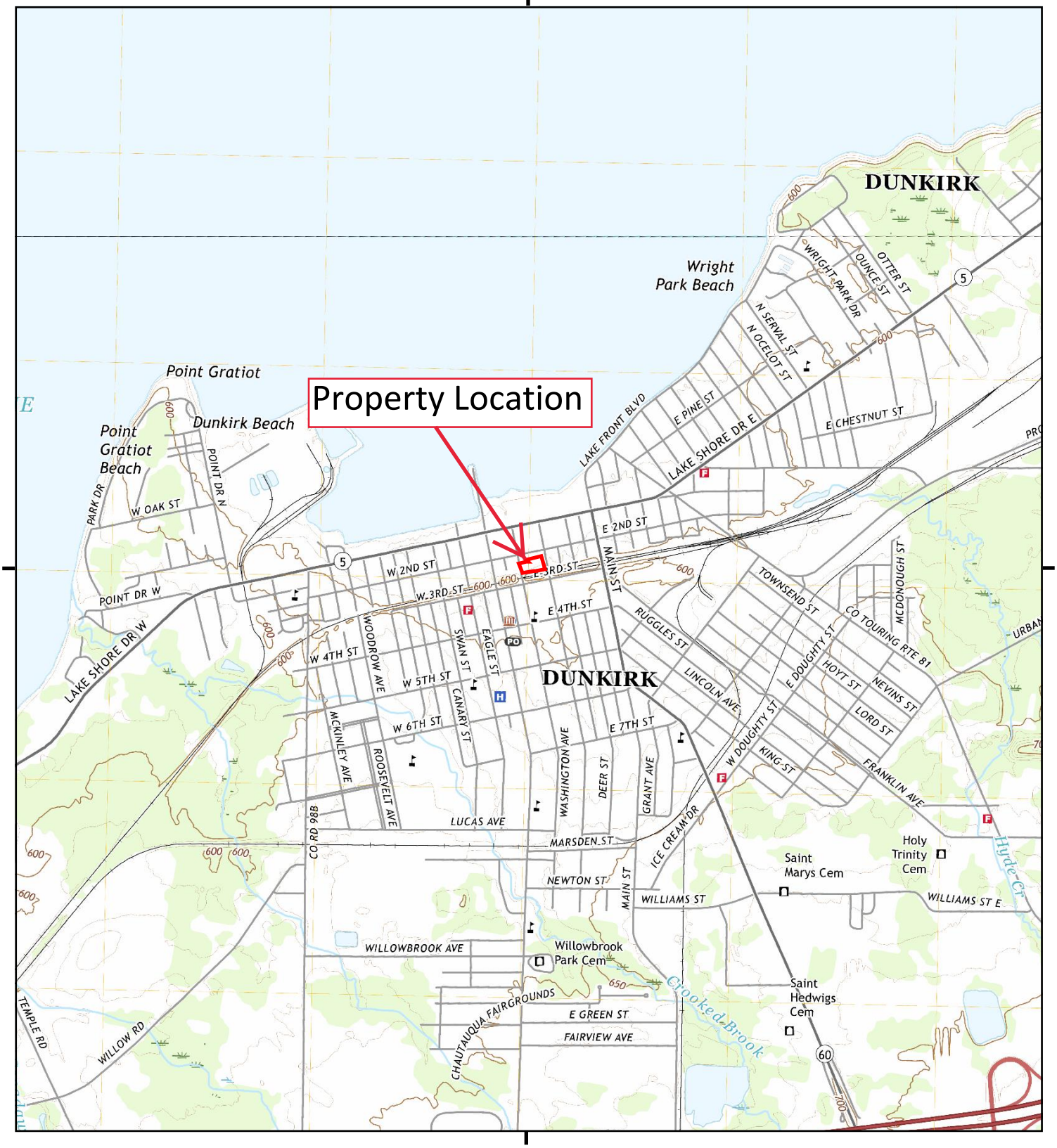
Bedrock Wells		
RI-BW-1	42.486206	-79.332242
RI-BW-2	42.485753	-79.332211
RI-BW-3	42.485981	-79.333261
Vapor Pobes		
RI-VP-1	42.485669	-79.332419
RI-VP-2	42.485981	-79.333264
RI-VP-3	42.485642	-79.332744
RI-VP-4	42.485814	-79.332853
RI-VP-5	42.485797	-79.332281
RI-VP-6	42.486106	-79.332303
RI-VP-7	42.486147	-79.332717
RI-VP-8	42.485647	-79.333308

TABLE 7
GROUNDWATER ELEVATIONS

Well ID	Top of Casing (Feet)	Depth to Water (Feet BTOC)	GW Elevation (ASL)	Total Depth of Wells
9/3/2025				
RI-MW-2	95.36	8.42	86.94	82.51
RI-BW-1	98.35	11.85	86.5	77.25
RI-BW-2	100.7	17.59	83.11	79.02
RI-BW-3	85.55	11.32	74.23	71.67
9/12/2025				
RI-MW-2	95.36	8.6	86.76	82.51
RI-BW-1	98.35	11.92	86.43	77.25
RI-BW-2	100.7	17.6	83.1	79.02
RI-BW-3	95.55	11.49	84.06	71.67

Notes:
1. Values are provided in feet
2 Elevation values are based on site specific survey

Figures



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Dunkirk, 2019, 7.5-minute
N, North of Dunkirk, 2019, 7.5-minute

FIGURE 1
Site Location Map
Block of Washington, E.2nd & Park

N

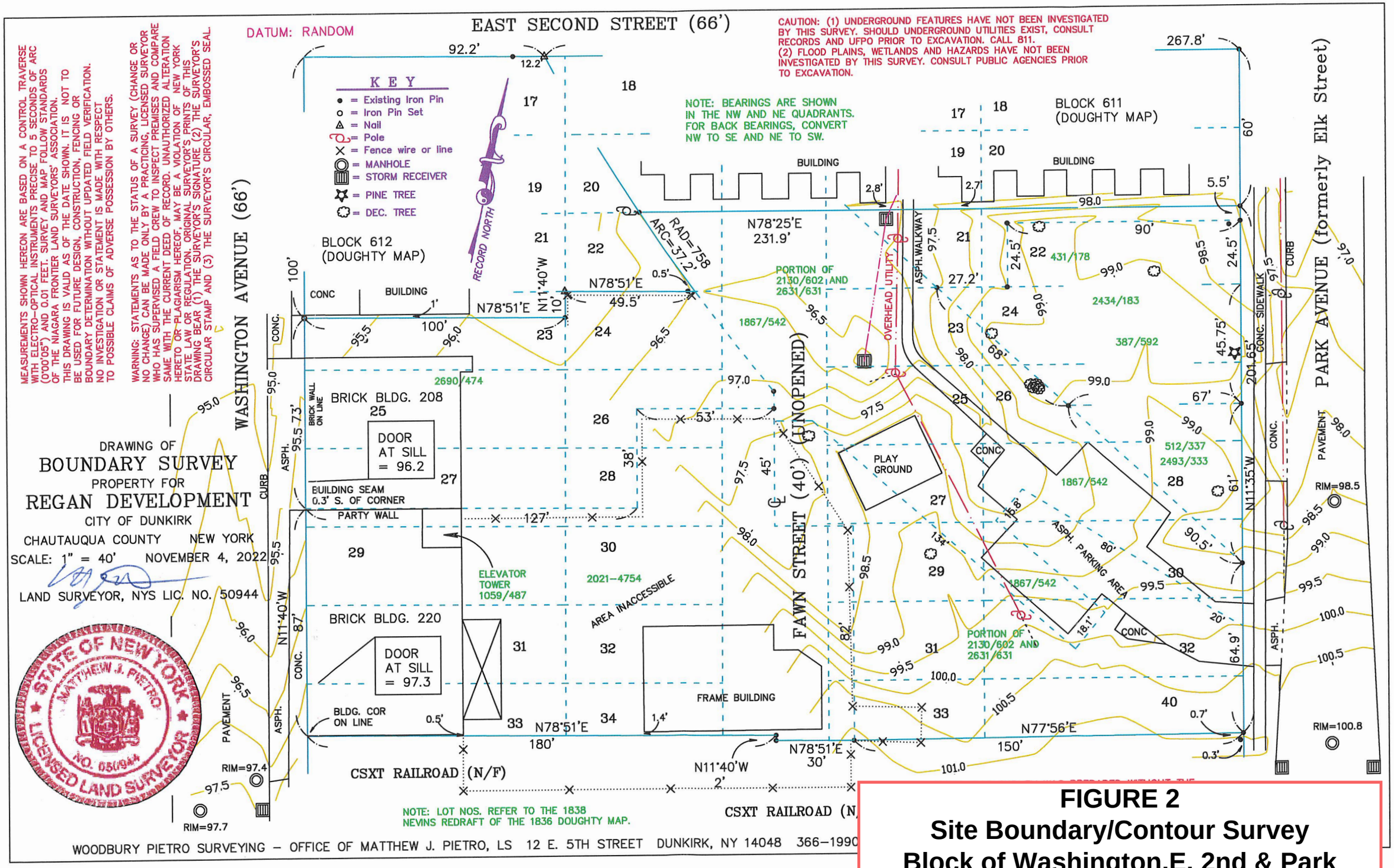
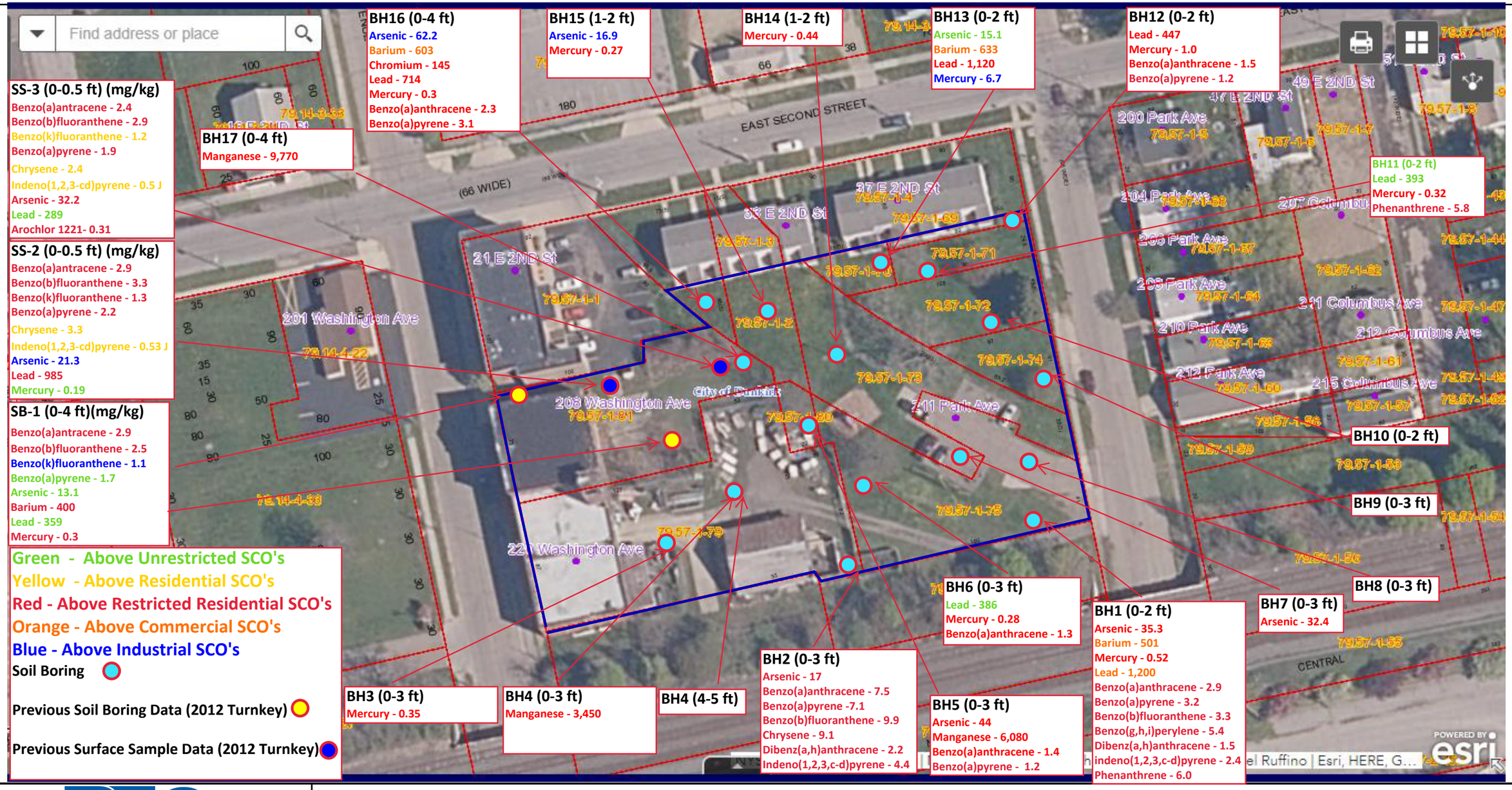
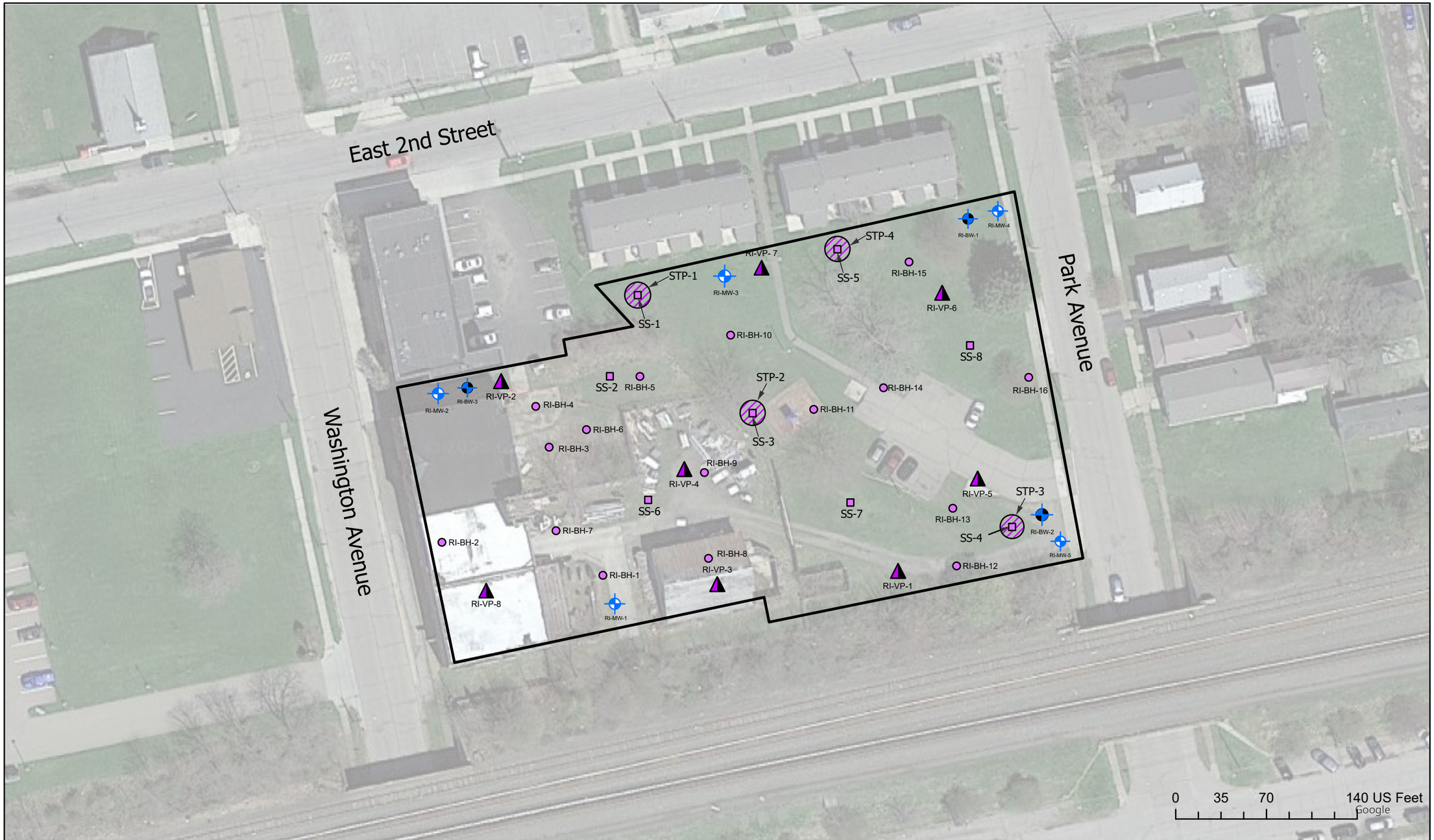


FIGURE 2
Site Boundary/Contour Survey
Block of Washington.E. 2nd & Park



BRYDGES ENGINEERING IN ENVIRONMENT AND ENERGY, DPC	Boring Locations	
	Dunkirk	1/13/2023
	New York	Regan Development - Dunkirk

FIGURE 3 - Phase 2 ESA - Block of Washington,E. 2nd & Park-Boring Soil Sample Locations & Analytical Results



LEGEND

- Property Boundary
- MW-1 — RI Monitoring Well
- RI-BH-1 — RI Boring Locations
- VP-1 — Vapor Point
- STP-1 — Step Out Sample
- SS-2 — Surface Sample
- RI-BW-1 — RI Bedrock Well

BE3
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CLIENT: REGAN DEVELOPMENT

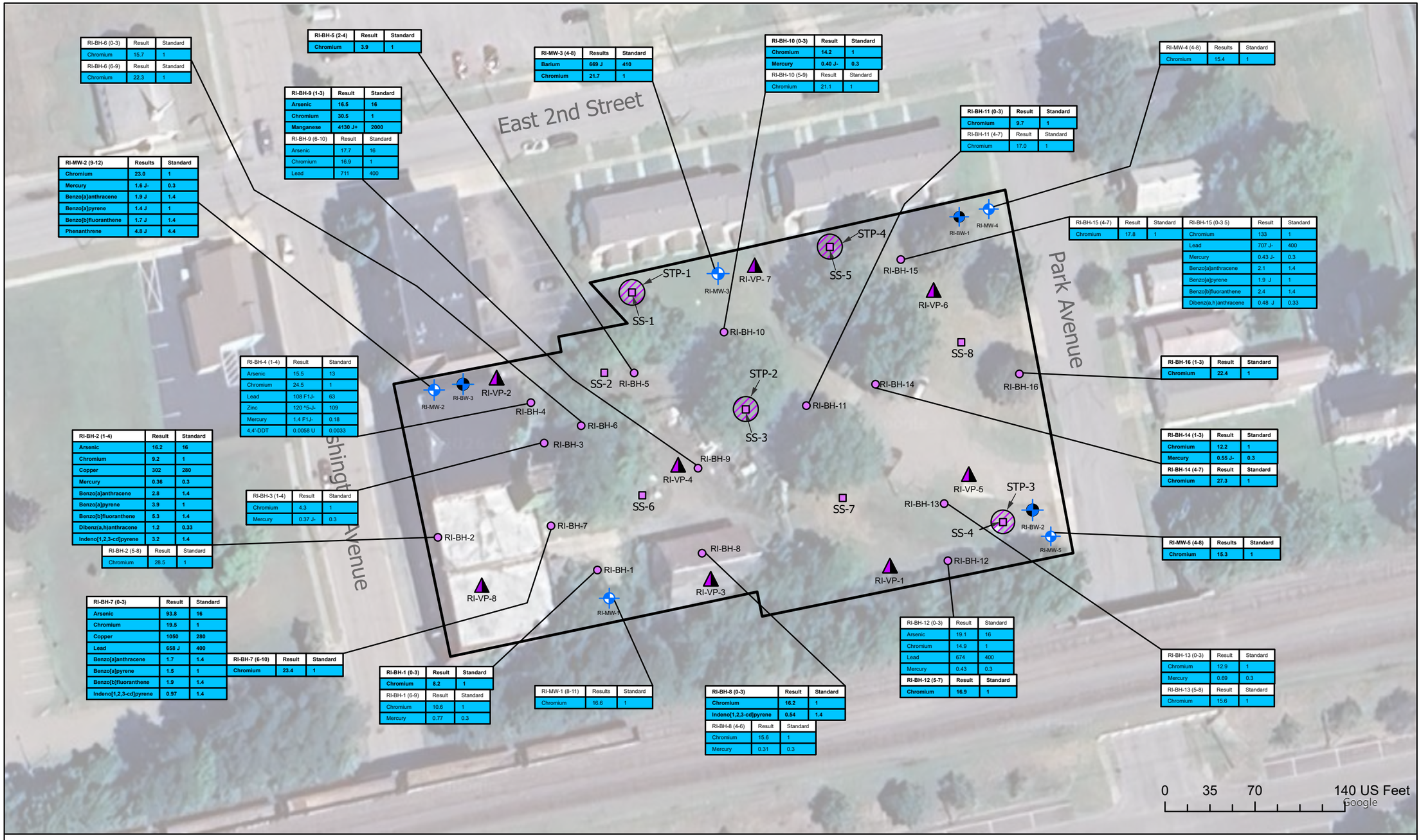
FIGURE 4
RI Sampling Locations

Block of Washington, East 2nd and Park
Dunkirk, NY 14048

N
W E
S

DATE ISSUED:
July 31, 2025

SCALE: 1:910



RI-BH-6 (0-3)	Result	Standard
Chromium	15.7	1
RI-BH-6 (6-9)	Result	Standard
Chromium	22.3	1

RI-BH-5 (2-4)	Result	Standard
Chromium	**3.9**	**1**

RI-MW-3 (4-8)	Results	Standard
Barium	**669 J**	**410**
Chromium	**21.7**	**1**

RI-BH-10 (0-3)	Result	Standard
Chromium	**14.2**	**1**
Mercury	**0.40 J-**	**0.3**
RI-BH-10 (5-9)	Result	Standard
Chromium	21.1	1

RI-MW-4 (4-8)	Results	Standard
Chromium	15.4	1

RI-BH-9 (1-3)	Result	Standard
Arsenic	**16.5**	**16**
Chromium	**30.5**	**1**
Manganese	**4130 J+**	**2000**
RI-BH-9 (6-10)	Result	Standard
Arsenic	17.7	16
Chromium	16.9	1
Lead	711	400

RI-BH-11 (0-3)	Result	Standard
Chromium	**9.7**	**1**
RI-BH-11 (4-7)	Result	Standard
Chromium	17.0	1

RI-MW-2 (9-12)	Results	Standard
Chromium	**23.0**	**1**
Mercury	**1.6 J-**	**0.3**
Benzo[a]anthracene	**1.9 J**	**1.4**
Benzo[a]pyrene	**1.4 J**	**1**
Benzo[b]fluoranthene	**1.7 J**	**1.4**
Phenanthrene	**4.8 J**	**4.4**

RI-BH-15 (4-7)	Result	Standard
Chromium	17.8	1

RI-BH-15 (0-3 5)	Result	Standard
Chromium	133	1
Lead	707 J-	400
Mercury	0.43 J-	0.3
Benzo[a]anthracene	2.1	1.4
Benzo[a]pyrene	1.9 J	1
Benzo[b]fluoranthene	2.4	1.4
Dibenz(a,h)anthracene	0.48 J	0.33

RI-BH-4 (1-4)	Result	Standard
Arsenic	15.5	13
Chromium	24.5	1
Lead	108 F1J-	63
Zinc	120 *5-J-	109
Mercury	1.4 F1J-	0.18
4,4'-DDT	0.0058 U	0.0033

RI-BH-16 (1-3)	Result	Standard
Chromium	**22.4**	**1**

RI-BH-2 (1-4)	Result	Standard
Arsenic	**16.2**	**16**
Chromium	**9.2**	**1**
Copper	**302**	**280**
Mercury	**0.36**	**0.3**
Benzo[a]anthracene	**2.8**	**1.4**
Benzo[a]pyrene	**3.9**	**1**
Benzo[b]fluoranthene	**5.3**	**1.4**
Dibenz(a,h)anthracene	**1.2**	**0.33**
Indeno[1,2,3-cd]pyrene	**3.2**	**1.4**

RI-BH-2 (5-8)	Result	Standard
Chromium	28.5	1

RI-BH-3 (1-4)	Result	Standard
Chromium	4.3	1
Mercury	0.37 J-	0.3

RI-BH-14 (1-3)	Result	Standard
Chromium	**12.2**	**1**
Mercury	**0.55 J-**	**0.3**
RI-BH-14 (4-7)	Result	Standard
Chromium	**27.3**	**1**

RI-MW-5 (4-8)	Results	Standard
Chromium	**15.3**	**1**

RI-BH-7 (0-3)	Result	Standard
Arsenic	**93.8**	**16**
Chromium	**19.5**	**1**
Copper	**1050**	**280**
Lead	**658 J**	**400**
Benzo[a]anthracene	**1.7**	**1.4**
Benzo[a]pyrene	**1.5**	**1**
Benzo[b]fluoranthene	**1.9**	**1.4**
Indeno[1,2,3-cd]pyrene	**0.97**	**1.4**

RI-BH-7 (6-10)	Result	Standard
Chromium	**23.4**	**1**

RI-BH-1 (0-3)	Result	Standard
Chromium	**8.2**	**1**
RI-BH-1 (6-9)	Result	Standard
Chromium	10.6	1
Mercury	0.77	0.3

RI-MW-1 (8-11)	Results	Standard
Chromium	16.6	1

RI-BH-8 (0-3)	Result	Standard
Chromium	**16.2**	**1**
Indeno[1,2,3-cd]pyrene	**0.54**	**1.4**
RI-BH-8 (4-6)	Result	Standard
Chromium	15.6	1
Mercury	0.31	0.3

RI-BH-12 (0-3)	Result	Standard
Arsenic	19.1	16
Chromium	14.9	1
Lead	674	400
Mercury	0.43	0.3
RI-BH-12 (5-7)	**Result**	**Standard**
Chromium	**16.9**	**1**

RI-BH-13 (0-3)	Result	Standard
Chromium	12.9	1
Mercury	0.69	0.3
RI-BH-13 (5-8)	Result	Standard
Chromium	15.6	1

LEGEND

- Property Boundary
- RI Monitoring Well (MW-1)
- RI Boring Locations (RI-BH-1)
- Vapor Point (VP-1)
- Step Out Sample (STP-1)
- Surface Sample (SS-2)
- RI Bedrock Well (RI-BW-1)

NOTES

1. All values are provided in parts per million (ppm).
2. Standard references restricted residential SCOs.

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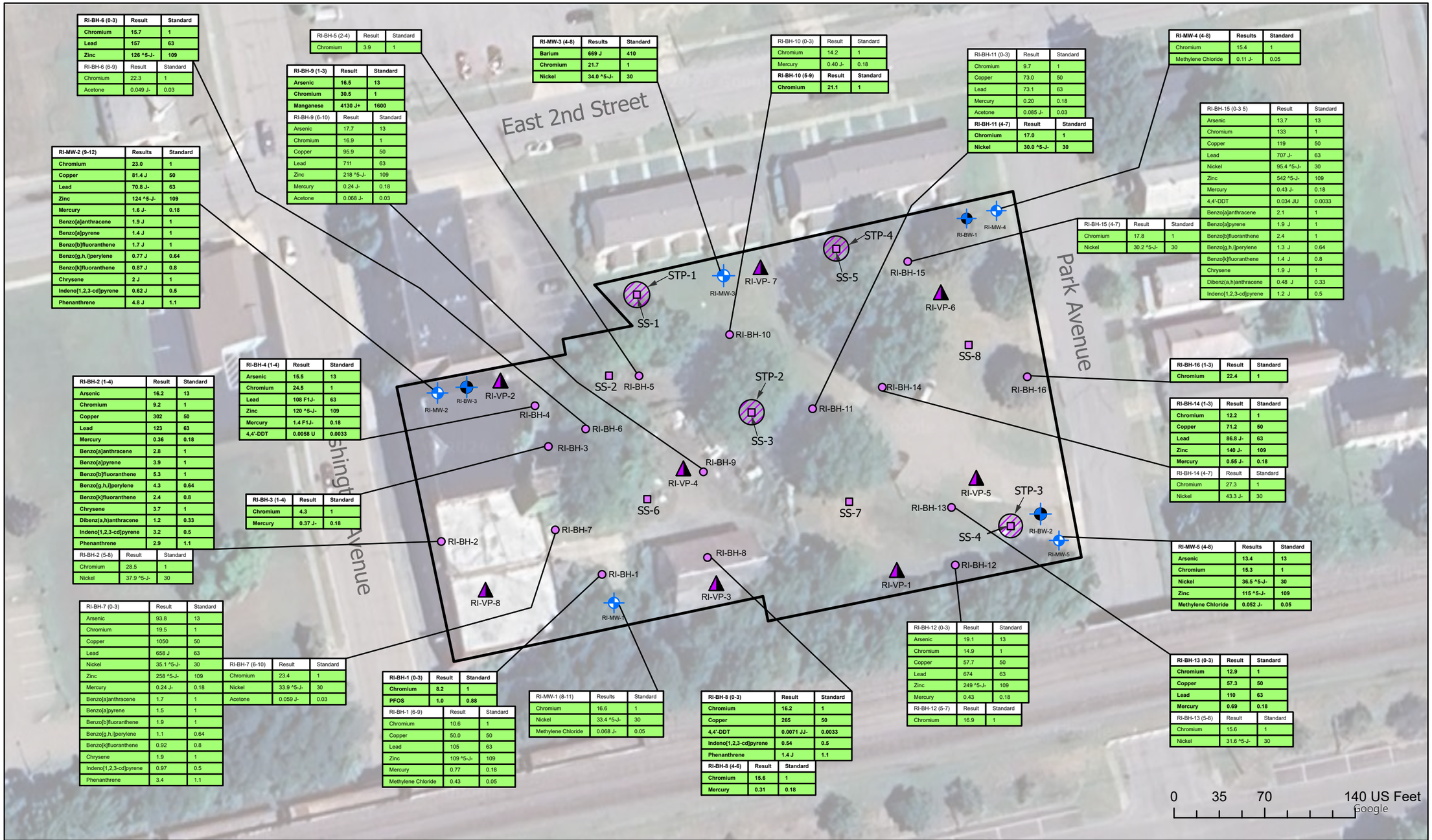
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FIGURE 5
RI Restricted Residential Exceedances
Boring Soil Samples
Block of Washington, East 2nd and Park
Dunkirk, NY 14048

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RI-BH-6 (0-3)	Result	Standard
Chromium	15.7	1
Lead	157	63
Zinc	126 ^5-J-	109
RI-BH-6 (6-9)	Result	Standard
Chromium	22.3	1
Acetone	0.049 J-	0.03

RI-BH-5 (2-4)	Result	Standard
Chromium	3.9	1

RI-BH-9 (1-3)	Result	Standard
Arsenic	16.5	13
Chromium	30.5	1
Manganese	4130 J+	1600
RI-BH-9 (6-10)	Result	Standard
Arsenic	17.7	13
Chromium	16.9	1
Copper	95.9	50
Lead	711	63
Zinc	218 ^5-J-	109
Mercury	0.24 J-	0.18
Acetone	0.068 J-	0.03

RI-MW-3 (4-8)	Results	Standard
Barium	669 J	410
Chromium	21.7	1
Nickel	34.0 ^5-J-	30

RI-BH-10 (0-3)	Result	Standard
Chromium	14.2	1
Mercury	0.40 J-	0.18
RI-BH-10 (5-9)	Result	Standard
Chromium	21.1	1

RI-BH-11 (0-3)	Result	Standard
Chromium	9.7	1
Copper	73.0	50
Lead	73.1	63
Mercury	0.20	0.18
Acetone	0.085 J-	0.03
RI-BH-11 (4-7)	Result	Standard
Chromium	17.0	1
Nickel	30.0 ^5-J-	30

RI-MW-4 (4-8)	Results	Standard
Chromium	15.4	1
Methylene Chloride	0.11 J-	0.05

RI-BH-15 (0-3 5)	Result	Standard
Arsenic	13.7	13
Chromium	133	1
Copper	119	50
Lead	707 J-	63
Nickel	95.4 ^5-J-	30
Zinc	542 ^5-J-	109
Mercury	0.43 J-	0.18
4,4'-DDT	0.034 JU	0.0033
Benzo[a]anthracene	2.1	1
Benzo[a]pyrene	1.9 J	1
Benzo[b]fluoranthene	2.4	1
Benzo[g,h,i]perylene	1.3 J	0.64
Benzo[k]fluoranthene	1.4 J	0.8
Chrysene	1.9 J	1
Dibenz[a,h]anthracene	0.48 J	0.33
Indeno[1,2,3-cd]pyrene	1.2 J	0.5

RI-BH-15 (4-7)	Result	Standard
Chromium	17.8	1
Nickel	30.2 ^5-J-	30

RI-MW-2 (9-12)	Results	Standard
Chromium	23.0	1
Copper	81.4 J	50
Lead	70.8 J-	63
Zinc	124 ^5-J-	109
Mercury	1.6 J-	0.18
Benzo[a]anthracene	1.9 J	1
Benzo[a]pyrene	1.4 J	1
Benzo[b]fluoranthene	1.7 J	1
Benzo[g,h,i]perylene	0.77 J	0.64
Benzo[k]fluoranthene	0.87 J	0.8
Chrysene	2 J	1
Indeno[1,2,3-cd]pyrene	0.62 J	0.5
Phenanthrene	4.8 J	1.1

RI-BH-4 (1-4)	Result	Standard
Arsenic	15.5	13
Chromium	24.5	1
Lead	108 F1J-	63
Zinc	120 ^5-J-	109
Mercury	1.4 F1J-	0.18
4,4'-DDT	0.0058 U	0.0033

RI-BH-2 (1-4)	Result	Standard
Arsenic	16.2	13
Chromium	9.2	1
Copper	302	50
Lead	123	63
Mercury	0.36	0.18
Benzo[a]anthracene	2.8	1
Benzo[a]pyrene	3.9	1
Benzo[b]fluoranthene	5.3	1
Benzo[g,h,i]perylene	4.3	0.64
Benzo[k]fluoranthene	2.4	0.8
Chrysene	3.7	1
Dibenz(a,h)anthracene	1.2	0.33
Indeno[1,2,3-cd]pyrene	3.2	0.5
Phenanthrene	2.9	1.1
RI-BH-2 (5-8)	Result	Standard
Chromium	28.5	1
Nickel	37.9 ^5-J-	30

RI-BH-3 (1-4)	Result	Standard
Chromium	4.3	1
Mercury	0.37 J-	0.18

RI-BH-7 (0-3)	Result	Standard
Arsenic	93.8	13
Chromium	19.5	1
Copper	1050	50
Lead	658 J	63
Nickel	35.1 ^5-J-	30
Zinc	258 ^5-J-	109
Mercury	0.24 J-	0.18
Benzo[a]anthracene	1.7	1
Benzo[a]pyrene	1.5	1
Benzo[b]fluoranthene	1.9	1
Benzo[g,h,i]perylene	1.1	0.64
Benzo[k]fluoranthene	0.92	0.8
Chrysene	1.9	1
Indeno[1,2,3-cd]pyrene	0.97	0.5
Phenanthrene	3.4	1.1
RI-BH-7 (6-10)	Result	Standard
Chromium	23.4	1
Nickel	33.9 ^5-J-	30
Acetone	0.059 J-	0.03

RI-BH-1 (0-3)	Result	Standard
Chromium	8.2	1
PFOS	1.0	0.88
RI-BH-1 (6-9)	Result	Standard
Chromium	10.6	1
Copper	50.0	50
Lead	105	63
Zinc	109 ^5-J-	109
Mercury	0.77	0.18
Methylene Chloride	0.43	0.05

RI-MW-1 (8-11)	Results	Standard
Chromium	16.6	1
Nickel	33.4 ^5-J-	30
Methylene Chloride	0.068 J-	0.05

RI-BH-8 (0-3)	Result	Standard
Chromium	16.2	1
Copper	265	50
4,4'-DDT	0.0071 JJ-	0.0033
Indeno[1,2,3-cd]pyrene	0.54	0.5
Phenanthrene	1.4 J	1.1
RI-BH-8 (4-6)	Result	Standard
Chromium	15.6	1
Mercury	0.31	0.18

RI-BH-12 (0-3)	Result	Standard
Arsenic	19.1	13
Chromium	14.9	1
Copper	57.7	50
Lead	674	63
Zinc	249 ^5-J-	109
Mercury	0.43	0.18
RI-BH-12 (5-7)	Result	Standard
Chromium	16.9	1

RI-BH-16 (1-3)	Result	Standard
Chromium	22.4	1

RI-BH-14 (1-3)	Result	Standard
Chromium	12.2	1
Copper	71.2	50
Lead	86.8 J-	63
Zinc	140 J-	109
Mercury	0.55 J-	0.18
RI-BH-14 (4-7)	Result	Standard
Chromium	27.3	1
Nickel	43.3 J-	30

RI-MW-5 (4-8)	Results	Standard
Arsenic	13.4	13
Chromium	15.3	1
Nickel	36.5 ^5-J-	30
Zinc	115 ^5-J-	109
Methylene Chloride	0.052 J-	0.05

RI-BH-13 (0-3)	Result	Standard
Chromium	12.9	1
Copper	57.3	50
Lead	110	63
Mercury	0.69	0.18
RI-BH-13 (5-8)	Result	Standard
Chromium	15.6	1
Nickel	31.6 ^5-J-	30

LEGEND

- Property Boundary
- MW-1 — RI Monitoring Well
- RI-BH-1 — RI Boring Locations
- VP-1 — Vapor Point
- STP-1 — Step Out Sample
- SS-2 — Surface Sample
- RI-BW-1 — RI Bedrock Well

NOTES

1. All values are provided in parts per million (ppm).
2. Standard references unrestricted SCOs.

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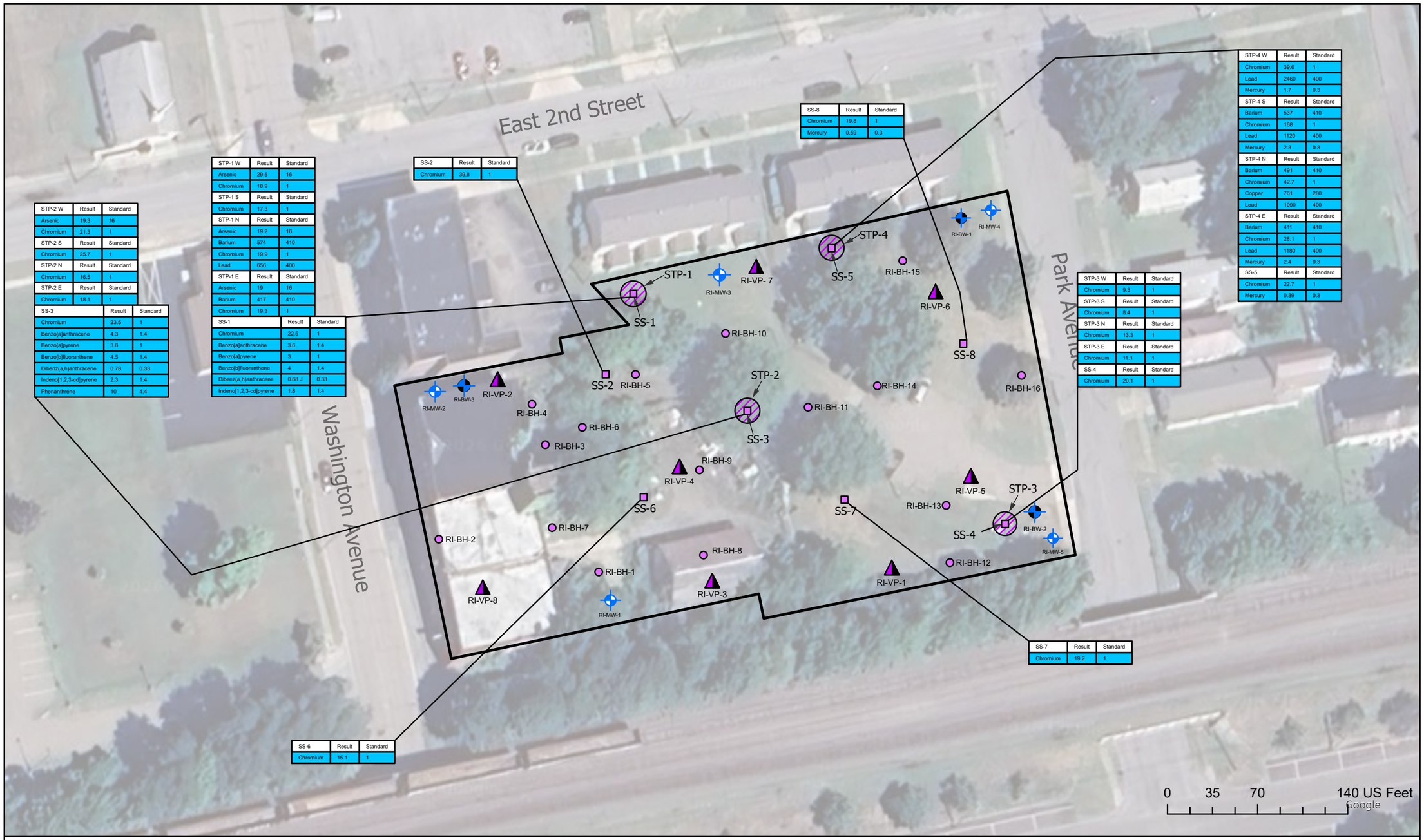
FIGURE 5A
RI Unrestricted Exceedances Boring Soil Samples

Block of Washington, East 2nd and Park
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STP-2 W	Result	Standard
Arsenic	19.3	16
Chromium	21.3	1
STP-2 S	Result	Standard
Chromium	25.7	1
STP-2 N	Result	Standard
Chromium	16.5	1
STP-2 E	Result	Standard
Chromium	18.1	1

SS-3	Result	Standard
Chromium	23.5	1
Benzo[a]anthracene	4.3	1.4
Benzo[a]pyrene	3.6	1
Benzo[b]fluoranthene	4.5	1.4
Dibenz(a,h)anthracene	0.78	0.33
Indeno[1,2,3-cd]pyrene	2.3	1.4
Phenanthrene	10	4.4

STP-1 W	Result	Standard
Arsenic	29.5	16
Chromium	18.9	1
STP-1 S	Result	Standard
Chromium	17.3	1
STP-1 N	Result	Standard
Arsenic	19.2	16
Barium	574	410
Chromium	19.9	1
Lead	656	400
STP-1 E	Result	Standard
Arsenic	19	16
Barium	417	410
Chromium	19.3	1

SS-1	Result	Standard
Chromium	22.5	1
Benzo[a]anthracene	3.6	1.4
Benzo[a]pyrene	3	1
Benzo[b]fluoranthene	4	1.4
Dibenz(a,h)anthracene	0.68 J	0.33
Indeno[1,2,3-cd]pyrene	1.8	1.4

SS-2	Result	Standard
Chromium	39.8	1

SS-8	Result	Standard
Chromium	19.8	1
Mercury	0.59	0.3

STP-3 W	Result	Standard
Chromium	9.3	1
STP-3 S	Result	Standard
Chromium	8.4	1
STP-3 N	Result	Standard
Chromium	13.3	1
STP-3 E	Result	Standard
Chromium	11.1	1
SS-4	Result	Standard
Chromium	20.1	1

STP-4 W	Result	Standard
Chromium	39.6	1
Lead	2460	400
Mercury	1.7	0.3
STP-4 S	Result	Standard
Barium	537	410
Chromium	168	1
Lead	1120	400
Mercury	2.3	0.3
STP-4 N	Result	Standard
Barium	491	410
Chromium	42.7	1
Copper	761	280
Lead	1090	400
STP-4 E	Result	Standard
Barium	411	410
Chromium	28.1	1
Lead	1180	400
Mercury	2.4	0.3
SS-5	Result	Standard
Chromium	22.7	1
Mercury	0.39	0.3

SS-6	Result	Standard
Chromium	15.1	1

SS-7	Result	Standard
Chromium	19.2	1

LEGEND

- Property Boundary
- MW-1 — RI Monitoring Well
- RI-BH-1 — RI Boring Locations
- VP-1 — Vapor Point
- STP-1 — Step Out Sample
- SS-2 — Surface Sample
- RI-BW-1 — RI Bedrock Well

NOTES

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2. Standard references restricted residential SCOs.

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FIGURE 6
RI Restricted Residential Exceedances Surface and Step-out Samples

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STP-2 W	Result	Standard
Arsenic	19.3	13
Chromium	21.3	1
Copper	202	50
Lead	267	63
Zinc	186 ^5-J-	109

STP-2 S	Result	Standard
Arsenic	14.2	13
Chromium	25.7	1
Lead	177	63
Nickel	39.7	30
Zinc	154 ^5-J-	109

STP-2 N	Result	Standard
Chromium	16.5	1
Copper	87.8	50
Lead	101	63
Zinc	159 ^5-J-	109

STP-2 E	Result	Standard
Chromium	18.1	1
Lead	154	63
Zinc	146 ^5-J-	109
Mercury	0.19	0.18

SS-3	Result	Standard
Arsenic	15.7	13
Chromium	23.5	1
Copper	52.3	50
Lead	96.4	63
Zinc	119 ^5-J-	109
Mercury	0.21	0.18
Benzo[a]anthracene	4.3	1
Benzo[a]pyrene	3.6	1
Benzo[b]fluoranthene	4.5	1
Benzo[g,h,i]perylene	2.8	0.64
Benzo[k]fluoranthene	2.4	0.8
Chrysene	4.1	1
Dibenz(a,h)anthracene	0.78	0.33
Indeno[1,2,3-cd]pyrene	2.3	0.5
Phenanthrene	10	1.1

STP-1 W	Result	Standard
Arsenic	29.5	13
Chromium	18.9	1
Lead	249	63

STP-1 S	Result	Standard
Chromium	17.3	1
Lead	131	63
Zinc	123 ^5-J-	109

STP-1 N	Result	Standard
Arsenic	19.2	13
Barium	574	410
Chromium	19.9	1
Copper	80.3	50
Lead	656	63
Zinc	731 ^5-J-	109

STP-1 E	Result	Standard
Arsenic	19	13
Barium	417	410
Chromium	19.3	1
Copper	82.8	50
Lead	399	63
Nickel	61.3	30
Zinc	435 ^5-J-	109
Mercury	0.18	0.18

SS-1	Result	Standard
Chromium	22.5	1
Lead	187	63
Zinc	142 ^5-J-	109
Benzo[a]anthracene	3.6	1
Benzo[a]pyrene	3	1
Benzo[b]fluoranthene	4	1
Benzo[g,h,i]perylene	2.1	0.64
Benzo[k]fluoranthene	2.8	0.8
Chrysene	3.4	1
Dibenz(a,h)anthracene	0.68 J	0.33
Indeno[1,2,3-cd]pyrene	1.8	0.5
Phenanthrene	3.4	1.1

SS-2	Result	Standard
Chromium	39.8	1
Copper	50.4	50
Lead	209	63
Manganese	1710	1600
Nickel	82.6	30
Zinc	175 ^5-J-	109
Benzo[b]fluoranthene	1.4	1
Benzo[g,h,i]perylene	0.68 J	0.64
Chrysene	1.2	1
Indeno[1,2,3-cd]pyrene	0.59 J	0.5
Phenanthrene	1.4	1.1

SS-8	Result	Standard
Arsenic	13.9	13
Chromium	19.8	1
Lead	353	63
Zinc	168 ^5-J-	109
Mercury	0.59	0.18
Phenanthrene	1.3	1.1

STP-3 W	Result	Standard
Chromium	9.3	1
Copper	69.9	50
Lead	95.9	63

STP-3 S	Result	Standard
Arsenic	15.8	13
Chromium	8.4	1
Copper	60.7	50

STP-3 N	Result	Standard
Chromium	13.3	1
Lead	140	63
Zinc	240 ^5-J-	109

STP-3 E	Result	Standard
Chromium	11.1	1
Copper	74	50
Lead	226	63
Mercury	0.18	0.18

SS-4	Result	Standard
Chromium	20.1	1
Copper	53.6	50
Lead	206	63
Zinc	177 ^5-J-	109
Mercury	0.21	0.18
Benzo[b]fluoranthene	1.3	1
Benzo[g,h,i]perylene	0.77 J	0.64
Chrysene	1.1	1
Indeno[1,2,3-cd]pyrene	0.63 J	0.5

STP-4 W	Result	Standard
Arsenic	13.2	13
Chromium	39.6	1
Copper	107	50
Lead	2460	63
Nickel	37.9	30
Zinc	652 ^5-J-	109
Mercury	1.7	0.18

STP-4 S	Result	Standard
Arsenic	13.7	13
Barium	537	410
Chromium	168	1
Copper	91.4	50
Lead	1120	63
Nickel	39.8	30
Zinc	686 ^5-J-	109
Mercury	2.3	0.18

STP-4 N	Result	Standard
Barium	491	410
Chromium	42.7	1
Copper	761	50
Lead	1090	63
Nickel	37.7	30
Zinc	1180 ^5-J-	109
Mercury	0.8	0.18

STP-4 E	Result	Standard
Barium	411	410
Chromium	28.1	1
Copper	56.6	50
Lead	1180	63
Zinc	595 ^5-J-	109
Mercury	2.4	0.18

SS-5	Result	Standard
Chromium	22.7	1
Lead	276	63
Zinc	285 ^5-J-	109
Mercury	0.39	0.18

SS-7	Result	Standard
Cadmium	2.7	2.5
Chromium	19.2	1
Lead	208	63
Zinc	178 ^5-J-	109
PFOS	0.89	0.88
Benzo[b]fluoranthene	1.1	1
Benzo[g,h,i]perylene	0.7 J	0.64
Indeno[1,2,3-cd]pyrene	0.54 J	0.5

SS-6	Result	Standard
Chromium	15.1	1
Zinc	118 ^5-J-	109

LEGEND

- Property Boundary
- MW-1 — RI Monitoring Well
- RI-BH-1 — RI Boring Locations
- VP-1 — Vapor Point
- STP-1 — Step Out Sample
- SS-2 — Surface Sample
- RI-BW-1 — RI Bedrock Well

NOTES

1. All values are provided in parts per million (ppm).
2. Standard references unrestricted SCOs.

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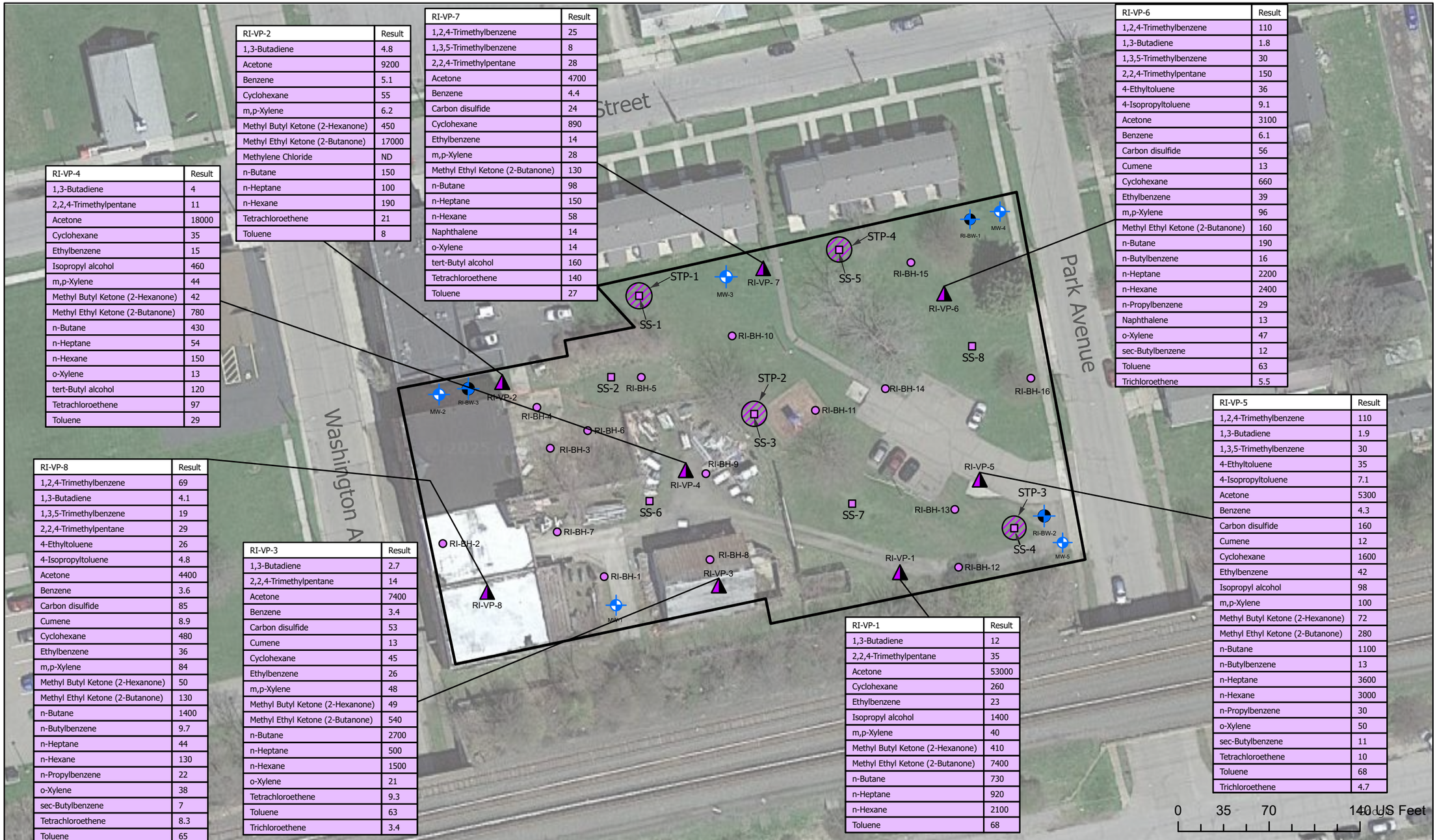
FIGURE 6A
RI Unrestricted Soil Exceedances
Surface and Step-out Samples

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Dunkirk, NY 14048

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RI-VP-2	Result
1,3-Butadiene	4.8
Acetone	9200
Benzene	5.1
Cyclohexane	55
m,p-Xylene	6.2
Methyl Butyl Ketone (2-Hexanone)	450
Methyl Ethyl Ketone (2-Butanone)	17000
Methylene Chloride	ND
n-Butane	150
n-Heptane	100
n-Hexane	190
Tetrachloroethene	21
Toluene	8

RI-VP-7	Result
1,2,4-Trimethylbenzene	25
1,3,5-Trimethylbenzene	8
2,2,4-Trimethylpentane	28
Acetone	4700
Benzene	4.4
Carbon disulfide	24
Cyclohexane	890
Ethylbenzene	14
m,p-Xylene	28
Methyl Ethyl Ketone (2-Butanone)	130
n-Butane	98
n-Heptane	150
n-Hexane	58
Naphthalene	14
o-Xylene	14
tert-Butyl alcohol	160
Tetrachloroethene	140
Toluene	27

RI-VP-6	Result
1,2,4-Trimethylbenzene	110
1,3-Butadiene	1.8
1,3,5-Trimethylbenzene	30
2,2,4-Trimethylpentane	150
4-Ethyltoluene	36
4-Isopropyltoluene	9.1
Acetone	3100
Benzene	6.1
Carbon disulfide	56
Cumene	13
Cyclohexane	660
Ethylbenzene	39
m,p-Xylene	96
Methyl Ethyl Ketone (2-Butanone)	160
n-Butane	190
n-Butylbenzene	16
n-Heptane	2200
n-Hexane	2400
n-Propylbenzene	29
Naphthalene	13
o-Xylene	47
sec-Butylbenzene	12
Toluene	63
Trichloroethene	5.5

RI-VP-4	Result
1,3-Butadiene	4
2,2,4-Trimethylpentane	11
Acetone	18000
Cyclohexane	35
Ethylbenzene	15
Isopropyl alcohol	460
m,p-Xylene	44
Methyl Butyl Ketone (2-Hexanone)	42
Methyl Ethyl Ketone (2-Butanone)	780
n-Butane	430
n-Heptane	54
n-Hexane	150
o-Xylene	13
tert-Butyl alcohol	120
Tetrachloroethene	97
Toluene	29

RI-VP-5	Result
1,2,4-Trimethylbenzene	110
1,3-Butadiene	1.9
1,3,5-Trimethylbenzene	30
4-Ethyltoluene	35
4-Isopropyltoluene	7.1
Acetone	5300
Benzene	4.3
Carbon disulfide	160
Cumene	12
Cyclohexane	1600
Ethylbenzene	42
Isopropyl alcohol	98
m,p-Xylene	100
Methyl Butyl Ketone (2-Hexanone)	72
Methyl Ethyl Ketone (2-Butanone)	280
n-Butane	1100
n-Butylbenzene	13
n-Heptane	3600
n-Hexane	3000
n-Propylbenzene	30
o-Xylene	50
sec-Butylbenzene	11
Tetrachloroethene	10
Toluene	68
Trichloroethene	4.7

RI-VP-8	Result
1,2,4-Trimethylbenzene	69
1,3-Butadiene	4.1
1,3,5-Trimethylbenzene	19
2,2,4-Trimethylpentane	29
4-Ethyltoluene	26
4-Isopropyltoluene	4.8
Acetone	4400
Benzene	3.6
Carbon disulfide	85
Cumene	8.9
Cyclohexane	480
Ethylbenzene	36
m,p-Xylene	84
Methyl Butyl Ketone (2-Hexanone)	50
Methyl Ethyl Ketone (2-Butanone)	130
n-Butane	1400
n-Butylbenzene	9.7
n-Heptane	44
n-Hexane	130
n-Propylbenzene	22
o-Xylene	38
sec-Butylbenzene	7
Tetrachloroethene	8.3
Toluene	65

RI-VP-3	Result
1,3-Butadiene	2.7
2,2,4-Trimethylpentane	14
Acetone	7400
Benzene	3.4
Carbon disulfide	53
Cumene	13
Cyclohexane	45
Ethylbenzene	26
m,p-Xylene	48
Methyl Butyl Ketone (2-Hexanone)	49
Methyl Ethyl Ketone (2-Butanone)	540
n-Butane	2700
n-Heptane	500
n-Hexane	1500
o-Xylene	21
Tetrachloroethene	9.3
Toluene	63
Trichloroethene	3.4

RI-VP-1	Result
1,3-Butadiene	12
2,2,4-Trimethylpentane	35
Acetone	53000
Cyclohexane	260
Ethylbenzene	23
Isopropyl alcohol	1400
m,p-Xylene	40
Methyl Butyl Ketone (2-Hexanone)	410
Methyl Ethyl Ketone (2-Butanone)	7400
n-Butane	730
n-Heptane	920
n-Hexane	2100
Toluene	68

LEGEND

- Property Boundary
- MW-1 — RI Monitoring Well
- RI-BH-1 — RI Boring Locations
- VP-1 — Vapor Point
- STP-1 — Step Out Sample
- SS-2 — Surface Sample
- RI-BW-1 — RI Bedrock Well

NOTES

1. All values are provided in ug/m3.

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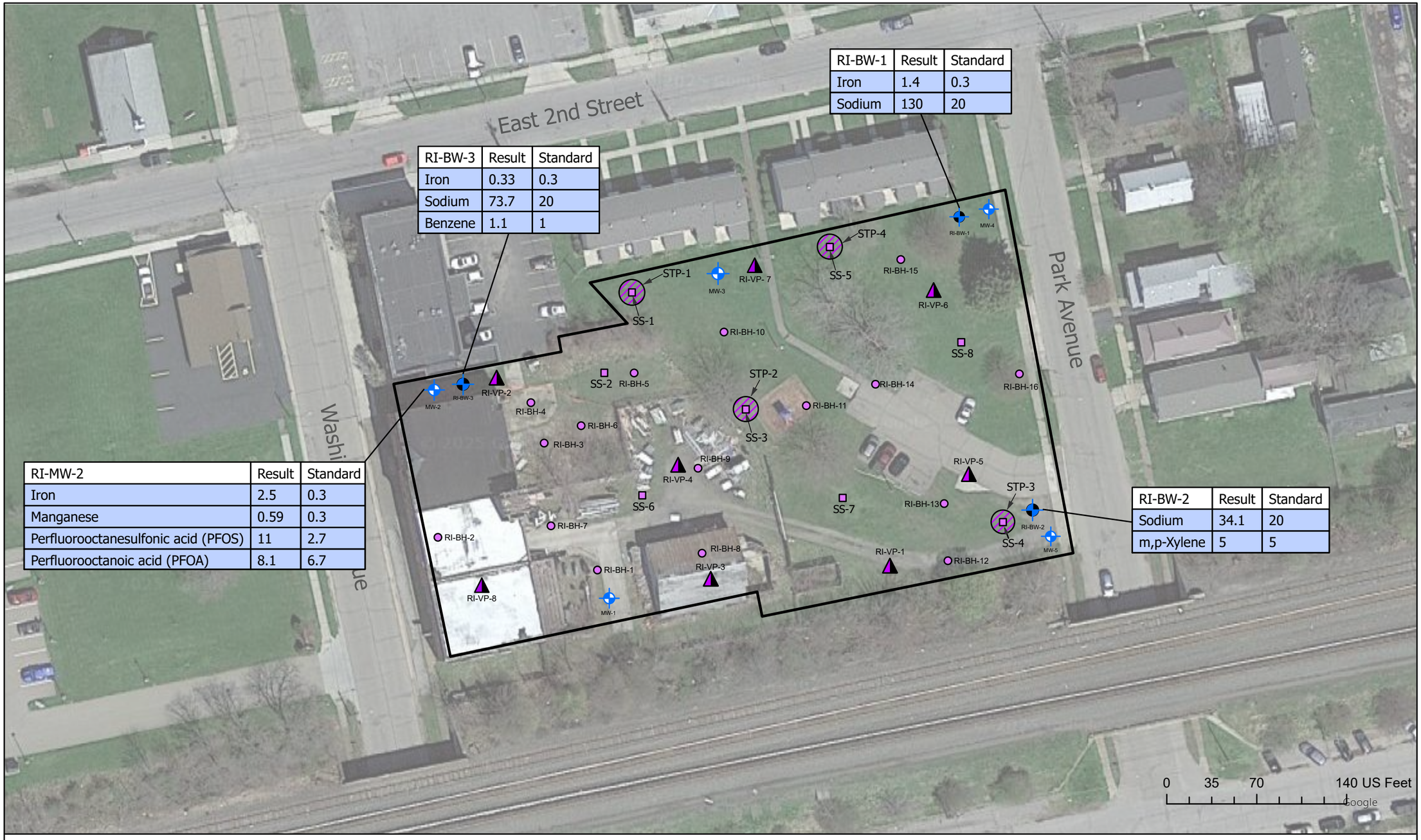
FIGURE 7A
RI Soil Vapor Results

Block of Washington, East 2nd and Park
Dunkirk, NY 14048

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DATE ISSUED:
November 21, 2025
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SCALE: 1:910



LEGEND

- Property Boundary
- MW-1 — RI Monitoring Well
- RI-BH-1 — RI Boring Locations
- VP-1 — Vapor Point
- STP-1 — Step Out Sample
- SS-2 — Surface Sample
- RI-BW-1 — RI Bedrock Well

NOTES

1. All values are provided in parts per billion (ppb)
2. Groundwater standard references TOGS 1.1.1 Guidance Values

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FIGURE 7B
RI Groundwater Results

Block of Washington, East 2nd and Park
Dunkirk, NY 14048

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November 21, 2025

SCALE: 1:910



LEGEND

- Property Boundary
- Proposed Asphalt Hardscape
- Proposed Building Footprint
- Proposed Stone/Gras Recreation Area
- Proposed Lawn/Tree Greenspace
- Potential Areas for Reuse

SQUARE FOOTAGE (SF) BREAKDOWN

1. Greenspace
   Recreation Area: 5,000 SF
   Lawn/Landscape Areas: 15,300 SF
2. Hardscape
   Building: 17,400 SF
   Asphalt Parking Lot: 21,500 SF

NOTES

1.) Greenspace Remedial Approach
-Remove approximately 2 feet of hardscape and/or underlying soils.
-Replace with 2 +/- feet of clean soils.
2.) Hardscape Remedial Approach
-Soils beneath the areas of proposed new development buildings and hardscape shall be cut/filled to the depth of new building foundations/slabs or hardscape to meet new development grades. Approximate average cuts and fills are as follows: Asphalt= -1.5 ft, Slabs= +3.25 ft, Foundations= -5 ft.
-Replace with building foundations or hardscape.
3.) Soil cover must meet a minimum of 2 feet of clean soil or hardscape meeting NYSDEC restricted residential criteria.

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FIGURE 8
Restricted Residential Remediation

Block of Washington, East 2nd and Park
Dunkirk, NY 14048

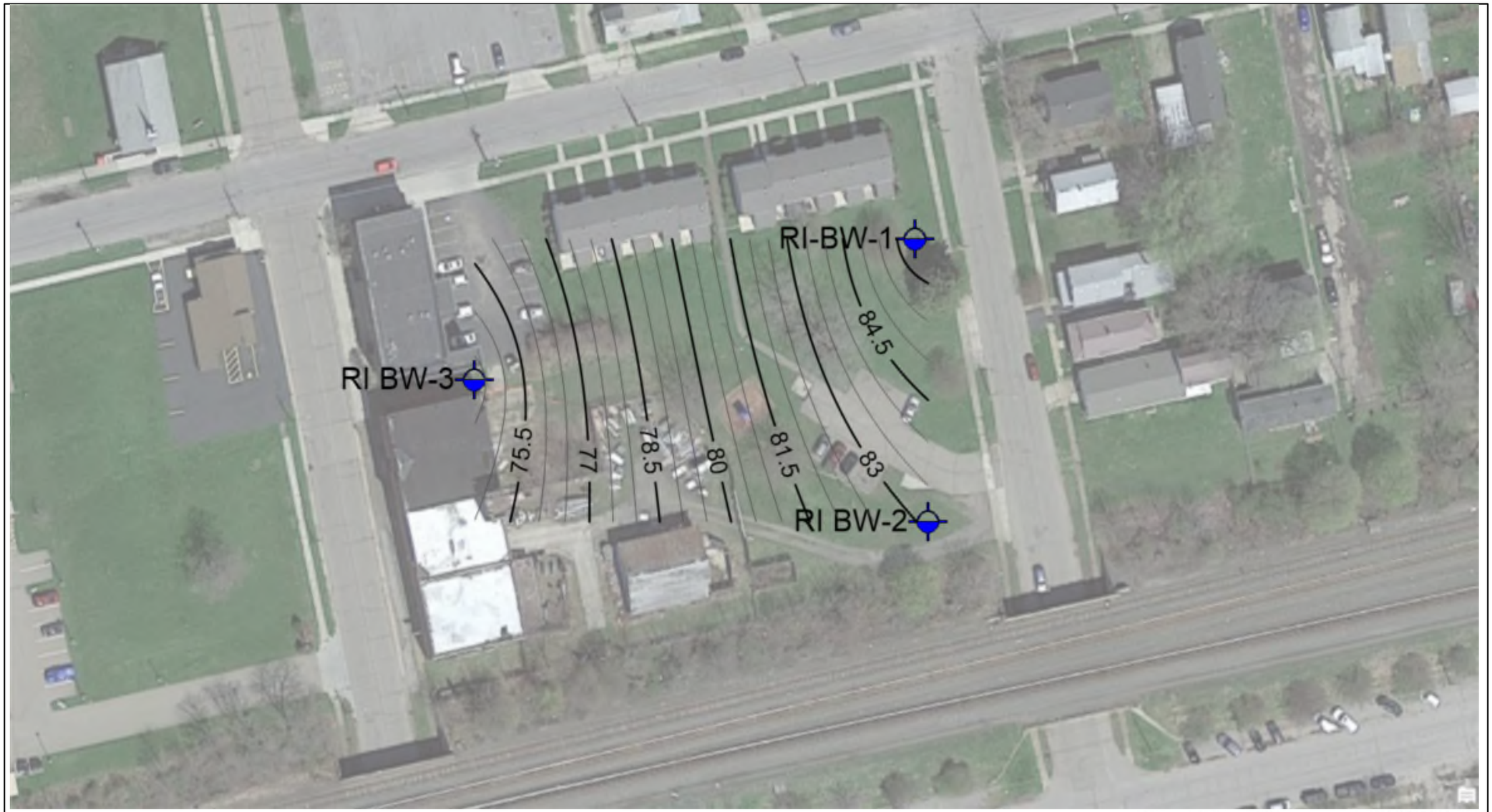
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September 4, 2025
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Figure 9
Project Schedule
Block of Washington, E. Second & Park Dunkirk, NY
BCP Site No. 907042

TASK	2026																											
	APR				MAY				JUNE				JULY				AUG				SEP				OCT			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
IV. Remedial Action Work Plan (RAWP)																												
DEC Review							■	■																				
Final Submittal/Report Approval									■																			
V. Building Demolition	■	■	■	■	■	■	■	■																				
VII. Remediation										■	■	■	■															
VIII. Site Management Plan (if needed)																												
Initial Submittal														■														
DEC Review															■	■	■											
Final Submittal/Report Approval																		■										
IX. Final Engineering Report																												
Initial Submittal																			■									
DEC Review																				■	■	■						
Final Submittal/Report Approval																							■					



LEGEND

- Property Boundary
- Bedrock Well Location

NOTES

1. Elevations are based off of Site specific survey
2. RI-BW-1 casing elevation = 98.35'
3. RI-BW-2 casing elevation = 100.73'
4. RI-BW-3 casing elevation = 95.55'
5. GW elevations were measured on 9/3/2025

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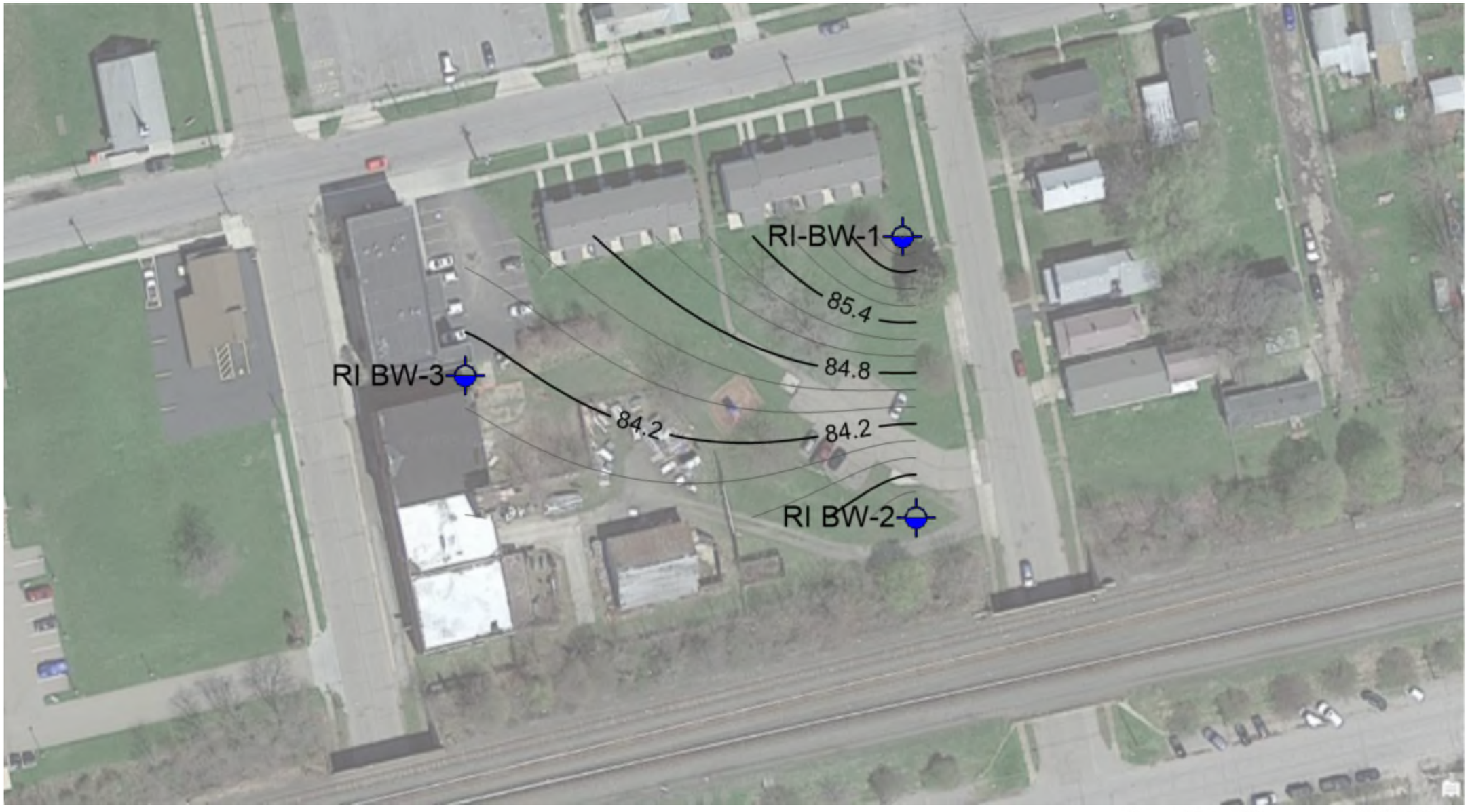
FIGURE 10
Bedrock Groundwater Contour Map
September 3rd, 2025

Block of Washington, East 2nd and Park
Dunkirk, NY 14048

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DATE ISSUED:
October 30, 2025
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SCALE: 1:1,910



LEGEND

- Property Boundary
- Bedrock Well Location

NOTES

1. Elevations are based off of Site specific survey
2. RI-BW-1 casing elevation = 98.35'
3. RI-BW-2 casing elevation = 100.73'
4. RI-BW-3 casing elevation = 95.55'
5. GW elevations were measured on 9/12/2025

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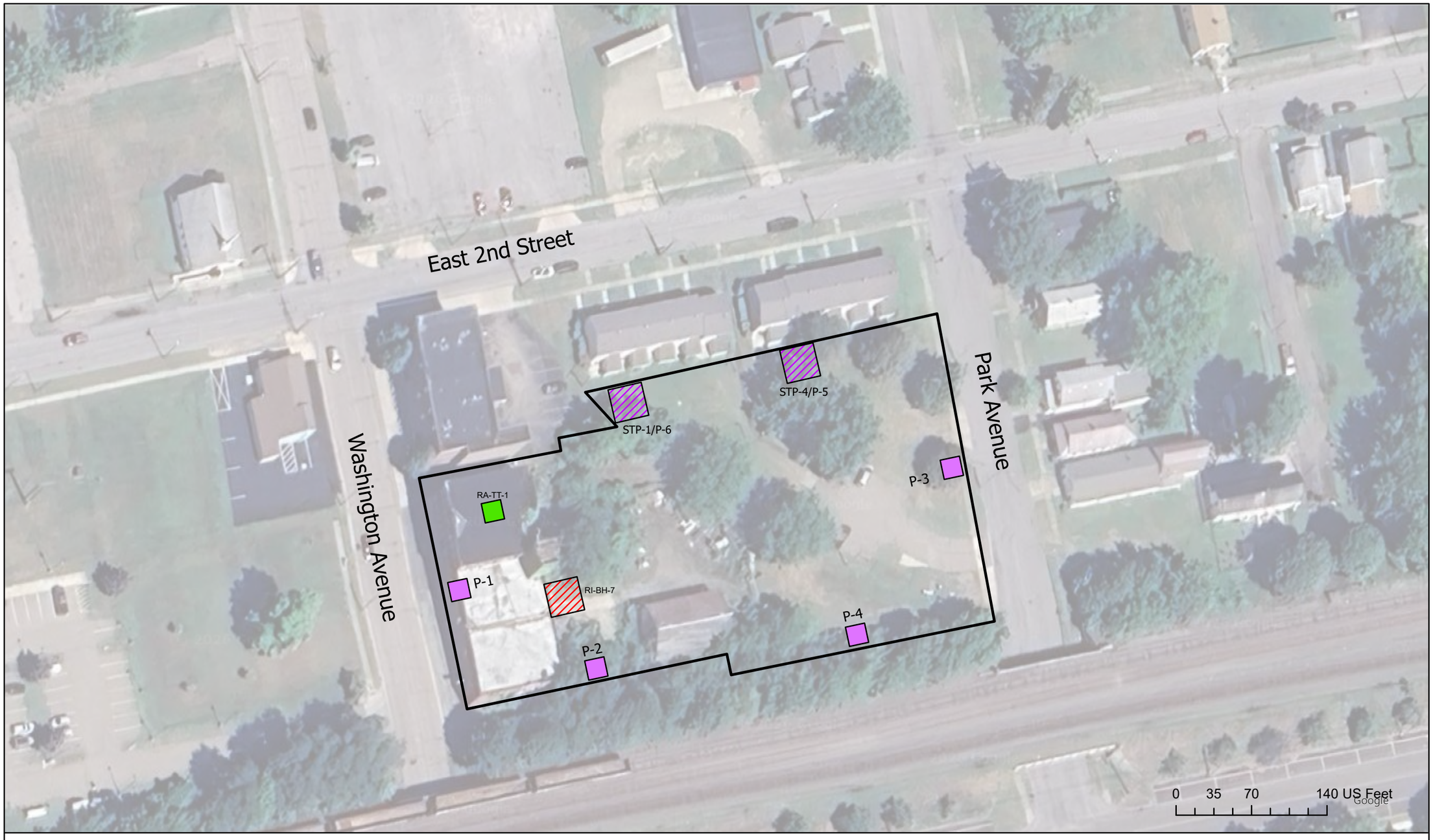
CLIENT: REGAN DEVELOPMENT

FIGURE 10A
Bedrock Groundwater Contour Map
September 12th, 2025
Block of Washington, East 2nd and Park
Dunkirk, NY 14048

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DATE ISSUED:
October 30, 2025
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SCALE: 1:1,910



LEGEND

- Property Boundary
- Perimeter Sample Location
- Hot Spot Excavation and Perimeter Sample Location
- Hot Spot Excavation Location
- Characterization Sample Location

NOTES

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FIGURE 11
Remedial Action Sampling Locations

Block of Washington, East 2nd and Park
Dunkirk, NY 14048

N W E S

DATE ISSUED:
May 12, 2026
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SCALE: 1:1,094

Appendices

Appendix A

Health and Safety Plan

HEALTH AND SAFETY PLAN
for
SITE INVESTIGATIONS AND REMEDIAL OVERSIGHT

11 PARCELS
BLOCK OF WASHINGTON, E. SECOND & PARK
CITY OF DUNKIRK, CHAUTAUQUA COUNTY, NEW YORK

Prepared for:

Regan Development Corporation
1055 Saw Mill River Road #204
Ardsley, NY 10502

Prepared By:

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Revised May 2026

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ATTACHMENTS

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Attachment 2 Heat Stress Management Program and Procedures
Attachment 3 Trenching and Excavation Health and Safety Requirements
Attachment 4 Map to Hospital
Attachment 5 NYSDOH Generic CAMP and Fugitive Dust and Particulate Monitoring

1.0 INTRODUCTION

The following health and safety procedures apply to Brownfield Cleanup Program (BCP) project personnel, including subcontractors, performing activities described in the Remedial Investigation Work Plan (RIWP). Please note, however, that contractors performing remedial work are required to either develop their own Health and Safety Plans (HASPs) meeting these requirements at a minimum or adopt this plan.

1.1 PURPOSE

Directed at protecting the health and safety of the field personnel during field activities, the following HASP was prepared to provide safe procedures and practices for personnel engaged in conducting the field activities associated with this project. The plan has been developed using the Occupational Safety and Health Administration (OSHA) 1910 and 1926 regulations and New York State Department of Environmental Conservation (NYSDEC) Brownfields Department of Environmental Remediation (DER)-10 as guidance. The purpose of this HASP is to establish personnel protection standards and mandatory safety practices and procedures for this task specific effort. This plan assigns responsibilities, establishes standard operating procedures, and provides for contingencies that may arise during the field efforts.

1.2 APPLICABILITY

The provisions of the plan are mandatory for all personnel engaged in field activities. All personnel who engage in these activities must be familiar with this plan and comply with its requirements. The plan is based on available information concerning the project area and planned tasks. If more data concerning the project area becomes available that constitute safety concerns, the plan will be modified accordingly. A member of each contractor on the BCP project will be designated as Field Safety Officer and will be responsible for field safety. Any modifications to the plan will be made by the Field Safety Officer after discussion with the Project Manager and Health and Safety Officer. All modifications will be documented and provided to the Project Manager and the Health and Safety Officer for approval. A copy of this plan will be available to all on-site personnel, including subcontractors prior to their initial entry onto the site.

Before field activities begin, all personnel will be required to read the plan. All personnel must agree to comply with the minimum requirements of this plan, be responsible for health and safety, and sign the Statement of Compliance before site work begins.

1.3 FIELD ACTIVITIES

The work addressed by this HASP includes remedial investigation (RI) activities such as assessment of subsurface conditions related to soil, groundwater and vapor and oversight activities related to remediation. Field work will be conducted that can include soil borings, monitoring well installation, groundwater, vapor sampling and soil sampling, etc.

1.4 PERSONNEL REQUIREMENTS

Key personnel are as follows:

Health and Safety Officer – Jason M. Brydges, P.E.
Engineer and Project Managers – Jason M Brydges, P.E, and Paul Staub, EIT
Geologist – John Boyd, PG
Technicians – Jim Hull
QA/QC – John Berry, P.E.

Responsibilities of some of the key personnel are as follows:

Project Manager:

- Assuring that personnel are aware of the provisions of the HASP and are proficient in work practices necessary to ensure safety and in emergencies;
- Verifying that the provisions of this plan are implemented;
- Assuring that appropriate personnel protective equipment (PPE), if necessary, is available and properly utilized by all personnel;
- Assuring that personnel are aware of the potential hazards associated with Site operations;
- Supervising the monitoring of safety performance by all personnel and ensuring that required work practices are employed; and,
- Maintaining sign-off forms and safety briefing forms.

Health and Safety Officer:

- Monitoring work practices to determine if potential hazards are present, such as heat/cold stress, safety rules near heavy equipment, etc.;
- Determining changes to work efforts or equipment to ensure the safety of personnel;
- Evaluating on-site conditions and recommend to the Project Manager modifications to work plans needed to maintain personnel safety;
- Determining that appropriate safety equipment is readily available and monitor its proper use;
- Stopping work if unsafe conditions occur or if work is not being performed in compliance with this plan:
- Monitoring personnel performance to ensure that the required safety procedures are followed.
- Documenting incident and reporting to Project Manager within 48 hours of occurrence if established safety rules and practices are violated; and,
- Conducting safety meetings as necessary.

Field Personnel, including geologists and technicians:

- Understanding the procedures outlined in this plan;
- Taking precautions to prevent injury to themselves and co-workers;
- Performing only those tasks believed to be safe;
- Reporting accidents or unsafe conditions to the Health and Safety Officer and Project Manager;

- Notifying the Health and Safety Officer and Project Manager of special medical problems (e.g., allergies, medical restrictions, etc.);
- Thinking about safety first while conducting field work; and,
- Not eating, drinking or smoking in work areas.

All Site personnel have the authority to stop work if conditions are deemed to be unsafe. Visitors will be required to report to the overall Site Project Manager or designee and follow the requirements of this plan and the Contractor's HASP (if different).

2.0 SITE DESCRIPTION AND SAFETY CONCERNS

2.1 SITE BACKGROUND AND DESCRIPTION

The property includes eleven separate parcels within the city block noted above. Some of these parcels are currently vacant and others include partially occupied former factory buildings. A summary of the background of the eleven parcels follows:

220 Washington (SBL #79.57-1-79) – The irregularly-shaped property is approximately 0.42-acres (Front 87 feet, depth 210 feet) and contains a 19,172 square foot brick and wood building built in 1900 and a 2,784 square foot separate shed-machine shop wood building built in 1960. The main brick structure contains two floors with no basement. It shares a common wall with the adjacent 208-214 Washington Avenue subject property to the north. Raised rail tracts are located to the south which separate the property from Third Street which is further south. The parcel abuts Washington Street to the west and further west across Washington Street is the Fredonia Technology Incubator and ECCB. The subject parcels 215 Park Avenue and Park Avenue Rear abut this property to the east. Park Avenue is further East. Currently the building is occupied by the Paradis Fence & Flag company. The structure contains floor tiles and florescent lights throughout. The first floor contains an active workshop and storage for tools, equipment, miscellaneous materials, and vehicles. The separate shed building contains mostly lumber and tools/equipment. Various miscellaneous equipment, lumber and metal fencing is located in areas around the building. Two large cylinder gas tanks are located in the rear of the building with no apparent signs of leakage. Both gas tanks are located on an asphalt driveway, but do not have any secondary containment. The location of the two gas tanks has not been previously sampled and will be further investigated during the RIWP. Some small quantities of maintenance chemicals, paints and spray cans are in the buildings. Historically this property was used for wholesale auto parts in the 1960s to the 1990s, auto sales and service in the 1940s and as part of the adjoining 208-214 Washington Street for the Mulholland company factory - makers of roadside dinning cars, automobile body parts, carriages, and springs from the late 1800s through at least the 1930s.

The Mulholland firm constructed a new traditional brick and wood frame plant on Washington Street in 1886.The firm changed its line of production with the changing times. Its original specialization was in manufacturing carriage springs, and later it diversified into the manufacture of component parts for automobiles (springs, drive shafts, and rubber tires). For a few years around 1910, complete automobiles were being assembled but from 1915 to 1925, it produced only car bodies. Around 1930, the firm shifted to the manufacture of streamlined roadside diners (steel-framed dining cars, 30 feet long and 10 feet wide). The Mulholland company continued through 1933, but then disappeared from the records, perhaps a victim of the Depression. After 1935, the factory was used for the manufacture of malted milk and storage of wholesale groceries.

208-214 Washington (SBL#79.57-1-81) - The irregularly shaped property is approximately 0.31-acres (Front 73 feet, depth 180 feet) and contains a 13,393 square foot brick and wood building built in 1900. The brick structure shares a common wall with 220 Washington Ave parcel and is a three-story row building, generally constructed of brick and wood. The structure is currently vacant and in very poor condition. The first floor of the building was rotted exposing the earthen floor beneath the building. The second and third floors are mostly collapsed and were not entered. The western portion of the building fronts Washington Avenue and abuts the sidewalk. The building occupies most of the property; however, the eastern portion of the Site is unimproved and abuts the East Second Street parcel (79.57-1-2) to the east and the 220 Washington Street parcel to the southeast. The Chadwick Bay Lofts are located adjacent to the north at 21 East Second Street**.** The parcel abuts Washington Street to the west and further west across Washington Street is the Fredonia Technology Incubator and ECCB. Historically, as part of the adjoining 208-214 Washington Street parcel, this parcel was the Mulholland company factory from the late 1800s through at least 1934. After 1935, this portion of the factory was used for the manufacture of malted milk and storage of wholesale groceries and may have been associated with auto parts warehousing and sales in the 1960s through the 1990s.

Park Ave. Rear (SBL #79.57-1-80) – The irregularly shaped property is approximately 0.02-acres (Front 20 feet, depth 45 feet) vacant unimproved parcel. The western portion of the parcel is adjacent to the 220 and 208-214 Washington Avenue properties. The north, south and eastern sides of the property border the subject parcels East Second Street and 215 Park Avenue. Historically, this property was part of the Burns Coal & Building Supply Company which was located on this and adjacent properties during the 1940s through the 1960s. Prior to that time there may have been a residential building on or partially on the property and the property may have been associated with the Mulholland Company.

East Second (SBL #79.57-1-2) - The irregularly shaped property is an approximately 0.08-acre (Front 40 feet, depth 85 feet) vacant unimproved parcel. The western portion of the parcel is adjacent to the subject 208-214 Washington Avenue property and The Chadwick Bay Lofts. City of Dunkirk Housing Authority residential apartments/row houses are located adjacent north at 35 East Second Street. The southern portion of the property is adjacent to the eastern end of the 208-214 Washington Avenue subject parcel. The eastern sides of the property border the subject parcels East Second Street (79.57-1-73) subject property. Historically, this property was part of the Burns Coal & Building Supply Company which was located on this and adjacent properties during the 1940s through the 1960s. Rail tracks and coal sheds may have also been associated with this property.

East Second Street (SBL #79.57-1-73) - The irregularly shaped property is approximately 0.06-acres (front 30 feet, depth 89 feet). It currently contains some vacant unimproved areas and sidewalk and parking areas. This parcel is divided into two separate land areas by the subject parcel East Second (79.57-1-2). The western portion of the parcel is adjacent to the subject 208-214 Washington Avenue property and The Chadwick Bay Lofts as well as 208-220 Washington Avenue parcels. City of Dunkirk Housing Authority residential apartments/row houses are located adjacent north at 35 East Second Street. The southern portion of the property is adjacent to the subject parcel 215 Park Avenue (79.57-1-75). The eastern sides of the property border the subject parcel subject property 215 Park Avenue (79.57-1-75), Park Avenue and Park Ave. (79.57-1-72). Historically, this property was part of the Burns Coal & Building Supply Company which was located on this and adjacent properties during the 1940s through the 1960s. Rail tracks and coal sheds may have also been associated with this property.

215 Park Avenue (SBL #79.57-1-75) - The irregularly shaped property is approximately 0.14-acres (front 41feet, depth 150 feet) and is a partially vacant parcel with a parking area. The western portion of the parcel is adjacent to the subject 220 Washington Avenue property. Elevated rail tracks are located south of the subject parcel and undeveloped vacant subject properties are north and east. Historically, this property was part of the Burns Coal & Building Supply Company which was located on this and adjacent properties during the 1940s through the 1960s. Rail tracks and coal sheds may have also been associated with this property.

211 Park Avenue (SBL #79.57-1-74) - The triangle shaped property is approximately 0.1-acre (front 61 feet, depth 67 feet) and is a vacant/undeveloped parcel. The western and southern portion of the subject parcel is adjacent to the subject East Second Street (79.57-1-70) property. Park Street is adjacent to the east and the subject Park Ave. (79.57-1-72) is adjacent north**.** Historically, this property contained a bottle warehouse in the 1960s, an Ice Cream Depot in the 1930s and 1940s, a sugar warehouse in the 1920s and a tin shop in the late 1800s. Rail tracks cross the subject parcel during those times as well.

Park Avenue (SBL #79.57-1-72) - The irregularly shaped property is an approximately 0.13-acre (front 45 feet, depth 125 feet) vacant unimproved parcel. The property abuts Park Avenue to the east and is surrounded by other subject parcels to the north, south and west. Historically, the western part of this parcel was part of the Burns Coal & Building Supply Company which was located on this and adjacent properties during the 1940s through the 1960s. The eastern portion of this parcel contained a bottle warehouse in the 1960s, an Ice Cream Depot in the 1930s and 1940s, a sugar warehouse in the 1920s and a tin shop in the late 1800s.

207 Park Avenue (SBL #79.57-1-71) - The rectangular shaped property is an approximately 0.05-acre (front 24 feet, depth 90 feet) vacant, unimproved parcel. The property abuts Park Avenue to the east, the subject parcel East Second Street (79.57-1-69) to the north and by other subject parcels to the south and west. Historically, this property appears to have been residential and contained residential structures with rail lines to the west.

East Second Street (SBL #79.57-1-70) - The irregularly shaped property is an approximately 0.04-acre (front 30 feet, depth 55 feet) vacant, unimproved parcel with a sidewalk running north south through the center. The property abuts The City of Dunkirk/Housing Authority row apartments to the north, 207 Park Avenue (SBL #79.57-1-71) to the south and the subject parcels 207 Park Avenue (SBL #79.57-1-71) and East Second Street (79.57-1-69) to the east. Other subject parcels are located to the west and south. Historically, this property contained rail tracks on its western end and was vacant and may have been residential on its eastern end.

East Second Street (SBL #79.57-1-69) - The rectangular shaped sliver is an approximately 0.01-acre (front 90 feet, depth 5 feet) vacant, unimproved parcel. The property abuts the City of Dunkirk/Housing Authority row apartments to the north, 207 Park Avenue (SBL #79.57-1-71) to the south, Park Avenue to the east, and the subject parcel East Second Street (SBL #79.57-1-70) to the west. Historically, this property appears to have been residential and contained residential structures.

2.2 HAZARD EVALUATION

Based on the findings related to historic use of the Site and previous investigations, contaminates of concern (COCs) in the soils and groundwater are semi-volatile organic compounds (SVOCs), and metals. There is also potential for chlorinated solvents and petroleum/PCBs in site soils, groundwater, and vapors.

The existing building materials may also have hazardous materials and universal wastes such as ACM in floors/caulk/roofing/insulation, LBP in ceilings/structures/windows/walls/doors, polychlorinated biphenyls (PCBs) in light ballasts and caulk throughout the building, and mercury in fluorescent bulbs.

Specific health and safety concerns to the project tasks include working around low levels of metals, semi-volatile organic compounds (SVOCs), and volatile organic compounds (VOCs) in soil and groundwater. Physical hazards include those associated with working near open excavations and adjacent to field equipment. Contractors will have separate detailed health and safety procedures/requirements for excavations and the transportation and disposal of impacted material that will meet or exceed requirements in this plan. A table of potential hazards and OSHA Standards for consideration during investigation and remedial activities is provided in **Attachment 1**.

2.2.1 Chemical Hazards

Chemical hazards detected at the site include metals and organic compounds that were detected in soil samples at concentrations that exceed NYSDEC Part 375 soil cleanup objectives. These compounds could be encountered during the RI and remedial activities and potential routes of exposure include:

- Skin contact;
- Inhalation of vapors or particles;
- Ingestion; and,
- Entry of contaminants through cuts, abrasions or punctures.

The anticipated levels of personnel protection will include Level D PPE that includes the following:

1. Long sleeve shirt and long pants
2. Work boots with steel toe
3. Hard hats when heavy equipment or overhead hazards are present
4. Safety glasses
5. Work gloves and chemical resistant gloves when sampling potentially contaminated materials
6. High visibility vests or outer gear when Site traffic is significant

Modifications may include booties, overalls, hearing protection, or respiratory protection if air monitoring levels indicate sustained photoionization detector (PID) readings greater than 5 ppm above established background levels. If these levels are reached, work will be halted pending discussions with field and office management. If any readings are recorded above background, work will proceed with caution and breathing zone monitoring will be conducted.

2.2.2 Other Physical Hazards

Depending on the time of year, weather conditions or work activity, some of the following physical hazards could result from project activities:

- Noise
- Heat Stress
- Cold Stress
- Slips, trips, and falls
- Exposure to moving machinery during drilling and excavation activities
- Physical eye hazards
- Lacerations and skin punctures
- Back strain from lifting equipment
- Electrical storms and high winds
- Contact with overhead or underground utilities

Slips, Trips, and Falls. Field personnel shall become familiar with the general terrain and potential physical hazards that is associated with the risk of slips, trips, and falls. Special care shall be taken when working near demolition and excavation operations and material stockpiles. Workers will observe all pedestrian and vehicle rules and regulations. Extra caution will be observed while working near roadways and while driving in reverse to ensure safety.

Noise. The Occupational Health & Safety Administration (OSHA) requires employers to implement a hearing conservation program when noise exposure is at or above 85 decibels averaged over 8 working hours, or an 8-hour time-weighted average (TWA). Hearing conservation programs strive to prevent initial occupational hearing loss, preserve and protect remaining hearing, and equip workers with the knowledge and hearing protection devices necessary to safeguard themselves.

For RI work on this site when tasks are performed around noise generating tools or equipment, all personnel shall wear hearing protection devices, such as earmuffs or ear plugs, as work conditions warrant. Any noise producing equipment that produces noise level conditions such as difficulty hearing while speaking to one another at a normal tone within three feet will warrant hearing protection if it's not already employed. If normal speech is interfered with due to work noise, the Health and Safety Officer or designee will mandate the use of hearing protection or other noise-producing equipment or events.

Heat/Cold Stress. Heat stress work modification may be necessary during ambient temperatures of greater than 29 degrees Celsius (°C) (85 degrees Fahrenheit [°F]) while wearing normal clothing or exceeding 21°C (70°F) while wearing PPE. Because heat stress is one of the most common and potentially serious illnesses at work sites, regular monitoring and preventive measures will be utilized such as additional rest periods, supplemental fluids, restricted consumption of drinks containing caffeine, use of cooling vests, or modification of work practices. Most of the work to be conducted during the oversight and monitoring operations is expected to consist of light manual labor and visual observation. Given the nature of the work and probable temperatures, heat stress hazards are not anticipated. See **Attachment 2** for heat stress management procedures.

If work is to be conducted during winter conditions, cold stress may be a concern to the health and safety of personnel. Wet clothes combined with cold temperatures can lead to hypothermia. If air temperature is less than 4°C (40°F) and a worker perspires, the worker should change to dry clothes. The following summary of the signs and symptoms of cold stress are provided as a guide for field personnel.

1. Incipient frostbite is a mild form of cold stress characterized by sudden blanching or whitening of the skin.
2. Chilblain is an inflammation of the hands and feet caused by exposure to cold moisture. It is characterized by a recurrent localized itching, swelling, and painful inflammation of the fingers, toes, or ears. Such a sequence produces severe spasms, accompanied by pain.
3. Second-degree frostbite is manifested by skin with a white, waxy appearance and the skin is firm to the touch. Individuals with this condition are generally not aware of its seriousness because the underlying nerves are frozen and unable to transmit signals to warn the body. Immediate first aid and medical treatment are required.
4. Third-degree frostbite will appear as blue blotchy skin. The tissue is cold, pale, and solid. Immediate medical attention is required.
5. Hypothermia develops when body temperature falls below a critical level. In extreme cases, cardiac failure and death may occur. Immediate medical attention is warranted when the following symptoms are observed:

    - Involuntary shivering
    - Irrational behavior
    - Slurred speech
    - Sluggishness

Fire and Explosion. These hazards will be minimal for activities associated with this project. All heavy equipment will be equipped with a fire extinguisher.

Trenching and Excavations. There are a variety of potential health and safety hazards associated with excavations. These include:

- Surface encumbrances, such as structures, fencing, stored materials, etc.;
- Below- and above-ground utilities, such as water and sewer lines, gas lines, telephone lines, and optical cable lines, etc.;
- Overhead power lines and other utilities;
- Vehicle and heavy equipment traffic around the excavations;
- Falling loads from lifting or digging equipment;
- Water accumulation within excavations;
- Hazardous atmospheres, such as oxygen deficiency, flammable gases, and toxic gases;
- Falling into or driving equipment into unprotected or unmarked excavations; and,
- Cave-in of loose rocks and soil at the excavation face.

OSHA requirements for trenching and excavations are contained in 29 Code of Federal Regulations (CFR), Subpart P, 1926:650 through 1926.652. See **Attachment 3** for details on excavation and trenching safety requirements, which include the following basic minimum excavation requirements:

- Personnel entry into excavations should be minimized whenever possible and no entry will occur in pits greater than 4 feet below ground surface (bgs). Sloping, shoring or equivalent means should be utilized.
- Surface encumbrances such as structures, fencing, piping, stored material etc. that may interfere with safe excavations should be avoided, removed or adequately supported prior to the start of excavations. Support systems should be inspected daily.
- Underground utility locations should be checked and determined, and permits should be obtained prior to initiating excavations. Local utility companies will be contacted at least two days in advance, advised of proposed work, and requested to locate underground installations. When excavations approach the estimated location of utilities, the exact location should be determined by careful probing or hand digging and when it is uncovered, proper supports should be provided.
- A minimum safe distance of 15 feet should be maintained when working around overhead high-voltage lines or the line should be de-energized following appropriate lock-out and tag- out procedures by qualified utility personnel.
- Excavations five feet or more, if entered, will require an adequate means of exit, such as a ladder, ramp, or steps and located to require no more than 25 feet of lateral travel. Under no circumstances should personnel be exited/entered an excavation using heavy equipment.
- Personnel working around heavy equipment, or who may be exposed to public vehicular traffic should wear high visibility clothes, especially at night.
- Heavy equipment or other vehicles operating next to or approaching the edge of an excavation will require that the operator have a clear view of the edge of the excavation, or that warning systems such as barricades, hand or mechanical signals, or stop logs be used. If possible, the surface grade should slope away from the excavation.
- Personnel should be safely located in and around the trench/excavation face and should not work underneath loads handled by lifting or digging equipment.
- Hazardous atmospheres, such as oxygen deficiency (atmospheres containing less than 19.5% oxygen), flammable gases (airborne concentrations greater than 20% of the lower explosive limit), and toxic gases (airborne concentrations above the OSHA Permissible Exposure Limit or other exposure limits) may occur in excavations. Monitoring should be conducted for hazardous atmospheres prior to entry and at regular intervals. Ventilation or respiratory protection may be provided to prevent personnel exposures to oxygen deficient or toxic atmospheres. Periodic retesting (at least each shift) of the excavation will be conducted to verify that the atmosphere is acceptable. A log or field book records should be maintained.
- Personnel should not work in excavations that have accumulated water or where water is accumulating unless adequate precautions have been taken. These precautions can include shield systems, water removal systems, or safety harnesses and lifelines. Groundwater entering the excavation should be properly directed away and down gradient from the excavation.
- Safety harnesses and lifelines should be worn by personnel entering excavations that qualify as confined spaces.
- Excavations near structures should include support systems such as shoring, bracing, or underpinning to maintain the stability of adjoining buildings, walls, sidewalks, or other structures endangered by the excavation operations.
- Loose rock, soil, and spoils should be piled at least two and preferably 5 feet or more from the edge of the excavation. Barriers or other effective retaining devices may be used to prevent spoils or other materials from falling into the excavation.

- Walkways or bridges with standard guardrails that meet OSHA specifications will be provided where employees, the public, or equipment are required to cross over excavations.
- Adequate barrier physical protection should be provided, and excavations should be barricaded or covered when not in use or left unattended. Excavations should be backfilled as soon as possible when completed.
- Safety personnel should conduct inspections prior to the start of work and as needed throughout the work shift and after occurrence that increases the hazard of collapse (i.e., heavy rain, vibration from heavy equipment, freezing and thawing, etc.).
- Personnel working in excavations should be protected from cave-ins by sloping or benching of excavation walls, a shoring system or some other equivalent means in accordance with OSHA regulations. Soil type is important in the determination of the angle of repose for sloping and benching, and the design of shoring systems.

2.2.3 Biological Hazards

Biological hazards can result from encounters with mammals, insects, snakes, spiders, ticks, plants, parasites, and pathogens. Mammals can bite or scratch when cornered or surprised. The bite or scratch can result in local infection with systemic pathogens or parasites. Insect and spider bites can result in severe allergic reactions in sensitive individuals. Exposure to poison ivy, poison oak or poison sumac results in skin rash. Ticks are a vector for several serious diseases. Dead animals, organic wastes, and contaminated soil and water can harbor parasites and pathogens. These hazards are reduced if work is conducted during late fall and winter months. The following are highlighted because they represent more likely concerns for the site-specific tasks and location:

Bees, Ants, Wasps and Hornets. Sensitization by the victim to the venom from repeated stings can result in anaphylactic reactions. If a stinger remains in the skin, it should be removed by teasing or scraping, rather than pulling. An ice cube placed over the sting will reduce pain. An analgesic corticosteroid lotion is often useful. People with known hypersensitivity to such stings should consult with their doctor about carrying a kit containing an antihistamine and aqueous epinephrine in a pre-filled syringe when in endemic areas. Nests and hives for bees, wasps, hornets and yellow jackets often occur in the ground, trees and brush. Before any nests or hives are disturbed, an alternate sampling location should be selected. If the sample location cannot be relocated, site personnel who may have allergic reactions shall not work in these areas.

Ticks. The incidence of Lyme disease is correlated to outdoor workers in areas where the disease is widespread and heightened risk of encountering ticks infected with B. burgdorferi, which varies from state to state, within states, and even within counties. Preventing tick bites is of utmost importance in preventing Lyme disease and other tickborne illnesses. Tick bite prevention strategies include avoidance or clearing of tick-infested habitats and use of personal protective measures (e.g., repellents and protective clothing). Tick checks should be done regularly, and ticks should be removed promptly. If a worker in a high-risk area develops flu-like symptoms (fever, chills, muscle aches, joint pains, neck stiffness, headache) or a bulls-eye rash, they should seek medical attention even if there is no recall of a tick bite. Workers who have experienced a tick bite should remove the tick and seek medical attention if signs and symptoms of tick-borne diseases occur.

Storm Conditions. When lightening is within 10 miles of the work site, all personnel should evacuate to a safe area.

Sun. When working in the sun, personnel should apply appropriate sun screening lotions (30 sunscreen or above), and/or wear long sleeve clothing and hats.

2.2.4 Activity Hazard Analysis

Table 1 presents a completed activity hazard analysis for the performance of an RI.

Table 1. Activity Hazard Analysis

PRINCIPAL STEPS	POTENTIAL SAFETY/HEALTH HAZARDS	RECOMMENDED CONTROLS
RI soil/groundwater investigation	Potential exposure to low levels of metals, SVOCs such as PAHs, petroleum products and solvents	1. Use of administrative controls (site control and general safety rules), work cloths, dust suppression 2. Use of real-time monitoring and action levels 3. Use Physical Hazards Standard Operating Procedures (SOPs) 4. Wear gloves when handling soil and groundwater
EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
Excavation and other heavy equipment, Backhoe or Geoprobe	1. Daily inspection of equipment 2. Continuous safety oversight	1. Safety plan review 2. Routine safety briefings

3.0 MONITORING

The purpose of air monitoring for potential airborne contaminants is to verify that protection levels are suitable. Monitoring will be performed for dust/particulates and volatile organic compounds during all intrusive RI activities such as borings/drillings and during excavation activities. Daily background and calibration readings will be recorded prior to the start of field activities. All monitoring equipment used during this investigation will be maintained and calibrated and records of calibration and maintenance will be kept in accordance with 29 CFR 1910.120(b)4(11)E.

A Community Air Monitoring Program (CAMP) will be conducted. CAMP reports will be submitted to DEC/DOH for review on a weekly basis and also as soon as possible if/when an exceedance occurs. All data from the CAMP should be included in the RIR.

3.1 PARTICULATE MONITORING

Real-time air monitoring readings are obtained from upwind and downwind locations in accordance with DER-10 for community air-monitoring. Daily field reports will be completed that document activities performed, equipment and manpower onsite, screening and monitoring results, general Site conditions, and weather conditions.

3.2 AIR MONITORING FOR WORKER PROTECTION

Real time air monitoring will be conducted whenever site soil is disturbed during sampling, excavation, grading, etc. A real time personal aerosol monitor (i.e., TSI SidePak AM5 10 Personal Aerosol monitor or equivalent) will be used. This monitor is a laser photometer that measures data as both real-time aerosol mass-concentration and 8-hour time weighted average (TWA). The monitor will be used to measure real-time concentrations in milligrams per meter cubed (mg/m^3). Action levels are based on potential exposure to calcium carbonate and will be as follows (SEE NOTE BELOW):

- 15 mg/m^3 total dust
- 5 mg/m^3 respirable fraction for nuisance dusts

Dust suppression techniques should be employed prior to exceeding the action levels. However, if these levels are exceeded, then work will be halted, and additional dust suppression techniques employed until safe levels are reached.

NOTE: For worker protection Appendix 1A NYSDOH Generic Community Air Monitoring Plan and Appendix 1 B Fugitive Dust and Particulate Monitoring from DER-10 are provided in Appendix B of the RIWP and will be followed by all field workers.

3.3 TOTAL VOLATILE ORGANICS MONITORING

Monitoring of VOCs will be conducted using a PID – See Note below. If a sustained reading of 5 ppm above background occurs, then work will be halted, and personnel will evacuate the work area. Levels will be allowed to stabilize, and another reading will be taken in the breathing zone. If background levels continue to be exceeded, then work will not continue at that location and the project manager will be notified of the situation. Action levels will remain the same.

NOTE: Appendix 1A NYSDOH Generic Community Air Monitoring Plan and Appendix 1 B Fugitive Dust and Particulate Monitoring from DER-10 are provided in Appendix B of the RIWP and will be followed by all field workers.

4.0 SAFE WORKING PRACTICES

The following general safe work practices always apply to a construction site:

- Eating, drinking, chewing gum or tobacco and smoking are prohibited within the work area.
- Contact with potentially contaminated substances should be avoided.
- Puddles, pools, mud, etc. should be avoided if possible.
- Kneeling, leaning, or sitting on equipment or on the ground should be avoided if possible.
- Upon leaving the work area, hands, face and other exposed skin surfaces should be thoroughly washed.
- Unusual site conditions shall be promptly conveyed to the project manager, health and safety officer, or site superintendent for resolution.
- A first-aid kit shall be available at the site.
- Field personnel should use all their senses to alert themselves to potentially dangerous situations (i.e., presence of strong, irritating, or nauseating odors).
- If severe dusty conditions are present, then soils will be dampened to mitigate dust.
- All equipment will be cleaned before leaving the work area.
- Field personnel must attend safety briefings and should be familiar with the physical characteristics of the investigation, including:
    - Accessibility to personnel, equipment, and vehicles.
    - Areas of known or suspected contamination.
    - Site access.
    - Routes and procedures to be used during emergencies.
- Personnel will perform all investigation activities with a “buddy” who is able to:
    - Provide his or her partner with assistance.
    - Notify management or emergency personnel if needed.
- Excavation activities shall be terminated immediately in the event of thunder or electrical storm.
- The use of alcohol or drugs at the site is strictly prohibited.

5.0 PERSONAL SAFETY EQUIPMENT AND SITE CONTROL

5.1 PERSONAL SAFETY EQUIPMENT

As required by OSHA in 29 CFR 1920.132, this plan constitutes a workplace hazard assessment to select PPE to perform the site investigation. The PPE to be donned by on-site personnel during this investigation are those associated with the industry standard of Level D. Protective clothing and equipment to initiate the project will include:

- Work clothes, pants and long sleeves
- Work boots with steel toe
- Work gloves as necessary
- Hard hat if work is conducted near equipment
- Safety glasses
- Hearing protection as necessary

Modifications may include chemically resistant gloves, booties, and overalls. If air monitoring indicates levels are encountered that require respiratory protection (sustained readings at or above action levels above a daily established background), then work will be halted, and an adequate resolution of PPE will be made by the health and safety manager, field manager, and project manager.

5.2 SITE CONTROL

Site control will be established near each work zone by the Contractor. The purpose is to control access to the immediate work areas from individuals not associated with the project. All work zones will be fenced off with controlled access and appropriately designated as an exclusion area.

Each excavation or drilling area where heavy equipment is being utilized will be set up as a work zone and include an exclusion area and support zone. The exact configuration of each zone is dependent upon location, weather conditions, wind direction and topography. The Contractor's safety manager will establish the control areas daily at each excavation.

An area of 10 feet (as practical) around each excavation will be designated as the exclusion area. This is the area where potential physical hazards are most likely to be encountered by field personnel. The size of the exclusion area may be altered to accommodate site conditions and the drilling/excavation location. If levels of protection higher than Level D are used, this plan will be modified to include decontamination procedure. The Site excavation contractor will be required to have eye/face wash equipment/means available on-site.

A support area will be defined for each field activity where support equipment will be located. Normal work clothes are appropriate within this area. The location of this area depends on factors such as accessibility, wind direction (upwind of the operation.), and resources (i.e., roads, shelter, utilities). The location of this zone will be established daily. Excavation areas will be filled or secured (fencing) to prevent access from the public.

6.0 EMERGENCY INFORMATION

In the event of an emergency, the field personnel or the health and safety manager will employ emergency procedures. A copy of emergency information will be kept in the field and will be reviewed during the initial site briefing. Copies of emergency telephone numbers and directions to the nearest hospital will be prominently posted in the field.

6.1 MEDICAL TREATMENT AND FIRST AID

A first aid kit adequate for anticipated emergencies will be maintained in the field. If any injury should require advanced medical assistance, emergency personnel will be notified, and the victim will be transported to the hospital. The Contractor will establish his own first aid station and details will be provided in his HASP.

In the event of an injury or illness, work will cease until the field safety and oversight inspector has examined the cause of the incident and taken appropriate corrective action. Any injury or illness, regardless of extent, is to be reported to the project manager and health and safety officer.

6.2 EMERGENCY CONTACTS

Emergency telephone numbers will be posted in the field and are listed below:

- Ambulance, Fire, Police 911
- Poison Control Center 800-222-1222
- NYSDEC Spills Hotline 800-457-7362
- Jason M. Brydges, BE3 716-830-8636
- Michael Keller, NYSDEC PM 716 851-7218
- Renata Ockerby, NYSDOH PM 518-402-7860
- Brooks TLC Hospital System 529 Central Ave, Dunkirk - **(716) 366-1111** See **Attachment 4**.

Verbal communications between workers or use of a vehicle horn repeatedly at intervals of three short beeps shall be used to signal all on-site personnel to immediately evacuate the area and report to the vehicle parking area.

6.3 EMERGENCY STANDARD OPERATING PROCEDURES

The following standard operating procedures are to be implemented by on-site personnel in the event of an emergency. The health and safety manager and Contractor's field manager shall manage response actions.

1. Upon notification of injury to personnel, the designated emergency signal shall be sounded. All personnel are to terminate their work activities and assemble in a safe location. The emergency facility listed above shall be notified. If the injury is minor, but requires medical attention, the Contractor's field manager or the health and safety manager shall accompany the victim to the hospital and help in describing the circumstances of the accident to the attending physician.
2. Upon notification of an equipment failure or accident, the Contractor's field manager or the health and safety manager shall determine the effect of the failure or accident on site operations. If the failure or accident affects the safety of personnel or prevents completion of the scheduled operations, all personnel are to leave the area until the situation is evaluated, and appropriate actions taken.
3. Upon notification of a natural disaster, such as tornado, high winds, flood, thunderstorm or earthquake, on-site work activities are to be terminated and all personnel are to evacuate the area.

6.4 EMERGENCY RESPONSE FOLLOW-UP ACTIONS

Following activation of an emergency response, the health and safety officer shall notify the project manager, and the Contractor's field manager shall submit a written report documenting the incident to the project manager.

6.5 MEDICAL TREATMENT

The Contractor's field manager shall be informed of any site-related injury, exposure or medical condition resulting from work activities. All personnel are entitled to medical evaluation and treatment in the event of a site accident or incident.

6.6 SITE MEDICAL SUPPLIES AND SERVICES

The Contractor's field manager or a trained first aid crew member shall evaluate all injuries at the site and render emergency first-aid treatment, as appropriate. If an injury is minor but requires professional medical evaluation, the field manager shall escort the employee to the appropriate emergency room. For major injuries occurring at the site, emergency services shall be requested. A first-aid kit shall be readily accessible, fully supplied, and maintained at specified locations used for on-site operations.

6.7 PRECAUTIONS

Universal precautions shall be followed on-site that consist of treating all human blood and certain body fluids as being infected with Human Immune Deficiency Virus (HIV), Hepatitis B virus (HBV), or other blood borne pathogens. Clothing and first-aid materials visibly contaminated with blood or other body fluids will be collected and placed into a biohazard bag. Individuals providing first aid or cleanup of blood- or body-fluid contaminated items should wear latex gloves. If providing CPR, a one-way valve CPR device should be used. Biohazard bags, latex gloves, and CPR devices will be included in the site first-aid kits.

Work areas visibly contaminated with blood or body fluids shall be cleaned using a 1:10 dilution of household bleach. If equipment becomes contaminated with blood or body fluids, and can not be sufficiently cleaned, the equipment shall be placed in a plastic bag and sealed. Any personnel servicing the equipment shall be made aware of the contamination, so that proper precautions can be taken.

7.0 RECORDKEEPING

The Contractor's field manager and health and safety officer are responsible for site record keeping. Prior to the start of work, they will review this Plan along with the Contractor's HASP. A Site safety briefing will be completed prior to the initiation of field activities. This shall be recorded in the field logbook. An accident report should be completed by the Field Manager if an accident occurs and forwarded to the project manager.

8.0 PERSONNEL TRAINING REQUIREMENTS

8.1 INITIAL SITE BRIEFING

Prior to site entry, the Contractor's health and safety manager shall provide all personnel (including site visitors) with site-specific health and safety training. A record of this training shall be maintained. This training shall consist of the following:

- Discussion of the elements contained within this plan
- Discussion of responsibilities and duties of key site personnel
- Discussion of physical, biological and chemical hazards present at the site
- Discussion of work assignments and responsibilities
- Discussion of the correct use and limitations of the required PPE
- Discussion of the emergency procedures to be followed at the site
- Safe work practices to minimize risk
- Communication procedures and equipment

- Emergency notification procedures

8.2 DAILY SAFETY BRIEFINGS

The Contractor's health and safety manager will determine if a daily safety briefing is required. The briefing shall discuss the specific tasks scheduled for that day and the following topics:

- Specific work plans
- Physical, chemical or biological hazards anticipated
- Fire or explosion hazards
- PPE required
- Emergency procedures, including emergency escape routes, emergency medical treatment, and medical evacuation from the site
- Weather forecast for the day
- Buddy system
- Communication requirements
- Site control requirements
- Material handling requirements

9.0 COMMUNITY AIR MONITORING PROGRAM (CAMP)

A Community Air Monitoring Program (CAMP) requires real-time monitoring for VOCs and particulates (i.e., dust) at the upwind and downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The program 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 and on-site workers not directly involved with work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. A New York State Department of Health (NYSDOH) generic CAMP obtained from NYSDEC DER-10 is presented in the **Appendix B** of the RIWP that will be followed and adhered to for work activities that could generate dust from an impacted area.

A program for suppressing fugitive dust and particulate matter monitoring will also be conducted in accordance *NYSDEC DER-10* titled *Appendix 1B Fugitive Dust and Particulate Monitoring,* which is also provided in **Appendix B**. The fugitive dust suppression and particulate monitoring program will be employed at the site during building demolition, IRM site remediation and other intrusive activities which warrant its use.

Both the CAMP and the fugitive dust and particulate monitoring program will be administered by the environmental engineer/consultant. Monitoring results of the CAMP will be reported to the New York State Department of Health daily for review in daily field reports that will include a work location map, wind direction, location of CAMP monitoring stations, and CAMP data.

The NYSDEC and NYSDOH will be notified within one business day of any exceedances noted in CAMP data as well as any corrective measures taken to suppress fugitive dust.

ATTACHMENT 1

Table of Potential Hazards and OSHA Standards

Potential Hazards and OSHA Standards for Consideration during IRMs

Site Exposure/Control	Potentially Applicable OSHA Standard*	
	1910 General Industry	1926 Construction
Hazard Assessmen & Employee Training	29 CFR 1910.132(d)	29 CFR 1926.21(b)
Chemical Exposure	29 CFR 1910.1000	29 CFR 1926.55
Noise Exposure	29 CFR 1910.95	29 CFR 1926.52
Sanitation	29 CFR 1910.141	29 CFR 1926.51
Wiring Methods (temporary wiring)	29 CFR 1910.305(a)(2) 29 CFR 1910.333	29 CFR 1926.405(a)(2)
Electrical Hazards		29 CFR 1926.416
Emergency Action Planning	29 CFR 1910.38	29 CFR 1926.35
Excavation	covered by 1926	29 CFR 1926 Subpart P
Confined Space Entry	29 CFR 1910.146	29 CFR 1926.21(b)(6)29 CFR 1926.353(b)
Material Handling	29 CFR Subpart N	29 CFR Subpart N29 CFR 1926.600-60229 CFR 1926.604
Building Demolition	covered by 1926	29 CFR 1926 Subpart T
Site ContaminantAbatement	29 CFR 1910.1000-1029 29 CFR 1910.1043-1052	29 CFR 1926.5529 CFR 1926.6229 CFR 1926.1101-1152
Elevated Work Surfaces	29 CFR 1910 Subpart D 29 CFR 1910 Subpart F	29 CFR 1926 Subpart L29 CFR 1926 Subpart M29 CFR 1926.552
Chemical Storage	29 CFR 1910 Subpart H29 CFR 1910.1200	29 CFR 1926.5929 CFR 1926 Subpart F
Personal Protective Equipment	29 CFR 1910 Subpart I	29 CFR 1926 Subpart E
Heavy Equipment Operation	29 CFR 1910.9529 CFR 1910 Subpart N	29 CFR 1926.5229 CFR 1926 Subpart O
Tasks-Long Duration	29 CFR 1910.141-142	29 CFR 1926.51

The Federal General Industry and Construction citations are provided above

ATTACHMENT 2

Heat Stress Management Program and Procedures

INTRODUCTION

Panamerican employees engage in a variety of activities with potential exposure to excessive ambient temperatures and humidity, with the overall result being Aheat stress@. This procedure establishes the Panamerican Heat Stress Management Program. It establishes responsibilities and basic requirements for personnel who may be required to work in situations where the ambient temperature exceeds 21° C (70° F) while wearing protective equipment (e.g., hazardous waste site investigations) or when the ambient temperature exceeds 29° (85° F) while wearing normal clothing. Because heart stress is one of the most common and potentially serious illnesses at job sites and particularly hazardous waste sites, regular monitoring and other preventive measures are warranted.

There are no regulations addressing heat stress. However, it should be noted that OSHA does recognize heat stress as a potentially serious health hazard and can site employers under the Ageneral duty clause@ of the Occupational Safety Health Act if heat-related illness is occurring or likely to occur.

PROGRAM ADMINISTRATION AND RESPONSIBILITIES

The Heat Stress Management Program is administered by Panamerican Managers and Health and Safety personnel.

These Individuals:

- Oversee the implementation of the Heat Stress Management Program;
- Periodically audit and evaluate program implementation;
- Evaluate this procedure on an ongoing basis to see that it reflects current practice and regulations;
- Assist field crews in their implementation of this procedure.

Project Managers (PM) and Safety Personnel are responsible for:

- Implementing this Procedure in all field operations:
- Providing guidance to staff regarding heat stress management as described in the Procedure; and
- Providing feedback to management regarding program effectiveness.

Staff Members are responsible for:

- Complying with this Procedure as it applies to their activities; and
- Providing feed back to their supervisor regarding program effectiveness.

HEAT STRESS HAZARDS AND RISK FACTORS

Heat Stress is defined as the total net load on the body with contributions from both exposure to external sources, such as sunshine and hot surfaces, and from internal metabolic heat production. A person=s

exposure to the increased ambient temperatures and humidity produces physiological responses referred to as heat stress which are characterized by an increase in the: a) Acore@ or Adeep body temperature@. b) heart rate, c) blood flow to the skin, and d) water and salt loss due to sweating. Conditions of excessive heat stress may occur either when the physical work is too heavy or the environment is too hot in relation to the work being performed. If work is performed under hot environmental conditions, the work load effort must be reviewed and the heat exposure limit maintained at or below the levels to protect the worker from the risk of acute heat illness.

In general, there are four types of physiological disorders associated with heat stress. They include:

- Heat Rash - a skin reaction occurring as a result of obstructed sweat glands, often associated with impermeable clothing.

- Heat Cramps - painful muscle spasms of extremities and abdomen, resulting from inadequate balance of electrolytes which are lost from sweating.

- Heat Exhaustion - a mild form of heat stroke due to depletion of body fluids and electrolytes. Blood vessels dilate despite decreased volume of blood. Symptoms include weakness, dizziness, nausea, rapid pulse, and a small increase in body temperature.

- Heatstroke - a potentially fatal disorder resulting from failure of the body=s thermoregulatory system. The classical description of heatstroke includes (1) a major disruption of central nervous function (unconsciousness of convulsions), (2) a lack of sweating (3) hot, dry, red or mottled skin, and (4) a core temperature in excess of 41^{o}C (105.8^{o} F). Heatstroke is a serious medical condition which calls for emergency medical action.

Seven factors play significant roles in the development of or predisposition to, heat stress disorders. These factors include:

- Acclimatization - Heat acclimatization leads to increased and quicker sweating, cooler skin due to an increase in evaporative cooling and a lower, more stable core body temperature. Maximal sweating rates in unacclimatized persons are lower, but salt concentrations in their perspiration are higher, requiring a higher rate of salt replacement.

- Age - Older individuals are generally more susceptible to heat stress than younger individuals. However, older healthy workers are able to perform well in hot jobs if permitted to proceed at a self-regulated pace.

- Gender - The average woman has a lower aerobic capacity than a similar-sized man. Nevertheless, when working at similar proportions of their maximum aerobic capacity, women perform similarly or only slightly less well than men.

- Body Fat - The lower level of physical fitness, decreased maximum work capacity and decreased cardiovascular capacity frequently associated with obesity predispose individuals to heat disorders.

- Water and Electrolyte Balance - Sustained, effective work performance in heat requires a

replacement of body water and electrolytes lost through sweating. If this water is not replaced by drinking, continued sweating will draw on water reserves from both tissues and body cells leading to dehydration.

- Use of Alcohol and Medication - Not withstanding the potential hazards from impaired coordination and judgment, the ingestion of alcohol before or during work in the heat should not be permitted because it reduces heat tolerance and increases the risk of heat illness, Many drugs, including diuretics and antihypertensives, can interfere with the body=s thermoregulation.

- Physical Fitness - Physical conditioning enhances heat tolerance by increasing the functional capacity of the cardiovasculatory system, and reduces the time required to develop heat acclimatization by about 50% over those not physically fit.

The factors listed above are to be taken into account by all project personnel when planning or executing a project subject to heat stress conditions. The factors should be taken into consideration for:

- the development of the project schedule;
- the ordering of supplies/equipment;
- the support facilities to be made available at the site;
- the execution of work tasks; and
- the after work hours activities.

The following is a summary of signs and symptoms of heat stress:

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 and moist skin
- Heavy sweating
- Dizziness, fainting and nausea

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 or death occurs. Competent medical help must be obtained. Signs and symptoms are:

- Red, hot and unusually dry skin
- Lack of or reduced perspiration
- Dizziness and confusion

- Strong, rapid pulse and coma.

HEAT AND STRESS PREVENTION

Preventive measures should be taken to prevent personnel from experiencing heat stress illness. Prevention of heat stress is also important because if an individual has experienced a heat illness incident, he has an increased likelihood of future occurrences. Preventive measures include: favorable work scheduling, acclimatization of workers to hot environments, drinking sufficient quantities of fluids, providing cool, sheltered work and rest areas, and utilizing cooling devices as appropriate of feasible. Heat stress monitoring/work rest regimens are discussed below.

Work Schedules and Activity

If possible, work should be scheduled during the coolest part of the day. Early morning and evening work can be considerably more effective than working midday when the additional time for breaks and heat stress monitoring are taken into account.

Employees should also be encourages to maintain a certain level of activity during the work shift. Prolonged standing in hot environments can lead to heat illness because the blood pools in the lower extremities. Workers should periodically walk about to encourage blood circulation from the feet and legs.

Acclimatization of Workers

A properly designed and applied heat acclimatization program will dramatically increase the ability of workers to work at a hot job and will decrease the risk of heat-related illnesses and unsafe acts. Heat acclimatization can usually be induced in 5 to 7 days of exposure to the hot job. For workers who have had previous experience with the job, the acclimatization regimen should be exposure for 50% on day 1, 60% on day 2, 80% on day 3 and 100% on day 4. For workers new to job the schedule should be 20% on day 1 with a 20% increase in each additional day.
Acclimatization can be induced by sustained elevations of the skin and core body temperatures above levels for the same work in cool environments for an hour or more per day. Acclimatization needs periodic reinforcement such as occurs daily during the work week. Persons may show some loss of acclimatization on the first day of the new shift after being idle for two days or over a weekend. After vacations of two weeks or longer he loss of acclimatization is substantial, several days at work will be needed before heat tolerance is fully restored.

Drinking Sufficient Quantities of Fluids

Under hot conditions where sweat production may reach 6 to 8 liters per day, voluntary replacement of the water lost is usually incomplete. The normal thirst mechanism is not sensitive enough to urge us to drink enough water to prevent dehydration. Individuals are seldom aware of the exact amount of seat they produce of how much water is needed to replace that lost in sweat; 1 liter/hour is not an uncommon rate of water loss. Every effort should be made to encourage individuals to drink water, low-sodium noncarbonated beverages or electrolyte replacement fluids (e.g., Gatorade). Lightly salted water (1 gram/liter of water (0.1%) or one level teaspoon per 15 quarts of water), should be provided to unacclimated workers. The salt should be dissolved completely and the water kept cool. Salt tablets as dietary supplements are not generally recommended.

Workers should drink at least 500 ml (one pint) of water before beginning work. The fluid should be maintained at temperatures of 10° to 15° (50 to 59° F). If possible, small quantities of fluids should be consumed at frequent intervals (e.g., 150 to 250 milliliters (ml), or at least a quarter pint, every 20 minutes) rather than the intake of 750 ml (3 cups) or more once per hour. Individuals vary, but water intake should total 4 to 8 liters (quarts) per day. When heat stress is considered a potential problem, a minimum of 1 liter/hour/person of water are to be maintained onsite. Individual paper or plastic cups will be provided in order to prevent the spread of communicable disease.

Alcohol and diuretics such as caffeine (contained in coffee, tea and soft drinks) can increase dehydration. Therefore employees with potential exposure to heat stress should be discouraged from the consumption of these types of fluids during and after working hours.

Cool, sheltered Work and Rest Areas

Exposure to direct sunlight significantly increases the overall thermal loading of the body, thereby increasing an individuals susceptibility to heat stress illnesses. Whenever possible work should be conducted under suspended tarps, in shady areas or in other sheltered areas in order to reduce thermal loading caused by the sun. Cool sheltered areas should be provided also for rest breaks. A rest area should be situated so that part of it is in the contamination reduction area so that workers can take breaks without being required to undertake a full decontamination procedure. Canopies or tarps and open air tents, are types of cool shelters which can provide shaded rest areas.

Cooling Devices

Auxiliary cooling devices can be successfully used to provide body cooling, especially to workers wearing protective garments at hazardous waste sites. Vortex coolers utilize high velocity air which is directed inside the protective clothing. Vortex coolers have been used successfully in some operations. Cooling vests utilizing Ablue ice@ type packs can provide some cooling to the torso, but add weight for the wearer and can inhibit body movements.

Newer, more sophisticated tube and refrigerant systems woven into undergarments are also available. However, some of these systems ,,may not be effective in situations where the work involves considerable motion, since bending and lifting can crimp the tubes, impending the flow of refrigerant.

Heat Stress Monitoring

Several heat stress monitoring systems have been devised to help manage heat stress in hot work environments. Panamerican performs heat stress monitoring when: 1) employees are wearing normal work clothing in ambient temperatures exceeding 29° C, (85° F) and 2) employees wearing chemical protective clothing (including paper coveralls) working in ambient temperatures exceeding 21° C (70° F). The temperature differential is related to the reduced ability of a person to maintain a core temperature of $\pm$ 37° C (98.6° F) when wearing chemical protective clothing.

It should be noted by personnel that there are no Afast and true@ methods of heat stress monitoring; likewise there are no regulations concerning heat stress monitoring. Individual susceptibility to heat stress is highly variable. Some individuals are highly susceptible to any increase in their internal body temperature while other individuals can work very well with internal body temperatures of 39°C (102.2° F) or higher.

The heat stress monitoring systems should be used by Site Safety Officers as guidelines and not necessarily as hard, fast rules. Individuals working in elevated temperatures should be queried on a regular basis regarding their perceived state of heat stress. If the calculated heat stress index value indicates that work can continue but a person states that they believe they are experiencing heat stress, the work effect should be discontinued and a rest break taken.

Likewise, if the calculated heat stress index value indicates that a rest break should be taken but the workers believe they can work longer, they should be permitted to work longer providing that their heart rates do not exceed 110 beats per minute. If the individual's heart rate rates exceed 110 beats per minute a rest break will be taken. In all cases, individual workers should not be permitted or expected to perform excessive work which could result in heat stress. If a SSO has any concerns that an individual may be pushing himself/herself past the Abreaking point@ the calculated work/rest regimen will be followed.

For strenuous field activities that are part of ongoing site work activities in hot weather, the following procedures shall be used to monitor the body=s physiological response to heat, and to monitor the work cycle of each site worker. There are two phases to this monitoring: the initial work/rest cycle is used to estimate how long the first work shifts of the day should be. Heart rate monitoring of each worker will establish the length of the successive work periods. Both phases are to be used are to be used for heat stress monitoring. Failure to use either one could place workers at risk of heat-related disorders.

Phase 1 - Determination of the Initial Work - Rest Regimen

The determination of the initial work - rest regimen can be performed using either of two methods:

-The Modified Dry Bulb Index; or
-The Wet Bulb Globe Thermometer (WBGT) Index

After the initial work - rest regimen has been determined, environmental conditions must be monitored for changes which would require a modification to the work - rest regimen. This, coupled with the heart rate monitoring, determines the work cycles to be followed on a site.

The Modified Dry Bulb Index accounts for the effects caused by solar, load, air temperature, and chemical protective clothing, under a light work load (walking at approximately 3 mph). A mercury thermometer, shielded from direct sunlight, is used to measure ambient temperature. The percentages of (of time) of sunlight and cloud cover are then estimated to determine a sunshine quality factor (e.g., 100% sunshine - no cloud cover = 1.0; 50% sunshine - 50% cloud cover = 0.5; 0% sunshine - 100% cloud cover = 0.0). When these two sets of values have been obtained, they are inserted into the following equation to calculate the adjusted temperature:

$$T\,(^{o}C, \text{adjusted}) = T\,(^{o}C, \text{actual}) + (7.2 \times \text{sunshine quality factor})$$

-OR-

$$T\,(^{o}F, \text{adjusted}) = T\,(^{o}F, \text{actual}) + (13 \times \text{sunshine quality factor})$$

After the adjusted temperature has been calculated, the length of the first work shift can be determined using the following table:

Initial Break and Physiological Monitoring Cycles

ADJUSTED TEMPERATURE	NORMAL WORK CLOTHES	PROTECTIVE CLOTHING
90^0F (32.2^0 C) or above	After each 45 minutes of work	After each 15 minutes of work
87.5^0-90^0 F (30.8^0-32.2^0 C)	After each 60 minutes of work	After each 30 minutes of work
82.5^0-87.5^0 F (28.1^0-30.8^0 C)	After each 90 minutes of work	After each 60 minutes of work
77.5^0-82.5^0 F (25.3^0-28.1^0 C)	After each 120 minutes of work	After each 90 minutes of work
72.5^0-77.5^0 F (22.5^0-25.3^0 C)	After each 150 minutes of work	After each 120 minutes of work

NOTE: The standard rest period is 15 minutes

WET BULB GLOBE THERMOMETER INDEX

The Wet Bulb Globe Thermometer (WBGT) Index was developed by the U.S. Army in the 1950s to prevent heat stress in army recruits. The WBGT Index accounts for the effects caused by humidity, air movement, evaporation, air temperature and work rate. It does not, however, account for the effects of chemical protective clothing, non-acclimatized workers, age, or other factors which may affect the likelihood of heat stress. Because of this, it is necessary to make adjustments to the index and conduct Heart Rate Monitoring.

WBGT measurements are usually obtained through the use of are-contained electronic devices. Such devices are easy to set up and can provide the user with the capabilities to store data and download to print out a hard copy.

Heat produced by the body and the environmental heat together determine the total heat load. Therefore, after the WBGT Index has been obtained, the anticipated work load category of each job shall be determined and the initial-rest regimen established using the table below.

The work load category may be determined by ranking each job into light, medium and heavy categories on the basis of type of operation. Examples of each category are:

Light work:	sitting or standing to control machines, performing light hand work
Moderate work:	walking about with moderate lifting and pushing; and
Heavy work:	pick and shovel work.

PERMISSIBLE HEAT EXPOSURE			
WORK-REST REGIMEN	WORK LOAD		
	LIGHT	MODERATE	HEAVY
	30.0^0 C/86^0 F	26.7^0 C/80.1^0 F	25^0C/77^0F
75% Work-25% Rest Each Hour	30.6^0 C/87.1^0 F	28^0 C/82.4^0 F	25.9^0 C/78.6^0 F
50% Work-50% Rest Each Hour	31.4^0 C/88.5^0 F	29.4^0 C/85.0^0 F	27.9^0 C/82.2^0 F
25%Work-75 % Rest Each Hour	32.2^0 C/90.0^0 F	31.1^0 C/88.0^0 F	30.0^0 C/86.0^0 F

The table reads as follows:

Light, continuous work is possible at any WBGT reading up to 30^0 C (86^0F) but above that limit work breaks

are needed to recover from the heat; light work at temperatures of between 30.0 and 30.6^{0}C (86 to 87^{0}F) can be conducted, but 15 minute breaks must be taken every hour, etc. It is important to note that this table is applicable primarily to healthy, acclimatized personnel; wearing standard work clothing.

NOTE: An additional 6 to 11^{0}C (42.8 to 51.8^{0}F) must be added to the calculated WBGT temperature for personnel wearing chemical protective clothing prior to determining the initial work - rest regimen from this table. Because the WBGT Index does not take into account unacclimatized workers, or individual susceptibilities, the addition to the WBGT value does not eliminate the requirement for Heart Rate Monitoring after work has begun.

Phase 2 - Heart Rate Monitoring

An increase in the heart rate is a significant indication of stress, whether induced by exposure to heat or through physical labor. Although baseline heart rates can vary significantly between individuals and during the day for an individual, a heart rate of 110 beats per minute or greater is an indication of physiological stress. To prevent heat stress illnesses, the heart rate (HR) should be measured by radial (wrist) or carotid (neck) pulse for 30 seconds as early as possible in the rest period. The HR at the beginning of the rest period should not exceed 110 beats/minute. If the HR is higher, the next work period should be shortened by 33 percent while the length of the rest period stays the same. If the pulse rate still exceeds 110 beats/minute at the beginning of the next rest period, the following work period should be further shortened by 33 percent while the length of the rest period stays the same.

ATTACHMENT 3

Trenching and Excavation
Health and Safety Requirements

REGULATORY AUTHORITY

Excavations will be performed in accordance with OSHA 29 CFR, subpart P, 1926:650-1926.652 and USACOE EM 385-1-1 section 25 requirements as they apply to project activities.

GENERAL

- **At all times the need for personnel to enter excavations will be minimized. Inspections or sample removal will be done from above the excavation, whenever possible.**
- **Personnel will only enter excavations after the requirements of this plan have been met.**
- **Personnel protective equipment including hard hat, safety glasses and steel-toe work boots may be required.**

SURFACE ENCUMBRANCES

Surface encumbrances such as structures, fencing, piping, stored material etc. which may interfere with safe excavations will be avoided, removed or adequately supported prior to the start of excavations. Support systems will be inspected daily.

UNDERGROUND UTILITIES

Underground utility locations will be checked and determined and permits as necessary will be in place prior to initiating excavations. Local utility companies will be contacted at least two days in advance, advised of proposed work, and requested to locate underground installations. When excavations approach the estimated location of utilities, the exact location will be determined by careful probing or hand digging and when it is uncovered, proper supports will be provided.

OVERHEAD OBSTACLES

A minimum safe distance of 20 feet will be maintained when working around overhead high-voltage lines or the line will be de-energized following appropriate lock-out and tag-out procedures by qualified utility personnel.

ENTRY/EXIT ROUTES

Excavations five feet or more deep will require an adequate means of exit, such as a ladder, ramp, or steps and located so as to require no more than 25 feet of lateral travel. Under no circumstances will

personnel be raised.

VEHICLE CONTROL/SAFETY

Personnel working around heavy equipment, or who may be exposed to public vehicular traffic will wear a traffic warning vest consisting of at least 400 square inches of red or orange material. At night, at least 400 square inches of florescent or other reflective material will be worn.

For excavation work on or adjacent to highways or streets, signs, signals, and barricades tat conform to the requirements of the current American National Standards Institute (ANSI) D6.1, Manual on Uniform Traffic Control Devices for Streets and Highways will be used to protect work areas. Signs, signals, and barricades will be adequately lighted at night. Flagmen will be provided when signs, signals and barricades do not provide adequate protection. Flagmen will use signals and procedures contained in the current issue of ANSI D6.1. At night, flagmen will be clearly illuminated so as to be easily seen by approaching traffic.

For mobile equipment operating next to or approaching the edge of an excavation, the operator will have a clear view of the edge of the excavation, or a warning system such as barricades, hand or mechanical signals, or stop logs will be used. If possible the surface grade will slope away from the excavation.

Personnel will be safely located in and around the trench and will not be permitted to work underneath loads handled by lifting or digging equipment. Personnel are required to stand away from vehicles being loaded and unloaded. Operators can remain in the cabs of vehicles being loaded or unloaded provided the vehicles are equipped to provide adequate protection to the operator.

HAZARDOUS ATMOSPHERES

Hazardous atmospheres, such as oxygen deficiency (atmospheres containing less than 19.5% oxygen), flammable gases or vapors (airborne concentrations greater than 20% of the lower explosive limit), and toxic gases or vapors (airborne concentrations above the OSHA Permissible Exposure Limit or other exposure limits) may occur in excavations, especially around landfills and hazardous waste sites.

In locations where oxygen deficiency or hazardous gaseous conditions are possible, the air in the excavation will be tested before personnel are permitted to enter an excavation deeper than 4 feet. When flammable gases are present, adequate ventilation will be provided and sources of ignition will be eliminated. Ventilation or respiratory protection will be provided to prevent personnel exposures to oxygen deficient or toxic atmospheres. Periodic retesting (at least each shift) of the excavation will be conducted to verify that the atmosphere is acceptable. A log or field book records will be maintained of all test results.

WATER ACCUMULATION HAZARDS

Personnel will not work in excavations that have accumulated water or where water is accumulating unless adequate precautions have been taken. These precautions can include special support or shield systems, water removal systems such as pumps, or safety harnesses and lifelines. Water removal systems will be operated and monitored by experienced personnel. Diversion ditches or dikes will be used to prevent surface water from entering the excavation and to provide adequate drainage of the area around the excavation. Adequate precautions, as described above, will be taken for excavating

subject to heavy rains.

STABILITY OF ADJACENT STRUCTURES

Support systems such as shoring, bracing, or underpinning will be provided to maintain the stability of adjoining buildings, walls, or other structures endangered by the excavation operations. Excavations below a foundation or retaining wall that could be reasonably expected to pose a hazard to personnel will not be permitted unless:

- **a support system is provided**
- **The excavation is in stable rock; or**
- **A Registered Professional Engineer has determined that the structure will not be effected by the excavation activity or that the excavation work will pose a hazard to employees. The Professional Engineer is required to demonstrate how the above determination was made on the basis of appropriate calculations.**

Sidewalks will not be undermined unless shored to protect from possible collapse.

PROTECTION FROM LOOSE ROCK, MATERIALS OR SPOILS

In excavations and trenches that personnel may be required to enter, loose rock, excavated or other material, and spoils will be effectively stored and retained at least two feet or more from the edge of the excavation.

As an alternative to the clearance prescribed above, barriers or other effective retaining devices may be used in order to prevent spoils or other materials from falling into the excavation.

Walkways, runways, and sidewalks will be kept clear of excavated material from other obstructions.

Scaling operations may be used to remove loose material and will be performed only by experienced crews under the direct supervision of a competent supervisor. The scalers will be provided with scaler=s lifelines, safety belts, boatswain chair, and other safety equipment necessary for their protection.

FALL PROTECTION

Walkways or bridges with standard guardrails that meet OSHA specifications will be provided where employees, the public, or equipment are required to cross over excavations.

Adequate barrier physical protection will be provided at all remotely located excavations. All excavations will be barricaded or covered.

EMERGENCY RESCUE

In the event of a cave-in, the Emergency Rescue Squad will be immediately notified. The caller should provide his name, location, nature of the accident (an excavation collapse), the dimensions of the excavation, and number of people trapped in the excavation. Personnel are not to enter a collapsed trench to attempt rescue. This may cause a further collapse of the trench. Under no circumstance is heavy equipment to be used to attempt rescue of personnel in a collapsed excavation; injury or decapitation could be the result. All heavy equipment and traffic in the area is to be shut down and

stopped to reduce vibration. Pumps should be started if water ensues.

INSPECTION PROGRAM

Safety personnel will conduct daily inspections of the excavation, the adjacent areas, and protective systems. Inspections will be conducted prior to the start of work and as needed throughout the work shift. Inspections will also be made after every rainstorm or other occurrence that increases the hazard of collapse (i.e., vibration from heavy equipment, freezing and thawing, etc.).

The excavation inspection will include a check for the following:

- **Evidence if situations that could result in possible cave-in (i.e. soil crumbling or sloughing, water saturated soils, freezing and thawing, unusual vibrations such as from heavy equipment, heavy rains, surface run off entering trench, etc.);**
- **Indications of failure of protective systems;**
- **Hazardous atmosphere (oxygen deficiency, flammable and toxic gases and vapors);**
- **Condition and support of exposed underground installations;**
- **Adequate means of egress;**
- **Signs, signals, and barricades for work area protection;**
- **Precautionary measures to control water accumulation;**
- **Stability and support of adjacent structures; and**
- **Adequate protection from loose rock and soil.**

PROTECTIVE SYSTEMS

Personnel working in excavations will be protected from cave-ins by sloping and/or benching of excavation walls, a shoring system or some other equivalent means except when:

- **The excavation is made entirely in stable rock; or**
- **Excavations are less than five feet deep and safety personnel have determined that there is no indication of potential cave-in. Depending on site and soil conditions protective measures may be taken for the excavations less than five feet in depth.**

The most important factor influencing the choice of protective systems is the soil type classification. Once the soil type has been classified, selection of the protective system, the determination of the angle of repose for sloping and benching, and the design of shoring systems will be made. Decisions will be based on careful evaluation of pertinent factors such as depth of cut; possible variation in water content of the material while the excavation is open; anticipated changes in materials from exposure to air, sun, water, or freezing; loading imposed structures equipment, overlying material, or stored material; and vibration from equipment, blasting traffic or other sources.

Soil Classification

Appendix A of the OSHA Excavation Standard describes a methjod to classify soils into four types:

1. Stable Rock - Solid mineral matter that can be excavated with vertical sides.

2. Type A - cohesive soils with an unconfined compressive strength of 1.5 ton per square foot (tsf) or greater. Examples include: clay; silty clay; sandy clay; clayey loam; and cemented soils such as caliche and hardpan. No soil is considered to be Type A if it is fissured, subject to vibration, previously disturbed, or part of a sloped, layered system.

3. Type B - cohesive soils with an unconfined compressive strength of greater than 0.5 tsf but less than 1.5 tsf. Examples include: angular gravel similar to crushed rock; silt; silty loam; and sandy loam; Type B soils also include : previously disturbed soils that are not type C; Type A soils that are fissured or subject to vibration; and dry rock that is not stable.

4. Type C - cohesive soils with an unconfined compressive strength of 0.5 tsf or less. Examples include: gravel; sand; loamy sand; submerged soil or soil from which water is seeping; submerged rock that is not stable.

The engineer, geologist, or safety personnel will conduct at least one visual and at least one manual test as described in the OSHA excavation standard in order to classify soils. Visual tests include looking for : particle size and soil cohesiveness (clumping); cracking in the excavation sides which suggests fissured material; underground installations ans previously disturbed soils; layered soil systems that slope toward the excavation; evidence of surface water and water seeping from the sides of the excavation; and sources of vibration that may affect the excavation stability. Manual tests include: plascticity; dry strength; tumb penetration; drying test; and strength tests using a pocket penetrometer or hand-operated shearvane.

<u>Sloping and Benching</u>

One of the following options for sloping and benching systems described in section 1926.652(b) of the OSHA Excavation Standard will be used in excavations of .5 foot or deeper or at the discretion of the safety personnel:

- **The walls of excavation will be sloped at an angle not steeper than 0ne-and one-half horizontal to one vertical. Sloping configurations will follow the slopes shown for Type C soils in Appendix B of the OSHA Excavation Standard.**

- **Maximum allowable slopes and sloping and benching configurations will be determined according to soil type as described in Appendices A and B of the OSHA Excavation Standard.**

- **Use of other written tabulated data and designs, such as tables and charts, to design sloping and benching systems. A copy of the tabulated data must be approved by a registered Professional Engineer. A copy of the tabulated data must be kept at the job site.**

Personnel are not allowed to work on the faces of sloped or benched excavations above other workers unless the workers at the lower levels are protected from falling material or equipment. Similar protection will be provided for personnel working in excavations below other workers.

<u>Support Systems, Shield Systems, and Other Protective Devices</u>

One of the following options described in OSHA (1926.652 (c)) will be followed.

- **Timber shoring, designed according to the conditions and requirements of Appendix C of the OSHA Excavation Standard or aluminum hydraulic shoring designed according to manufacturers tabulated data or Appendix D of the OSHA Excavation Standard. In order to use the information in Appendices C or D, the soil type must first be determined using the classification system in Appendix A. For each soil type the size and spacing of the cross braces, uprights, and walls that comprise the shoring system are then selected based on the depth and width of the trench.**

- **Use of the manufacturer=s written tabulated to design support systems, shielded systems, and other protective devices. Any deviation from this tabulated data must be approved by the manufacturer. A copy of the tabulated data as well as any approvals to deviate from the tabulated data must be kept at the job site.**

- **Use of other written tabulated data to design support systems, shield systems, and other protective devices. The tabulated data must be approved by a Registered Professional Engineer. A copy of the tabulated data must be kept at the job site.**

- **Use of a written support system, shield system, and other protective device design that has been approved by a Registered Professional Engineer. A copy of the written design must be kept at the job site.**

<u>Installation and Removal of Support</u>

Cross braces or trench jacks, uprights, and walls will be secured together to prevent sliding, falling or kickouts.

Additional precautions by way of shoring and bracing will be taken to prevent slides or cave-ins when excavations or trenches are made in locations adjacent to backfilled excavations, or where excavations are subjected to vibrations from railroad or highway traffic, the operation of machinery, or any other source.

If it is necessary to place or operate power shovels, derricks, trucks, materials, or other heavy objects on a level above or near any excavation, the side of the excavation will be sheetpiled, shored, and braced as necessary to resist the extra pressure due to such superimposed loads.

Backfilling and removal of trench supports will progress together from the bottom of the trench. Jacks or braces will be released slowly and , in unstable soil, ropes will be used to pull out the jacks or braces from above after employees have cleared the trench.

<u>Shield Systems</u>

Portable trench boxes or sliding trench shields may be used for protection of personnel in lieu of a shoring system or sloping. Where such trench boxes or shields are used, they will be designed, constructed and maintained in a manner which will provide protection equal to or greater than the sheeting or shoring required for the trench. Shields will be installed so as to restrict lateral or other hazardous movement. Personnel are not allowed inside shields when shields are being moved.

EXCAVATION SAFETY LIST

To be completed prior to each work shift, or prior to personnel entering a new trench for the first time, by the Site Safety Officer/Competent Person:

Project_____Location_____

Job Number_____

Competent Person(CP)*_____Date_____

		Yes	No	N/A
1.	**Has the site been cleared for utilities and other underground obstructions?**	____	____	____
2.	**If on public property, has the regional utility locating service been notified?**	____	____	____
3.	**Has the excavation equipment been safety checked by the operator?**	____	____	____
4.	**Are copies of relevant OSHA excavation regulations available on site?**	____	____	____
5.	**Will the excavation be 5 feet or more in depth?**	____	____	____
6.	**If 4 is yes, will personnel enter the excavation at any time?**	____	____	____
7.	**If 4a is yes, have provisions been made for shoring, sloping, or benching the excavation? Describe:** _____ _____ _____	____	____	____
8.	**Has an inspection of the site and excavation been conducted by the SSO?**	____	____	____
9.	**Has the Competent Person conducted visual and manual tests to classify the soil?**	____	____	____

*** According to Federal OSHA, A Competent Person is a person who is capable of identifying existing and predictable hazards in the surroundings; or working conditions which are unsanitary, hazardous, or dangerous to employees; and who has the authority to take prompt corrective measures to eliminate them.**

10.	**G**	**Visual Test _____(type)**			
	G	**Manual Test_____(type)**			
	G	**Soil Classification_____(type)**			
11.		**Are there any conditions that might expose employees to injury from possible moving ground?**	____	_____	____
12.		**Is excavated material being placed at least 2 feet from the edge of the excavation?**	____	____	____
13.		**Is work in the excavation at all times under the immediate supervision of the SSO or other competent person?**	____	____	____
14.		**Is there a stairway, ladder, or ramp securely fastened in place to provide ingress and egress from the excavation?**	____	____	____
15.		**If the excavation is 4 feet or more in depth, are safe means of access (see 8) provided so as to require no more than 25 feet of lateral travel to reach them?**	____	____	____
16.		**If structural ramps are installed that are used for access/egress: were they designed by a qualified engineer?**	____	____	____
17.		**Do the structural ramps have appropriate means to prevent slipping and are the ramps uniform in thickness?**	____	____	____
18.		**Are walkways or bridges provided across the excavation to safe crossing?**	____	____	____
19.		**If excavations are 71/2 or more feet in depth, do the walkways have guardrails and toeboards?**	____	____	____
20.		**Are undermined structures adequately supported to safely carry all anticipated loads and protect workers?**	____	____	____
21.		**Are there adequate means provided to prevent mobile equipment from inadvertently entering the excavation?**	____	____	____
22.		**Is the excavation well marked and barricaded to prevent personnel from falling IN?**	____	____	____
23.		**Are means available to prevent surface water from entering the excavation and to provide**	____	____	____

	adequate drainage of the area adjacent to the trench?			
24.	**Where it is reasonable to expect hazardous atmospheres, including oxygen deficiency, to exist in the excavation, is appropriate atmosphere testing equipment available.**	____	____	____
25.	**Has the testing equipment been calibrated, and the calibrations recorded, today?**	____	____	____
26.	**Are employees trained in proper use of this equipment?**	____	____	____
27.	**Has a harness and lifeline been provided whenever an employee is required to enter a confined footing excavation?**	____	____	____
28.	**Is appropriate personal protective equipment (hardhat, safety boots, eye protection, etc.) available and in use?**	____	____	____

Notes:_____

_____

_____

_____

_____ _____

CPs Name (Print) **Signature**

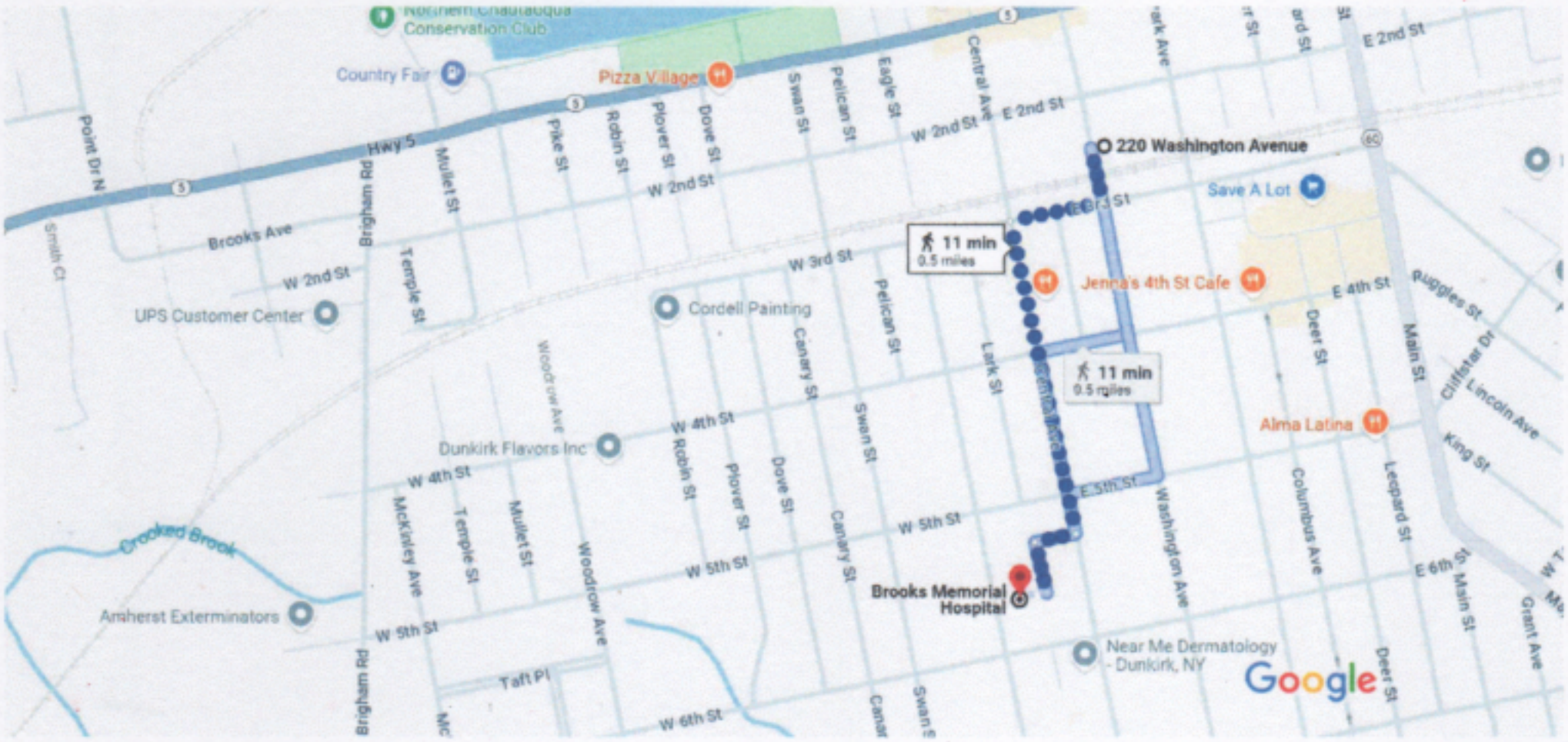
ATTACHMENT 4

Map to Hospital

Google Maps

220 Washington Ave, Dunkirk, NY 14048 to Brooks Mem Hospital, 529 Central Ave, Dunkirk, NY 14048

Walk 0.5 mile, 11 min



via Central Ave	11 min	0.5 mile
via Washington Ave and Central Ave	11 min	0.5 mile
via Washington Ave	11 min	0.5 mile

All routes are mostly flat

Appendix B

Community Air Monitoring Plan

COMMUNITY AIR MONITORING PROGRAM (CAMP)

11 PARCELS
BLOCK OF WASHINGTON, E. SECOND & PARK
CITY OF DUNKIRK, CHAUTAUQUA COUNTY, NEW YORK

Prepared for:

Regan Development Corporation
1055 Saw Mill River Road #204
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SEPTEMBER 2024

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1.0 Community Air Monitoring Program 1

Attachments

1- NYSDOH Generic CAMP and Fugitive Dust and Particulate Monitoring

1.0 COMMUNITY AIR MONITORING PROGRAM (CAMP)

A Community Air Monitoring Program (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the upwind and downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The program 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 and on-site workers not directly involved with work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. A NYSDOH generic CAMP obtained from NYSDEC DER-10 is presented in Attachment 1 that will be followed and adhered to for work activities that could release potential contaminants from an impacted area.

A program for suppressing fugitive dust and particulate matter monitoring will also be conducted in accordance NYSDEC DER-10 titled Appendix 1B Fugitive Dust and Particulate Monitoring, which is also provided in Attachment 1. The fugitive dust suppression and particulate monitoring program will be employed at the site during building demolition, site investigations/remediation and other intrusive activities which warrant its use.

Both the CAMP and the fugitive dust and particulate monitoring program will be administered by the environmental engineer/consultant. Monitoring results of the CAMP will be reported to the New York State Department of Health daily for review.

NYSDEC and NYSDOH are to be provided CAMP data on a daily basis when collected in daily field reports. Daily field reports will include work zones, wind direction, location of CAMP monitoring devices, and CAMP data. When sample excursions occur, identify the reason for the excursions and measures to address the excursions.

ATTACHMENT 1

NYSDOH Generic CAMP
and
Fugitive Dust and Particulate Monitoring

Appendix 1A
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 1B
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° C (14 to 122° 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.

Special Requirements for Work Within 20 Feet of Potentially Exposed Individuals or Structures

When work areas are within 20 feet of potentially exposed populations or occupied structures, the continuous monitoring locations for VOCs and particulates must reflect the nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures. The use of engineering controls such as vapor/dust barriers, temporary negative-pressure enclosures, or special ventilation devices should be considered to prevent exposures related to the work activities and to control dust and odors. Consideration should be given to implementing the planned activities when potentially exposed populations are at a minimum, such as during weekends or evening hours in non-residential settings.

- If total VOC concentrations opposite the walls of occupied structures or next to intake vents exceed 1 ppm, monitoring should occur within the occupied structure(s). Depending upon the nature of contamination, chemical-specific colorimetric tubes of sufficient sensitivity may be necessary for comparing the exposure point concentrations with appropriate pre-determined response levels (response actions should also be pre-determined). Background readings in the occupied spaces must be taken prior to commencement of the planned work. Any unusual background readings should be discussed with NYSDOH prior to commencement of the work.

- If total particulate concentrations opposite the walls of occupied structures or next to intake vents exceed 150 mcg/m^3, work activities should be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 mcg/m^3 or less at the monitoring point.

- Depending upon the nature of contamination and remedial activities, other parameters (e.g., explosivity, oxygen, hydrogen sulfide, carbon monoxide) may also need to be monitored. Response levels and actions should be pre-determined, as necessary, for each site.

Special Requirements for Indoor Work With Co-Located Residences or Facilities

Unless a self-contained, negative-pressure enclosure with proper emission controls will encompass the work area, all individuals not directly involved with the planned work must be absent from the room in which the work will occur. Monitoring requirements shall be as stated above under "Special Requirements for Work Within 20 Feet of Potentially Exposed Individuals or Structures" except that in this instance "nearby/occupied structures" would be adjacent occupied rooms. Additionally, the location of all exhaust vents in the room and their discharge points, as well as potential vapor pathways (openings, conduits, etc.) relative to adjoining rooms, should be understood and the monitoring locations established accordingly. In these situations, it is strongly recommended that exhaust fans or other engineering controls be used to create negative air pressure within the work area during remedial activities. Additionally, it is strongly recommended that the planned work be implemented during hours (e.g. weekends or evenings) when building occupancy is at a minimum.

Appendix C

Quality Assurance/Quality Control Plan

QUALITY ASSURANCE/QUALITY CONTROL PLAN

11 PARCELS
BLOCK OF WASHINGTON, E. SECOND & PARK
CITY OF DUNKIRK, CHAUTAUQUA COUNTY, NEW YORK

Prepared for:

Regan Development Corporation
1055 Saw Mill River Road #204
Ardsley, NY 10502

Prepared By:

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Revised May 2026

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1.0 INTRODUCTION

This Quality Assurance/Quality Control (QA/QC) Plan provides an overview of QA/QC procedures required for the project. It also provides methods for laboratory testing of environmental samples obtained from the Site, which helps to ensure the quality of the data produced. The organizational structure for this project is presented in the Work Plan, which identifies the names of key project personnel. The project manager is responsible for verifying that QA procedures are followed in the field so that quality, representative samples are collected. The Project Manager is in contact with the analytical laboratory to monitor laboratory activities so that holding times and other QA/QC requirements are met. The anticipated quantity of field samples collected, and corresponding analytical parameters/methods are provided will be specified in the Remedial Action Work Plan (RAWP).

TABLE 1
ANALYTICAL SUMMARY TABLE

PARAMETER	ANALYTICAL METHOD
Part 375 VOCs	8260
Part 375 SVOCs	8270
Part 375 Metals	6010/7470/7471
Part 375 PCBs	8082
Part 375 Pesticides	8081
Sub-Slab Soil Vapor	TO-15
Ambient Air	TO-15 SIM
Emerging Contaminants	1633
1,4-Dioxane	8270 SIM

Holding Times: 8260-14 days and 8270, 8081, and 8082-7 days

A complete analyte list is provided in **Table 2** and analytical methods and procedures are provided in **Table 3**. Both tables are located at the end of this document.

All samples analyzed for VOCs and/or SVOCs will report TICs as specified in DER-10 Section 2.1(a)1.i. Sampling for emerging contaminants will be conducted in accordance with the NYSDEC Guidance Sampling, Analysis, and Assessment of Per-And Polyfluoroalkyl Substances (PFAS) Under NYSDEC's Part 375 Remedial Programs – April 2023. As part of a site investigation or remedial action compliance program, whenever samples of potentially affected media are collected and analyzed for the standard Target Analyte List/Target Compound List (TAL/TCL), PFAS analysis should also be performed. Field sampling for PFAS performed should follow the appropriate procedures outlined for soils, sediments, or other solids (Appendix B), non-potable groundwater (Appendix C), surface water (Appendix D), public or private water supply wells (Appendix E), and fish tissue (Appendix F). QA/QC samples (e.g. duplicates, MS/MSD) should be collected as specified in DER-10, Section 2.3(c).

As detailed in the guidance document, EPA Method 1633 is the procedure to use for environmental samples. Reporting limits for PFOA and PFOS in aqueous samples should not exceed 2 ng/L. Reporting limits for PFOA and PFOS in solid samples should not exceed 0.5 µg/kg. Reporting limits for all other PFAS in aqueous and solid media should be as close to these limits as possible. The analytical laboratory proposed for use for the analysis of samples will be a certified NYSDOH ELAP laboratory. The QA Manager of the laboratory will be

responsible for performing project-specific audits and for overseeing the quality control data generated. The field geologist/technician coordinates all personnel involved with field sampling, verifies that all sampling is conducted per the FSP, and communicates regularly with the Project Manager. The ultimate responsibility for maintaining quality throughout the project rests with the Project Manager, including field and laboratory QA/QC.

2.0 DATA QUALITY OBJECTIVES

2.1 BACKGROUND

Data quality objectives (DQOs) are qualitative and quantitative statements, which specify the quality of data required supporting the investigation for the site. DQOs focus on the identification of the end use of the data to be collected. The project DQOs are achieved utilizing the definitive data category as outlined in *Guidance for the Data Quality Objectives Process,* EPA QA/G-4 (September 1994). All sample analyses will provide definitive data, which are generated using rigorous analytical methods such as reference methods approved by the United States Environmental Protection Agency (USEPA). The purpose of this investigation is to determine the nature and extent of contamination at the site and along the boundaries of the stie.

Within the context of the purpose stated above, the project DQOs for data collected during this investigation are:

- To assess the nature and extent of contamination in soil and soil vapor
- To maintain the highest possible scientific/professional standards for each procedure
- To develop sufficient data to assess whether the levels of contaminates identified in the media sampled exceed regulatory guidelines

2.2 QA OBJECTIVES FOR CHEMICAL DATA MEASUREMENT

Sample analytical methodology for the media sampled and data deliverables are required to adhere to the requirements in NYSDEC Analytical Services Protocol. Laboratories are instructed to complete Sample Preparation and Analysis Summary forms and submit with the data packages. The laboratory is instructed that matrix interferences must be fixed to the extent practicable. To achieve the definitive data category described above, the data quality indicators of precision, accuracy, representativeness, comparability, and completeness are measured during analysis.

2.2.1 Precision

Precision examines the distribution of the reported values about their mean. The distribution of reported values refers to how different the individual reported values are from the average reported value. Precision may be affected by the natural variation of the matrix or contamination within that matrix and by errors made in field or laboratory handling procedures. Precision is evaluated using analyses of a laboratory matrix spike/matrix spike duplicate (for organics) and matrix duplicates (for inorganics), which indicate analytical precision through the reproducibility of the analytical results. Relative Percent Difference (RPD) is used to evaluate precision and it must meet the method requirements.

2.2.2 Accuracy

Accuracy measures the analytical bias in a measurement system. Sources of error are the sampling process, field contamination, preservation, handling, sample matrix, sample preparation, and analysis techniques. These data help to assess the potential concentration contribution from various outside sources. The laboratory objective for accuracy is to equal or exceed the accuracy demonstrated for the applied analytical methods on samples of the same matrix. The percent recovery criterion is used to estimate accuracy based on recovery in the matrix spike/matrix spike duplicate and matrix spike blank samples. The spike and spike duplicate, which will give an indication of matrix effects that may be affecting target compounds is also a good gauge of method efficiency.

2.2.3 Representativeness

Representativeness expresses the degree to which the sample data accurately and precisely represent the characteristics of a population of samples, parameter variations at a sampling point, or environmental conditions. Representativeness is a qualitative parameter, which is most concerned with the proper design of the sampling program or sub-sampling of a given sample. Objectives for representativeness are defined for sampling and analysis tasks and are a function of the investigative objectives. The sampling procedures described in the Field Sampling Plan have been selected with the goal of obtaining representative samples for the media of concern.

2.2.4 Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. A DQO for this program is to produce data with the greatest possible degree of comparability. This goal is achieved through using standard techniques to collect and analyze representative samples and reporting analytical results in appropriate units. Complete field documentation will support the assessment of comparability. Comparability is limited by the other parameters (e.g., precision, accuracy, representativeness, completeness, comparability), because only when precision and accuracy are known can data sets be compared with confidence. For data sets to be comparable, it is imperative that contract-required methods and procedures be explicitly followed.

2.2.5 Completeness

Completeness is defined as a measure of the amount of valid data obtainable from a measurement system compared to the amount that was expected to be obtained under normal conditions. It is important that appropriate QA procedures be maintained to verify that valid data are obtained to meet project needs. For the data generated, a goal of 90% is required for completeness (or usability) of the analytical data. If this goal is not met, then project personnel will determine whether the deviations might cause the data to be rejected.

3.0 SAMPLING LOCATIONS, CUSTODY, AND HOLDING TIMES

Sampling locations are discussed in the RAWP. Procedures addressing field and laboratory sample chain-of-custody and holding times details are presented in the Field Sampling Plan. The laboratory must meet the method required detection limits which are referenced within the methods.

4.0 CALIBRATION PROCEDURES AND FREQUENCY

To obtain a high level of precision and accuracy during sample processing procedures, laboratory instruments must be calibrated properly. Several analytical support areas must be considered so the integrity of standards and reagents is upheld prior to instrument calibration. The following sections describe the analytical support areas and laboratory instrument calibration procedures.

4.1 ANALYTICAL SUPPORT AREAS

Prior to generating quality data, several analytical support areas must be considered; these are detailed in the following paragraphs.

Standard/Reagent Preparation – Primary reference standards and secondary standard solutions shall be obtained from National Institute of Standards and Technology (NIST), or other reliable commercial sources to verify the highest purity possible. The preparation and maintenance of standards and reagents will be accomplished according to the methods referenced. All standards and standard solutions are to be formally documented (i.e., in a logbook) and should identify the supplier, lot number, purity/concentration, receipt/preparation date, preparers name, method of preparation, expiration date, and any other pertinent information. All standard solutions shall be validated prior to use. Care shall be exercised in the proper storage and handling of standard solutions (e.g., separating volatile standards from nonvolatile standards). The laboratory shall continually monitor the quality of the standards and reagents through well documented procedures.

Balances – The analytical balances shall be calibrated and maintained in accordance with manufacturer specifications. Calibration is conducted with two Class AS" weights that bracket the expected balance use range. The laboratory shall check the accuracy of the balances daily and they must be properly documented in permanently bound logbooks.

Refrigerators/Freezers – The temperature of the refrigerators and freezers within the laboratory shall be monitored and recorded daily. This will verify that the quality of the standards and reagents is not compromised, and the integrity of the analytical samples is upheld. Appropriate acceptance ranges (2 to 6°C for refrigerators) shall be clearly posted on each unit in service.

Water Supply System – The laboratory must maintain a sufficient water supply for all project needs. The grade of the water must be of the highest quality (analyte-free) to eliminate false-positives from the analytical results. Ultraviolet cartridges or carbon absorption treatments are recommended for organic analyses and ion-exchange treatment is recommended for inorganic tests. Appropriate documentation of the quality of the water supply system(s) will be performed on a regular basis.

4.2 LABORATORY INSTRUMENTS

Calibration of instruments is required to verify that the analytical system is operating properly and at the sensitivity necessary to meet established quantitation limits. Each instrument for organic and inorganic analyses shall be calibrated with standards appropriate to the type of instrument and linear range established within the analytical method(s). Calibration of laboratory instruments will be performed according to specified methods.

In addition to the requirements stated within the analytical methods, the contract laboratory will be required to analyze an additional low-level standard at or near the detection limits. In general, standards will be used that bracket the expected concentration of the samples. This will require the use of different concentration levels, which are used to demonstrate the instrument's linear range of calibration.

Calibration of an instrument must be performed prior to the analysis of any samples and then at periodic intervals (continuing calibration) during the sample analysis to verify that the instrument is still calibrated. If the contract laboratory cannot meet the method required calibration requirements, corrective action shall be taken. All corrective action procedures taken by the contract laboratory are to be documented, summarized within the case narrative, and submitted with the analytical results.

5.0 INTERNAL QUALITY CONTROL CHECKS

Internal QC checks are used to determine if analytical operations at the laboratory are in control, as well as determining the effect sample matrix may have on data being generated. Two types of internal checks are performed and are described as batch QC and matrix-specific QC procedures. The type and frequency of specific QC samples performed by the contract laboratory will be according to the specified analytical method and project specific requirements. Acceptable criteria and target ranges for these QC samples are presented within the referenced analytical methods.

QC results which vary from acceptable ranges shall result in the implementation of appropriate corrective measures, potential application of qualifiers, and/or an assessment of the impact these corrective measures have on the established data quality objectives. Quality control samples including any project-specific QC will be analyzed are discussed below.

5.1 BATCH QC

Method Blanks – A method blank is defined as laboratory-distilled or deionized water that is carried through the entire analytical procedure. The method blank is used to determine the level of laboratory background contamination. Method blanks are analyzed at a frequency of one per analytical batch.

Matrix Spike Blank Samples – A matrix spike blank (MSB) sample is an aliquot of water spiked (fortified) with all the elements being analyzed for calculation of precision and accuracy to verify that the analysis that is being performed is in control. An MSB will be performed for each matrix and organic parameter only.

5.2 MATRIX-SPECIFIC QC

Matrix Spike Samples – An aliquot of a matrix is spiked with known concentrations of specific compounds as stipulated by the methodology. The matrix spike (MS) and matrix spike duplicate (MSD) are subjected to the entire analytical procedure to assess both accuracy and precision of the method for the matrix by measuring the percent recovery and relative percent difference of the two spiked samples. The samples are used to assess matrix interference effects on the method, as well as to evaluate instrument performance. MS/MSDs are analyzed at a frequency of one each per 20 samples per matrix.

Matrix Duplicates – The matrix duplicate (MD) is two representative aliquots of the same sample which are prepared and analyzed identically. Collection of duplicate samples provides for the evaluation of precision both in the field and at the laboratory by comparing the analytical results of two samples taken from the same location. Obtaining duplicate samples from a soil matrix requires homogenization (except for volatile organic compounds) of the sample aliquot prior to filling sample containers, to best achieve representative samples. Every effort will be made to obtain replicate samples; however, due to interferences, lack of homogeneity, and the nature of the soil samples, the analytical results are not always reproducible.

Rinsate (Equipment) Blanks – A rinsate blank is a sample of laboratory demonstrated analyte-free water passed through and over the cleaned sampling equipment. A rinsate blank is used to indicate potential contamination from ambient air and from sample instruments used to collect and transfer samples. This water must originate from one common source within the laboratory and must be the same water used by the laboratory performing the analysis. The rinsate blank should be collected, transported, and analyzed in the same manner as the samples acquired that day. Rinsate blanks for nonaqueous matrices should be performed at a rate of 10 percent of the total number of samples collected throughout the sampling event. Rinse blanks will not be performed on samples (i.e., groundwater) where dedicated disposable equipment is used.

Trip Blanks – Trip blanks are not required for nonaqueous matrices. Trip blanks are required for aqueous sampling events. They consist of a set of sample bottles filled at the laboratory with laboratory demonstrated analyte free water. These samples then accompany the bottles that are prepared at the lab into the field and back to the laboratory, along with the collected samples for analysis. These bottles are never opened in the field. Trip blanks must return to the lab with the same set of bottles they accompanied to the field. Trip blanks will be analyzed for volatile organic parameters. Trip blanks must be included at a rate of one per volatile sample shipment.

6.0 CALCULATION OF DATA QUALITY INDICATORS

6.1 PRECISION

Precision is evaluated using analyses of a field duplicate or a laboratory MS/MSD that indicate analytical precision through the reproducibility of the analytical results. RPD is used to evaluate precision by the following formula:

$$RPD = \frac{(X_1 - X_2)}{[(X_1 + X_2)/2]} \times 100\%$$

where:

X_1 = Measured value of sample or matrix spike
X_2 = Measured value of duplicate or matrix spike duplicate

Precision will be determined using MS/MSD (for organics) and matrix duplicates (for inorganics) analyses.

6.2 ACCURACY

Accuracy is defined as the degree of difference between the measured or calculated value and the true value. The closer the numerical value of the measurement comes to the true value or actual concentration, the more accurate the measurement is. Analytical accuracy is expressed as the percent recovery of a compound or element that has been added to the environmental sample at known concentrations before analysis. Analytical accuracy may be assessed using known and unknown QC samples and spiked samples. It is presented as percent recovery. Accuracy will be determined from matrix spike, matrix spike duplicate, and matrix spike blank samples, as well as from surrogate compounds added to organic fractions (i.e., volatiles, semivolatiles, PCB), and is calculated as follows:

$$Accuracy\ (\%R) = \frac{(X_s - X_u)}{K} \times 100\%$$

where:

X_s - Measured value of the spike sample
X_u - Measured value of the unspiked sample
K - Known amount of spike in the sample

6.3 COMPLETENESS

Completeness is calculated on a per matrix basis for the project and is calculated as follows:

$$Completeness\ (\%C) = \frac{(X_v - X_n)}{N} \times 100\%$$

where:

X_v - Number of valid measurements
X_n - Number of invalid measurements
N - Number of valid measurements expected to be obtained

7.0 CORRECTIVE ACTIONS

Laboratory corrective actions shall be implemented to resolve problems and restore proper functioning to the analytical system when errors, deficiencies, or out-of-control situations exist at the laboratory. Full documentation of the corrective action procedure needed to resolve the problem shall be filed in the project records, and the information summarized in the case narrative. A discussion of the corrective actions to be taken is presented in the following sections.

7.1 INCOMING SAMPLES

Problems noted during sample receipt shall be documented by the laboratory. The Project Manager shall be contacted immediately for problem resolution. All corrective actions shall be documented thoroughly.

7.2 SAMPLE HOLDING TIMES

If any sample extraction or analyses exceed method holding time requirements, the Project Manager shall be notified immediately for problem resolution. All corrective actions shall be documented thoroughly.

7.3 INSTRUMENT CALIBRATION

Sample analysis shall not be allowed until all initial calibrations meet the appropriate requirements. All laboratory instrumentation must be calibrated in accordance with method requirements. If any initial/continuing calibration standards exceed method QC limits, recalibration must be performed and, if necessary, reanalysis of all samples affected back to the previous acceptable calibration check.

7.4 REPORTING LIMITS

The laboratory must meet the method required detection limits listed in NYSDEC ASP, 10/95 criteria. If difficulties arise in achieving these limits due to a sample matrix, the laboratory must notify PEI project personnel for problem resolution. To achieve those detection limits, the laboratory must utilize all appropriate cleanup procedures to retain the project required detection limits. When any sample requires a secondary dilution due to high levels of target analytes, the laboratory must document all initial analyses and secondary dilution results. Secondary dilution will be permitted only to bring target analytes within the linear range of calibration. If samples are analyzed at a secondary dilution with no target analytes detected, the Project Manager will be immediately notified so that appropriate corrective actions can be initiated.

7.5 METHOD QC

All QC method-specified QC samples shall meet the method requirements referenced in the analytical methods. Failure of method-required QC will result in the review and possible qualification of all affected data. If the laboratory cannot find any errors, the affected sample(s) shall be reanalyzed or re-extracted/redigested, then reanalyzed within method-required holding times to verify the presence or absence of matrix effects. If matrix effect is confirmed, the corresponding data shall be flagged accordingly using the flagging symbols and criteria. If matrix effect is not confirmed, then the entire batch of samples may have to be reanalyzed or re-extracted/redigested, then reanalyzed at no cost. Project Manager shall be notified as soon as possible to discuss possible corrective actions should unusually difficult sample matrices be encountered.

7.6 CALCULATION ERRORS

All analytical results must be reviewed systematically for accuracy prior to submittal. If upon data review calculation or reporting errors exist, the laboratory will be required to reissue the analytical data report with the corrective actions appropriately documented in the case narrative.

8.0 DATA REDUCTION, VALIDATION, AND USABILITY

8.1 DATA REDUCTION

Laboratory analytical data are first generated in raw form at the instrument. These data may be either in a graphic or printed tabular format. Specific data generation procedures and calculations are found in each of the referenced methods. Analytical results must be reported consistently. Identification of all analytes must be accomplished with an authentic standard of the analyte traceable to NIST or USEPA sources. Individuals experienced with an analysis and knowledgeable of requirements will perform data reduction.

8.2 DATA VALIDATION

Data validation is a systematic procedure of reviewing a body of data against a set of established criteria to provide a specified level of assurance of validity prior to its intended use. All analytical results from soil and groundwater samples will have ASP Category B deliverables and DUSRs. The data validation will be in accordance with DER-10 Section 2.2 with ASP - Category B data deliverables provided by the laboratory and a DUSR provided for validation. Where possible, discrepancies will be resolved by the project manager.

- Technical holding times will be in accordance with NYSDEC ASP, 7/2005 edition.
- Organic calibration and QC criteria will be in accordance with NYSDEC ASP, 7/2005 edition. Data will be qualified if it does not meet NYSDEC ASP, 7/2005 criteria.

Note that analytical results from the PCB Survey will also complete DUSRs and be submitted to EQuIS, in accordance with the Quality Assurance/Quality Control Plan (QA/QC Plan). All EDDs will be submitted to EQuIS and a copy will be sent to the NYSDEC PM Michael Keller at michael.keller @dec.ny.gov.

9.0 REFERENCES

Comprehensive Environmental Response Compensation and Liability Act (CERCLA) Quality Assurance Manual, Final Copy, Revision I, October 1989.

National Enforcement Investigations Center of USEPA Office of Enforcement. *NEIC Policies and Procedures.* Washington: USEPA.
New York State Department of Environmental Conservation (NYSDEC) 2005. *Analytical Services Protocol*, (ASP) 7/2005 Edition. Albany: NYSDEC.

NYSDEC "DER-10 Technical Guidance for Site Investigation and Remediation (DER-10)," dated May 3, 2010, Appendix 2B

TABLE 2
ANALYTE LIST

Part 375 Metals (ICP)
EPA 6010C

Analyte

Arsenic
Barium
Beryllium
Cadmium
Chromium
Copper
Lead
Manganese
Nickel
Selenium
Silver
Zinc
Mercury EPA 7471B
Cyanide, Total EPA 9014

PCBs **EPA 7471B**

PCB-1016
PCB-1221
PCB-1232
PCB-1242
PCB-1248

Chlorinated Pesticides
EPA 8081B/ Herbicides EPA 8151

4,4-DDD
4,4-DDE
4,4-DDT
Aldrin
alpha-BHC
beta-BHC
cis-Chlordane
delta-BHC
Dieldrin
Endosulfan I
Endosulfan II
Endosulfan Sulfate
Endrin
Endrin Aldehyde
Endrin Ketone
gamma-BHC (Lindane)
Heptachlor
Heptachlor Epoxide
Methoxychlor
Toxaphene
trans-Chlordane
2,4,5-TP Acid (Silvex)

Semi-Volatile Organics (Acid/Base Neutrals)
EPA 8270D

1,1-Biphenyl
1,2,4,5-Tetrachlorobenzene
1,2,4-Trichlorobenzene
1,2-Dichlorobenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
2,2-Oxybis (1-chloropropane)
2,3,4,6-Tetrachlorophenol
2,4,5-Trichlorophenol
2,4,6-Trichlorophenol
2,4-Dichlorophenol
2,4-Dimethylphenol
2,4-Dinitrophenol
2,4-Dinitrotoluene
2,6-Dinitrotoluene
2-Chloronaphthalene
2-Chlorophenol
2-Methylnapthalene
2-Methylphenol
2-Nitroaniline
2-Nitrophenol
3&4-Methylphenol
3,3'-Dichlorobenzidine
3-Nitroaniline
4,6-Dinitro-2-methylphenol
4-Bromophenyl phenyl
4-Chloro-3-methylphenol
4-Chloroaniline
4-Chlorophenyl phenyl ether
4-Nitroaniline
4-Nitrophenol
Acenaphthene
Acenaphthylene
Acetophenone
Anthracene
Atrazine
Benzaldehyde
Benzo (a) anthracene
Benzo (a) pyrene
Benzo (b) fluoranthene
Benzo (g,h,i) perylene
Benzo (k) fluoranthene
Bis (2-chloroethoxy) methane
Bis (2-chloroethyl) ether
Bis (2-ethylhexyl) phthalate
Butylbenzylphthalate
Caprolactam
Carbazole
Chrysene
Dibenz (a,h) anthracene
Dibenzofuran
Diethyl phthalate
Dimethyl phthalate
Di-n-butyl phthalate
Di-n-octylphthalate
Fluoranthene
Fluorene
Hexachlorobenzene
Hexachlorobutadiene
Hexachlorocyclopentadiene
Hexachloroethane
Indeno (1,2,3-cd) pyrene
Isophorone
Naphthalene
Nitrobenzene
N-Nitroso-di-n-propylamine
N-Nitrosodiphenylamine
Pentachlorophenol
Phenanthrene
Phenol
Pyrene

Volatile Organics
EPA 8260C

1,1,1-Trichloroethane
1,1,2,2-Tetrachloroethane
1,1,2-Trichloroethane
1,1-Dichloroethane
1,1-Dichloroethene
1,2,3-Trichlorobenzene
1,2,4-Trichlorobenzene
1,2,4-Trimethylbenzene
1,2-Dibromo-3-Chloropropane
1,2-Dibromoethane
1,2-Dichlorobenzene
1,2-Dichloroethane
1,2-Dichloropropane
1,3,5-Trimethylbenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
1,4-dioxane
2-Butanone
2-Hexanone
4-Methyl-2-pentanone
Acetone
Benzene
Bromochloromethane
Bromodichloromethane

TABLE 2 (Continued)

Volatile Organics
(Continued)

Bromomethane
Carbon disulfide
Carbon Tetrachloride
Chlorobenzene
Chloroethane
Chloroform
Chloromethane
cis-1,2-Dichloroethene
cis-1,3-Dichloropropene
Cyclohexane
Dibromochloromethane
Dichlorodifluoromethane
Ethylbenzene
Freon 113
Isopropylbenzene
m,p-Xylene
Methyl acetate
Methyl tert-butyl Ether
Methylcyclohexane
Methylene chloride
Naphthalene
n-Butylbenzene
n-Propylbenzene
o-Xylene
p-Isopropyltoluene
sec-Butylbenzene
Styrene
tert-Butylbenzene
Tetrachloroethene
Toluene
trans-1,2-Dichloroethene
trans-1,3-Dichloropropene
Trichloroethene
Trichlorofluoromethane
Vinyl chloride

Volatiles-Air - TO-15

Acetone
Benzene
Carbon disulfide
Chloromethane
Dichlorodifluoromethane
Ethanol
Ethylbenzene
Ethyl Acetate
4-Ethyltoluene
Heptane
Hexane
Isopropyl Alcohol
Methylene chloride
Methyl ethyl ketone
Propylene
1,1,1-Trichloroethane
1,2,4-Trimethylbenzene
1,3,5-Trimethylbenzene
2,2,4-Trimethylpentane
Tertiary Butyl Alcohol
Tetrachloroethylene
Toluene
Trichloroethylene
Trichlorofluoromethane
m,p-Xylene
o-Xylene
Xylenes (total)
Acetone
Benzene
Carbon disulfide
Chloromethane
Dichlorodifluoromethane
Ethanol
Ethylbenzene
Ethyl Acetate
4-Ethyltoluene
Heptane
Hexane
Isopropyl Alcohol
Methylene
Methyl ethyl ketone
Propylene
1,1,1-Trichloroethane

TABLE 3
PFAS ANALYTE LIST

Group	Chemical Name	Abbreviation	CAS Number
Perfluoroalkyl sulfonates	Perfluorobutanesulfonic acid	PFBS	375-73-5
	Perfluorohexanesulfonic acid	PFHxS	355-46-4
	Perfluoroheptanesulfonic acid	PFHpS	375-92-8
	Perfluorooctanessulfonic acid	PFOS	1763-23-1
	Perfluorodecanesulfonic acid	PFDS	335-77-3
Perfluoroalkyl carboxylates	Perfluorobutanoic acid	PFBA	375-22-4
	Perfluoropentanoic acid	PFPeA	2706-90-3
	Perfluorohexanoic acid	PFHxA	307-24-4
	Perfluoroheptanoic acid	PFHpA	375-85-9
	Perfluorooctanoic acid	PFOA	335-67-1
	Perfluorononanoic acid	PFNA	375-95-1
	Perfluorodecanoic acid	PFDA	335-76-2
	Perfluoroundecanoic acid	PFUA/PFUdA	2058-94-8
	Perfluorododecanoic acid	PFDoA	307-55-1
	Perfluorotridecanoic acid	PFTriA/PFTrDA	72629-94-8
	Perfluorotetradecanoic acid	PFTA/PFTeDA	376-06-7
Fluorinated Telomer Sulfonates	6:2 Fluorotelomer sulfonate	6:2 FTS	27619-97-2
	8:2 Fluorotelomer sulfonate	8:2 FTS	39108-34-4
Perfluorooctane-sulfonamides	Perfluroroctanesulfonamide	FOSA	754-91-6
Perfluorooctane-sulfonamidoacetic acids	N-methyl perfluorooctanesulfonamidoacetic acid	N-MeFOSAA	2355-31-9
	N-ethyl perfluorooctanesulfonamidoacetic acid	N-EtFOSAA	2991-50-6

TABLE 4 - ANALYTICAL METHODS & PROCEDURES SUMMARY

Groundwaters

Analyte(s)	Method	Preservation	Holding Time	Container
Volatile Organics	8260	HCl to pH <2, cool to ≤6°C	14 days	2 - 40 ml septum sealed vials
Semivolatile Organics	8270	cool to ≤6°C	Samples extracted within 7 days and extracts analyzed within 40 days following extraction	1 liter amber with Teflon lined cap
Organochlorine Pesticides	8081	cool to ≤6°C		1 liter amber with Teflon lined cap
Chlorinated Herbicides (silvex)	8151	cool to ≤6°C		1 liter amber with Teflon lined cap
PCBs	8082	cool to ≤6°C	none	1 liter amber with Teflon lined cap
ICP Metals	6010	HNO3 to pH <2	6 months	250 ml. plastic
Mercury	7470	HNO3 to pH <2	28 days	250 ml. plastic
Hexavalent Chromium	7196	cool to ≤6°C	24 hours	125 ml. plastic
Cyanide, Total	9010	NaOH to pH >12, cool to ≤6°C	14 days	250 ml. plastic
PFAS	1633	cool to ≤6°C	Samples extracted within 14 days and extracts analyzed within 28 days following extraction	250 ml. HDPE
1,4-Dioxane	8270 SIM	cool to ≤6°C	Samples extracted within 7 days and extracts analyzed within 40 days following extraction	1 liter amber with Teflon lined cap

Soils

Analyte(s)	Method	Preservation	Holding Time	Container
Volatile Organics	8260	cool to ≤6°C	14 days	4 oz. widemouth glass with Teflon lined cap
Semivolatile Organics	8270	cool to ≤6°C	Samples extracted within 14 days and extracts analyzed within 40 days following extraction	4 oz. widemouth glass with Teflon lined cap
Organochlorine Pesticides	8081	cool to ≤6°C		4 oz. widemouth glass with Teflon lined cap
Chlorinated Herbicides (silvex)	8151	cool to ≤6°C		4 oz. widemouth glass with Teflon lined cap
PCBs	8082	cool to ≤6°C	none	4 oz. widemouth glass with Teflon lined cap
ICP Metals	6010	none	6 months	4 oz. widemouth glass with Teflon lined cap
Mercury	7471	cool to ≤6°C	28 days	4 oz. widemouth glass with Teflon lined cap
Hexavalent Chromium	3060/7196	cool to ≤6°C	30 days to extraction 7 days from extraction to analysis	4 oz. widemouth glass with Teflon lined cap
Cyanide, Total	9012	cool to ≤6°C	14 days	4 oz. widemouth glass with Teflon lined cap
PFAS	1633	cool to ≤6°C	Samples extracted within 14 days and extracts analyzed within 40 days following extraction	250 ml.HDPE
1,4-Dioxane	8270 SIM	cool to ≤6°C	Samples extracted within 7 days and extracts analyzed within 40 days following extraction	4 oz. widemouth glass with Teflon lined cap

TABLE 4 - ANALYTICAL METHODS & PROCEDURES SUMMARY CONT.

Soil Gas

Analytes	Method	Preservation	Holding Time	Container
VOCs	EPA Method TO-15	None	14 Days	Evacuated 6-Liter SUMMA® Canister

Ambient Air

VOCs	EPA Method TO-15 SIM	None	14 Days	Evacuated 6-Liter SUMMA® Canister

Appendix D

Field Sampling Plan

FIELD SAMPLING PLAN

11 PARCELS
BLOCK OF WASHINGTON, E. SECOND & PARK
CITY OF DUNKIRK, CHAUTAUQUA COUNTY, NEW YORK

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May 2026

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1.0 INTRODUCTION

This Field Sampling Plan (FSP) provides procedures for the field activities designed in the Work Plan where soil, groundwater, and vapor sampling are required at the Site. The field procedures presented in this manual should be followed by all field personnel, as adherence can help to ensure the quality and usability of the data collected. The FSP should be used collectively with and comply with the following documents:

- The HASP.
- The QA/QC Plan.
- The RI Work Plan.

Sampling for emerging contaminants will be conducted in accordance with the NYSDEC Guidance Sampling, Analysis, and Assessment of Per-And Polyfluoroalkyl Substances (PFAS) Under NYSDEC's Part 375 Remedial Programs – April 2023. As part of a site investigation or remedial action compliance program, whenever samples of potentially affected media are collected and analyzed for the standard Target Analyte List/Target Compound List (TAL/TCL), PFAS analysis should also be performed. Field sampling for PFAS performed should follow the appropriate procedures outlined for soils, sediments, or other solids (Appendix B), non-potable groundwater (Appendix C), surface water (Appendix D), public or private water supply wells (Appendix E), and fish tissue (Appendix F). QA/QC samples (e.g. duplicates, MS/MSD) should be collected as specified in DER-10, Section 2.3(c).

As detailed in the guidance document, EPA Method 1633 is the procedure to use for environmental samples. Reporting limits for PFOA and PFOS in aqueous samples should not exceed 2 ng/L. Reporting limits for PFOA and PFOS in solid samples should not exceed 0.5 µg/kg. Reporting limits for all other PFAS in aqueous and solid media should be as close to these limits as possible. The analytical laboratory proposed for use for the analysis of samples will be a certified NYSDOH ELAP laboratory.

All field equipment requiring calibration will be calibrated per, and at the frequency, recommended by the equipment manufacturer.

2.0 SOIL SAMPLING

Soil samples are obtained as outlined in the Work Plan, considering the following general protocol:

1. Inspect newly created test pit or boring core stratigraphy once obtained in/from the subsurface.
2. Sample soil, and record depth and any physical characteristics (e.g., contamination, odor, discoloration, debris, etc.) in the logbook.
3. Quickly place the calibrated PID into the exposed soil and record the instrument readings in the logbook.
4. Samples should be collected at locations and frequency per the Work Plan and QA/QC Plan.
5. Decontaminate sampling implements after use and between sample locations. In most cases, dedicated sampling equipment is utilized thereby eliminating equipment decontamination. If dedicated equipment is not used, "dry" decontamination will be applied and "wet" as necessary. Procedures for dry and wet decontamination are provided below.

6. Label each sample container with the appropriate sample identification and place samples in a cooler (cooled to 4 degrees C.) for shipment to the laboratory.
7. Initiate chain-of-custody procedures.

Dry decontamination procedures may include the use of stiff brushes or scrappers to remove debris off of sampling equipment. Dry decontamination methods are typically used with solid contaminants and prior to wet decontamination methods.

Wet decontamination procedures may include the use of Alconox water or a steam cleaner to rinse and scrub contamination away from sampling equipment. If necessary, a decontamination station with wash water and wash water containment will be used. Wash water will be drummed and characterized prior to proper disposal/discharge.

2.1 TEST PIT PROCEDURES

Test pit sampling is a standard method of soil sampling to obtain representative samples for identification as well as to serve as a means of obtaining significant information about the subsurface. The following steps describe the procedures for test pit operations.

2.1.1 Field Preparation

1. Verify underground utilities have been found.
2. Review scope of work, safety procedures and communication signals with site personnel.
3. Pre-clean the sampling equipment prior to use, as necessary.
4. Mark and review trench locations. Specific locations are determined in the field and are selected based on areas of visible or potential surface contamination or debris, pre-determined locations representing specific Site areas, and field obstructions

2.1.2 Excavation and Sample Collection

1. Position backhoe/equipment into appropriate area considering direction of excavation, obstructions, safety concerns, etc.
2. Commence excavation with the backhoe upwind of the excavation, as possible.
3. Ensure continuous air monitoring has been activated.
4. Screen soil regularly for VOCs as excavation progresses and soil is stockpiled.
5. As directed by field technician for each test trench, topsoil, or cover soil (if any) is excavated and placed on poly/plastic sheeting.
6. Soil/material below the topsoil is excavated to the depth as directed by field technician and placed on poly/plastic sheeting separate from the topsoil/cover soil.
7. Segregate grossly impacted material from material, as possible, using visual observations and PID screening.
8. Record geologic log as trenches are excavated visually inspecting subsurface material for discoloration or staining and documenting pit/trench with photos. The following information will be recorded for each test pit log:
    - Depth, length, and width of the excavation.
    - Description of each lithological unit including depth and thickness of distinct soil, fill, or rock layers.
    - Description of any man-made impacts or apparent contamination.
    - Depth to groundwater and bedrock, if encountered.

9. Collect soil samples using dedicated stainless-steel spoons directly from the bucket of the backhoe at ground surface. No personnel shall enter the excavation to collect samples unless provisions in the HASP have been addressed for entering an excavation.
10. Place each soil sample directly into appropriate sample bottles/jars.
11. Clearly label the sample bottles and jars.
12. Place each jar in an ice-filled cooler.
13. Ship samples to the laboratory as soon as possible, but no later than 24 hours after collection.
14. Document the types and numbers of samples collected on Chain-of-Custody.
15. Record time and date of sample collection and a description of the sample and any associated air monitoring measurements in the field logbook.
16. After sampling, backfill and compact (e.g., bucket and equipment tracks/wheels) the excavated material from each trench or pit prior to moving to the next location.
17. Backfill with indigenous soil in the order in which the material was removed with the topsoil/cover soil placed last to cover the trench, placing impacted material at bottom of pit/trench and covering with 'clean' material.
18. Decontaminate sampling and excavation equipment between sampling locations (i.e., if not dedicated) and at completion over top of excavation area using dry methods initially and steam cleaning, as needed.

3.0 SAMPLE DOCUMENTATION

Each soil and groundwater sample is logged in a bound field notebook by the technician or geologist. Field notes should include, but are not limited to the following:

- descriptions of subsurface material encountered during sampling,
- sample numbers and types of samples recovered, and
- date and time of sampling event.

The technician or geologist also completes a daily drilling or sampling record and chains-of-custody for all samples collected that are being transported to the laboratory. Once sampling program is complete, the geologist or technician transfers field notes/logs onto standard forms (e.g., boring logs, sampling logs, daily reports, etc.) to be included with the formal investigation report.

4.0 SAMPLING CONTAINER SELECTION

The selection of sample containers is based on the media being sampled and the required analysis. Container selection should be completed in advance of mobilizing into the field with close communications with the laboratory.

5.0 SAMPLE LABELING

The following procedure helps to prevent misidentification of samples and to clarify the location and purpose of environmental samples collected during the investigation:

1. Fix a non-removable (when wet) label to each container.
2. Wrap each sample bottle within 2-inch cellophane tape.
3. Write the following information with permanent marker on each label:
    A. Site name
    B. Sample identification
    C. Project number
    D. Date/time
    E. Sampler's initials
    F. Sample preservation
    G. Analysis required

Each sample is assigned a unique identification alpha-numeric code, such as RR-ss1 or WS-TP1 (2-3'), where the abbreviations represent RR – River Road (site), surface sample 1 and Waste Site, test pit 1, obtained at 2-3' bgs. Other common abbreviations include the following:

- BH = Geoprobe Borehole
- SW = Surface Water
- SED = Sediment
- SB = Soil Boring
- MSB = Matrix Spike Blank
- NSS = Near Surface Soil (1' - 2' depth)
- EB = Equipment Rinse Blank
- HW = Hydrant Water (Decon/Drilling Water)
- GW = Groundwater
- TB = Trip Blank
- RB = Rinse Blank
- MS/MSD =Matrix Spike/Matrix Spike Duplicate

6.0 SAMPLE SHIPPING

Proper documentation of sample collection and the methods used to control these documents are referred to as chain-of-custody procedures. Chain-of-custody procedures are essential for (1) presenting analytical results in a legal or regulatory forum (e.g., evidence in litigation or administrative hearings), (2) minimizing loss or misidentification of samples, and (3) ensuring that unauthorized persons do not tamper with collected samples.

The following chain-of-custody guidelines should be utilized during sample collection as outlined in and prepared by the National Enforcement Investigations Center (NEIC) Policies and Procedures of the USEPA Office of Enforcement:

1) Complete chain-of-custody record with all relevant information.
2) Send original chain with the samples in a sealed, waterproof bag taped inside the sample cooler.
3) Place adequate inert cushioning material (e.g., corrugated plastic, polypropylene foam wrap, etc.) in bottom of cooler.
4) Place bottles in cooler so they do not touch (use cushioning material for dividers).
5) Place VOA vials in sealed/waterproof bags in the center of the cooler.

6) Pack cooler with ice in sealed/waterproof plastic bags.
7) Pack cooler with cushioning material.
8) Place any additional paperwork in sealed bag with original chain.
9) Tape cooler drain shut.
10) Wrap cooler with packing tape at two locations to secure lid. Do not cover labels.
11) Place lab address on top of cooler.
12) Ship samples via overnight carrier the same day that they are collected.
13) Label cooler with "This side up" on all sides and "Fragile" on at least two sides.
14) Fix custody seals on front right and left of cooler and cover with packaging tape.

7.0 SOIL VAPOR INTRUSION SAMPLING

Soil vapor intrusion (SVI) investigation consists of sampling contaminant vapors that may exist beneath the building slabs, inside the buildings, and outside the buildings. Sample collection includes the following procedures per New York State Department of Health *Guidance for Evaluating Soil Vapor Intrusion in the State of New York*.

7.1 SUB-SLAB AIR SAMPLING PROCEDURES

7.1.1 Sampling Locations

Select the sub-slab sample collection points by observing the condition of the building floor slab for apparent penetrations such as concrete floor cracks, floor drains, or sump holes. The floor conditions will be noted, and potential locations of subsurface probes will be selected. The locations will ideally be away from the foundation walls, apparent penetrations, and buried pipes.

7.1.2 Sampling Probes

Drill a 5/8-inch diameter hole approximately one inch deep into the concrete floor using a 5/8-inch diameter drill bit and a hammer drill. Extend the hole through the remaining thickness of the slab and about three inches below the base of the slab using a ½-inch diameter drill bit. Remove the concrete cuttings using the ½-inch drill bit in an up-down motion. Clean out the shallow 5/8-inch drilled hole using a round steel wire brush. Carefully clean the surface of the concrete adjacent to the 5/8-inch hole using a flat wire brush to remove any residual concrete dust from the floor's surface. Dabbing the surface with clay can also remove the dust. These steps will allow the clay seal (see below) to better adhere to the concrete surface.

Insert one end of a 1.5-foot length of ¼-inch diameter (OD) Teflon or HDPE tubing through the center hole of a 5/8-inch diameter rubber stopper. About two inches of the tubing should extend beyond and below the narrow end of the stopper. Insert the tubing into the 5/8-inch diameter borehole so that the bottom of the stopper rests on top of the 1/2-inch diameter drilled hole. Pack the annulus of the 5/8-inch diameter hole with Sculpy modeling clay and extend the clay about 1.5-inches above the floor adhering tightly to the tubing. The clay should be in a volcano-like shape with a wide base adhering to the concrete floor and narrowing at the upper end of contact with the tubing. This shape allows the tubing to move without disturbing the contact of the clay with the floor and the tubing. The clay should cover and adhere to a minimum of one-half inch of the concrete surface beyond the borehole.

7.1.3 Helium Tracer Gas Testing

Place a 1-quart (or similar size) container over the sample probe after threading the sample tube through a hole in the top of the bucket. Seal the tube to the bucket with clay. The bucket should also have another hole drilled in the top for the injection of helium, and a hole in the side near the floor for the measurement of helium gas concentrations.

Connect a helium (99.999% pure) cylinder tubing to the top port of bucket enclosure and seal with clay or other sealing material. Insert a helium detector probe in the bottom port of the bucket. Release enough helium to displace any ambient air in the bucket until the concentration of helium reaches a minimum of 90%. Maintain this minimum concentration by testing with a helium detector. The Helium cylinder should be open during the purge time to cause a slight positive pressure within the enclosure.

Connect the sample tubing to a GilAir vacuum pump or equivalent using 3/8-inch O.D. silicone tubing. Connect a 1-liter Tedlar bag to the outlet of the pump using silicone tubing and collect a 1-liter sample. Purging flow rates must not exceed 0.2 liters per minute (L/min). Analyze the Tedlar bag for helium using a helium detector and record the results on the Summa Canister Data Sheet. A concentration of helium 10% or greater indicates a poor seal of the sample probe and it must be reinstalled and retested. After purging, remove the bucket enclosure from over the sample probe.

7.1.4 Sample Collection

Assign sample identification to the Summa canister sample identification tag and record on chain of custody (COC), and the Summa Canister Data Sheet. Also record the Summa canister and flow controller (regulator) serial numbers on the COC and Summa Canister Data Sheet. Attach a pre-calibrated/certified 24-hour flow controller, and particulate filter to the Summa canister. Attach the sample tube to the Summa canister using a ¼-inch Swagelok nut with appropriate ferrules, to the end of the flow controller/particulate filter assembly. The sampling period will be 24 hours for sub-slab soil vapor, indoor and outdoor air samples.

Open canister valve to initiate sample collection and record sample start time, date, and initial canister vacuum on the canister identification tag and on the Summa Canister Data Sheet. If the canister does not show sufficient vacuum (generally less than 25“Hg), do not use. Take a digital photograph of canister setup and surrounding area. Include in the photograph a dry erase board or similar display which presents sample ID, location, and date.

After 24 hours, record sample end time and canister pressure on the Summa Canister Data Sheet, and close valve. Disconnect the Teflon tubing and remove flow controller/particulate filter assembly from canister. Seal canister with laboratory supplied brass plug. Ship the samples, with COCs, overnight, to the selected laboratory for standard TO-15 analysis.

7.2 INDOOR/OUTDOOR AIR SAMPLING PROCEDURES

Place the indoor air Summa canister/flow controller inlet at breathing height in the approximate center of the space being sampled, or, for the outdoor air sample, elevated on a table or other object in a location upwind of the building being sampled. The breathing height is defined as four to six feet above the floor or ground. As an option, a length of Teflon tubing can be attached to the Summa canister/flow controller inlet and raised to breathing zone height.

Record the canister and flow controller serial numbers on the canister identification tag, COC and the Summa Canister Data Sheet. Assign sample identification to the canister identification tag and record on the COC and the Summa Canister Data Sheet. Remove brass plug from canister fitting and save.

Attach a pre-calibrated/certified 24-hour flow controller and particulate filter to the Summa canister. For the outside air sample, also connect the laboratory supplied "candy cane" fitting to the flow controller. Open canister valve to initiate sample collection and record start time, date, and gauge vacuum reading on the canister identification tag and on the Summa Canister Data Sheet. Take a photograph of canister setup and surrounding area.

After 24 hours, record the gauge vacuum reading, close the Summa canister valve completely and record the end time on the Summa Canister Data Sheet. There should still be a slight vacuum in the Summa canister. If no vacuum remains in the canister, or the canister does not show a significant net loss in vacuum after sampling, the sample should be re-collected using a new Summa canister and flow controller. Disconnect any tubing and candy cane fittings from the Summa canister and remove the flow controller. Replace the brass plug on the canister. Ship canister, with COCs, overnight, to the selected laboratory.

7.3 Soil Vapor Sampling

A soil vapor assessment can be completed outside of buildings in the subsurface to assess potential vapor concerns across the site. Soil vapor sampling and probe installation will be conducted in accordance with NYSDOH guidance for evaluating soil vapor intrusion (NYSDOH Soil Vapor Intrusion Guidance-October 2006).

- Vapor Points are typically installed at a depth above native soil, groundwater level, top of bedrock, or at a depth comparable to building foundations.
- A unique boring should be bored to be converted to vapor point locations.
- Vapor Point Installation diagrams should be developed.
- Vapor probe holes are completed as follows:
    - A ¼ inch PVC tube with a 3/8-inch stainless steel screen at the bottom is installed at the bottom of each probe hole.
    - Porous sand is backfilled around the screen to a two-foot depth (or less depending on total depth of the borehole) of each hole
    - A bentonite seal will be placed above the sand layer to seal off the hole around the tubing.
    - Air samples are collected in regulated summa canisters over a 24-hour period in a 6 Liter Summa® Canister.
    - Samples will be analyzed for USEPA TO- 15 compounds

7.4 Quality Control

The number of Quality Control samples (duplicates) to be taken during sub-slab sampling may be found in the QA/QC Plan. The duplicate sample rate is usually 10 percent. Field duplicates for sub-slab, indoor air and outdoor air samples will be collected by attaching the T-fitting supplied by the laboratory to two Summa canisters with attached regulators. For sub-slab samples, the inlet of the T-fitting will then be attached to the sub-slab sample tubing using a Swagelok fitting. For indoor and outdoor air samples, any tubing used to raise the sampling height will also be attached to the inlet of the T fitting. For sampling, both Summa canister valves are opened and closed simultaneously.

7.5 SAMPLE LABELING

Each sub-slab sample should have the following information at a minimum placed on the laboratory supplied sample label:

- Site name
- Sample identification – see below
- Date/time
- Sampler's initials
- Analysis required – TO-15

The serial number of the canister and regulator used during sampling is also noted on the Summa canister identification tag and on the COC. Each sub-slab, indoor air and outdoor air sample will be assigned a unique alpha-numeric code. An example of this code and a description of its components are presented below. Field duplicate samples will be assigned a unique identification alphanumeric code that specifies the date of collection, the letters FD (for field duplicate) and an ascending number that records the number of duplicate samples collected that day. For example, the first field duplicate collected on February 22, 2023 would be assigned the sample number in the format YYYYMMDD-FD-1 = 20230222-FD-1.

Subsequent duplicates collected on the same day will be assigned FD-2, FD-3 etc. Field sampling crew will record the duplicate sample information on the Summa Canister Data Sheets and in the field book.

7.6 FIELD DOCUMENTATION

Field notebooks are used during all on-site work. A dedicated field notebook is maintained by the field technician overseeing the site activities. Sub-slab sampling procedures should be photo-documented. The field sampling team will maintain sampling records that include the following data:

- Sample Identification
- Date and time of sample collection
- Identity of samplers
- Sampling methods and devices
- Purge volumes (soil vapor)
- Volume of soil vapor sample extracted
- The Summa canister vacuum before and after samples collected
- Chain of Custody and shipping information

The proper completion of the following forms/logs is considered correct procedure for documentation during the indoor air-sampling program:

1. Field Logbook - weather-proof hand-bound field book
2. Summa Canister Data Sheet
3. Chain of Custody Form

7.7 SAMPLE SHIPPING

Proper documentation of sample collection and the methods used to control these documents are referred to as chain-of-custody procedures. Chain-of-custody procedures are essential for presentation of sample analytical chemistry results as evidence in litigation or at administrative hearings held by regulatory agencies. Chain-of-custody procedures also serve to minimize loss or misidentification of samples and to ensure that unauthorized persons do not tamper with collected samples.

The following chain-of-custody guidelines should be utilized during sample collection as outlined in and prepared by the National Enforcement Investigations Center (NEIC) Policies and Procedures of the USEPA Office of Enforcement:

- Complete the chain-of-custody (COC) record with all relevant information.
- Ship original COC with the samples in a sealed waterproof plastic bag and place inside the box containing a Summa canister.
- Retain a copy of the COC for field records.
- Ship Summa canisters in the same boxes the laboratory used for shipping.
- Place the lab address on top of sample box/cooler.
- Fix numbered custody seals across box lid flaps and cooler lid.
- Cover seals with wide, clear tape.
- Ship samples via overnight carrier within three days of sample collection if possible.

Appendix E

DER-10 Imported Fill Requirements

site-specific exemption for one or more of the requirements set forth in this section, based upon site-specific conditions, such as:

i. use and redevelopment of the site;

ii. depth of the placement of the backfill material relative to the surface or subsurface structures;

iii. depth of the placement of the backfill material relative to groundwater;

iv. volume of backfill material;

v. potential for odor from the backfill material;

vi. presence of historic fill in the vicinity of the site;

vii. DEC-issued beneficial use determination, pursuant to 6 NYCRR Part 360; or

viii. background levels of contamination in areas surrounding the site.

9. For remedial programs pursuant to the BCP, DEC can only provide a site-specific exemption for backfill consistent with the provisions of paragraph 8 above as follows:

i. for Track 2 and Track 3 cleanups, for soils greater than 15 feet below ground surface; or

ii. for Track 4 cleanups, for soils beneath buildings, pavement and other improvements or for soils beneath the soil cover system or soil cap over exposed surface soils.

10. Sampling fill imported to or exported from a site. The remedial party will sample and analyze the fill being imported to the site in accordance with this subdivision and Table 5.4(e)10. Samples of the fill will be collected based on the soil quantity and type of constituents identified in the table and will be a combination of discrete and composite samples, handled as follows:

i. for VOCs only, grab samples are allowed. These grab samples are one or more discrete samples taken from the fill, with the number as specified in the volatile column of Table 5.4(e)10 for the soil quantity in question, and analyzed for the VOCs identified in Appendix 5; or

ii. for SVOCs, inorganics and PCBs/pesticides:

(1) one or more composite samples are collected from the volume of soil identified in Table 5.4(e)10 for analysis, with each composite from a different location in the fill volume;

(2) each composite is prepared by collecting discrete samples from 3 to 5 random locations from the volume of soil to be tested; and

(3) the discrete samples are mixed, and after mixing, a sample of the mixture is analyzed for the SVOCs, inorganic and PCBs/pesticide constituents identified in Appendix 5.

Table 5.4(e)10 Recommended Number of Soil Samples for Soil Imported To or Exported From a Site			
Contaminant	**VOCs**	**SVOCs, Inorganics & PCBs/Pesticides**	
Soil Quantity (cubic yards)	**Discrete Samples**	**Composite**	**Discrete Samples/Composite**
0-50	1	1	3-5 discrete samples from different locations in the fill being provided will comprise a composite sample for analysis
50-100	2	1	
100-200	3	1	
200-300	4	1	
300-400	4	2	
400-500	5	2	
500-800	6	2	
800-1000	7	2	
➢ 1000	Add an additional 2 VOC and 1 composite for each additional 1000 Cubic yards or consult with DER		

(f) Compliance for soil exported from a site for reuse. For soil that is being exported from a site to locations other than permitted disposal facilities, the handling requirements are set forth in this subdivision and in paragraph 5.4(e)4.

1. Levels of contamination must not exceed the lower of the groundwater and residential use levels as shown in Appendix 5, absent a beneficial use determination issued by DEC. DER will coordinate with the Division of Solid & Hazardous Materials (DSHM), prior to the start of the remedial action, relative to whether the exported soil can be used beneficially in accordance with 6 NYCRR 360-1. The sampling and analysis requirements are set forth in paragraph 5.4(e)10.

2. The number of required samples are specified in Table 5.4(e)10 and paragraph (e)10 above, which may be modified by the DER project manager based on various factors, including the location of the site receiving the soil.

(g) Compliance for the decommissioning of monitoring wells. All monitoring wells not required for site management should be decommissioned in accordance with paragraph (d)6 above prior to DER approval of the FER.

5.5 Underground Storage Tank Closure

(a) The first step for underground storage tank (UST) closure is the identification, removal, treatment, containment and/or stabilization of the contents to prevent contaminant exposure to receptors and to prevent further movement of contaminants through any pathway as set forth herein.

1. A health and safety plan for the site is developed, as described in section 1.9, by a qualified individual in accordance with subparagraph 1.5(a)3.i.

2. Underground tank closures not performed in accordance with this section will require a certification of the closure report by a professional engineer, as described in section 1.5.

Updated
Allowable Constituent Levels for Imported Fill or Soil

Source: These table are derived from soil cleanup objective (SCO) tables in 6 NYCRR 375. Table 375-6.8(a) is the source for unrestricted use and Table 375-6.8(b) is the source for restricted use.

Note: For constituents not included in this table, refer to the contaminant for supplemental soil cleanup objectives (SSCOs) in the Commissioner Policy on *Soil Cleanup Guidance*. If an SSCO is not provided for a constituent, contact the DER PM to determine a site-specific level.

Table 375-6.8(a). Unrestricted use soil cleanup objectives

Table 375-6.8(a). Unrestricted use soil cleanup objectives.

Contaminant	CAS Number	Unrestricted Use
Metals		
Arsenic	7440-38-2	13 [c]
Barium	7440-39-3	410 [c]
Beryllium	7440-41-7	4.4
Cadmium	7440-43-9	2.5 [c]
Chromium, hexavalent [e]	18540-29-9	1 [b]
Chromium, trivalent [e]	16065-83-1	30 [c]
Copper	7440-50-8	50
Total Cyanide [e, f]		2.3 [c]
Lead	7439-92-1	63 [c]
Manganese	7439-96-5	1600 [c]
Mercury (Total)		0.18 [c]
Nickel	7440-02-0	30
Selenium	7782-49-2	3.9 [c]
Silver	7440-22-4	2
Zinc	7440-66-6	109 [c]
PCBs/Pesticides		
4,4'-DDE	72-55-9	0.0033 [b]
4,4'-DDT	50-29-3	0.0033 [b]
4,4'-DDD	72-54-8	0.0033 [b]

Table 375-6.8(a). Unrestricted use soil cleanup objectives.

Contaminant	**CAS Number**	**Unrestricted Use**
Aldrin	309-00-2	0.0048 [c]
alpha-BHC	319-84-6	0.02
beta-BHC	319-85-7	0.021
Chlordane (alpha)	5103-71-9	0.014
delta-BHC [g]	319-86-8	0.04
Dieldrin	60-57-1	0.005 [c]
Endosulfan I [d, f]	959-98-8	4.3
Endosulfan II [d, f]	33213-65-9	4.3
Endosulfan sulfate [d, f]	1031-07-8	4.3
Endrin	72-20-8	0.014
Heptachlor	76-44-8	0.013
Lindane	58-89-9	0.025
Polychlorinated biphenyls	1336-36-3	0.1
Semivolatile organic compounds		
1,4 Dioxane	123-91-1	0.1 [b]
Acenaphthene	83-32-9	20
Acenaphthylene [f]	208-96-8	100 [a]
Anthracene [f]	120-12-7	100 [a]
Benz(a)anthracene [f]	56-55-3	1 [c]
Benzo(a)pyrene	50-32-8	1 [c]
Benzo(b)fluoranthene [f]	205-99-2	1 [c]

Table 375-6.8(a). Unrestricted use soil cleanup objectives.

Contaminant	CAS Number	Unrestricted Use
Benzo(g,h,i)perylene [f]	191-24-2	0.64
Benzo(k)fluoranthene [f]	207-08-9	0.8 [c]
Chrysene [f]	218-01-9	1 [c]
Dibenz(a,h)anthracene [f]	53-70-3	0.33 [b]
Dibenzofuran [f]	132-64-9	2.1
Fluoranthene [f]	206-44-0	85
Fluorene	86-73-7	30
Indeno(1,2,3-cd)pyrene [f]	193-39-5	0.5 [c]
m-Cresol [f]	108-39-4	0.33 [b]
Naphthalene [f]	91-20-3	12
o-Cresol [f]	95-48-7	0.33 [b]
p-Cresol [f]	106-44-5	0.33 [b]
Pentachlorophenol	87-86-5	0.8 [b]
Phenanthrene [f]	85-01-8	1.1 [c]
Phenol	108-95-2	0.33 [b]
Pyrene [f]	129-00-0	64
Volatile organic compounds		
1,1,1-Trichloroethane [f]	71-55-6	0.68
1,1-Dichloroethane [f]	75-34-3	0.27
1,1-Dichloroethene [f]	75-35-4	0.24
1,2-Dichlorobenzene [f]	95-50-1	1.1

Table 375-6.8(a). Unrestricted use soil cleanup objectives.

Contaminant	CAS Number	Unrestricted Use
1,2-Dichloroethane	107-06-2	0.02 [c]
cis -1,2-Dichloroethene [f]	156-59-2	0.19
trans-1,2-Dichloroethene [f]	156-60-5	0.19
1,3-Dichlorobenzene [f]	541-73-1	2.6
1,4-Dichlorobenzene	106-46-7	1.8
Acetone	67-64-1	0.03
Aniline	62-53-3	0.04
Benzene	71-43-2	0.06
n-Butylbenzene [f]	104-51-8	18
Carbon tetrachloride [f]	56-23-5	0.76
Chlorobenzene	108-90-7	4.5
Chloroform	67-66-3	0.37
Ethylbenzene [f]	100-41-4	1
Hexachlorobenzene [f]	118-74-1	0.33 [b]
Methyl ethyl ketone	78-93-3	0.10
Methyl tert-butyl ether [f]	1634-04-4	0.1
Methylene chloride	75-09-2	0.05
Nitrobenzene	98-95-3	0.08[c]
n – Propylbenzene [f]	103-65-1	5
sec-Butylbenzene [f]	135-98-8	25
tert-Butylbenzene [f]	98-06-6	11

Table 375-6.8(a). Unrestricted use soil cleanup objectives.

Contaminant	**CAS Number**	**Unrestricted Use**
Tetrachloroethene	127-18-4	1.3
Toluene	108-88-3	0.7
Trichloroethene	79-01-6	0.47
1,2,4-Trimethylbenzene [f]	95-63-6	5.9
1,3,5-Trimethylbenzene [f]	108-67-8	3.1
Vinyl chloride [f]	75-01-4	0.03
Xylene (mixed)	1330-20-7	0.26
All soil cleanup objectives are in parts per million (ppm).		

[a.] The soil cleanup objectives for unrestricted use were capped at a maximum value of 100 ppm. See the New York State Department of Environmental Conservation Technical Support Document (2006), section 9.3.
[b.] For constituents where the calculated soil cleanup objective was lower than the contract required quantitation limit, the contract required quantitation limit is used as the Track 1 soil cleanup objective value.
[c.] For constituents where the calculated soil cleanup objective was lower than the rural soil background concentration, the rural soil background concentration is used as the Track 1 soil cleanup objective value for this use of the site. See the New York State Department of Environmental Conservation Technical Support Document (2006), Section 9 and Appendix D.
[d.] The soil cleanup objective is the sum of endosulfan I, endosulfan II, and endosulfan sulfate.
[e.] The soil cleanup objective for this specific compound (or family of compounds) is met if the analysis for the total species of this contaminant is below the specific soil cleanup objective.
[f.] Protection of ecological resources soil cleanup objectives were not developed for contaminants identified in Table 375-6.8(b) with “NS”. Where such contaminants appear in Table 375-6.8(a), the applicant may be required by the department to calculate a protection of ecological resources soil cleanup objective according to the New York State Department of Environmental Conservation Technical Support Document (2006).
[g] This soil cleanup objective is derived from data on mixed isomers of BHC.

Table 375-6.8(b). Restricted use soil cleanup objectives.

Table 375-6.8(b) Restricted use soil cleanup objectives.

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted Residential	Commercial	Industrial		
Metals							
Arsenic	7440-38-2	16 [f]	16 [f]	16 [f]	16 [f]	13 [f]	16 [f]
Barium	7440-39-3	410	410	410	10,000 [d]	433	820
Beryllium	7440-41-7	8.8	43	670	750	10	47
Cadmium	7440-43-9	2.5 [f]	2.5 [f]	3.7	4.4	4	7.5
Chromium, hexavalent [h]	18540-29-9	1 [e]	1 [e]	11	11	20	19
Chromium, trivalent [h]	16065-83-1	30 [f]	110	1,700	2,000	160	NS
Copper	7440-50-8	280	280	280	10,000 [d]	50	1720
Total Cyanide [h]		2.6	13	28	240	NS	40
Lead	7439-92-1	400	400	1,000	3,900	63 [f]	450
Manganese	7439-96-5	2,000 [f]	2,000 [f]	10,000 [d]	10,000 [d]	1600 [f]	2,000 [f]
Mercury (Total)		0.30 [j]	0.30 [j]	1.1 [j]	1.1 [j]	0.18 [f]	0.73
Nickel	7440-02-0	87	320	320	5,900	30	130
Selenium	7782-49-2	22	110	1,700	2,000	3.9 [f]	4 [f]
Silver	7440-22-4	22	110	1,700	2,000	2	8.3
Zinc	7440-66-6	1,300	6,600	10,000 [d]	10,000 [d]	109 [f]	2,480
PCBs/Pesticides							
4,4’-DDE	72-55-9	0.78	3.4	22	22	0.0033 [e]	9.3

Table 375-6.8(b) Restricted use soil cleanup objectives.

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted Residential	Commercial	Industrial		
4,4'-DDT	50-29-3	0.78	3.8	27	27	0.0033 [e]	135
4,4'- DDD	72-54-8	1.2	5	33	33	0.0033 [e]	14
Aldrin	309-00-2	0.0088	0.044	0.33	0.33	0.14	0.19
alpha-BHC	319-84-6	0.042	0.18	1.2	1.2	0.04 [g]	0.02
beta-BHC	319-85-7	0.042	0.18	1.8	2.9	0.6	0.09
Chlordane (alpha)	5103-71-9	0.14	0.65	8.2	11	1.3	4.5
delta-BHC	319-86-8	100	100 [a]	500 [b]	1,000 [c]	0.04 [g]	0.1
Dieldrin	60-57-1	0.017	0.075	0.48	0.48	0.006	0.1
Endosulfan I	959-98-8	8.4 [i]	35 [i]	360 [i]	580 [i]	NS	65
Endosulfan II	33213-65-9	8.4 [i]	35 [i]	360 [i]	580 [i]	NS	44
Endosulfan sulfate	1031-07-8	8.4 [i]	35 [i]	360 [i]	580 [i]	NS	47 [c]
Endrin	72-20-8	1.2	5.3	55	87	0.014	0.06
Heptachlor	76-44-8	0.12	0.53	5.1	5.1	0.14	0.38
Lindane	58-89-9	0.05	0.21	0.21	3.4	6	0.05
Polychlorinated biphenyls	1336-36-3	1	1	1	25	1	3.2
Semivolatiles							
1,4-Dioxane	123-91-1	1.4	5.7	36	36	0.1 [e]	0.1 [e]
Acenaphthene	83-32-9	100 [a]	100 [a]	500 [b]	1,000 [c]	20	98

Table 375-6.8(b) Restricted use soil cleanup objectives.

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted Residential	Commercial	Industrial		
Acenaphthylene	208-96-8	100 [a]	100 [a]	500 [b]	1,000 [c]	NS	365
Anthracene	120-12-7	100 [a]	100 [a]	500 [b]	1,000 [c]	NS	1,000 [c]
Benz(a)anthracene	56-55-3	1 [f]	1.4	37	37	NS	1 [f]
Benzo(a)pyrene	50-32-8	1 [f]	1 [f]	3.7	3.7	2.6	22
Benzo(b)fluoranthene	205-99-2	1 [f]	1.4	37	37	NS	2.1
Benzo(g,h,i)perylene	191-24-2	1.2	4.9	47	78	NS	1,000 [c]
Benzo(k)fluoranthene	207-08-9	1.2	4.9	47	78	NS	2
Chrysene	218-01-9	1.2	4.9	47	78	NS	1 [f]
Dibenz(a,h) anthracene	53-70-3	0.33 [e]	0.33 [e]	3.7	3.7	NS	1,000 [c]
Dibenzofuran	132-64-9	4.2	18	180	290	NS	110
Fluoranthene	206-44-0	100 [a]	100 [a]	500 [b]	1,000 [c]	NS	1,000 [c]
Fluorene	86-73-7	100 [a]	100 [a]	500 [b]	1,000 [c]	30	386
Indeno(1,2,3-cd) pyrene	193-39-5	0.5 [f]	1.4	37	37	NS	6.6
m-Cresol	108-39-4	100 [a]	100 [a]	500 [b]	1,000 [c]	NS	0.33 [e]
Naphthalene	91-20-3	84 [a]	100 [a]	500 [b]	1,000 [c]	NS	12
o-Cresol	95-48-7	100 [a]	100 [a]	500 [b]	1,000 [c]	NS	0.33 [e]
p-Cresol	106-44-5	100 [a]	100 [a]	500 [b]	1,000 [c]	NS	0.33 [e]
Pentachlorophenol	87-86-5	0.8 [e]	1.3	6.9	7	0.8 [e]	0.8 [e]

Table 375-6.8(b) Restricted use soil cleanup objectives.

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted Residential	Commercial	Industrial		
Phenanthrene	85-01-8	1.2	4.9	47	78	NS	1,000 [c]
Phenol	108-95-2	100 [a]	100 [a]	500 [b]	1,000 [c]	30	0.33 [e]
Pyrene	129-00-0	100 [a]	100 [a]	500 [b]	1,000 [c]	NS	1,000 [c]
Volatiles							
1,1,1-Trichloroethane	71-55-6	100 [a]	100 [a]	500 [b]	1,000 [c]	NS	0.68
1,1-Dichloroethane	75-34-3	19	47	240	240	NS	0.27
1,1-Dichloroethene	75-35-4	0.41	0.98	5.1	5.1	NS	0.33
1,2-Dichlorobenzene	95-50-1	100 [a]	100 [a]	500 [b]	1,000 [c]	NS	1.1
1,2-Dichloroethane	107-06-2	2.4	5.8	30	30	10	0.02
cis-1,2-Dichloroethene	156-59-2	8.7	41	500 [b]	590	NS	0.19
trans-1,2-Dichloroethene	156-60-5	75	100 [a]	500 [b]	1,000 [c]	NS	0.19
1,3-Dichlorobenzene	541-73-1	11	38	280	280	NS	2.6
1,4-Dichlorobenzene	106-46-7	10	24	130	130	20	1.8
Acetone	67-64-1	100 [a]	100 [b]	500 [b]	1,000 [c]	2.2	0.03
Aniline	62-53-3	6.7	8.1	36	36	32	0.04
Benzene	71-43-2	1.2	3.7	20	20	70	0.06
n-Butylbenzene	104-51-8	100 [a]	100 [a]	500 [b]	1,000 [c]	NS	18
Carbon tetrachloride	56-23-5	1.9	7.1	41	41	NS	0.76

Table 375-6.8(b) Restricted use soil cleanup objectives.

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted Residential	Commercial	Industrial		
Chlorobenzene	108-90-7	73	100 [a]	500 [b]	1,000 [c]	40	4.5
Chloroform	67-66-3	4.8	24	180	180	12	0.37
Ethylbenzene	100-41-4	32	76	390	390	NS	1
Hexachlorobenzene	118-74-1	0.33 [e]	0.33 [e]	1.8	2.9	NS	3.2
Methyl ethyl ketone	78-93-3	100 [a]	100 [a]	500 [b]	1,000 [c]	100 [a]	0.10
Methyl tert-butyl ether	1634-04-4	40	100 [a]	500 [b]	890	NS	0.1
Methylene chloride	75-09-2	17	81	500 [b]	1,000 [c]	12	0.05
Nitrobenzene	98-95-3	0.77	1.8	8.9	8.9	2	0.08[f]
n-Propylbenzene	103-65-1	100 [a]	100 [a]	500 [b]	1,000 [c]	NS	5
sec-Butylbenzene	135-98-8	100 [a]	100 [a]	500 [b]	1,000 [c]	NS	25
tert-Butylbenzene	98-06-6	100 [a]	100 [a]	500 [b]	1,000 [c]	NS	11
Tetrachloroethene	127-18-4	15	18	81	81	2	1.3
Toluene	108-88-3	100 [a]	100 [a]	500 [b]	1,000 [c]	36	0.7
Trichloroethene	79-01-6	1.7	6.4	54	54	2	0.47
1,2,4-Trimethylbenzene	95-63-6	41	100 [a]	500 [b]	1,000 [c]	NS	5.9
1,3,5-Trimethylbenzene	108-67-8	41	100 [a]	500 [b]	1,000 [c]	NS	3.1
Vinyl chloride	75-01-4	0.099	0.48	7.1	7.1	NS	0.03
Xylene (mixed)	1330-20-7	100 [a]	100 [a]	500 [b]	1,000 [c]	0.26	1.2

Table 375-6.8(b) Restricted use soil cleanup objectives.

Contaminant	CAS Number	Protection of Public Health				Protection of Ecological Resources	Protection of Ground-water
		Residential	Restricted Residential	Commercial	Industrial		
All soil cleanup objectives are in parts per million (ppm).							
NS = Not specified. See New York State Department of Environmental Conservation Technical Support Document (2006).							

[a.] The soil cleanup objectives for residential, restricted-residential, and ecological resources use were capped at a maximum value of 100 ppm. See New York State Department of Environmental Conservation Technical Support Document (2006) section 9.3.
[b.] The soil cleanup objectives for commercial use were capped at a maximum value of 500 ppm. See New York State Department of Environmental Conservation Technical Support Document (2006) section 9.3.
[c.] The soil cleanup objectives for industrial use and the protection of groundwater were capped at a maximum value of 1000 ppm. See New York State Department of Environmental Conservation Technical Support Document (2006) section 9.3.
[d.] The soil cleanup objectives for metals were capped at a maximum value of 10,000 ppm. See New York State Department of Environmental Conservation Technical Support Document (2006) section 9.3.
[e.] For constituents where the calculated soil cleanup objective was lower than the contract required quantitation limit, the contract required quantitation limit is used as the soil cleanup objective value.
[f.] For constituents where the calculated soil cleanup objective was lower than the rural soil background concentration, the rural soil background concentration is used as the Track 2 soil cleanup objective value for this use of the site. See the New York State Department of Environmental Conservation Technical Support Document (2006), Section 9 and Appendix D.
[g.] This soil cleanup objective is derived from data on mixed isomers of BHC.
[h.] The soil cleanup objective for this specific compound (or family of compounds) is considered to be met if the analysis for the total species of this contaminant is below the specific soil cleanup objective.
[i.] This soil cleanup objective is for the sum of endosulfan I, endosulfan II, and endosulfan sulfate.
[j.] Protection of public health soil cleanup objectives for total mercury are based on either the rural soil background concentration for total mercury (0.3 ppm or 0.18 ppm for habitat) or the most toxic mercury form that may be present in soil samples. If total mercury is found in soil

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Request to Import/Reuse Fill or Soil

This form is based on the information required by DER-10, Section 5.4(e) and 6NYCRR Part 360.13. Use of this form is not a substitute for reading the applicable regulations and Technical Guidance document.

SECTION 1 – SITE BACKGROUND

Site Name:

Site Number:

The allowable site use is: Choose an item

Have Ecological Resources been identified? Choose an item

Is this soil originating from the site? Choose an item

How many cubic yards of soil will be imported/reused? Choose an item

If greater than 1000 cubic yards will be imported, enter volume to be imported:

SECTION 2 – MATERIAL OTHER THAN SOIL

Is the material to be imported gravel, rock or stone? Choose an item

Does it contain less than 10%, by weight, material that passes a size 100 sieve? Choose an item

Is this virgin material from a permitted mine or quarry? Choose an item

Is this material recycled concrete or brick from a DEC registered processing facility? Choose an item

SECTION 3 - SAMPLING

Provide a brief description of the number and type of samples collected in the space below:

Example Text: 5 discrete samples were collected and analyzed for VOCs. 2 composite samples were collected and analyzed for SVOCs, Inorganics & PCBs/Pesticides.

If the material meets requirements of DER-10 section 5.4(e)5 (other material), no chemical testing needed.

SECTION 3 CONT'D - SAMPLING

Provide a brief written summary of the sampling results or attach evaluation tables (compare to DER-10, Appendix 5):

Example Text: Arsenic was detected up to 17 ppm in 1 (of 5) samples; the allowable level is 16 ppm.

If Ecological Resources have been identified use the "If Ecological Resources are Present" column in Appendix 5.

SECTION 4 – SOURCE OF FILL

Name of person providing fill and relationship to the source:

Name and address of fill source:

Location where fill was obtained:

Identification of any state or local approvals as a fill source:

If no approvals are available, provide a brief history of the use of the property that is the fill source:

Provide a list of supporting documentation included with this request:

The information provided on this form is accurate and complete.

_____ _____

Signature Date

_____

Print Name

_____

Firm

Appendix F

Community and Environmental Response Plan

BE3 BRYDGES ENGINEERING IN ENVIRONMENT AND ENERGY, DPC

COMMUNITY AND ENVIRONMENTAL RESPONSE PLAN

BLOCK OF WASHINGTON, E. SECOND & PARK DUNKIRK, CHAUTAUQUA COUNTY, NEW YORK BCP SITE NO. C907042

Prepared for:

Regan Development Corporation
1055 Saw Mill River Road #204
Ardsley, New York 10502

Prepared by:

BRYDGES ENGINEERING
IN ENVIRONMENT AND ENERGY, DPC

960 Busti Ave Suite B-150
Buffalo, New York, 14213

October 2025

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1.0 INTRODUCTION

This Community and Environmental Response Plan (CERP) has been prepared to summarize the controls, monitoring and/or work practices that will be implemented during remedial efforts at the Site to address the potential for short-term impacts to the surrounding community or environmental resources. The remediation will include the following:

- Place a cover system over impacted Site soils to meet New York State Department of Environmental Conservation (NYSDEC) Part 375 Track 4 Restricted Residential Soil Cleanup Objectives (SCOs)
- Implement an Environmental Easement (EE) and Site Management Plan (SMP)

The CERP is a concise summary of the controls, monitoring, and work practices and how they combine and provide the necessary protection of the community and ecological resources. Additional details regarding how this will be implemented are contained in various sections of the Remedial Action Work Plan (RAWP). The purpose of the CERP is to provide members of the community with information on the steps and programs that have been put in place to protect their health and minimize the disturbance caused by construction activity. This effort will be performed under the approval and oversight of NYSDEC and New York State Department of Health (NYSDOH).

This CERP has been prepared in accordance with NYSDEC Final Department of Environmental Remediation (DER)-10 Technical Guidance for Site Investigation and Remediation Section 5.1(f), dated May 2010 and updated April 2019.

1.1 CERP ORGANIZATION

This CERP has been organized in general accordance with Section 5.1(f) NYSDEC DER- 10 as follows:

- Section 1 – Introduction (describes the purpose and objectives of the CERP)
- Section 2 – Community Air Monitoring Plan (CAMP)
- Section 3 – Public Protection Measures
- Section 4 – Vapor/Odor Management
- Section 5 – Noise Reduction Plan
- Section 6 – Vibration Monitoring
- Section 7 – Site Security Plan
- Section 8 – Storm Water and Erosion Control Plan
- Section 9 – Waste Management
- Section 10 – Traffic Management Plan

2.0 COMMUNITY AIR MONITORING PLAN

A site-specific CAMP has been prepared for the Site and shall be in force during remedial efforts. The intent of the CAMP 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 work activities) from volatile organic compounds (VOCs) and particulates (i.e., dust) carried in the air as a direct result of remedial work activities on the Site. The CAMP provides air monitoring procedures, contamination concentration limits, and procedures to reduce VOCs and dust generation if the limits are approached. The CAMP is included as an attachment to the RAWP.

The CAMP includes the NYSDEC DER-10 titled Appendix 1A-New York State Department of Health Generic Community Air Monitoring Plan and will be followed and adhered to for remedial efforts.

A program for suppressing fugitive dust and particulate matter monitoring will also be conducted in accordance with NYSDEC DER-10 titled Appendix 1B Fugitive Dust and Particulate Monitoring which is also provided in the CAMP. The fugitive dust suppression and particulate monitoring program will be employed at the Site during remedial efforts and other intrusive activities which warrant its use.

3.0 PUBLIC PROTECTION PLAN

Several plans to protect the public from physical hazards at the Site will be implemented. Each of these measures is designed to make the area surrounding the remediation safe for the public.

3.1 WARNING SIGNS

The contractor will place signs at the entrances to the property indicating that the Site is being remediated and under oversight of NYSDEC.

3.2 SITE FENCING

Fencing will be placed around the property that comprises the Site where none exist and entrance gates with locks to deter entrance during non-work hours.

4.0 VAPOR/ODOR MANAGEMENT PLAN

If significant nuisance odors are noted, the Owner, the BE3 qualified environmental professional (QEP) and the contractor will consult to determine what type of emission control action is appropriate. Actions that may be taken to reduce contaminant or odor levels include the following:

- Cover working areas of exposed impacted soils, trucks loaded with impacted soils, or stockpiles of impacted soils with tarpaulin covers, vapor reducing foam, or other vapor control agents
- Reduce the production rate or change the sequence of work activities
- Change the work methods or equipment to alternatives that reduce the potential to create dust or release contaminants into the air
- Use specialized odor suppressing foams (i.e., a product which reduces the ability of vapors and dust to enter the air) to cover the contaminated
- Mist water onto soil in order to prevent dust that may carry odors

Corrective measures may also include halting work and implementing additional dust suppression techniques which may include:

- Applying water on haul roads
- Wetting equipment and excavation faces
- Spraying water on truck buckets during excavation and dumping
- Restricting heavy equipment traffic use or areas of operation
- Restricting vehicle speeds
- Covering excavated areas and materials after excavation activity ceases or completing excavation, grading, and filling in small area sequences to reduce leaving large surface areas exposed

In practice, these actions will typically be used proactively to prevent alert levels from being reached at the Site perimeter.

5.0 NOISE REDUCTION PLAN

The remedial activities conducted on Site will conform to the noise codes/ordinances for the City of Dunkirk during the work.

To comply, construction activities on the Site will be prohibited between the hours of 6:00 PM and 7:00 AM Monday through Friday, Saturdays, Sundays, and on all legal holidays. In the event of an emergency that requires work to be conducted during these times, the contractor will seek a variance from the Building Department Administrator to permit such activities.

It is not anticipated that the activities at the Site will create excess levels of noise to a degree that would cause concern to nearby residents. If noise issues do become a concern the following steps may be taken to reduce the noise level caused by construction:

- Locating pieces of machinery on the Site to maximize the distance from potential receptors
- Developing a design for a perimeter sound barrier at the Site
- Specifying the use of low noise emission construction equipment

The work that will be completed does not currently require the contractor to perform tasks which are commonly associated with high levels of noise. The periodic use of back up alarms on vehicles may be the noise that is commonly heard from the Site, and the contractor will make every effort to minimize the need for vehicles to use them.

6.0 VIBRATION MONITORING

It is not anticipated that the remedial activities at the Site will generate high levels of vibrations for nearby residents. The remedial work that will be completed does not currently require the contractor to perform tasks that are commonly associated with high levels of vibration such as blasting, or pile driving.

The most common source of vibrations from the Site will be from pavement busting and compaction equipment, which will be used to compact clean soil as it is used to replace impacted soil that has been excavated. Compaction equipment will create vibrations over a very small area and not nearly powerful enough to cause damage to nearby structures.

7.0 SITE SECURITY PLAN

The objectives of the Site security plan are to prevent the vandalism/destruction of construction equipment, prevent access, and minimize health and safety concerns for surrounding property owners.

7.1 PERIMETER SECURITY

The Site will be completely fenced and have locked gates.

7.2 EQUIPMENT SECURITY

All vehicles and/or equipment left on the Site will be secured at the end of each working day and during non-workdays. No vehicles or equipment will be left overnight in an unsecured location. The contractor will ensure that all non-essential equipment is de-energized when left on-site and not in use to prevent any malfunctions from occurring while workers are not present.

8.0 STORMWATER AND EROSION CONTROL PLAN

The Stormwater Management Report (SWMR) is intended to minimize soil erosion, and control stormwater on the Site.

8.1 IMPLEMENTATION OF EROSION CONTROL MEASURES

Filtrexx SiltSoxx or silt fences will be installed around the perimeter of the support zones and all areas to be excavated and/ or backfilled to control erosion.

The contractor shall install and maintain the erosion control measures for the duration of the excavation/backfill work.

8.2 STORMWATER RUNOFF CONTROL

The contractor will be required to utilize appropriate control measures to direct stormwater to flow around an excavation area and to a discharge point. Appropriate controls are detailed in the Site SWMR and may include digging a small ditch to direct the water flow, or building barriers out of clean soil to collect the stormwater so it can be pumped to a suitable discharge point.

9.0 WASTE MANAGEMENT

The waste management plan identifies the procedures for managing, treatment, and disposal of waste materials generated during Site remediation. All wastes removed from the Site will be transported by properly permitted and/or licensed waste haulers directly to approved disposal facilities. All trucks will be inspected to ensure the proper placards, decals and permits are displayed. Trucks will utilize the most direct hauling route to the disposal facility.

9.1 SOIL MANAGEMENT AND TREATMENT

Impacted soils removed from excavation areas will be loaded into trucks for transport to the approved disposal facility. Trucks will not be allowed to stage on local roadways. The Contractor will schedule trucks in a manner that will minimize the wait time for loading.

Vehicles containing impacted soil will be covered with a solid plastic tarp. If necessary, spray-on odor suppressing materials may be used to reduce potential VOC emissions or odors during transit.

9.2 CONSTRUCTION DEWATERING AND TREATMENT

Stormwater encountered during excavation that has been impacted by contaminated soils will be pumped to a temporary storage/frac tank. The water will be sampled and tested to determine if it can be discharged to the municipal sewer system or required to be sent to a disposal facility.

10. TRAFFIC MANAGEMENT PLAN

The objectives of the traffic plan at the Site are to describe the objectives for traffic control and address any potential concerns. The traffic control plan outlines traffic management at the Site for:

- Trucking materials on and off-site
- Contractor access and parking
- Equipment accesses and storage
- Traffic control at the Site entrance
- Requirements for truck flagmen at Site access gates

Trucking of materials and equipment to and from the Site will be through an established entrance gate. Contractor employees will also enter and leave the Site through this same gate. The contractor's traffic control personnel will direct traffic as needed upon delivery of equipment, trailers, excavation support materials, etc. To maintain access and lines of sight, the contractor will arrange for and coordinate with the appropriate local authorities to ensure that on-street parking nearest to the entrance/exit gate is limited throughout the duration of work. Trucks will not be allowed to queue on local streets; however, the contractor may negotiate with a third party to obtain off-site parking where vehicles can wait to be loaded. All the roadways utilized by the contractor during the work will be checked daily for spillage and seepage, and cleaned to the satisfaction of Owner's representative, as necessary. All trucking on local roadways will meet the requirements of all local regulatory agencies.

10.1 TRUCK CONTROLS

Upon Site arrival, each truck will be visually inspected to ensure appropriate permits are in place. Trucks hauling impacted soil will be initially lined with polypropylene plastic tarp along their beds to prevent water from seeping out of the soil onto local streets. When applicable, odorous truckloads of soil will be foamed to control odors (refer to Sections 4 and 9). The trucks will also utilize a heavy tarp which will be extended over the cargo area and overlap the sides and rear of the cargo area to prevent soil being removed from the truck by wind. Trucks, before exiting the Site, will pass through an inspection area and be inspected to ensure tires and undercarriages are clean and that tarps are secured. Excessive mud and loose dirt observed on the truck tires will be removed by installing a truck wash station or equivalent at the exit gate. Additional excess mud and soil on truck carriages will be manually removed with brooms and brushes, as necessary. The proper cleaning of trucks exiting the Site will aid in minimizing/eliminating dust and soil leaving the Site.

Appendix G

SWMR

Stormwater Management Report
for
(Part I)

220 Washington Ave
Tax Parcels 79.57-1.81, 80, 79, 75, 74, 73, 72, 71, 70 69 and 2

City of Dunkirk
Chautauqua County, New York

Prepared for

Regan Development Corporation

1055 Saw Mill River Road #204

Ardsley, NY 10501

September 21, 2023



Prepared by:

EP
LAND SERVICES

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STORMWATER MANAGEMENT REPORT
For
220 WASHINGTON AVE

CITY OF DUNKIRK, CHAUTAUQUA COUNTY, NY

The overall Stormwater Management package consists of three reports:

- The first report is the Stormwater Management Report. The Engineering report demonstrates through calculations that the proposed management technique will operate correctly and that the practice is designed in accordance with applicable standards.
- The second report is the Post-Construction Maintenance Plan. The Maintenance Plan identifies to the Owner which activities can be anticipated to ensure that the stormwater management practice operated correctly. Routine maintenance activities have been identified and typical annual operating expenses have been presented.

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I:\ENGINEERING PROJECTS\OTHER CLIENTS\2022\2022-09 DUNKIRK-REGAN\03-ADMIN\REPORTS\STORM REPORT\SWMR REPORT SITE 2 (220 WASHINGTON. 9.21.23) .DOCX

1.0 EXECUTIVE SUMMARY

Regan Development is proposing to construct a multi-family parcel located at 220 Washington Ave in the City of Dunkirk. The parcels are approximately 1.54 acres and are comprised of tax parcels 79.57-1.81, 80, 79, 75, 74, 73, 72, 71, 70 69 and 2. The proposed project will construct one multi-family in a three (3) story building, totaling 48 multi-family apartment units. Access to the site will be from Washington Ave and Park Ave.

The proposed plan the project will be subject to NYSDEC SPDES Phase II requirements for water quality and quantity as the project will disturb greater than 1 acre. Approximately 1.8 acres will be disturbed for the development of the site. The proposed site improvements have been designed in accordance with the Stormwater Management Design Manual (SWDM) published by the New York State Department of Environmental Conservation (NYSDEC) The objective of controlling water quantity is to ensure that the peak rate of runoff leaving the site does not increase as result of site development. Enhanced stormwater regulations implemented in 2003 call for more stringent design standards when dealing with stormwater runoff on sites disturbing more than 1 acre of land. The "new" regulations are commonly referred to as "Phase II" guidelines. The proposed improvements for the project site meet or exceed water quantity, runoff reduction and water quality requirements as specified in the 2015 NYSDEC SWDM guidelines.

Per NYSDEC FAQ

4. Does a construction activity that discharges to a combined sewer require coverage under GP-02-01?

A: No, discharges to combined sewers do not require coverage under GP-02-01.

Therefore, a site stormwater runoff flows to Dunkirk Wastewater Treatment Plant and is part of the combined sewer overflow (CSO) system, a permit from NYSDEC for construction activities (GP-0-20-001) is **not applicable** for this project site and thus not subject to NYSDEC SWDM. This makes some sense as the wastewater plant has its own SPDES permit # and GP-0-20-001 is a SPDES permit.

To meet the intent of GP-0-20-001 stormwater permit, the proposed management strategy consists of using a Hydrodynamic Unit to treat Water Quality Volume (WQv) for the site. water quantity. To manage water quantity, the proposed management strategy consists of using an underground stormwater detention array system.

The following Stormwater Management Report quantitatively assesses the pre-development and post-development runoff conditions of the site. The report documents that the proposed improvements will meet the minimum requirements of water quality parameters as set forth in the NYSDEC guidelines.

1.1 Methodology for Designing Storm Water Management

1. Determine contributory watershed area(s) and subsequent sub-watersheds for proposed site according to site conditions. Design a pipe layout to convey stormwater to selected locations.

2. Evaluate pre and post development stormwater runoff conditions for various storm intensities, durations and frequencies of occurrences using USDA Technical Release 55 (TR-55) methodology.

3. Evaluate peak runoff and storage requirements for the NYSDEC specified 1, 2, 10, 25, 50 and 100-year storm frequencies.

2.0 SITE CONDITIONS

2.1 Topography

The general topography slopes from south to north See Exhibit E.2 for the existing topography and the site is generally flat where the proposed development will be located. Most of the project area stormwater runoff flows to an existing low point in center of property (catch basin behind Row Housing facing East 2nd St.) and is directed to the existing closed drainage system on East 2nd Street. The stormwater runoff from the existing closed drainage system eventually converges with the Combined Sewer Overflow (CSO) system and flows north to the CSO outfall/wastewater treatment plant.

2.2 Soils

The USDA Soil Survey was used to determine the existing soils within the project boundaries. Hydrologic soil groups were determined to analyze runoff volumes and flow rates. Soils found within the project and adjacent properties are as follows:

Ur	Urban	HSG D

Urban Soils do not have a Hydrologic Soil Groups (HSG) designation. HSG D was assigned to Urban soils based upon soil testing performed by BE3 DPC.

2.3 Test Pits and Percolation Test

Test pits and percolation texts are not required for this project based upon NYSDEC GP0-20-001 permit is not applicable for this project site.

3.0 PRE AND POST DEVELOPMENT PEAK DISCHARGE

This section describes the stormwater analysis relative to the site, including the runoff generated within the limits of the site as well as contributing watershed to the discharge point. Analysis of upstream/downstream watershed to the receiving waters for this project site is not included in the computations for this report. The peak discharge rates represented in this report demonstrate only the expected peak flows from the delineated watersheds and do not take into account the overall watersheds. The non-delineated Pre and Post Development upstream/downstream watersheds are considered base flow and where the proposed site improvement will not have an effect on stormwater runoff. Therefore, the Pre and Post Development non-delineated upstream/downstream watershed will have the exact same stormwater runoff characteristics.

3.1 Pre-Development Area Descriptions and Discharge Points

The Pre-Development stormwater system was analyzed by subdividing the watershed areas to estimate the runoff from each watershed area. The site was divided into three (3) areas, based on the discharge points. (Refer to Figure 2– "Pre-Development Watersheds" in Exhibit E.3)

Pre-Development Area #1 has been delineated and stormwater runoff flows to Washington Ave existing closed drainage system. The watershed is approximately 0.52 acres in size and contains pavement/impervious area, gravel (railroad tracks), brush and grass. All stormwater runoff from this watershed will eventually flow to the to the existing 48-inch CSO sewer line on Washington Ave (Discharge Point #1).

Pre-Development Area #2 has been delineated and stormwater runoff flows to East 2nd Street existing closed drainage system (Discharge Point #2). The watershed is approximately 1.62 acres in size and contains pavement/impervious area, gravel (railroad tracks), brush, dirt, and grass.

Pre-Development Area #3 has been delineated and stormwater runoff flows to Park Ave existing closed drainage system. The watershed is approximately 0.49 acres in size and contains pavement/impervious area, gravel (railroad tracks), brush, dirt and grass. All stormwater runoff from this watershed will eventually flow to the to the existing 24-inch CSO sewer line on Park Ave (Discharge Point #3).

3.2 Post Development Area Descriptions and Discharge Points

The following section describes the post development stormwater system. The post development watershed has been subdivided in order to accurately estimate the runoff from the watershed and the effect of the proposed development. To analyze and compare the post development conditions with the pre-development conditions, the watershed was divided into two (2) areas. (Refer to Figure 3 – "Post-Development Watersheds" in Exhibit E.4)

Post Development Area #1 has been delineated and stormwater runoff flows to Washington Ave existing closed drainage system. The watershed is approximately 0.28 acres in size and contains pavement/impervious area, gravel (railroad tracks), brush and grass. All stormwater runoff from this watershed will eventually flow to the to the existing 48-inch CSO sewer line on Washington Ave (Discharge Point #1).

Post Development Area #1A is approximately 1.46 acres in size and contains grass, gravel (railroad tracks), brush and impervious areas from the proposed site improvements. The stormwater runoff will be collected by an on-site closed drainage system. The closed drainage system will direct stormwater runoff to the underground detention array. The underground detention array will then meter stormwater runoff to the existing closed drainage system on Wahington Ave. (Discharge Point #1).

Post Development Area #2 has been delineated and stormwater runoff flows to East 2nd Street existing closed drainage system (Discharge Point #2). The watershed is approximately 0.54 acres in size and contains pavement/impervious area and grass.

Post Development Area #3 has been delineated and stormwater runoff flows to Park Ave existing closed drainage system. The watershed is approximately 0.32 acres in size and contains pavement/impervious area, gravel (railroad tracks), brush and grass. All stormwater runoff from this watershed will eventually flow to the to the existing 24-inch CSO sewer line on Park Ave (Discharge Point #3).

3.3 Time of Concentration (TOC)

Times of Concentration (TOC) paths were determined for Pre and Post Development subareas by using the methodology described in National Resource Conservation Service's TR-55 manual. Sheet flow never exceeded 150 feet over natural undisturbed terrain for Pre-Development and 100 feet for Post Development per NYSDEC standards over disturbed areas. A Manning's n=0.80 was used for Pre and Post development areas that sheet flowed across wooded areas. Manning's n=0.24 for areas in which there was sheet flow across lawns or a Manning's N value of 0.011 across pavement. Channel flow time for existing swales were estimated based on a 1-foot depth along with contours from the base map to determine cross sectional area and wetted perimeter. Channel flow time through proposed/existing piping was based on a 12" SICPP, flowing full with a Manning's n=0.012. Calculations for the TOC paths can be found in Exhibit C.

3.4 Weighted Curve Number (CN)

Within each watershed area, cover type and hydrologic condition are compared to the Hydrologic Soil Group classification to derive a runoff curve number. Subsequently, a weighted average, or composite runoff curve number (CN) is determined. Runoff curve number supporting calculations for pre-development and post-development scenarios are presented in Exhibit A.2 and A.3.

3.5 Peak Discharges for Pre and Post Development Areas

The stormwater analysis was performed using *Hydraflow Hydrographs* software developed by *Intellisolve*® (see Exhibit C). The software uses the Soil Conservation Service (SCS), now known as (NRCS) National Resources Conservation Service, for both pre and post development areas/watersheds are shown in the following tables. Note: the peak discharges for both pre and post development were based on TOC, runoff (Q), Weighted Curve Number (CN) and other factors.

Table-1 Pre-Development Peak Discharge

Watershed	1-Year Peak Flow (cfs)	2-Year Peak Flow (cfs)	10-Year Peak Flow (cfs)	25-Year Peak Flow (cfs)	50-Year Peak Flow (cfs)	100-Year Peak Flow (cfs)	CN	Area (Acres)	TOC (Min.)
Pre Area #1	1.114	1.406	2.188	2.734	3.326	3.966	94	0.519	6.20
Pre Area #2	2.005	2.776	5.025	6.816	8.466	10.43	86	1.618	7.90
Pre Area #3	0.849	1.112	1.871	2.451	2.979	3.603	90	0.496	6.10

Table-2 Post Development Peak Discharge (Unattenuated)

Watershed	1-Year Peak Flow (cfs)	2-Year Peak Flow (cfs)	10-Year Peak Flow (cfs)	25-Year Peak Flow (cfs)	50-Year Peak Flow (cfs)	100-Year Peak Flow (cfs)	CN	Area (Acres)	TOC (Min.)
Post Area #1	0.515	0.672	1.101	1.431	1.731	2.085	91	0.283	6.00
Post Area #1A	2.512	3.32	5.537	7.254	8.816	10.66	90	1.468	6.00
Post Area #2	0.775	1.056	1.864	2.502	3.087	3.781	87	0.547	6.00
Post Area #3	0.526	0.703	1.194	1.577	1.926	2.339	89	0.327	6.00

** All Post Development watersheds were assigned a Time of Concentration of 6.0 minutes (minimum value) to determine the worst-case peak runoff conditional for these watersheds.*

4.0 NYSDEC UNIFORM SIZING CRITERIA

The Environmental Protection Agency and New York State Department of Environmental Conservation have placed a greater emphasis on ensuring that water quality standards are maintained both onsite as well as downstream of the development. Maintaining water quality involves the removal or reduction of pollutants including suspended solids, phosphates, nitrates and other chemicals generated by development. The new water quality standards expand upon the peak flow attenuation concept to include parameters designed to protect downstream channels from stream bank erosion and flooding.

NYSDEC assumes that, by default, the proposed stormwater management practice meets water quality objectives if the proposed practice is designed in accordance with the List of Acceptable Stormwater Management Practices set forth in the *NYS Stormwater Management Design Manual (SMDM, Chapters 5 and 6)*.

Based upon the fact that NYSDEC GP0-20-001 permit is **not applicable for this project** site and wanting to meet the intent of NYSDEC SWDM, Chapter 9 of NYSDEC SWDM was reviewed. As the project site will be redeveloped, NYSDEC SWDM Chapter 9 applies to this project.

NYSDEC Section 9.2.1 Sizing Criteria

III- The plan proposes the use of alternative SMPs to treat 75 % of the water quality volume from the disturbed, impervious area as well as any additional runoff from tributary areas that are not within the disturbed, impervious area. The use of alternative SMPs is discussed in Sections 9.3 and 9.4 of this chapter, which is focused on the accepted verified manufactured technologies.

Section 9.3 Alternative Stormwater Practices

When using an alternative SMP (i.e. proprietary practices), the WQv criteria shall be met by applying the sizing criteria in Section 9.2.1, Option B.III. to one of the alternative SMPs . Proprietary practices must be sized to capture and treat the WQv resulting from the contributing drainage area depending on whether it uses a volume-based or a rate-based sizing approach. For practices with a volume based sizing approach, the practice must be sized to capture and treat 75 % of the WQv as defined in Chapter 4 of the Manual. For flow through practices, the practice must be sized to treat the peak rate of runoff from the WQv design storm, as defined in Chapters 4 and 10, and Appendix B of this Manual. The flow capacity identified in the verification process for the specific alternative practice must be greater than or equal to the calculated peak runoff rate from the WQv design storm. For offline practices, the installation must include flow diversion that protects the practice from exceeding the design criteria.

Section 9.4 Alternative Stormwater Practices Proprietary Practices

Hydrodynamic systems such as gravity and vortex separators –devices that move water in a circular, centrifugal manner to accelerate the separation and deposition of primarily sediment from the water. They are suitable for removal of coarse particles, small drainage areas, and are more effective in an offline configuration.

4.1 Runoff Reduction Volume (RRv)

Not applicable for this project.

4.2 Water Quality Volume (WQv)

The Water Quality Volume is designed to improve water quality sizing to capture and treat 90% of the average annual stormwater runoff volume. The proposed stormwater management strategy for this project is sized to accommodate the Water Quality Volume. The WQv was determined to be 2.749 cf for Post Development Area #1A. The Water Quantity Area was based upon proposed parking areas, proposed building area and sidewalk within Post Area #1A watershed. See Exhibit B.1 for calculations.

4.3 Channel Protection Volume (CPv)

Not applicable for this project.

4.4 Overbank Flood Protection Volume

The overbank flood protection volume requirements are incorporated to prevent an increase in the frequency of flooding and magnitude of out-of-bank flooding downstream of the management practice. Overbank control

requires storage to attenuate the post-development 10-year, storm, and reduce the 24-hour peak discharge rate to the pre-development rates.

4.5 Extreme Flood Protection Volume

The intent of the extreme flood protection volume is to a) prevent the increased risk of flood damage from large storm events, b) maintain the boundaries of the pre-development 100-year floodplain, and c) protect the physical integrity of the stormwater management practices. Extreme flood protection control requires storage to attenuate the post-development 100-year, 24-hour peak discharge rate to the pre-development rates. The 100-year attenuated storm event is further discussed in Section “5.0 Proposed Water Quality and Quantity Controls project.

4.6 Safe passage of the 100-Year Design Storm

The physical integrity of the stormwater management practice must be maintained. The outlet structure(s) and emergency spillways must be designed to accommodate the 100-year design storm. Used in conjunction with the stage-storage relationship, the safe passage of the 100-year design storm reveals the maximum water surface elevation anticipated for the management practice. The 100-year storm event is further discussed in Section “5.0 Proposed Water Quality and Quantity Controls”.

5.0 PROPOSED WATER QUALITY AND QUANTITY CONTROLS

5.1 Proposed Stormwater Management Strategy

Stormwater runoff is to be collected by catch basins and an on-site closed drainage system. The proposed strategy consists of utilizing a closed drainage system that directs the runoff towards an underground detention array to manage water quantity. The underground array will be made of four (4) sticks of 30-inch pipe with a length of 300 feet. The underground array will send stormwater to a hydrodynamic unit or have a by-pass pipe at a higher elevation before the stormwater is released to the existing 48-inch CSO sewer on Washington Ave.

The stormwater analysis was performed using *Hydraflow Hydrographs* software developed by *Intellisolve*®. The software uses the Soil Conservation Service (SCS), now known as (NRCS) National Resources Conservation Service, hydrologic methods to compute the 24-hour precipitation event. The runoff curve numbers, and time of concentrations were computed using the NRCS TR-55 tabular methodology as described in Section 3.0 of this report. The 24-hour rainfall amounts for City of Dunkirk are documented in Exhibit A.1.

The hydrograph model is set up to simulate Pre-Development Areas and Post-Development to all Discharge Points (see Exhibit C). It is the goal of the hydraulic model to demonstrate the water surface elevation within the proposed infiltration basins and the net increase in peak discharge rates occur between pre-development and post-development conditions for the 1, 2, 10, 25, 50 and 100-year storm events.

5.2 Water Quantity Using TR-55 Tabular Method For Post Development Areas #1 and #1A

Under the proposed condition stormwater runoff from Post Development Areas #1 and #1A is greater than Pre-Development Areas #1 peak runoff rates. As Post Development areas peak flows greater than Pre-Development peak flow a detention basin or underground holding chamber is required for this project site.

Table-4 Post Flow from Underground Detention Array System

	1-Year Flow (cfs)	2-Year Flow (cfs)	10-Year Flow (cfs)	25-Year Flow (cfs)	50-Year Flow (cfs)	100-Year Flow (cfs)
Post Development Area #1A	2.512	3.32	5.537	7.254	8.816	10.66
Max. Water Surface Elevation (WSEL)	93.54	93.54	94.22	94.51	94.80	95.25
Outflow (WQV #1)	0.484	0.524	0.595	0.636	0.675	0.731
Outflow Flow to CB#1	0.012	0.356	2.136	3.642	4.840	6.257

To obtain the peak outflow from the proposed underground pipe storage array system labeled “Array” in the software model, a 4” orifice labeled as “Clv A” at elevation 92.05 (flow to WQv#1) and a 15” orifice labeled “Clv B” at elevation 93.55 (high flow by-pass) was used to stimulate storm events in the *Hydraflow Hydrographs* software model.

The 100-year WSEL has been determined to be 95.25 or there is 0.80 feet of freeboard within the array. It should be noted that additional storage volume in closed drainage system and catch basin structures potential storage capacity not included to available storage volumes.

As shown in *Hydraflow Hydrographs* software model, “Diversion 1” is flow leaving the underground array by the 4” pipe (Flow to WQv) and is hydrograph #9 in the hydraulic model, while “Diversion 2” is flow leaving the underground array by the 15” pipe (high flow by-pass) and is hydrograph #10 in the hydraulic model.

5.3 Combined Flows to All Discharge Points

As stormwater runoff from the site will discharge to the existing closed drainage system on Washington Ave. As all stormwater from the site enters the CSO system Post Development Area #1, 1A, #2 and #3 must be compared to Pre-Development Areas #1, #2 and #3. As flow from the underground Array will either send stormwater runoff from the site to the WQv treatment device or directly to the existing closed drainage system (by-pass pipe) *Hydraflow Hydrographs* software hydraulic model calculations the expect combined Post Development peak

discharge rate to Discharge Point #1 and to the entire CSO system based upon routing time and orifice configuration/elevations. As the hydraulic modeling simulated for the 1, 2, 10, 25 50 and 100-year storm events, the post development combined peak flow rate to all Discharge Points can be determined and are listed below.

Table-5 Peak Flow to all Discharge Points

	1-Year Flow (cfs)	2-Year Flow (cfs)	10-Year Flow (cfs)	25-Year Flow (cfs)	50-Year Flow (cfs)	100-Year Flow (cfs)
Combined Pre Development Flow (Area #1, #2 and #3)	3.914	5.240	8.949	11.86	14.53	17.69
Post Combined Flow (Area #1)	2.256	2.935	6.080	8.967	11.61	14.38
Net Change in Flow	-1.658	-2.305	-2.869	-2.893	-2.92	-3.31

The combined Pre-Development and Post Development combined peak discharge to CSO system can be seen in Exbibit C hydrographs #11 and #12.

5.4 Water Quality Treatment (Area #1A)

Post Development Area #1A watershed has been designed in accordance with NYSDEC Phase II Management Guidelines with respect to Water Quality requirements even though GP 0-20-001 permit is **not applicable** for this project site based upon FAQ #4. Per NYSDEC SWDM Chapter 9 Section 9.2.1 III the redevelopment area must treat 75 % of the water quality volume from the disturbed, impervious area as well as any additional runoff from tributary areas that are not within the disturbed, impervious area.

As the project area is only 1.52 acres only 75% of 0.98 acres of impervious area for the entire project site is required to be treated for WQv. The 75% equates to 0.73 acres of impervious must be treated. In Post Development Area #1A there is 0.76 acres of impervious area thus meeting the required treatment area.

The proposed hydrodynamic unit has been sized to treat 0.76 acres of impervious area with a peak flow of 0.731 cfs. Based upon a peak flow of 0.731 (100-year event) based upon Table 4) a hydrodynamic separator has been sized for that treatment flow. Contech Model 2020 with a treatment flow of 1.1 cfs has been selected.

5.5 Summary

As the project site is **not** subject to NYSDEC SWDM Chapter 9 and WQv was still designed for, the project stormwater exceeds local and NYSDEC requirements. The Hydrodynamic unit was sized to treat the WQv and will treat over 75% of the impervious area of the project site area. The proposed underground detention array holds back stormwater flows below Pre-development peak flows to the existing CSO system.

6.0 PROPOSED CONVEYANCE SYSTEM AND DISCHARGE POINT

The proposed closed drainage was designed and checked to pass the 10-year storm event. Calculations for anticipated flow through each pipe run can be found in Exhibit D.1. The anticipated flows through each proposed pipe run were based upon the percentage of watershed flowing to each proposed catch basin.

Exhibit A – Soils, Rainfall and CN Calculations

.1 24-Hour Rainfall Intensity Table

.2 Pre-Development CN

.3 Post Development CN

.4 NRCS Soil Information

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Metadata for Point

Smoothing	Yes
State	New York
Location	New York, United States
Latitude	42.485 degrees North
Longitude	79.331 degrees West
Elevation	180 feet
Date/Time	Tue Sep 19 2023 08:51:50 GMT-0400 (Eastern Daylight Time)

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr
1yr	0.26	0.40	0.50	0.65	0.81	1.00	**1yr**	0.70	0.92	1.13	1.36	1.61
2yr	0.31	0.48	0.60	0.79	1.00	1.23	**2yr**	0.86	1.13	1.39	1.66	1.96
5yr	0.37	0.58	0.73	0.97	1.24	1.54	**5yr**	1.07	1.38	1.75	2.08	2.45
10yr	0.42	0.66	0.83	1.13	1.47	1.83	**10yr**	1.27	1.61	2.08	2.48	2.90
25yr	0.50	0.79	1.00	1.38	1.83	2.30	**25yr**	1.58	1.98	2.62	3.11	3.63
50yr	0.56	0.90	1.15	1.61	2.17	2.74	**50yr**	1.87	2.31	3.12	3.70	4.30
100yr	0.64	1.03	1.33	1.89	2.57	3.26	**100yr**	2.22	2.71	3.72	4.41	5.09
200yr	0.73	1.20	1.55	2.21	3.05	3.88	**200yr**	2.63	3.17	4.43	5.23	6.03
500yr	0.88	1.45	1.88	2.73	3.83	4.89	**500yr**	3.30	3.91	5.58	6.58	7.55

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr
1yr	0.21	0.33	0.40	0.54	0.66	0.73	**1yr**	0.57	0.72	0.88	1.11	1.30
2yr	0.30	0.46	0.57	0.77	0.95	1.12	**2yr**	0.82	1.09	1.24	1.49	1.75
5yr	0.34	0.52	0.64	0.88	1.12	1.29	**5yr**	0.97	1.27	1.45	1.72	2.00
10yr	0.36	0.55	0.69	0.96	1.24	1.44	**10yr**	1.07	1.41	1.61	1.91	2.20
25yr	0.40	0.60	0.75	1.07	1.41	1.68	**25yr**	1.21	1.65	1.87	2.18	2.50
50yr	0.41	0.63	0.78	1.13	1.52	1.88	**50yr**	1.31	1.84	2.14	2.41	2.76
100yr	0.44	0.66	0.83	1.19	1.64	2.10	**100yr**	1.41	2.06	2.44	2.62	3.05
200yr	0.45	0.68	0.87	1.25	1.75	2.35	**200yr**	1.51	2.30	2.80	2.89	3.36
500yr	0.48	0.71	0.92	1.34	1.90	2.76	**500yr**	1.64	2.70	3.38	3.22	3.82

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		MADE BY:	JWE	DATE:	9/20/2023
PROJECT:	208-220 Washington Ave	CHKD BY:		DATE:	
SUBJECT:	Pre-Development Condition	REVISED BY:		DATE:	
	AREA #1 & #2	CHKD BY:		DATE:	

Applicable Standards:

Urban Hydrology for Small Watersheds, Technical Release 55. USDA, June 1986.

PRE-DEVELOPMENT

AREA	Land Use Area (feet^2)	Land Use / Cover Description[1]	Hydrologic Soil Group[1]	Actual CN[1]	AREA Area (feet^2)	Factored CN %	Factored CN CN	Weighted CN
#1	15,656	*Paved parking lots,roofs etc.*	D	98	**22,594**	69%	67.9	**94**
	3,538	*Urban Open Space, Fair (50 - 75% grass)*	D	84	**sq. feet**	16%	13.2	
	1,000	*Brush, brush-weed-grass mix (Fair)*	D	77		4%	3.4	
	2,400	*Streets, Gravel*	D	91	**=**	11%	9.7	
				0		0%	0.0	
				0	**0.519**	0%	0.0	
				0	**acres**	0%	0.0	
				0		0%	0.0	
				0	**=**	0%	0.0	
				0		0%	0.0	
				0	**0.001**	0%	0.0	
				0	**sq. mi**	0%	0.0	
	22,594					100%		

AREA	Land Use Area (feet^2)	Land Use / Cover Description[1]	Hydrologic Soil Group[1]	Actual CN[1]	AREA Area (feet^2)	Factored CN %	Factored CN CN	Weighted CN
#2	10,675	*Paved parking lots,roofs etc.*	D	98	**70,467**	15%	14.8	**86**
	37,492	*Urban Open Space, Fair (50 - 75% grass)*	D	84	**sq. feet**	53%	44.7	
	12,000	*Brush, brush-weed-grass mix (Fair)*	D	77		17%	13.1	
	7,300	*Streets, Dirt*	D	89	**=**	10%	9.2	
	3,000	*Streets, Gravel*	D	91		4%	3.9	
				0	**1.618**	0%	0.0	
				0	**acres**	0%	0.0	
				0		0%	0.0	
				0	**=**	0%	0.0	
				0		0%	0.0	
				0	**0.003**	0%	0.0	
				0	**sq. mi**	0%	0.0	
	70,467					100%		

Comments: [1] Source: TR-55, Tables 2-2a,b,c.

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		MADE BY:	JWE	DATE:	9/20/2023
PROJECT:	208-220 Washington Ave	CHKD BY:		DATE:	
SUBJECT:	Pre-Development Condition	REVISED BY:		DATE:	
	AREA #3	CHKD BY:		DATE:	

Applicable Standards:

Urban Hydrology for Small Watersheds, Technical Release 55. USDA, June 1986.

PRE-DEVELOPMENT

AREA	Land Use Area (feet^2)	Land Use / Cover Description[1]	Hydrologic Soil Group[1]	Actual CN[1]	AREA Area (feet^2)	Factored CN %	Factored CN CN	Weighted CN
#3	7,950	*Paved parking lots,roofs etc.*	D	98	**21,586**	37%	36.1	**90**
	11,036	*Urban Open Space, Fair (50 - 75% grass)*	D	84	**sq. feet**	51%	42.9	
	500	*Brush, brush-weed-grass mix (Fair)*	D	77		2%	1.8	
	500	*Streets, Dirt*	D	89	**=**	2%	2.1	
	1,600	*Streets, Gravel*	D	91		7%	6.7	
				0	**0.496**	0%	0.0	
				0	**acres**	0%	0.0	
				0		0%	0.0	
				0	**=**	0%	0.0	
				0		0%	0.0	
				0	**0.001**	0%	0.0	
				0	**sq. mi**	0%	0.0	
	21,586					100%		

AREA	Land Use Area (feet^2)	Land Use / Cover Description[1]	Hydrologic Soil Group[1]	Actual CN[1]	AREA Area (feet^2)	Factored CN %	Factored CN CN	Weighted CN
				0	**0**	0%	0.0	**0**
				0	**sq. feet**	0%	0.0	
				0		0%	0.0	
				0	**=**	0%	0.0	
				0		0%	0.0	
				0	**0.000**	0%	0.0	
				0	**acres**	0%	0.0	
				0		0%	0.0	
				0	**=**	0%	0.0	
				0		0%	0.0	
				0	**0.000**	0%	0.0	
				0	**sq. mi**	0%	0.0	
	-					0%		

Comments: [1] Source: TR-55, Tables 2-2a,b,c.

PROJECT #	2022-09E	SHEET #	1 OF: 2	PAGE #	OF:
		MADE BY:	JWE	DATE:	9/20/2023
PROJECT:	208-220 Washington Ave	CHKD BY:		DATE:	
SUBJECT:	Post Development Condition	REVISED BY:		DATE:	
	AREA #1 & #2	CHKD BY:		DATE:	

Applicable Standards:

Urban Hydrology for Small Watersheds, Technical Release 55. USDA, June 1986.

POST-DEVELOPMENT

AREA	Land Use Area (feet^2)	Land Use / Cover Description[1]	Hydrologic Soil Group[1]	Actual CN[1]	AREA Area (feet^2)	Factored CN %	Factored CN CN	Weighted CN
#1	7,100	*Paved parking lots,roofs etc.*	D	98	**12,341**	58%	56.4	**91**
	3,741	*Urban Open Space, Good (> 75% grass)*	D	80	**sq. feet**	30%	24.3	
	500	*Brush, brush-weed-grass mix (Fair)*	D	77		4%	3.1	
	1,000	*Streets, Gravel*	D	91	**=**	8%	7.4	
				0		0%	0.0	
				0	**0.283**	0%	0.0	
				0	**acres**	0%	0.0	
				0		0%	0.0	
				0	**=**	0%	0.0	
				0		0%	0.0	
				0	**0.000**	0%	0.0	
				0	**sq. mi**	0%	0.0	
	12,341					100%		

AREA	Land Use Area (feet^2)	Land Use / Cover Description[1]	Hydrologic Soil Group[1]	Actual CN[1]	AREA Area (feet^2)	Factored CN %	Factored CN CN	Weighted CN
#2	9,860	*Paved parking lots,roofs etc.*	D	98	**23,836**	41%	40.5	**87**
	13,976	*Urban Open Space, Good (> 75% grass)*	D	80	**sq. feet**	59%	46.9	
				0		0%	0.0	
				0	**=**	0%	0.0	
				0		0%	0.0	
				0	**0.547**	0%	0.0	
				0	**acres**	0%	0.0	
				0		0%	0.0	
				0	**=**	0%	0.0	
				0		0%	0.0	
				0	**0.001**	0%	0.0	
				0	**sq. mi**	0%	0.0	
	23,836					100%		

Comments: [1] Source: TR-55, Tables 2-2a,b,c.

PROJECT #	2022-09E	SHEET #	2 OF: 2	PAGE #	OF:
		MADE BY:	JWE	DATE:	9/20/2023
PROJECT:	208-220 Washington Ave	CHKD BY:		DATE:	
SUBJECT:	Post Development Condition	REVISED BY:		DATE:	
	AREA #3 & #1A	CHKD BY:		DATE:	

Applicable Standards:

Urban Hydrology for Small Watersheds, Technical Release 55. USDA, June 1986.

POST-DEVELOPMENT

AREA	Land Use Area (feet^2)	Land Use / Cover Description[1]	Hydrologic Soil Group[1]	Actual CN[1]	AREA Area (feet^2)	Factored CN %	Factored CN CN	Weighted CN
#3	6,320	*Paved parking lots,roofs etc.*	D	98	**14,237**	44%	43.5	**89**
	6,367	*Urban Open Space, Good (> 75% grass)*	D	80	**sq. feet**	45%	35.8	
	200	*Brush, brush-weed-grass mix (Fair)*	D	77		1%	1.1	
	1,350	*Streets, Gravel*	D	91	**=**	9%	8.6	
				0		0%	0.0	
				0	**0.327**	0%	0.0	
				0	**acres**	0%	0.0	
				0		0%	0.0	
				0	**=**	0%	0.0	
				0		0%	0.0	
				0	**0.001**	0%	0.0	
				0	**sq. mi**	0%	0.0	
	14,237					100%		

AREA	Land Use Area (feet^2)	Land Use / Cover Description[1]	Hydrologic Soil Group[1]	Actual CN[1]	AREA Area (feet^2)	Factored CN %	Factored CN CN	Weighted CN
#1A	33,135	*Paved parking lots,roofs etc.*	D	98	**63,932**	52%	50.8	**90**
	13,347	*Urban Open Space, Good (> 75% grass)*	D	80	**sq. feet**	21%	16.7	
	12,800	*Brush, brush-weed-grass mix (Fair)*	D	77		20%	15.4	
	4,650	*Streets, Gravel*	D	91	**=**	7%	6.6	
				0		0%	0.0	
				0	**1.468**	0%	0.0	
				0	**acres**	0%	0.0	
				0		0%	0.0	
				0	**=**	0%	0.0	
				0		0%	0.0	
				0	**0.002**	0%	0.0	
				0	**sq. mi**	0%	0.0	
	63,932					100%		

Comments: [1] Source: TR-55, Tables 2-2a,b,c.

Soil Map—Chautauqua County, New York



Map Scale: 1:761 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 10 20 40 60

Feet
0 35 70 140 210

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Chautauqua County, New York
Survey Area Data: Version 20, Sep 10, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 17, 2020—Jul 5, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Ur	Urban land	1.7	100.0%
Totals for Area of Interest		**1.7**	**100.0%**

Hydrologic Soil Group and Surface Runoff

This table gives estimates of various soil water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

Surface runoff refers to the loss of water from an area by flow over the land surface. Surface runoff classes are based on slope, climate, and vegetative cover. The concept indicates relative runoff for very specific conditions. It is assumed that the surface of the soil is bare and that the retention of surface water resulting from irregularities in the ground surface is minimal. The classes are negligible, very low, low, medium, high, and very high.

Report—Hydrologic Soil Group and Surface Runoff

Absence of an entry indicates that the data were not estimated. The dash indicates no documented presence.

Hydrologic Soil Group and Surface Runoff–Chautauqua County, New York			
Map symbol and soil name	**Pct. of map unit**	**Surface Runoff**	**Hydrologic Soil Group**
Ur—Urban land			
Urban land	85	—	—

Data Source Information

Soil Survey Area: Chautauqua County, New York
Survey Area Data: Version 20, Sep 10, 2022

Exhibit B – WQv and Pretreatment

.1 WQv calculations

.2 Hydrodynamic Model Information

Version 1.8
Last Updated: 11/09/2015

Total Water Quality Volume Calculation
WQv(acre-feet) = [(P)(Rv)(A)] /12

Is this project subject to Chapter 10 of the NYS Design Manual (i.e. WQv is equal to post-development 1 year runoff volume)?.....	No

Design Point:	1	
P=	1.00	*inch*

Manually enter P, Total Area and Impervious Cover.

Breakdown of Subcatchments

Catchment Number	Total Area *(Acres)*	Impervious Area *(Acres)*	Percent Impervious *%*	Rv	WQv *(ft^3)*	Description
1	1.47	0.76	52%	0.52	2,749	Post 1A
2						
3						
4						
5						
6						
7						
8						
9						
10						
Subtotal (1-30)	1.47	0.76	52%	0.52	**2,749**	**Subtotal 1**
Total	1.47	0.76	52%	0.52	**2,749**	**Initial WQv**

Identify Runoff Reduction Techniques By Area

Technique	Total Contributing Area *(Acre)*	Contributing Impervious Area *(Acre)*	Notes
Conservation of Natural Areas	0.00	0.00	*minimum 10,000 sf*
Riparian Buffers	0.00	0.00	*maximum contributing length 75 feet to 150 feet*
Filter Strips	0.00	0.00	
Tree Planting	0.00	0.00	*Up to 100 sf directly connected impervious area may be subtracted per tree*
Total	**0.00**	**0.00**	

Recalculate WQv after application of Area Reduction Techniques

	Total Area *(Acres)*	Impervious Area *(Acres)*	Percent Impervious *%*	Runoff Coefficient Rv	WQv *(ft^3)*
"<<Initial WQv"	1.47	0.76	52%	0.52	2,749
Subtract Area	0.00	0.00			
WQv adjusted after Area Reductions	**1.47**	**0.76**	52%	0.52	2,749
Disconnection of Rooftops		0.00			
Adjusted WQv after Area Reduction and Rooftop Disconnect	1.47	0.76	52%	0.52	**2,749**
WQv reduced by Area Reduction techniques					0

CONTECH CONSTRUCTION PRODUCTS INC.

Hydrodynamic Separation Products Overview

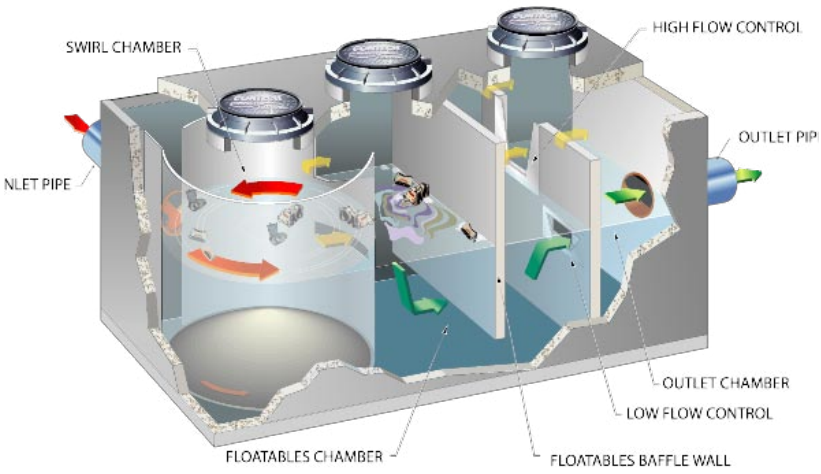


CDS™ Vortechs® VortSentry® VortSentry® HS

High performance hydrodynamic separation

The Vortechs system is a high-performance hydrodynamic separator that effectively removes finer sediment, oil and grease, and floating and sinking debris. Its swirl concentrator and flow controls work together to minimize turbulence and provide stable storage of captured pollutants. The design also allows for easy inspection and unobstructed maintenance access. With comprehensive lab and field testing, the system delivers proven results and site-specific solutions.

Precast models can treat peak design flows up to 25 cfs; cast-in-place models handle even greater flows. A typical system is sized to provide an 80% load reduction based on laboratory-verified removal efficiencies for varying particle size distributions such as 50-micron sediment particles.



How does it work?

Water enters the swirl chamber at a tangent, inducing a gentle swirling flow pattern and enhancing gravitational separation. Sinking pollutants stay in the swirl chamber while floating pollutants are stopped at the baffle wall. Typically Vortechs systems are sized such that 80% or more of runoff through the system will be controlled exclusively by the low flow control. This orifice effectively reduces inflow velocity and turbulence by inducing a slight backwater appropriate to the site.

During larger storms, the water level rises above the low flow control and begins to flow through the high flow control. The layer of floating pollutants is elevated above the influent pipe, preventing re-entrainment. Swirling action increases in relation to the storm intensity, which helps prevent re-suspension. When the storm drain is flowing at peak capacity, the water surface in the system approaches the top of the high flow control. The Vortechs system will be sized large enough so that previously captured pollutants are retained in the system even during these infrequent events.

As a storm subsides, treated runoff decants out of the Vortechs system at a controlled rate, restoring the water level to a dry-weather level equal to the invert of the inlet and outlet pipes. The low water level facilitates easier inspection and cleaning, and significantly reduces maintenance costs by reducing pump-out volume.



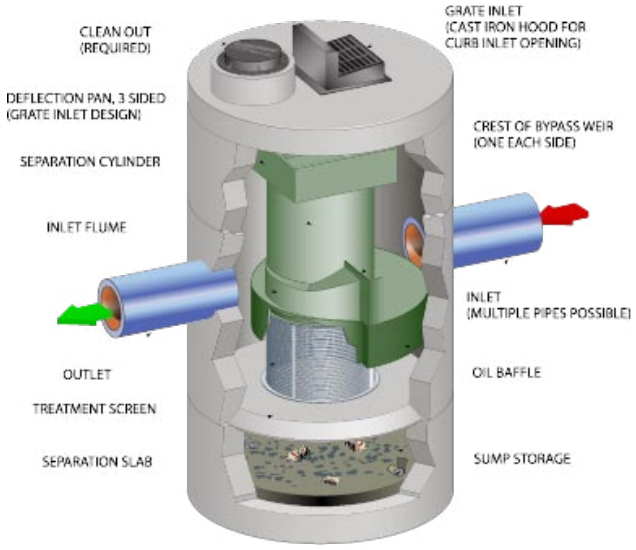
Vortechs

- Proven performance speeds approval process
- Treats peak flows without bypassing
- Flow controls reduce inflow velocity and increase residence time
- Unobstructed access simplifies maintenance
- Shallow system profile makes installation easier and less expensive
- Very low headloss
- Flexible design fits multiple site constraints

Vortechs®

Patented continuous deflection separation (CDS) technology

Using patented continuous deflective separation technology, the CDS system screens, separates and traps sediment, debris, and oil and grease from stormwater runoff. The indirect screening capability of the system allows for 100% removal of floatables and neutrally buoyant material without blinding. Flow and screening controls physically separate captured solids, and minimize the re-suspension and release of previously trapped pollutants. Available in precast or cast-in-place. Offline units can treat flows from 30 to 8500 L/s (1 to 300 cfs). Inline units can treat up to 170 L/s (7.5 cfs), and internally bypass larger flows in excess of 1420 L/s (50 cfs). The pollutant removal capability of the CDS system has been proven in the lab and field.



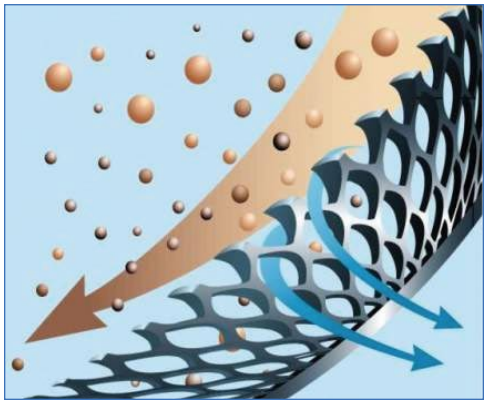
How does it work?

Stormwater enters the CDS unit's diversion chamber where the diversion weir guides the flow into the unit's separation chamber and pollutants are removed. All flows up to the system's treatment design capacity enter the separation chamber.

Swirl concentration and screen deflection forces floatables and solids to the center of the separation chamber where 100% of floatables and neutrally buoyant debris larger than the screen apertures are trapped.

Stormwater then moves through the separation screen, under the oil baffle and exits the system. The separation screen remains clog free due to continuous deflection.

During flow events exceeding the design capacity, the diversion weir bypasses excessive flows around the separation chamber, so captured pollutants will not wash out.





CDS

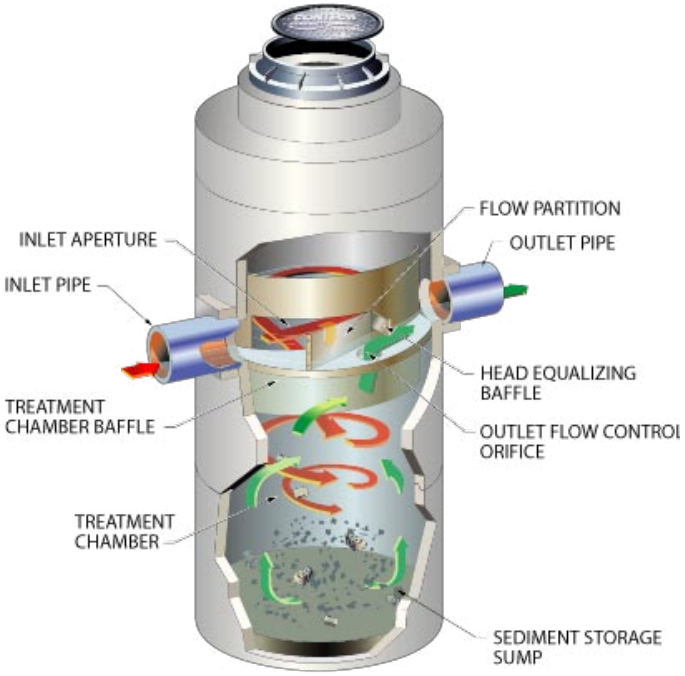
- Removes sediment, trash, and free oil and grease
- Patented screening technology captures and retains 100% of floatables, including neutrally buoyant and all other material larger than the screen aperture
- Operation independent of flow
- Performance verified through lab and field testing
- Unobstructed maintenance access
- Customizable/flexible design and multiple configurations available
- Separates and confines pollutants from outlet flow
- Inline, offline, grate inlet and drop inlet configurations available
- Multiple screen aperture sizes available

VortSentry®

Hydrodynamic separation with internal bypass

The VortSentry is a hydrodynamic separator with a small footprint that makes it an effective treatment option for projects where space is at a premium and effective removal of floating and sinking pollutants is critical. The internal bypass ensures treatment chamber velocities remain low, which improves performance and eliminates the risk of resuspension.

In addition to standalone applications, the VortSentry is an ideal pretreatment device. The system is housed inside a concrete manhole structure for easy installation (often without the use of a crane) and unobstructed maintenance access.



How does it work?

Stormwater runoff enters the unit tangentially to promote a gentle swirling motion in the treatment chamber. As stormwater circles within the chamber, settleable solids fall into the sump and are retained. Buoyant debris and oil and grease rise to the surface and are separated from the water as it flows under the baffle wall. Treated water exits the treatment chamber through a flow control orifice located behind the baffle wall.

During low-flow conditions all runoff is diverted into the treatment chamber by the flow partition. At higher flow rates, a portion of the runoff spills over the flow partition and is diverted around the treatment chamber, filling the head equalization chamber. This collapses the head differential between the treatment chamber and the outlet, resulting in a relatively constant flow rate in the treatment chamber even with a substantial increase in total flow through the system. This further reduces the potential for resuspension or washout of captured pollutants.



VortSentry

- Treatment and internal bypass in one structure
- Compact design ideal for congested sites
- Unobstructed maintenance access
- Round, lightweight construction for easy installation

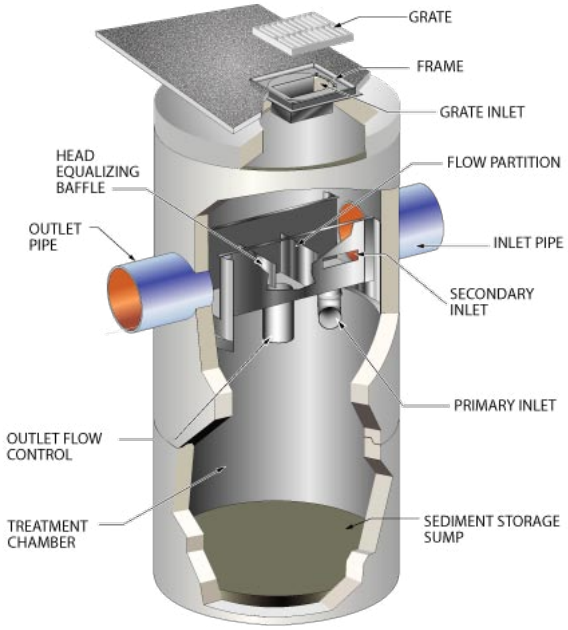
VortSentry® HS

Engineered performance and installation simplicity

The VortSentry HS system employs a helical flow pattern that enhances trapping and containment of pollutants and provides effective removal of settleable solids and floating contaminants from urban runoff.

With the ability to accept a wide range of pipe sizes, the VortSentry HS can treat and convey flows from small to large sites. A unique internal bypass design means higher flows can be diverted without the use of external bypass structures. The design of the VortSentry HS minimizes adverse velocities or turbulence in the treatment chamber. This helps to prevent the washout of previously captured pollutants even during peak conditions.

The VortSentry HS is also available in a grate inlet configuration, which is ideal for retrofits.



How does it work?

Flows from low intensity storms, which are most frequent, are directed into the treatment chamber through the primary inlet. The tangentially oriented downward pipe induces a swirling motion in the treatment chamber that increases capture and containment abilities. Moderate storm flows are directed into the treatment chamber through the secondary inlet, which allows for capture of floating trash and debris. The secondary inlet also provides for treatment of higher flows without significantly increasing the velocity or turbulence in the treatment chamber. This allows for a more quiescent separation environment. Settleable solids and floating pollutants are captured and contained in the treatment chamber.

Flow exits the treatment chamber through the outlet flow control, which manages the amount of flow that is treated and helps maintain the helical flow patterns developed within the treatment chamber.

Flows exceeding the system's rated treatment flow are diverted away from the treatment chamber by the flow partition. Internal diversion of high flows eliminates the need for external bypass structures. During bypass, the head equalizing baffle applies head on the outlet flow control to limit the flow through the treatment chamber. This helps prevent re-suspension of previously captured pollutants.



VortSentry HS

- Helical flow pattern enhances trapping and containment of pollutants
- High treatment and bypass capacities
- Compact footprint ideal for congested sites
- Lightweight design easy to install
- Available in both inline and grate inlet configurations
- Quick manufacturing turnaround time

Available Models

		CDS Model	Typical Internal MH Diameter or Equivalent ID[1] ft	m	Typical Depth[2] Below Pipe Invert ft	m	Water Quality Flow[3] 125 μm cfs	L/s	Screen Diameter/Height ft	m	Typical Sump Capacity yd³	m³
Precast**	Inline	CDS2015-4	4	1.2	3.5	1.1	0.7	19.8	2.0/1.5	0.6/0.5	0.5	0.4
		CDS2015	5	1.5	5.2	1.6	0.7	19.8	2.0/1.5	0.6/0.5	1.3	1.0
		CDS2020	5	1.5	5.7	1.7	1.1	31.2	2.0/2.0	0.6/0.6	1.3	1.0
		CDS2025	5	1.5	6.0	1.8	1.6	45.3	2.0/2.5	0.6/0.8	1.3	1.0
		CDS3020	6	1.8	6.2	1.9	2.0	56.6	3.0/2.0	0.9/0.6	2.1	1.6
		CDS3030	6	1.8	7.1	2.2	3.0	85.0	3.0/3.0	0.9/0.9	2.1	1.6
		CDS3035	6	1.8	7.6	2.3	3.8	106.2	3.0/3.5	0.9/1.1	2.1	1.6
		CDS4030	8	2.4	8.6	2.6	4.5	127.4	4.0/3.0	1.2/0.9	5.6	4.3
		CDS4040	8	2.4	9.7	3.0	6.0	169.9	4.0/4.0	1.2/1.2	5.6	4.3
		CDS4045	8	2.4	10.3	3.1	7.5	212.4	4.0/4.5	1.2/1.4	5.6	4.3
	Offline	CDS3020-D	6	1.8	6.2	1.9	2.0	56.6	3.0/2.0	0.9/0.6	2.1	1.6
		CDS3030-DV	6	1.8	6.9	2.1	3.0	85.0	3.0/3.0	0.9/0.9	2.1	1.6
		CDS3030-D	6	1.8	7.1	2.2	3.0	85.0	3.0/3.0	0.9/0.9	2.1	1.6
		CDS3035-D	6	1.8	8.7	2.6	3.8	106.2	3.0/3.5	0.9/1.1	2.1	1.6
		CDS4030-D	7	2.1	8.6	2.6	4.5	127.4	4.0/3.0	1.2/0.9	4.3	3.3
		CDS4040-D	7	2.1	9.6	2.9	6.0	169.9	4.0/4.0	1.2/1.2	4.3	3.3
		CDS4045-D	7	2.1	10.1	3.1	7.5	212.4	4.0/4.5	1.2/1.4	4.3	3.3
		CDS5042-DV	9.5	2.9	9.6	2.9	9.0	254.9	5.0/4.2	1.5/1.3	1.9	1.5
		CDS5640-D	8	2.4	9.5	2.9	9.0	254.9	5.6/4.0	1.7/1.2	5.6	4.3
		CDS5050-DV	9.5	2.9	10.3	3.1	11	311.5	5.0/5.0	1.5/1.5	1.9	1.5
		CDS5653-D	8	2.4	10.9	3.3	14	396.5	5.6/5.3	1.7/1.6	5.6	4.3
		CDS5668-D	8	2.4	12.4	3.8	19	538.1	5.6/6.8	1.7/2.1	5.6	4.3
		CDS5678-D	8	2.4	13.4	4.1	25	708.0	5.6/7.8	1.7/2.4	5.6	4.3
		CDS7070-DV	12	3.7	14	4.3	26	736.3	7.0/7.0	2.1/2.1	3.3	2.5
		CDS10060-DV	17.5	5.3	12	3.7	30	849.6	10.0/6.0	3.0/1.8	5.0 or 10.2	3.8 or 7.8
		CDS10080-DV	17.5	5.3	14	4.3	50	1416.0	10.0/8.0	3.0/2.4	5.0 or 10.2	3.8 or 7.8
		CDS100100-DV	17.5	5.3	16	4.9	64	1812.5	10.0/10.0	3.0/3.0	5.0 or 10.2	3.8 or 7.8
Cast In Place	Offline	CDS150134-DC	22	6.7**	22	6.7**	148	4191.4	15.0/13.4	4.6/4.1	20.4	15.6
		CDS200164-DC	26	7.9**	26	7.9**	270	7646.6	20.0/16.4	6.1/5.0	20.4	15.6
		CDS240160-DC	32	9.8**	25	7.6**	300	8496.2	24.0/16.0	7.3/4.9	20.4	15.6

**Sump Capacities and Depth Below Pipe Invert can vary due to specific site design

1. Structure diameter represents the typical inside dimension of the concrete structure. Offline systems will require additional concrete diversion components.
2. Depth Below Pipe and Sump Capacities can vary to accommodate specific site design.
3. Water Quality Flow is based on 80% removal of a Particle Size Distribution (PSD) having a mean particle size: d50=125-μm, which is a typical PSD gradation characterizing particulate matter (TSS/SSC) in urban rainfall runoff.

Water Quality Flow, Particle Size & Performance Notes:

- 80% removal (Re=80%) performance forecasts of the PSD having a d50=125-μm is derived from controlled tests of a unit equipped with 2400-μm screen. Performance forecasts for specific particle size gradations or d50s=50, 75, 125, 150 & 200-μm are also available. Removal forecasts based on unit evaluations conducted in accordance with the Technology Assessment Protocol - Ecology (TAPE) protocols, Washington Department of Ecology (WASDOE).
- Units can be sized to achieve specific Re performance for peak flow rates for specific Water Quality Flows, over the hydrograph of a Water Quality Storm Event or sized to meet a specific removal on an average basis using accepted probabilistic methods. When sizing based on a specific water quality flow rate, the required flow to be treated should be equal to or less than the listed water quality flow for the selected system.

  Contact our support staff for the most cost effective sizing for your area.

Vortechs Model	Swirl Chamber Diameter		Internal Length		Water Quality Flow[1] cfs / L/s			Peak Treatment Flow[2]		Sediment Storage	
	ft	m	ft	m	50 µm	110 µm	200 µm	cfs	L/s	yd³	m³
1000	3	0.9	9	2.7	0.21/5.9	0.59/16.7	0.98/27.8	1.6	45.3	0.7	0.5
2000	4	1.2	10	3.0	0.36/10.2	1.0/28.3	1.7/48.1	2.8	79.3	1.2	0.9
3000	5	1.5	11	3.4	0.59/16.7	1.7/48.1	2.7/76.5	4.5	127.4	1.8	1.4
4000	6	1.8	12	3.7	0.78/22.1	2.2/62.3	3.7/104.8	6.0	169.9	2.4	1.8
5000	7	2.1	13	4.0	1.1/31.1	3.1/87.8	5.2/147.2	8.5	240.7	3.2	2.4
7000	8	2.4	14	4.3	1.4/39.6	4.1/116.1	6.7/189.7	11.0	311.5	4.0	3.1
9000	9	2.7	15	4.6	1.8/51.0	5.2/147.2	8.5/240.7	14.0	396.4	4.8	3.7
11000	10	3.0	16	4.9	2.3/65.1	6.5/184.1	10.7/303.0	17.5	495.5	5.6	4.3
16000	12	3.7	18	5.5	3.3/93.4	9.3/263.3	15.3/433.2	25.0	707.9	7.1	5.4

1. Water Quality Flow Rates are based on 80% removal for the particle size distributions (PSD) listed above with d50 = 50, 110 & 200-µm. Particle size should be chosen based on anticipated sediment load.
2. Peak Treatment Flow is maximum flow treated for each unit listed. This flow represents an infrequent storm event such as a 10 or 25 yr storm.

Standard Vortechs System depth below invert is 3' for all precast models.

Cast-in-place system are available to treat higher flows. Check with your local representatives for specifications.

VortSentry Model	Swirl Chamber Diameter		Typical Depth Below Invert		Water Quality Flow[1] 110 µm		Max. Size Inlet/Outlet		Sediment Storage	
	ft	m	ft	m	cfs	L/s	in	mm	yd³	m³
VS30*	3	0.9	5.8	1.8	0.26	7.4	12	300	0.8	0.6
VS40	4	1.2	7.0	2.1	0.58	16.4	18	460	1.4	1.1
VS50*	5	1.5	8.0	2.4	1.1	31.1	18	460	2.2	1.7
VS60	6	1.8	8.9	2.7	1.8	51.0	24	600	3.1	2.4
VS70*	7	2.1	9.7	3.0	2.7	76.5	30	750	4.3	3.3
VS80	8	2.4	10.1	3.1	3.9	110.4	36	600	5.6	4.3

* Denotes models may not be manufactured in your area. Check with your local representative for availability.

1. Water Quality Flow is based on 80% removal of a particle size distribution with an average particle size of 110-µm. This flow also represents the maximum flow prior to which bypass occurs.

VortSentry HS Model	Swirl Chamber Diameter		Typical Depth Below Invert		Water Quality Flow[1] 240 µm		Max. Size Inlet/Outlet		Sediment Storage	
	ft	m	ft	m	cfs	L/s	in	mm	yd³	m³
HS36*	3	0.9	5.6	1.7	0.55	15.6	18	460	0.5	0.4
HS48	4	1.2	6.8	2.1	1.2	34.0	24	600	0.9	0.7
HS60*	5	1.5	8.0	2.4	2.2	62.3	30	760	1.5	1.1
HS72	6	1.8	9.2	2.8	3.7	104.8	36	900	2.1	1.6
HS84*	7	2.1	10.4	3.2	5.6	158.6	42	1050	2.8	2.1
HS96	8	2.4	11.5	3.5	8.1	229.4	48	1200	3.7	2.8

* Models may not be manufactured in your area. Check with your local representative for availability.

1. Water Quality Flow is based on 80% removal of a particle size distribution with an average particle size of 240-µm. This flow also represents the maximum flow prior to which bypass occurs.

Notes:

Systems can be sized based on a water quality flow (e.g. 1 inch storm) or on a net annual basis depending on the local regulatory requirement.

When sizing based on a water quality storm, the required flow to be treated should be equal or less than the listed water quality flow for the selected system. Systems sized based on a water quality storm are generally more conservatively sized.

Additional particle size distributions are available for sizing purposes upon request.

Depth below invert is measured to the inside bottom of the system. This depth can be adjusted to meet specific storage or maintenance requirements.

Contact our support staff for the most cost effective sizing for your area.

Customer Support

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CONTECH Stormwater Solutions' products are some of the easiest to install in the industry. We provide comprehensive installation drawings, details and instructions, as well as full technical support on every project.

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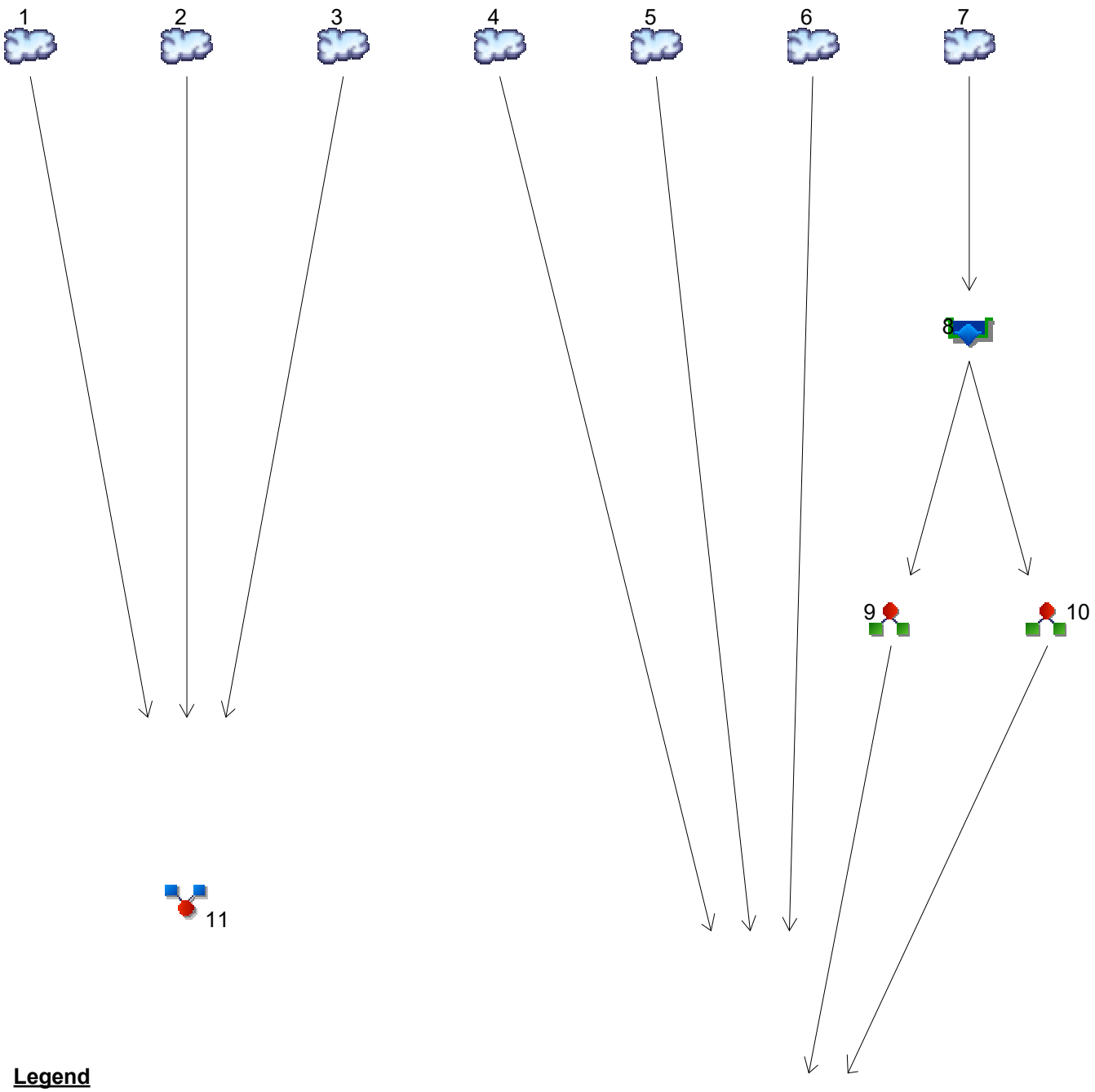
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Exhibit C – Hydrologic Model Simulation Using TR-55 Tabular Method

.1 Routing Tables for the 1, 2, 10, 25, 50 and 100 year storms with Inflow and Outflow Hydrographs

Watershed Model Schematic



Legend

Hyd.	Origin	Description
1	SCS Runoff	Pre Area #1
2	SCS Runoff	Pre Area #2
3	SCS Runoff	Pre Area #3
4	SCS Runoff	Post Area #1
5	SCS Runoff	Post Area #2
6	SCS Runoff	Post Area #3
7	SCS Runoff	Post Area #1A
8	Reservoir	Route Array
9	Diversion1	Flow to WQv
10	Diversion2	Bypass flow
11	Combine	Pre Combined flow to CSO
12	Combine	Post Combined flow to CSO

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Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

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Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	------	1.114	1.406	-------	0.585	2.188	2.784	3.326	3.966	Pre Area #1
2	SCS Runoff	------	2.005	2.776	-------	0.751	5.025	6.816	8.466	10.43	Pre Area #2
3	SCS Runoff	------	0.849	1.122	-------	0.386	1.871	2.451	2.979	3.603	Pre Area #3
4	SCS Runoff	------	0.515	0.672	-------	0.242	1.101	1.431	1.731	2.085	Post Area #1
5	SCS Runoff	------	0.775	1.056	-------	0.312	1.864	2.502	3.087	3.781	Post Area #2
6	SCS Runoff	------	0.526	0.703	-------	0.231	1.194	1.577	1.926	2.339	Post Area #3
7	SCS Runoff	------	2.512	3.320	-------	1.143	5.537	7.254	8.816	10.66	Post Area #1A
8	Reservoir	7	0.496	0.880	-------	0.375	2.731	4.279	5.514	6.988	Route Array
9	Diversion1	8	0.484	0.524	-------	0.375	0.595	0.636	0.675	0.731	Flow to WQv
10	Diversion2	8	0.012	0.356	-------	0.000	2.136	3.642	4.840	6.257	Bypass flow
11	Combine	1, 2, 3,	3.914	5.240	-------	1.681	8.949	11.86	14.53	17.69	Pre Combined flow to CSO
12	Combine	4, 5, 6, 9, 10,	2.255	2.935	-------	1.140	6.080	8.967	11.61	14.38	Post Combined flow to CSO

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

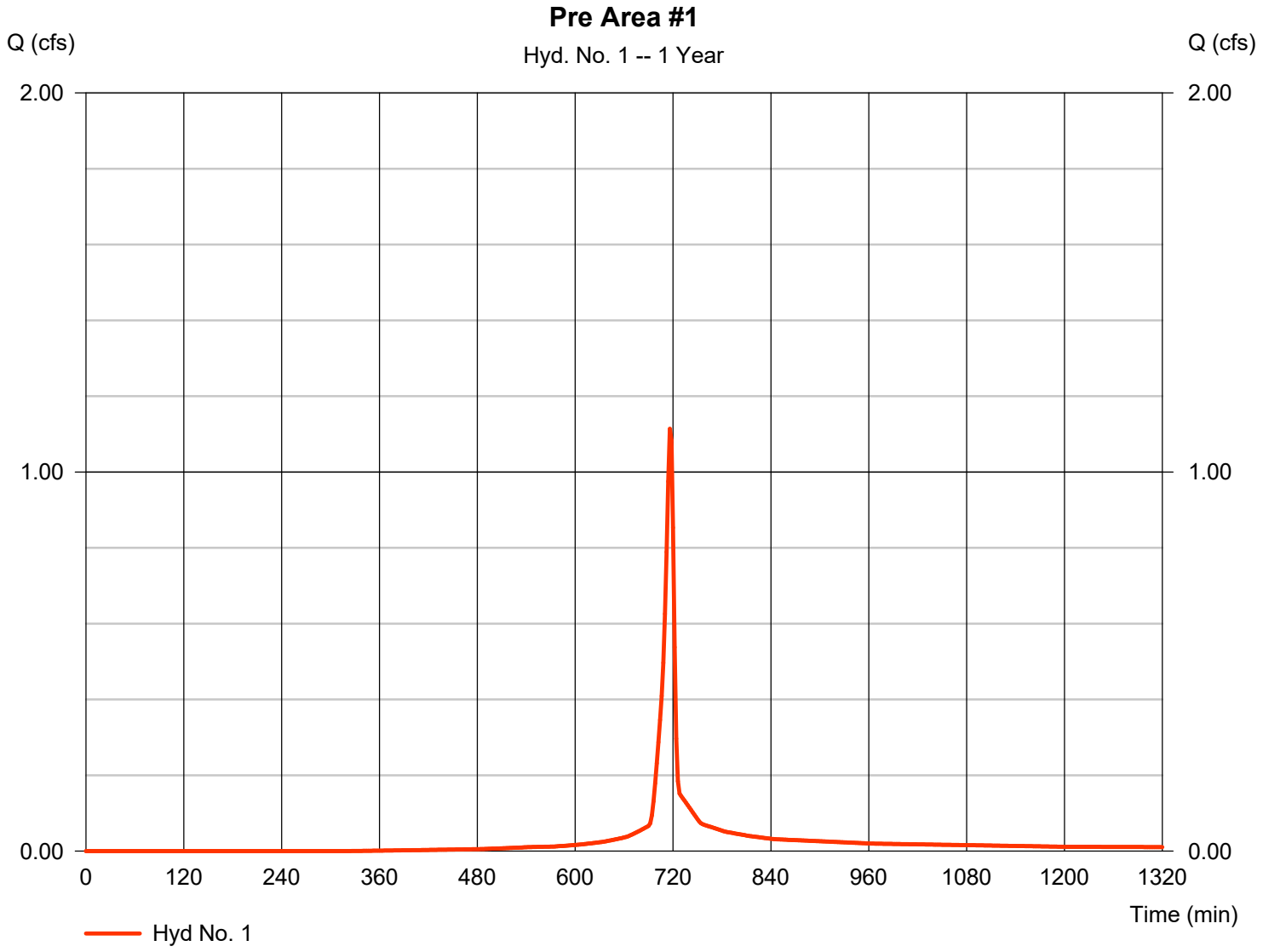
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	1.114	2	716	2,318	------	------	------	Pre Area #1
2	SCS Runoff	2.005	2	720	4,590	------	------	------	Pre Area #2
3	SCS Runoff	0.849	2	716	1,718	------	------	------	Pre Area #3
4	SCS Runoff	0.515	2	716	1,045	------	------	------	Post Area #1
5	SCS Runoff	0.775	2	718	1,556	------	------	------	Post Area #2
6	SCS Runoff	0.526	2	716	1,061	------	------	------	Post Area #3
7	SCS Runoff	2.512	2	716	5,085	------	------	------	Post Area #1A
8	Reservoir	0.496	2	726	5,082	7	93.54	1,657	Route Array
9	Diversion1	0.484	2	726	5,076	8	------	------	Flow to WQv
10	Diversion2	0.012	2	726	6	8	------	------	Bypass flow
11	Combine	3.914	2	718	8,626	1, 2, 3,	------	------	Pre Combined flow to CSO
12	Combine	2.255	2	718	8,745	4, 5, 6, 9, 10,	------	------	Post Combined flow to CSO

Hydrograph Report

Hyd. No. 1

Pre Area #1

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.114 cfs
Storm frequency	=	1 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	2,318 cuft
Drainage area	=	0.519 ac	Curve number	=	94
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	6.20 min
Total precip.	=	1.91 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 1

Pre Area #1

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.130		0.011		0.011		
Flow length (ft)	= 108.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 2.30		0.00		0.00		
Land slope (%)	= 14.00		0.00		0.00		
Travel Time (min)	**= 5.03**	**+**	**0.00**	**+**	**0.00**	**=**	**5.03**
Shallow Concentrated Flow							
Flow length (ft)	= 139.00		0.00		0.00		
Watercourse slope (%)	= 1.00		0.00		0.00		
Surface description	= Paved		Paved		Paved		
Average velocity (ft/s)	=2.03		0.00		0.00		
Travel Time (min)	**= 1.14**	**+**	**0.00**	**+**	**0.00**	**=**	**1.14**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

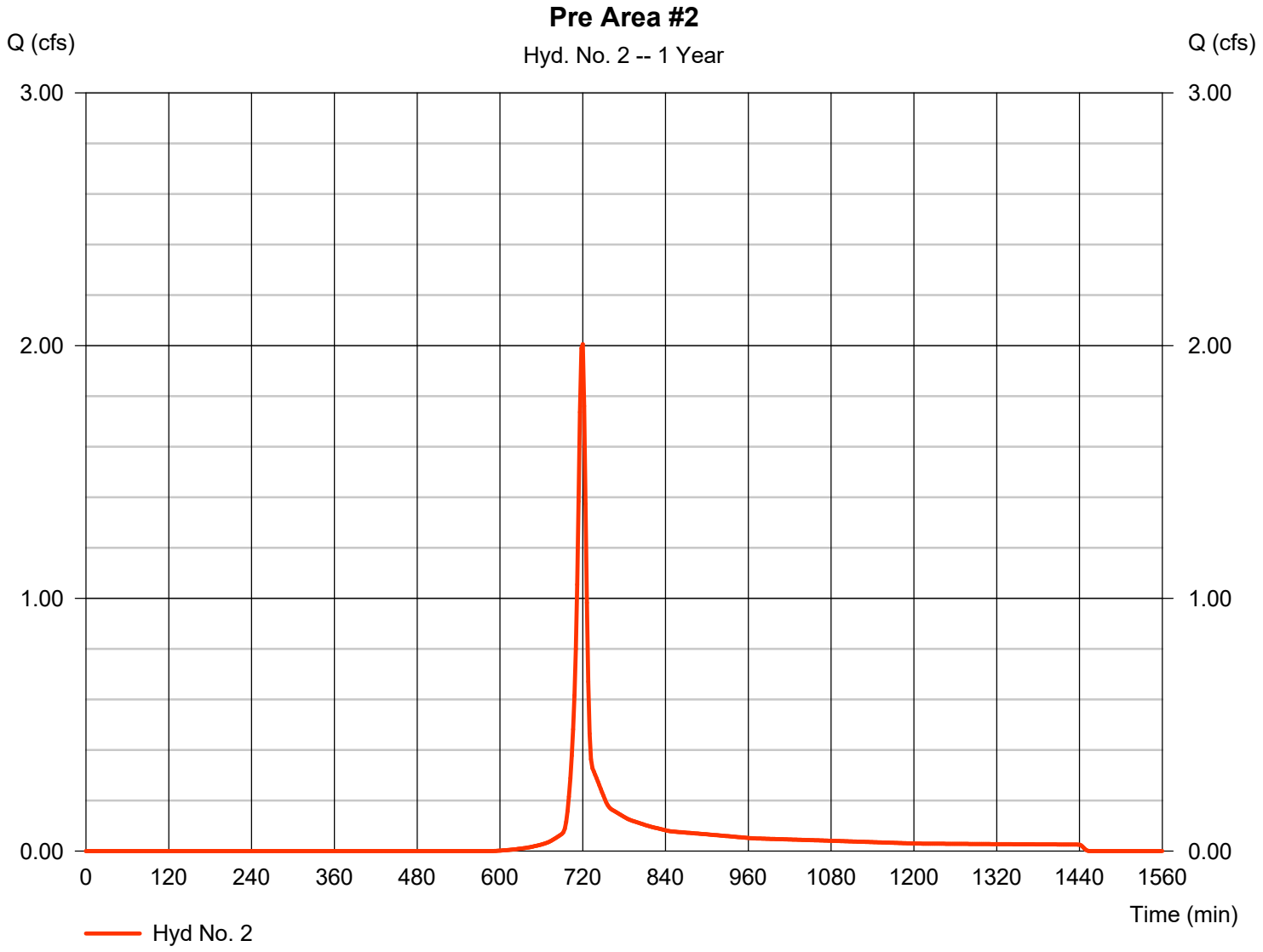
Total Travel Time, Tc ..... 6.20 min

Hydrograph Report

Hyd. No. 2

Pre Area #2

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.005 cfs
Storm frequency	=	1 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	4,590 cuft
Drainage area	=	1.618 ac	Curve number	=	86
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	7.90 min
Total precip.	=	1.91 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 2

Pre Area #2

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.130		0.011		0.011		
Flow length (ft)	= 150.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 2.30		0.00		0.00		
Land slope (%)	= 10.00		0.00		0.00		
Travel Time (min)	**= 7.49**	**+**	**0.00**	**+**	**0.00**	**=**	**7.49**
Shallow Concentrated Flow							
Flow length (ft)	= 74.00		0.00		0.00		
Watercourse slope (%)	= 4.00		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=3.23		0.00		0.00		
Travel Time (min)	**= 0.38**	**+**	**0.00**	**+**	**0.00**	**=**	**0.38**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

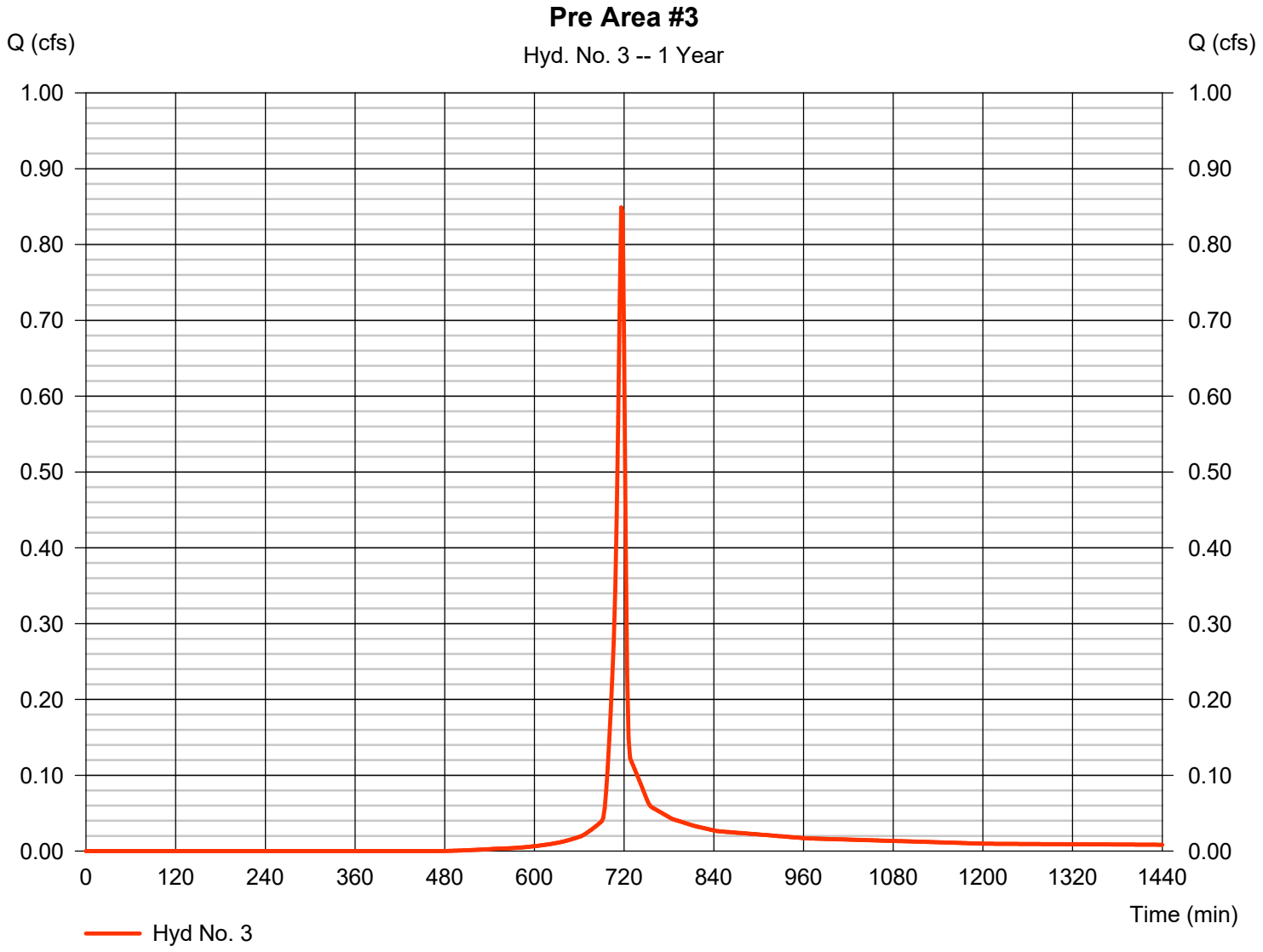
Total Travel Time, Tc ..... 7.90 min

Hydrograph Report

Hyd. No. 3

Pre Area #3

Hydrograph type	= SCS Runoff	Peak discharge	= 0.849 cfs
Storm frequency	= 1 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 1,718 cuft
Drainage area	= 0.496 ac	Curve number	= 90
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 6.10 min
Total precip.	= 1.91 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



TR55 Tc Worksheet

Hyd. No. 3

Pre Area #3

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.130		0.011		0.011		
Flow length (ft)	= 104.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 2.30		0.00		0.00		
Land slope (%)	= 13.00		0.00		0.00		
Travel Time (min)	**= 5.03**	**+**	**0.00**	**+**	**0.00**	**=**	**5.03**
Shallow Concentrated Flow							
Flow length (ft)	= 183.00		0.00		0.00		
Watercourse slope (%)	= 2.00		0.00		0.00		
Surface description	= Paved		Paved		Paved		
Average velocity (ft/s)	=2.87		0.00		0.00		
Travel Time (min)	**= 1.06**	**+**	**0.00**	**+**	**0.00**	**=**	**1.06**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

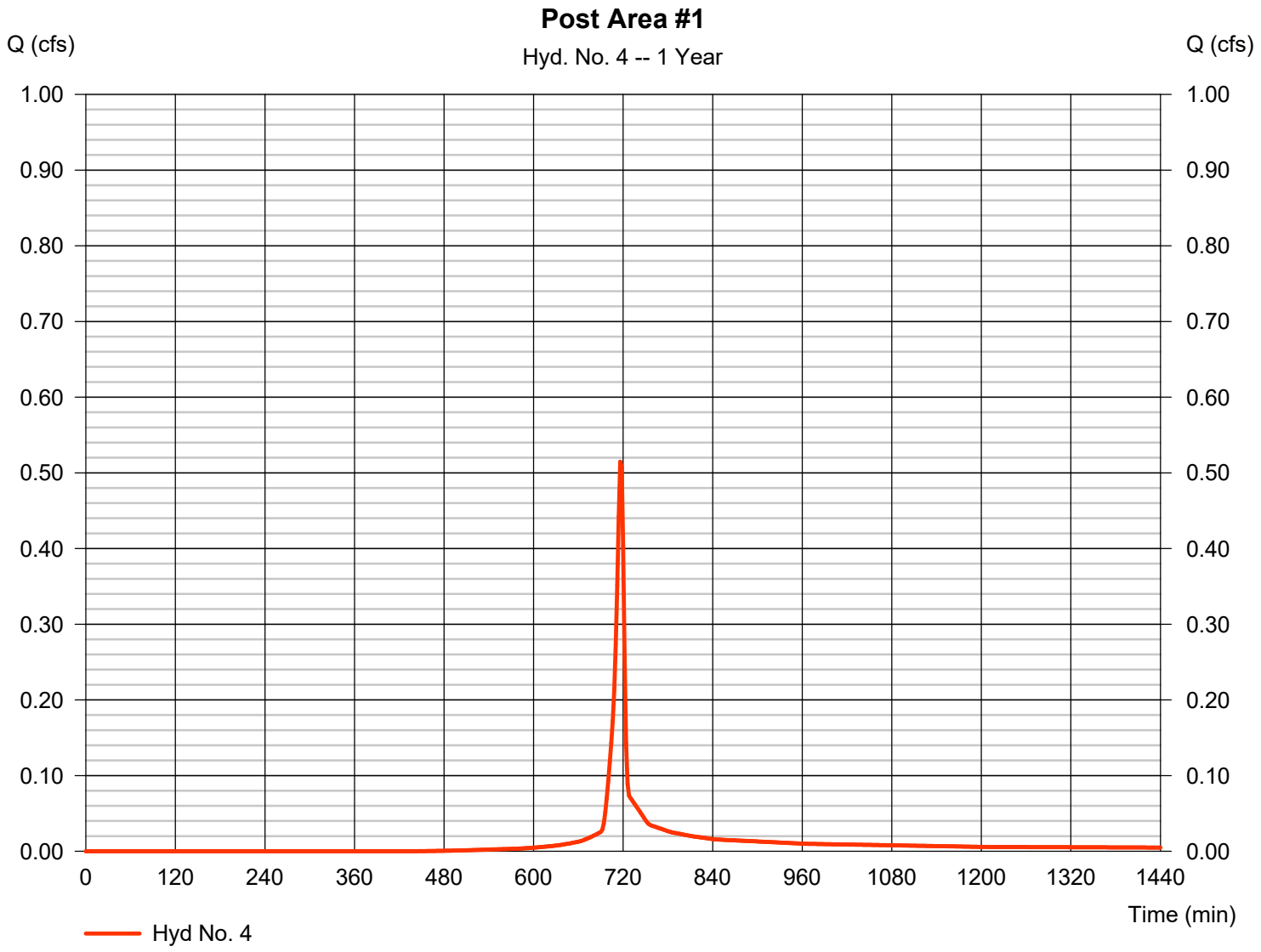
Total Travel Time, Tc ..... 6.10 min

Hydrograph Report

Hyd. No. 4

Post Area #1

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.515 cfs
Storm frequency	=	1 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	1,045 cuft
Drainage area	=	0.283 ac	Curve number	=	91
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	1.91 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

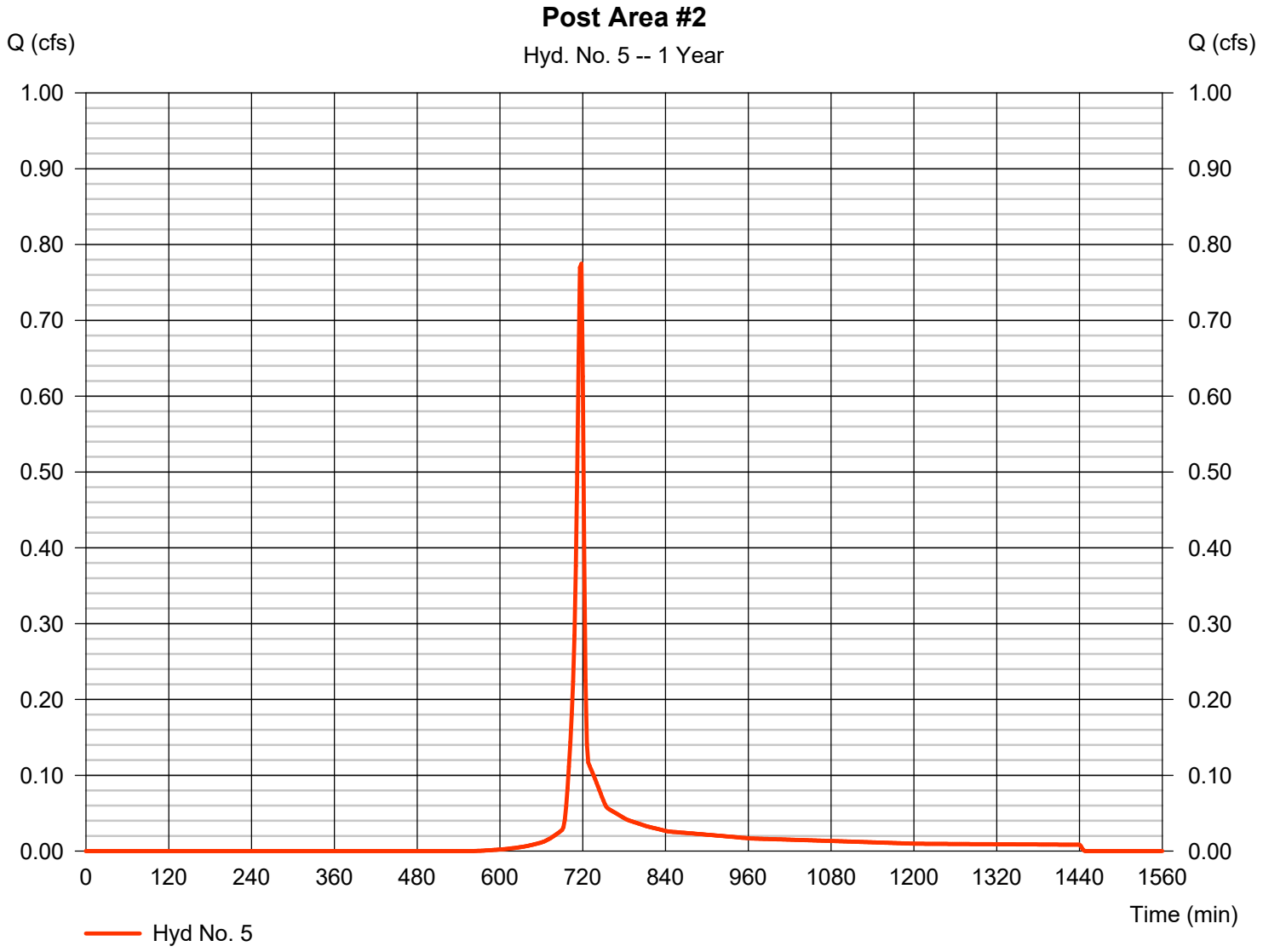


Hydrograph Report

Hyd. No. 5

Post Area #2

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.775 cfs
Storm frequency	=	1 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	1,556 cuft
Drainage area	=	0.547 ac	Curve number	=	87
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	1.91 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

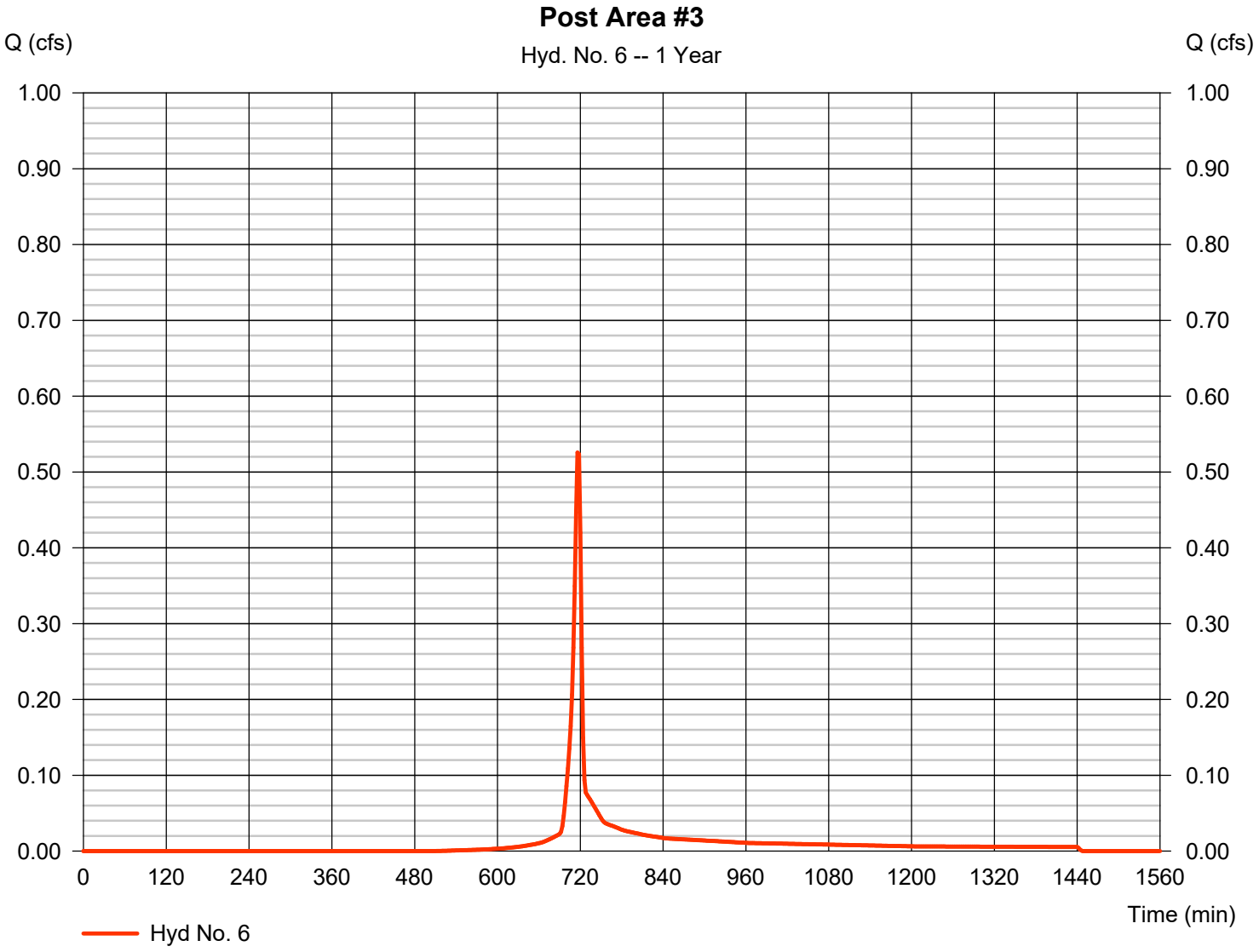


Hydrograph Report

Hyd. No. 6

Post Area #3

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.526 cfs
Storm frequency	=	1 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	1,061 cuft
Drainage area	=	0.327 ac	Curve number	=	89
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	1.91 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

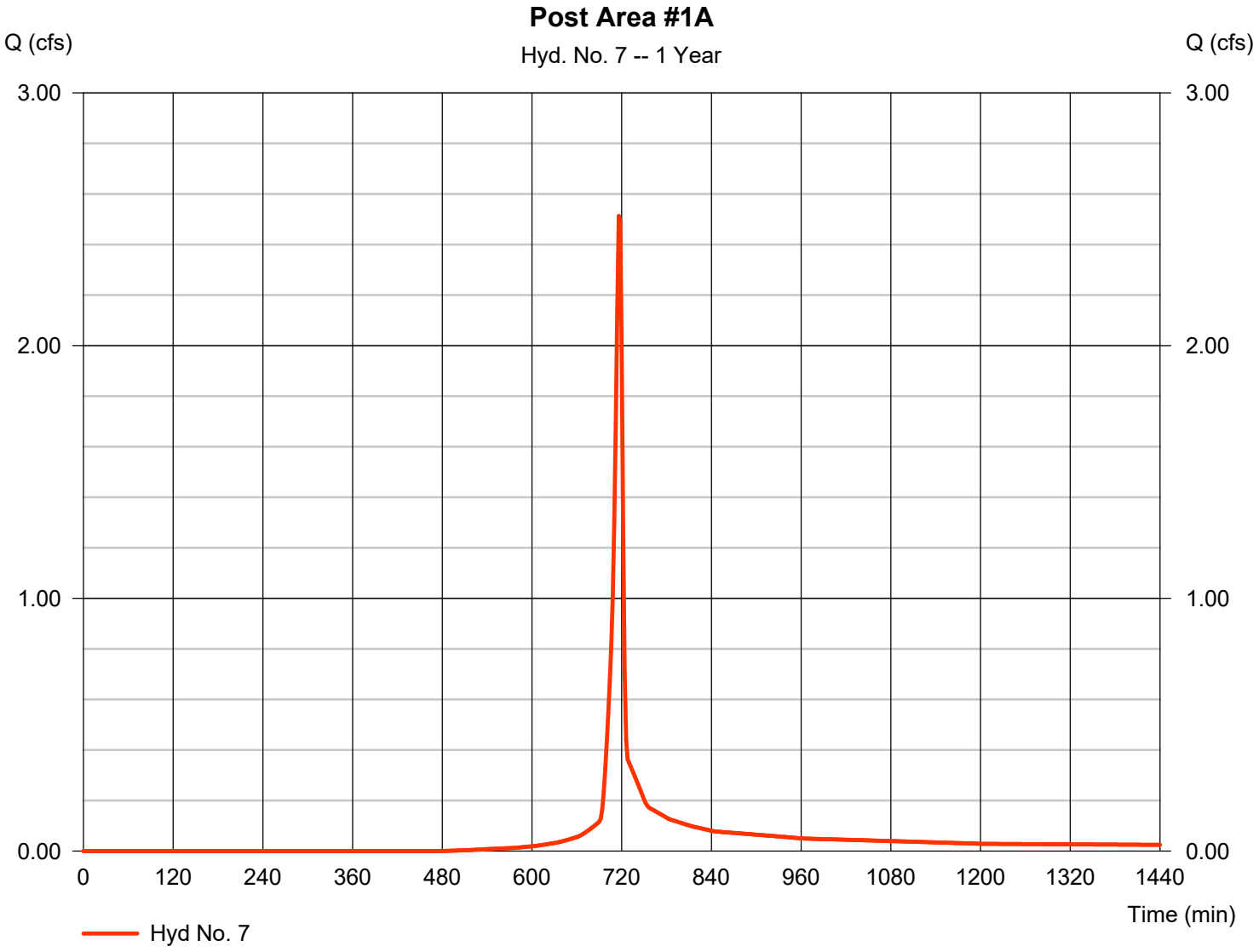


Hydrograph Report

Hyd. No. 7

Post Area #1A

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.512 cfs
Storm frequency	=	1 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	5,085 cuft
Drainage area	=	1.468 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	1.91 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



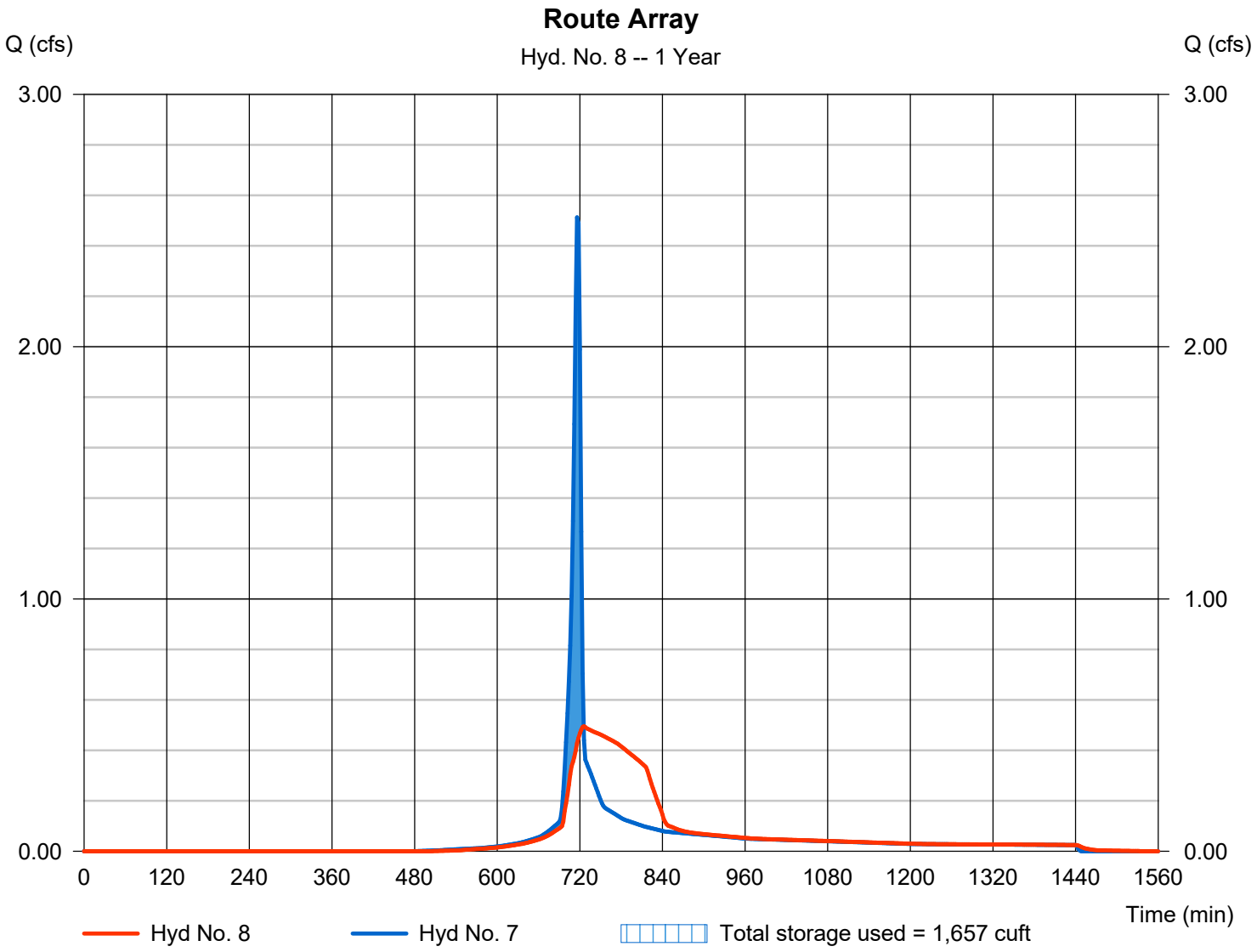
Hydrograph Report

Hyd. No. 8

Route Array

Hydrograph type	=	Reservoir	Peak discharge	=	0.496 cfs
Storm frequency	=	1 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	5,082 cuft
Inflow hyd. No.	=	7 - Post Area #1A	Max. Elevation	=	93.54 ft
Reservoir name	=	Array	Max. Storage	=	1,657 cuft

Storage Indication method used.



Pond Report

Pond No. 1 - Array

Pond Data

UG Chambers -Invert elev. = 92.05 ft, Rise x Span = 2.50 x 2.50 ft, Barrel Len = 300.00 ft, No. Barrels = 4, Slope = 0.50%, Headers = Yes

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	92.05	n/a	0	0
0.40	92.45	n/a	109	109
0.80	92.85	n/a	200	309
1.20	93.25	n/a	671	979
1.60	93.65	n/a	923	1,902
2.00	94.05	n/a	1,112	3,014
2.40	94.45	n/a	1,113	4,127
2.80	94.85	n/a	921	5,048
3.20	95.25	n/a	670	5,719
3.60	95.65	n/a	200	5,918
4.00	96.05	n/a	108	6,027

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 4.00	15.00	0.00	0.00
Span (in)	= 4.00	15.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 92.05	93.50	0.00	0.00
Length (ft)	= 6.00	40.00	0.00	0.00
Slope (%)	= 0.80	2.60	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	92.05	0.00	0.00	---	---	---	---	---	---	---	---	0.000
0.04	11	92.09	0.00 ic	0.00	---	---	---	---	---	---	---	---	0.004
0.08	22	92.13	0.02 ic	0.00	---	---	---	---	---	---	---	---	0.016
0.12	33	92.17	0.03 oc	0.00	---	---	---	---	---	---	---	---	0.031
0.16	43	92.21	0.05 oc	0.00	---	---	---	---	---	---	---	---	0.048
0.20	54	92.25	0.06 oc	0.00	---	---	---	---	---	---	---	---	0.065
0.24	65	92.29	0.08 oc	0.00	---	---	---	---	---	---	---	---	0.081
0.28	76	92.33	0.09 oc	0.00	---	---	---	---	---	---	---	---	0.095
0.32	87	92.37	0.10 oc	0.00	---	---	---	---	---	---	---	---	0.103
0.36	98	92.41	0.13 oc	0.00	---	---	---	---	---	---	---	---	0.126
0.40	109	92.45	0.16 oc	0.00	---	---	---	---	---	---	---	---	0.156
0.44	129	92.49	0.18 oc	0.00	---	---	---	---	---	---	---	---	0.182
0.48	149	92.53	0.20 oc	0.00	---	---	---	---	---	---	---	---	0.204
0.52	169	92.57	0.22 oc	0.00	---	---	---	---	---	---	---	---	0.224
0.56	189	92.61	0.24 oc	0.00	---	---	---	---	---	---	---	---	0.242
0.60	209	92.65	0.26 oc	0.00	---	---	---	---	---	---	---	---	0.259
0.64	229	92.69	0.27 oc	0.00	---	---	---	---	---	---	---	---	0.275
0.68	249	92.73	0.29 oc	0.00	---	---	---	---	---	---	---	---	0.290
0.72	269	92.77	0.30 oc	0.00	---	---	---	---	---	---	---	---	0.304
0.76	289	92.81	0.32 oc	0.00	---	---	---	---	---	---	---	---	0.318
0.80	309	92.85	0.33 oc	0.00	---	---	---	---	---	---	---	---	0.331
0.84	376	92.89	0.34 oc	0.00	---	---	---	---	---	---	---	---	0.344
0.88	443	92.93	0.35 ic	0.00	---	---	---	---	---	---	---	---	0.355
0.92	510	92.97	0.36 ic	0.00	---	---	---	---	---	---	---	---	0.365
0.96	577	93.01	0.37 ic	0.00	---	---	---	---	---	---	---	---	0.374
1.00	644	93.05	0.38 ic	0.00	---	---	---	---	---	---	---	---	0.384
1.04	711	93.09	0.39 ic	0.00	---	---	---	---	---	---	---	---	0.393
1.08	778	93.13	0.40 ic	0.00	---	---	---	---	---	---	---	---	0.402
1.12	845	93.17	0.41 ic	0.00	---	---	---	---	---	---	---	---	0.410
1.16	912	93.21	0.42 ic	0.00	---	---	---	---	---	---	---	---	0.419
1.20	979	93.25	0.43 ic	0.00	---	---	---	---	---	---	---	---	0.427
1.24	1,072	93.29	0.44 ic	0.00	---	---	---	---	---	---	---	---	0.435

Continues on next page...

Array

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
1.28	1,164	93.33	0.44 ic	0.00	---	---	---	---	---	---	---	---	0.443
1.32	1,256	93.37	0.45 ic	0.00	---	---	---	---	---	---	---	---	0.451
1.36	1,348	93.41	0.46 ic	0.00	---	---	---	---	---	---	---	---	0.459
1.40	1,441	93.45	0.47 ic	0.00	---	---	---	---	---	---	---	---	0.467
1.44	1,533	93.49	0.47 ic	0.00	---	---	---	---	---	---	---	---	0.474
1.48	1,625	93.53	0.48 ic	0.00 ic	---	---	---	---	---	---	---	---	0.486
1.52	1,718	93.57	0.49 ic	0.02 ic	---	---	---	---	---	---	---	---	0.513
1.56	1,810	93.61	0.50 ic	0.06 ic	---	---	---	---	---	---	---	---	0.556
1.60	1,902	93.65	0.50 ic	0.11 ic	---	---	---	---	---	---	---	---	0.613
1.64	2,013	93.69	0.51 ic	0.17 ic	---	---	---	---	---	---	---	---	0.685
1.68	2,125	93.73	0.52 ic	0.25 ic	---	---	---	---	---	---	---	---	0.771
1.72	2,236	93.77	0.52 ic	0.35 ic	---	---	---	---	---	---	---	---	0.869
1.76	2,347	93.81	0.53 ic	0.45 ic	---	---	---	---	---	---	---	---	0.980
1.80	2,458	93.85	0.54 ic	0.57 ic	---	---	---	---	---	---	---	---	1.104
1.84	2,569	93.89	0.54 ic	0.70 ic	---	---	---	---	---	---	---	---	1.239
1.88	2,680	93.93	0.55 ic	0.84 ic	---	---	---	---	---	---	---	---	1.387
1.92	2,792	93.97	0.56 ic	0.99 ic	---	---	---	---	---	---	---	---	1.542
1.96	2,903	94.01	0.56 ic	1.15 ic	---	---	---	---	---	---	---	---	1.709
2.00	3,014	94.05	0.57 ic	1.31 ic	---	---	---	---	---	---	---	---	1.884
2.04	3,125	94.09	0.58 ic	1.49 ic	---	---	---	---	---	---	---	---	2.067
2.08	3,237	94.13	0.58 ic	1.68 ic	---	---	---	---	---	---	---	---	2.259
2.12	3,348	94.17	0.59 ic	1.87 ic	---	---	---	---	---	---	---	---	2.454
2.16	3,459	94.21	0.59 ic	2.06 ic	---	---	---	---	---	---	---	---	2.658
2.20	3,570	94.25	0.60 ic	2.27 ic	---	---	---	---	---	---	---	---	2.869
2.24	3,682	94.29	0.60 ic	2.48 ic	---	---	---	---	---	---	---	---	3.082
2.28	3,793	94.33	0.61 ic	2.68 ic	---	---	---	---	---	---	---	---	3.295
2.32	3,904	94.37	0.62 ic	2.90 ic	---	---	---	---	---	---	---	---	3.514
2.36	4,016	94.41	0.62 ic	3.11 ic	---	---	---	---	---	---	---	---	3.732
2.40	4,127	94.45	0.63 ic	3.32 ic	---	---	---	---	---	---	---	---	3.951
2.44	4,219	94.49	0.63 ic	3.53 ic	---	---	---	---	---	---	---	---	4.167
2.48	4,311	94.53	0.64 ic	3.74 ic	---	---	---	---	---	---	---	---	4.377
2.52	4,403	94.57	0.64 ic	3.94 ic	---	---	---	---	---	---	---	---	4.585
2.56	4,495	94.61	0.65 ic	4.13 ic	---	---	---	---	---	---	---	---	4.782
2.60	4,588	94.65	0.66 ic	4.31 ic	---	---	---	---	---	---	---	---	4.968
2.64	4,680	94.69	0.66 ic	4.48 ic	---	---	---	---	---	---	---	---	5.139
2.68	4,772	94.73	0.67 ic	4.62 ic	---	---	---	---	---	---	---	---	5.284
2.72	4,864	94.77	0.67 ic	4.74 ic	---	---	---	---	---	---	---	---	5.416
2.76	4,956	94.81	0.68 ic	4.89 ic	---	---	---	---	---	---	---	---	5.566
2.80	5,048	94.85	0.68 ic	5.03 ic	---	---	---	---	---	---	---	---	5.712
2.84	5,115	94.89	0.69 ic	5.17 ic	---	---	---	---	---	---	---	---	5.854
2.88	5,182	94.93	0.69 ic	5.30 ic	---	---	---	---	---	---	---	---	5.993
2.92	5,249	94.97	0.70 ic	5.43 ic	---	---	---	---	---	---	---	---	6.128
2.96	5,316	95.01	0.70 ic	5.56 ic	---	---	---	---	---	---	---	---	6.260
3.00	5,383	95.05	0.71 ic	5.68 ic	---	---	---	---	---	---	---	---	6.389
3.04	5,450	95.09	0.71 ic	5.80 ic	---	---	---	---	---	---	---	---	6.516
3.08	5,518	95.13	0.72 ic	5.92 ic	---	---	---	---	---	---	---	---	6.640
3.12	5,585	95.17	0.72 ic	6.04 ic	---	---	---	---	---	---	---	---	6.762
3.16	5,652	95.21	0.73 ic	6.15 ic	---	---	---	---	---	---	---	---	6.881
3.20	5,719	95.25	0.73 ic	6.27 ic	---	---	---	---	---	---	---	---	6.998
3.24	5,739	95.29	0.74 ic	6.38 ic	---	---	---	---	---	---	---	---	7.113
3.28	5,759	95.33	0.74 ic	6.49 ic	---	---	---	---	---	---	---	---	7.227
3.32	5,779	95.37	0.75 ic	6.59 ic	---	---	---	---	---	---	---	---	7.338
3.36	5,799	95.41	0.75 ic	6.70 ic	---	---	---	---	---	---	---	---	7.448
3.40	5,819	95.45	0.76 ic	6.80 ic	---	---	---	---	---	---	---	---	7.556
3.44	5,838	95.49	0.76 ic	6.90 ic	---	---	---	---	---	---	---	---	7.663
3.48	5,858	95.53	0.76 ic	7.00 ic	---	---	---	---	---	---	---	---	7.768
3.52	5,878	95.57	0.77 ic	7.10 ic	---	---	---	---	---	---	---	---	7.871
3.56	5,898	95.61	0.77 ic	7.20 ic	---	---	---	---	---	---	---	---	7.974
3.60	5,918	95.65	0.78 ic	7.30 ic	---	---	---	---	---	---	---	---	8.074
3.64	5,929	95.69	0.78 ic	7.39 ic	---	---	---	---	---	---	---	---	8.174
3.68	5,940	95.73	0.79 ic	7.48 ic	---	---	---	---	---	---	---	---	8.272
3.72	5,951	95.77	0.79 ic	7.58 ic	---	---	---	---	---	---	---	---	8.370
3.76	5,962	95.81	0.80 ic	7.67 ic	---	---	---	---	---	---	---	---	8.466
3.80	5,973	95.85	0.80 ic	7.76 ic	---	---	---	---	---	---	---	---	8.561
3.84	5,983	95.89	0.81 ic	7.85 ic	---	---	---	---	---	---	---	---	8.654
3.88	5,994	95.93	0.81 ic	7.94 ic	---	---	---	---	---	---	---	---	8.747
3.92	6,005	95.97	0.81 ic	8.03 ic	---	---	---	---	---	---	---	---	8.839
3.96	6,016	96.01	0.82 ic	8.11 ic	---	---	---	---	---	---	---	---	8.930
4.00	6,027	96.05	0.82 ic	8.20 ic	---	---	---	---	---	---	---	---	9.020

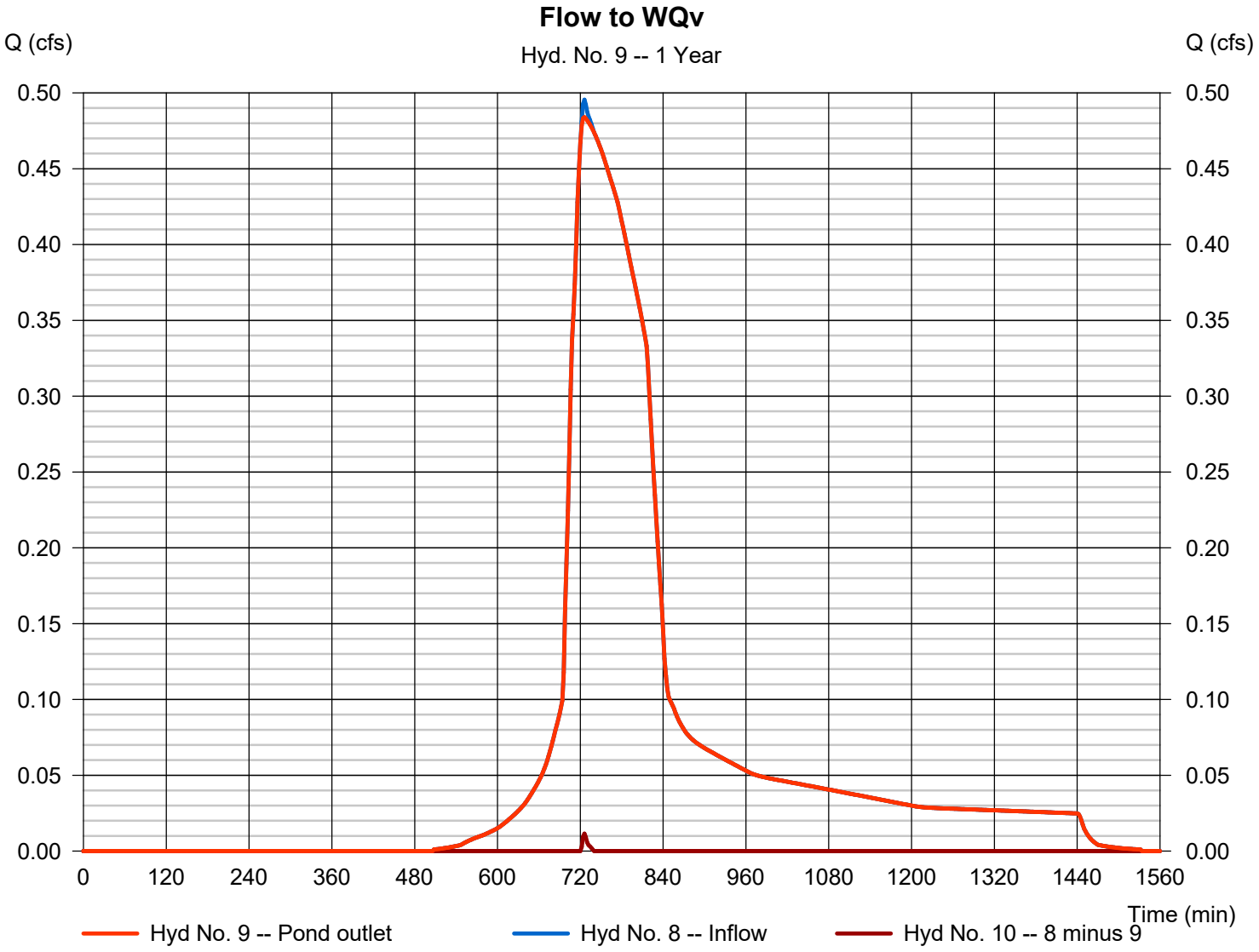
...End

Hydrograph Report

Hyd. No. 9

Flow to WQv

Hydrograph type	= Diversion1	Peak discharge	= 0.484 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 5,076 cuft
Inflow hydrograph	= 8 - Route Array	2nd diverted hyd.	= 10
Diversion method	= Pond - Array	Pond structure	= Culv/Orf A

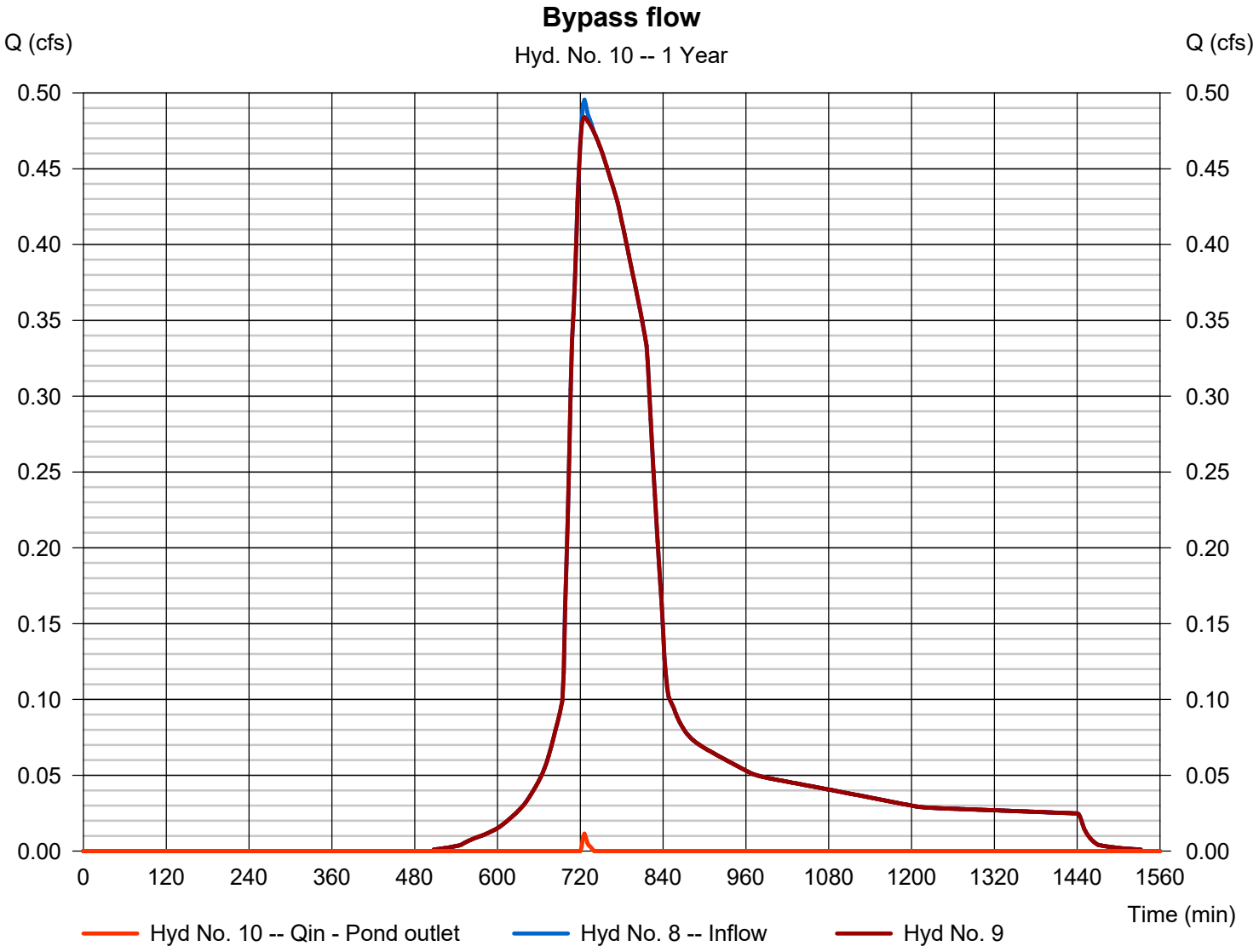


Hydrograph Report

Hyd. No. 10

Bypass flow

Hydrograph type	= Diversion2	Peak discharge	= 0.012 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 6 cuft
Inflow hydrograph	= 8 - Route Array	2nd diverted hyd.	= 9
Diversion method	= Pond - Array	Pond structure	= Culv/Orf A

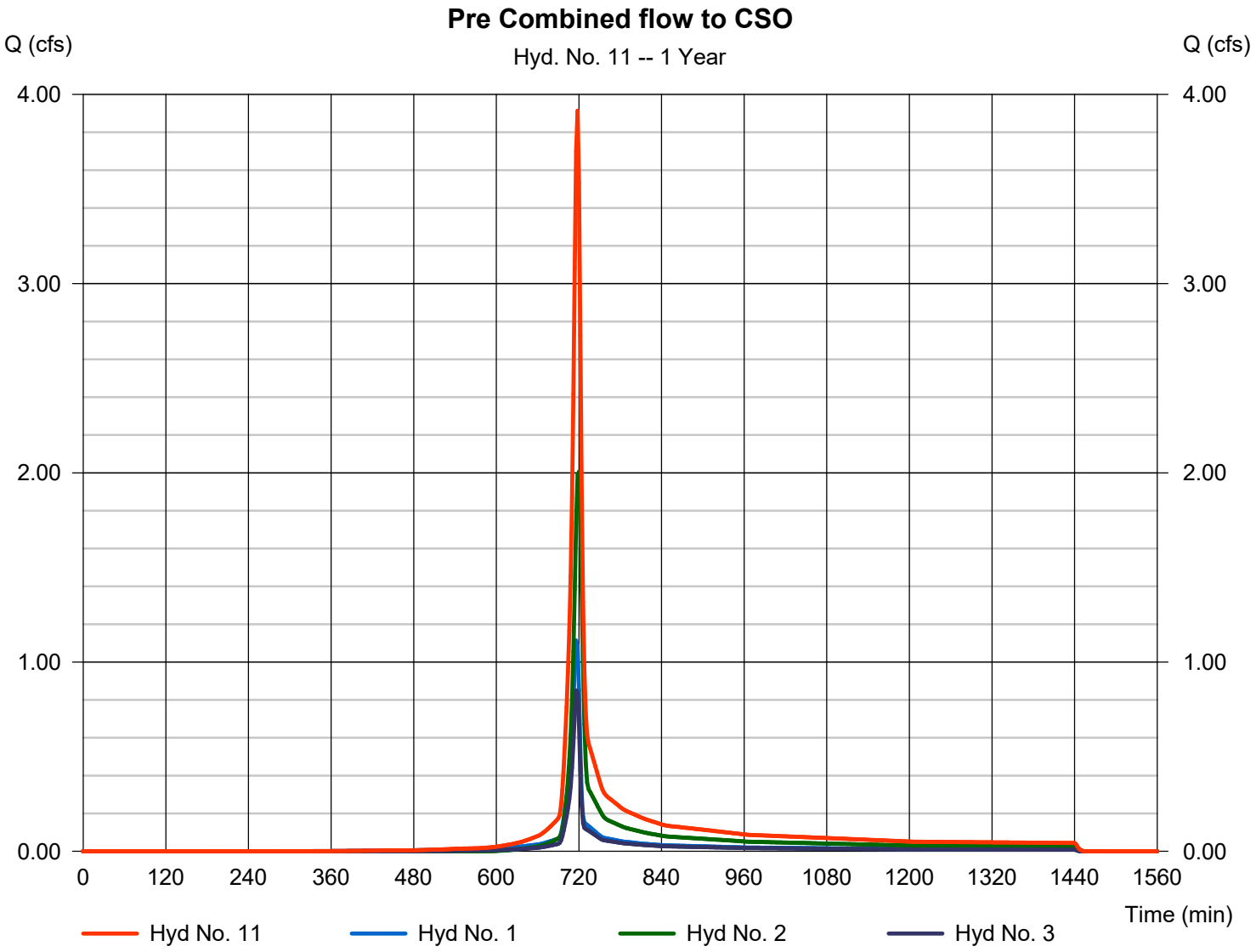


Hydrograph Report

Hyd. No. 11

Pre Combined flow to CSO

Hydrograph type	=	Combine	Peak discharge	=	3.914 cfs
Storm frequency	=	1 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	8,626 cuft
Inflow hyds.	=	1, 2, 3	Contrib. drain. area	=	2.633 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

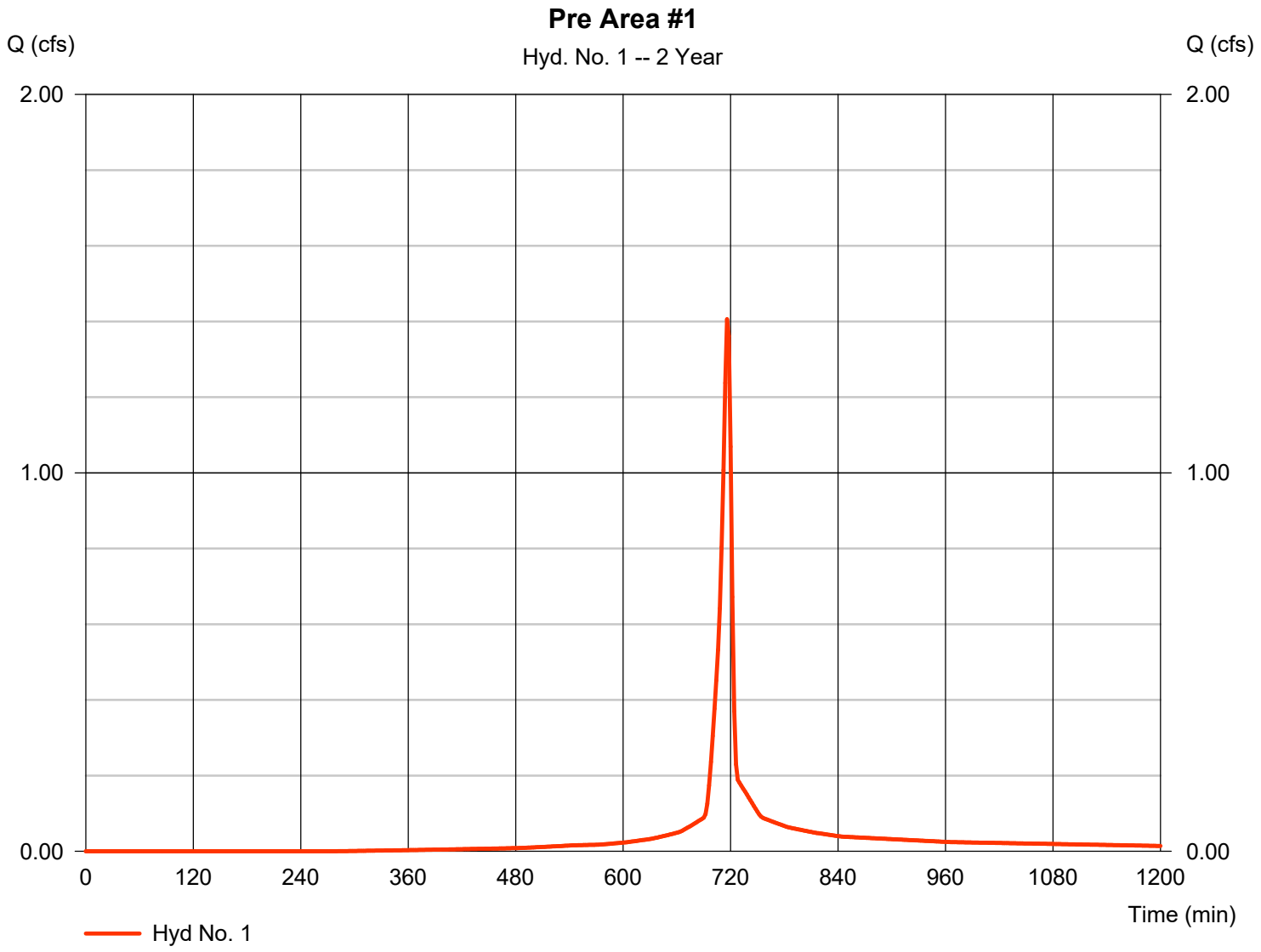
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	1.406	2	716	2,965	------	------	------	Pre Area #1
2	SCS Runoff	2.776	2	718	6,356	------	------	------	Pre Area #2
3	SCS Runoff	1.122	2	716	2,285	------	------	------	Pre Area #3
4	SCS Runoff	0.672	2	716	1,377	------	------	------	Post Area #1
5	SCS Runoff	1.056	2	716	2,133	------	------	------	Post Area #2
6	SCS Runoff	0.703	2	716	1,426	------	------	------	Post Area #3
7	SCS Runoff	3.320	2	716	6,763	------	------	------	Post Area #1A
8	Reservoir	0.880	2	724	6,761	7	93.77	2,246	Route Array
9	Diversion1	0.524	2	724	6,364	8	------	------	Flow to WQv
10	Diversion2	0.356	2	724	397	8	------	------	Bypass flow
11	Combine	5.240	2	718	11,607	1, 2, 3,	------	------	Pre Combined flow to CSO
12	Combine	2.935	2	718	11,696	4, 5, 6, 9, 10,	------	------	Post Combined flow to CSO

Hydrograph Report

Hyd. No. 1

Pre Area #1

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.406 cfs
Storm frequency	=	2 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	2,965 cuft
Drainage area	=	0.519 ac	Curve number	=	94
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	6.20 min
Total precip.	=	2.30 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

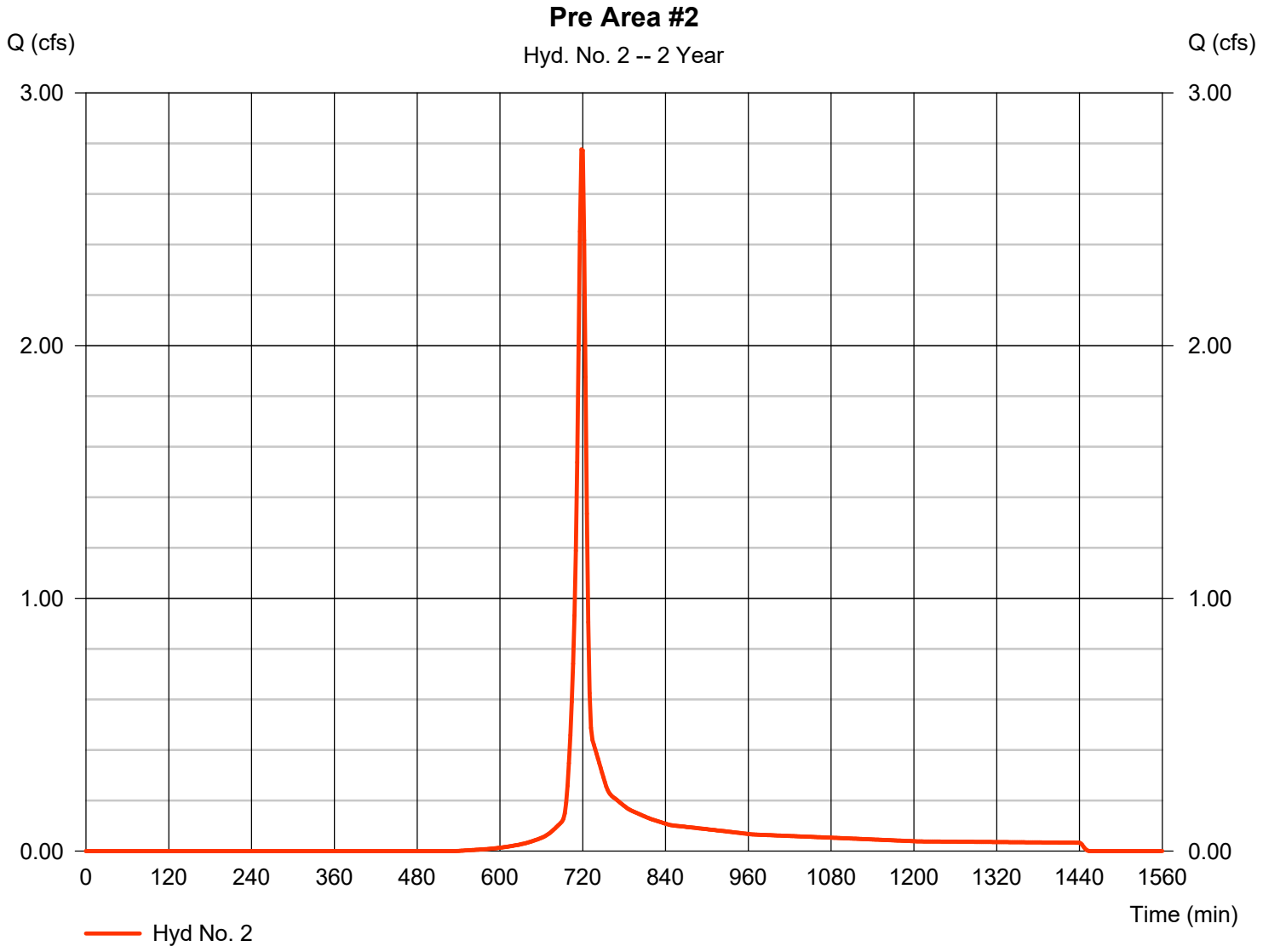


Hydrograph Report

Hyd. No. 2

Pre Area #2

Hydrograph type	= SCS Runoff	Peak discharge	= 2.776 cfs
Storm frequency	= 2 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 6,356 cuft
Drainage area	= 1.618 ac	Curve number	= 86
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 7.90 min
Total precip.	= 2.30 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

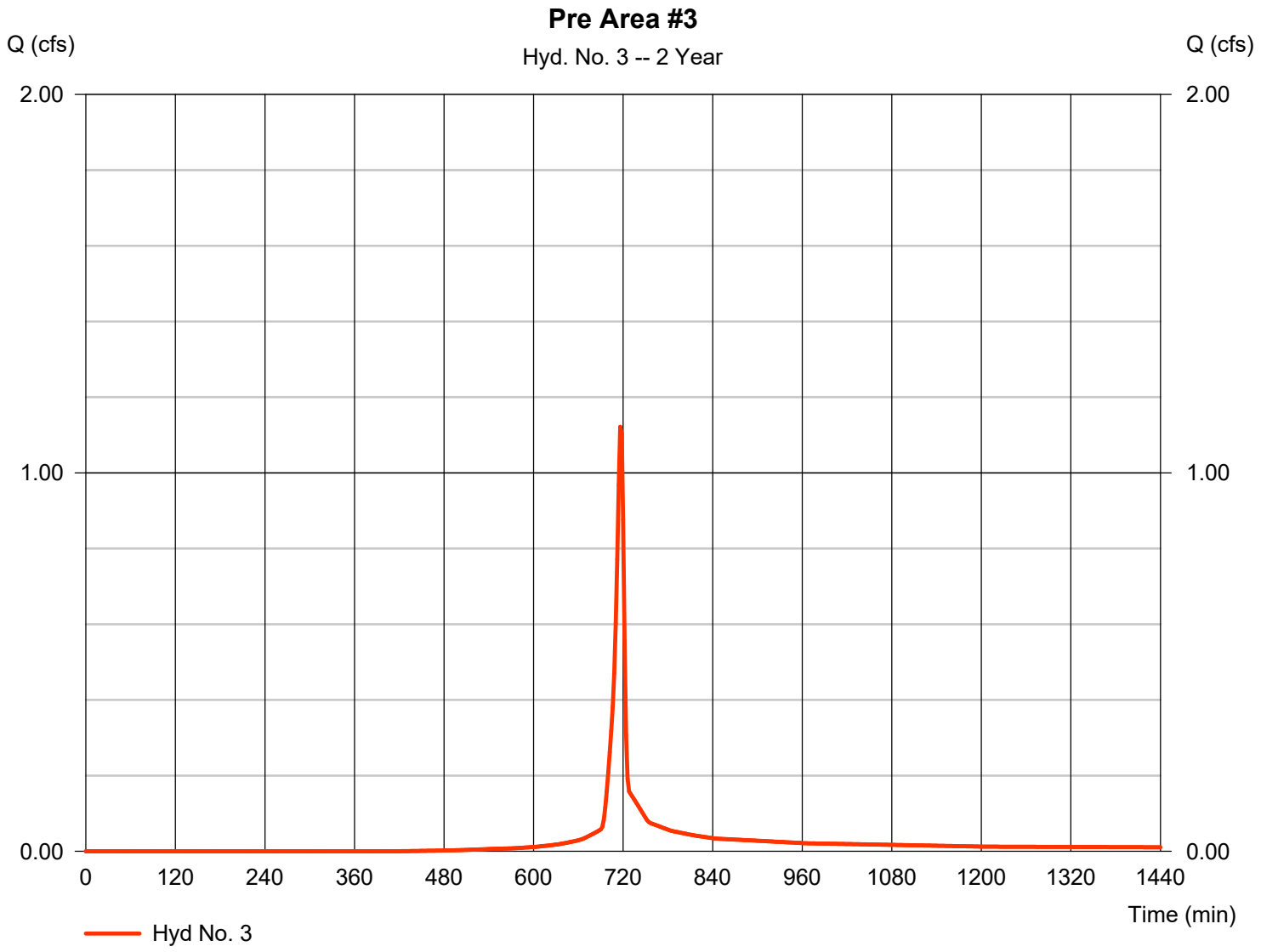


Hydrograph Report

Hyd. No. 3

Pre Area #3

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.122 cfs
Storm frequency	=	2 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	2,285 cuft
Drainage area	=	0.496 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	6.10 min
Total precip.	=	2.30 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

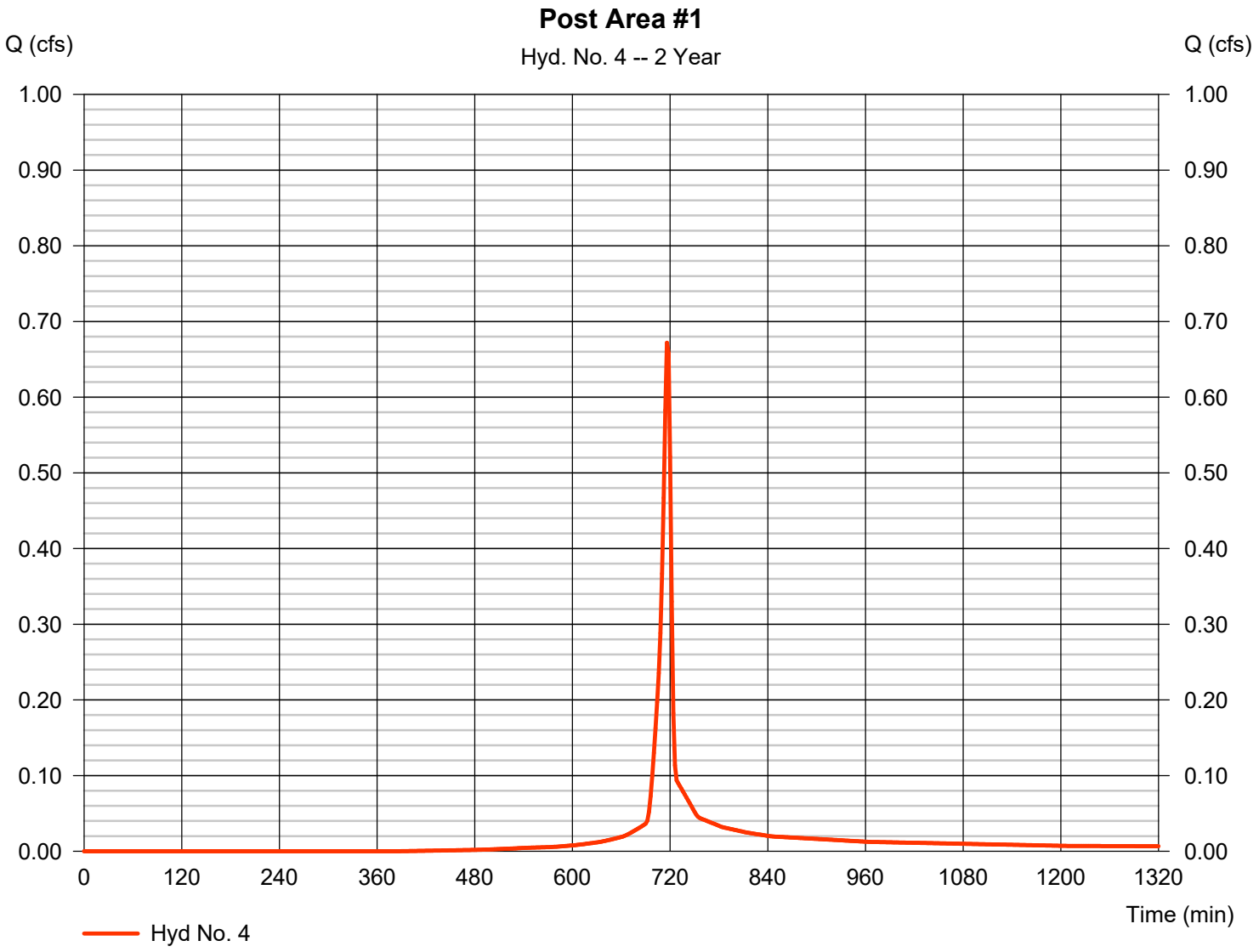


Hydrograph Report

Hyd. No. 4

Post Area #1

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.672 cfs
Storm frequency	=	2 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	1,377 cuft
Drainage area	=	0.283 ac	Curve number	=	91
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	2.30 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

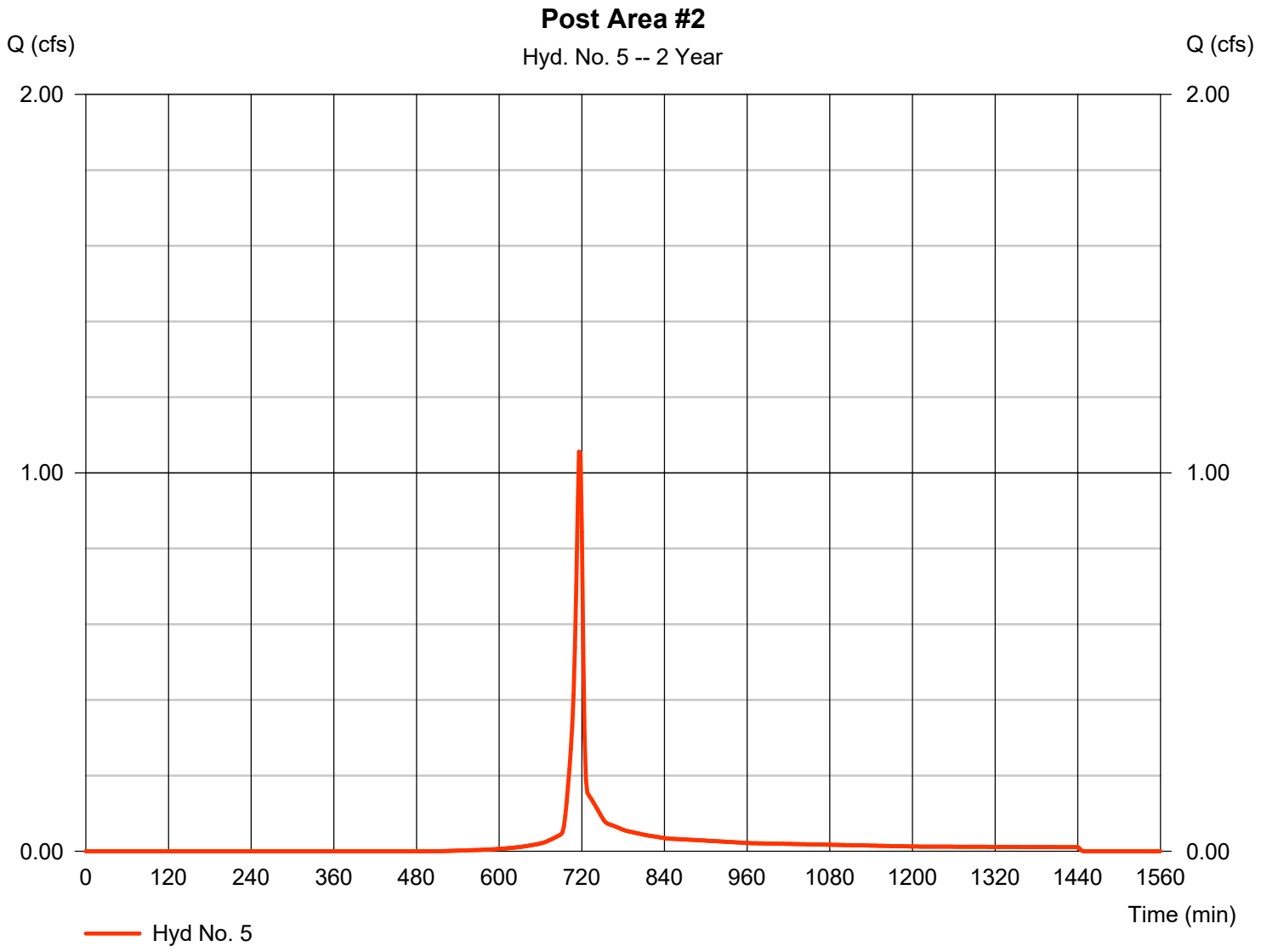


Hydrograph Report

Hyd. No. 5

Post Area #2

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.056 cfs
Storm frequency	=	2 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	2,133 cuft
Drainage area	=	0.547 ac	Curve number	=	87
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	2.30 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

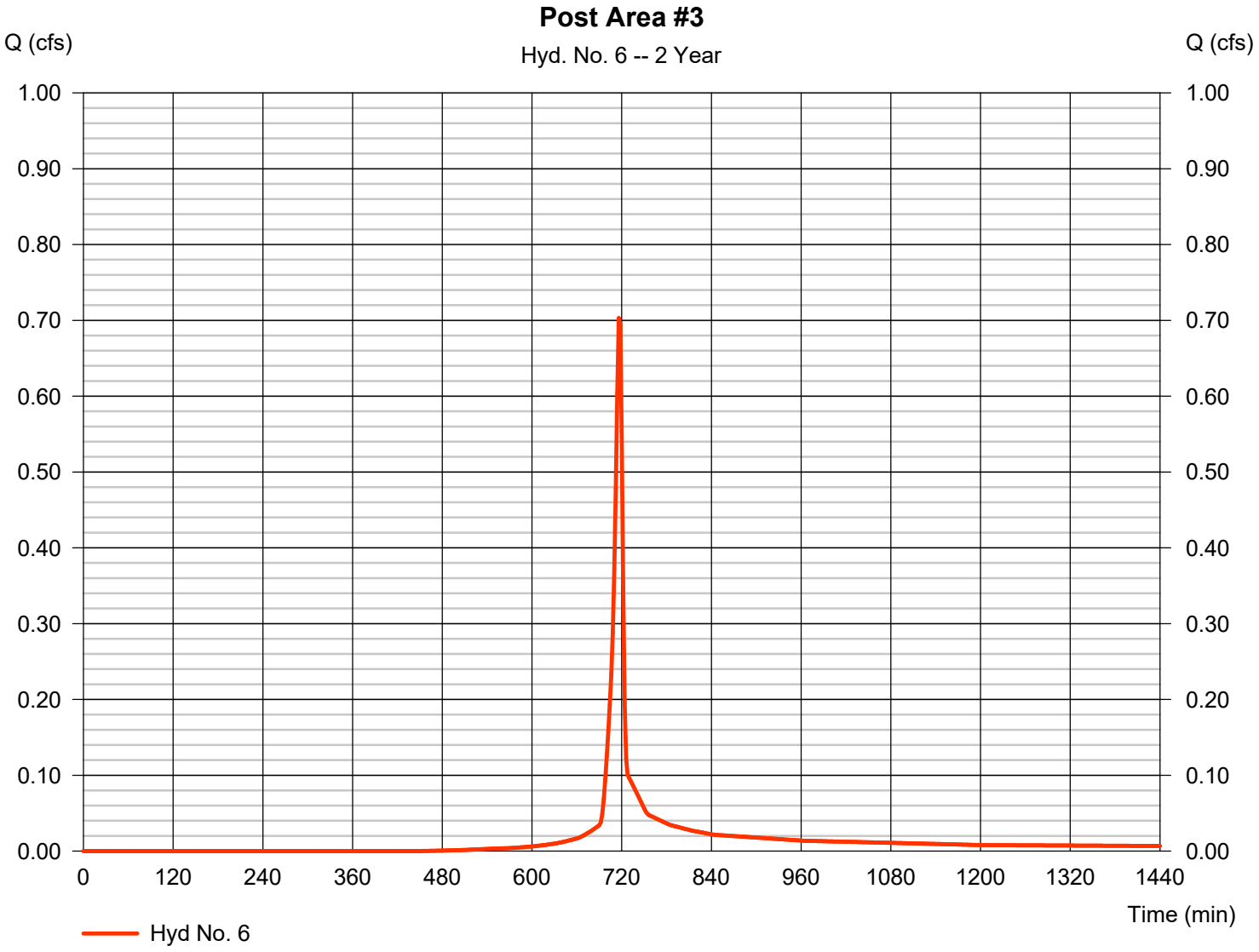


Hydrograph Report

Hyd. No. 6

Post Area #3

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.703 cfs
Storm frequency	=	2 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	1,426 cuft
Drainage area	=	0.327 ac	Curve number	=	89
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	2.30 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

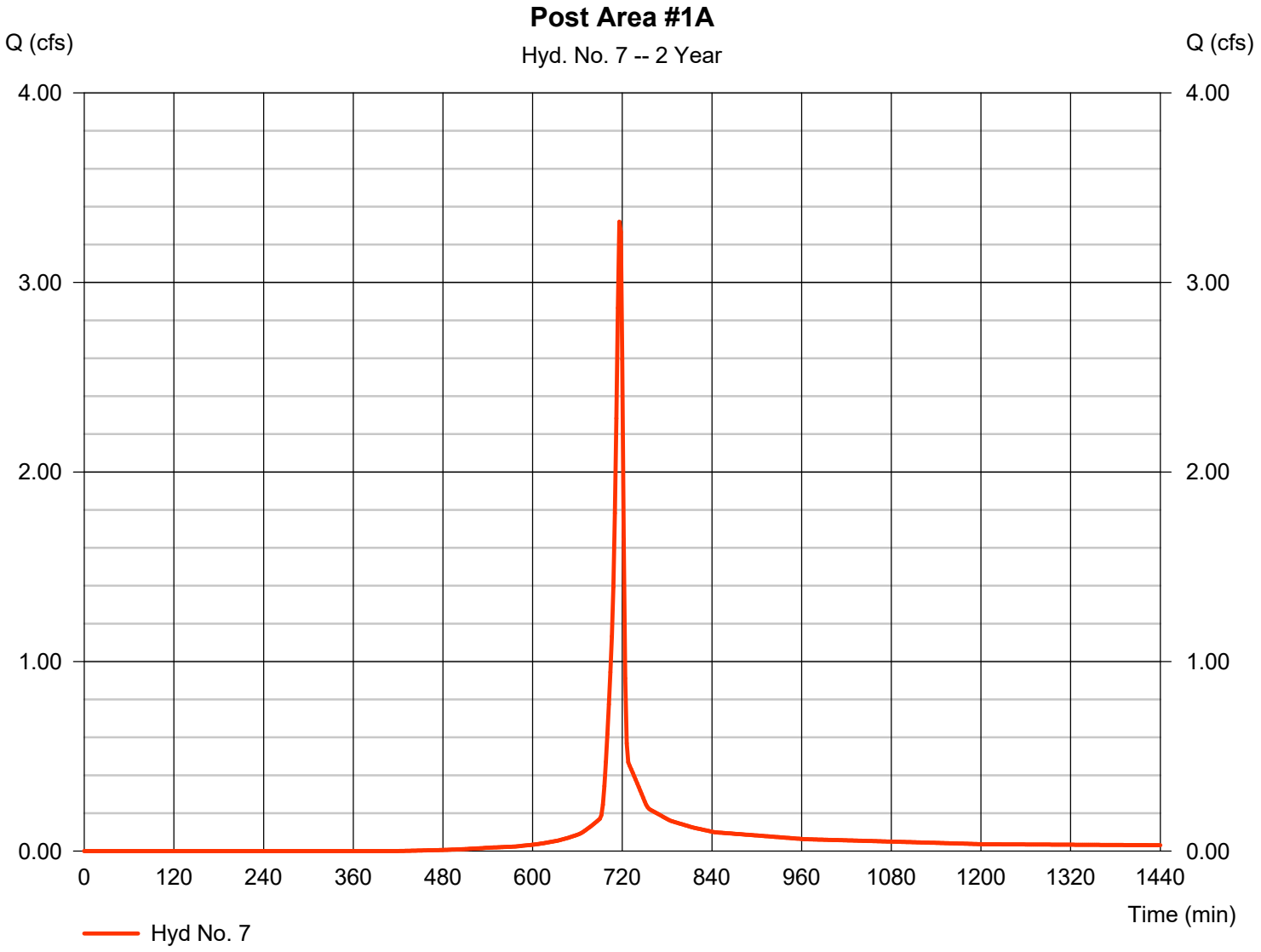


Hydrograph Report

Hyd. No. 7

Post Area #1A

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.320 cfs
Storm frequency	=	2 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	6,763 cuft
Drainage area	=	1.468 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	2.30 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



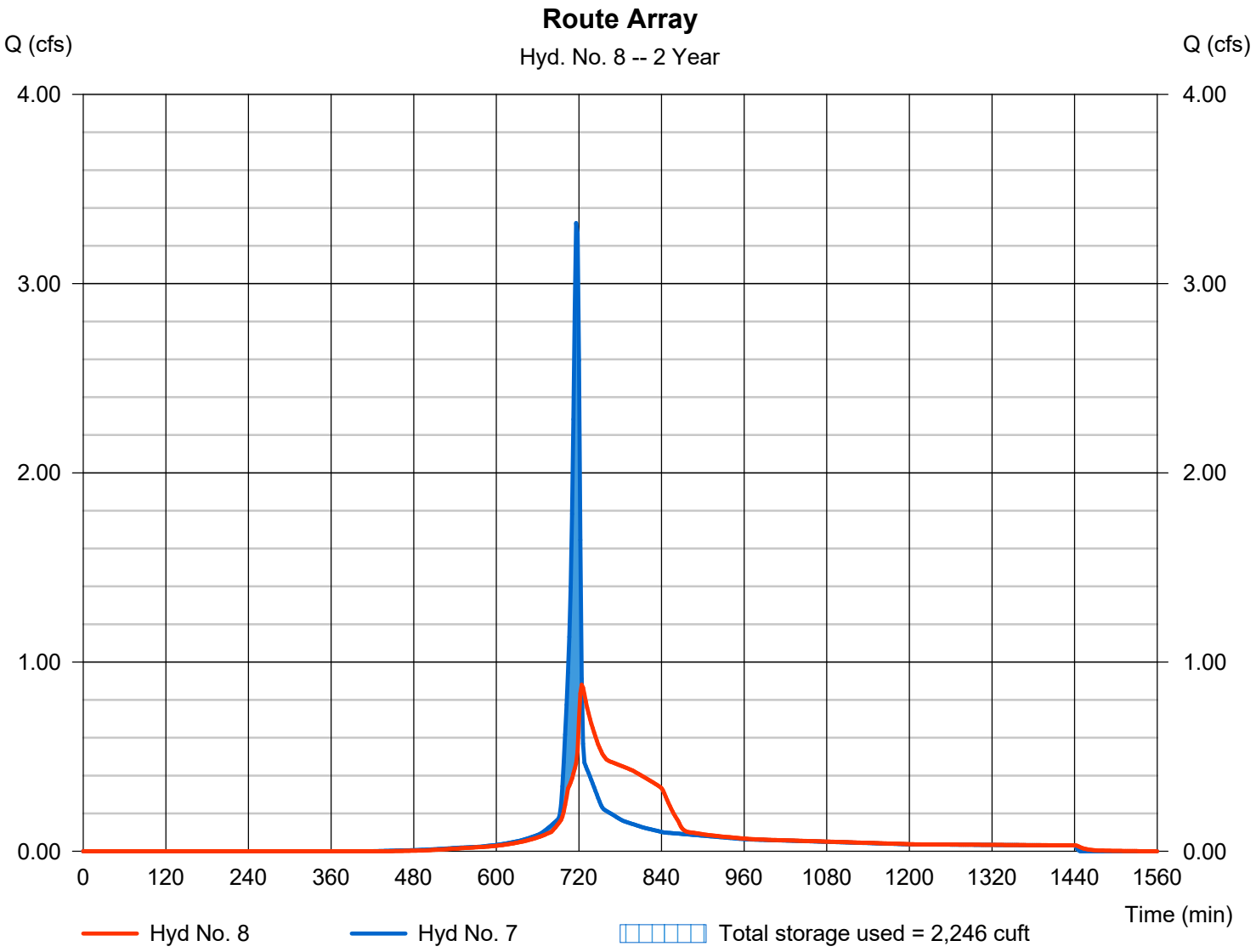
Hydrograph Report

Hyd. No. 8

Route Array

Hydrograph type	=	Reservoir	Peak discharge	=	0.880 cfs
Storm frequency	=	2 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	6,761 cuft
Inflow hyd. No.	=	7 - Post Area #1A	Max. Elevation	=	93.77 ft
Reservoir name	=	Array	Max. Storage	=	2,246 cuft

Storage Indication method used.

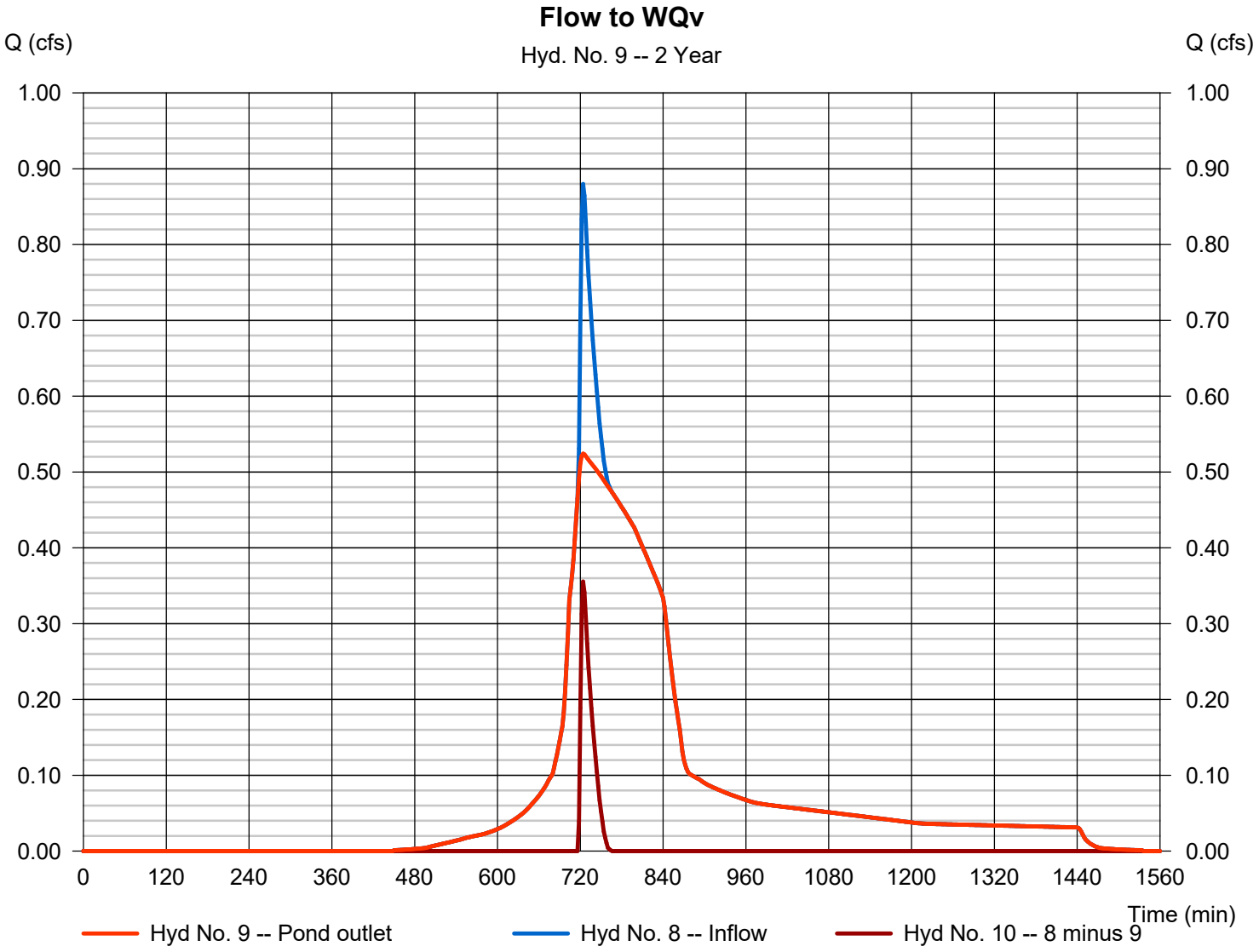


Hydrograph Report

Hyd. No. 9

Flow to WQv

Hydrograph type	= Diversion1	Peak discharge	= 0.524 cfs
Storm frequency	= 2 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 6,364 cuft
Inflow hydrograph	= 8 - Route Array	2nd diverted hyd.	= 10
Diversion method	= Pond - Array	Pond structure	= Culv/Orf A

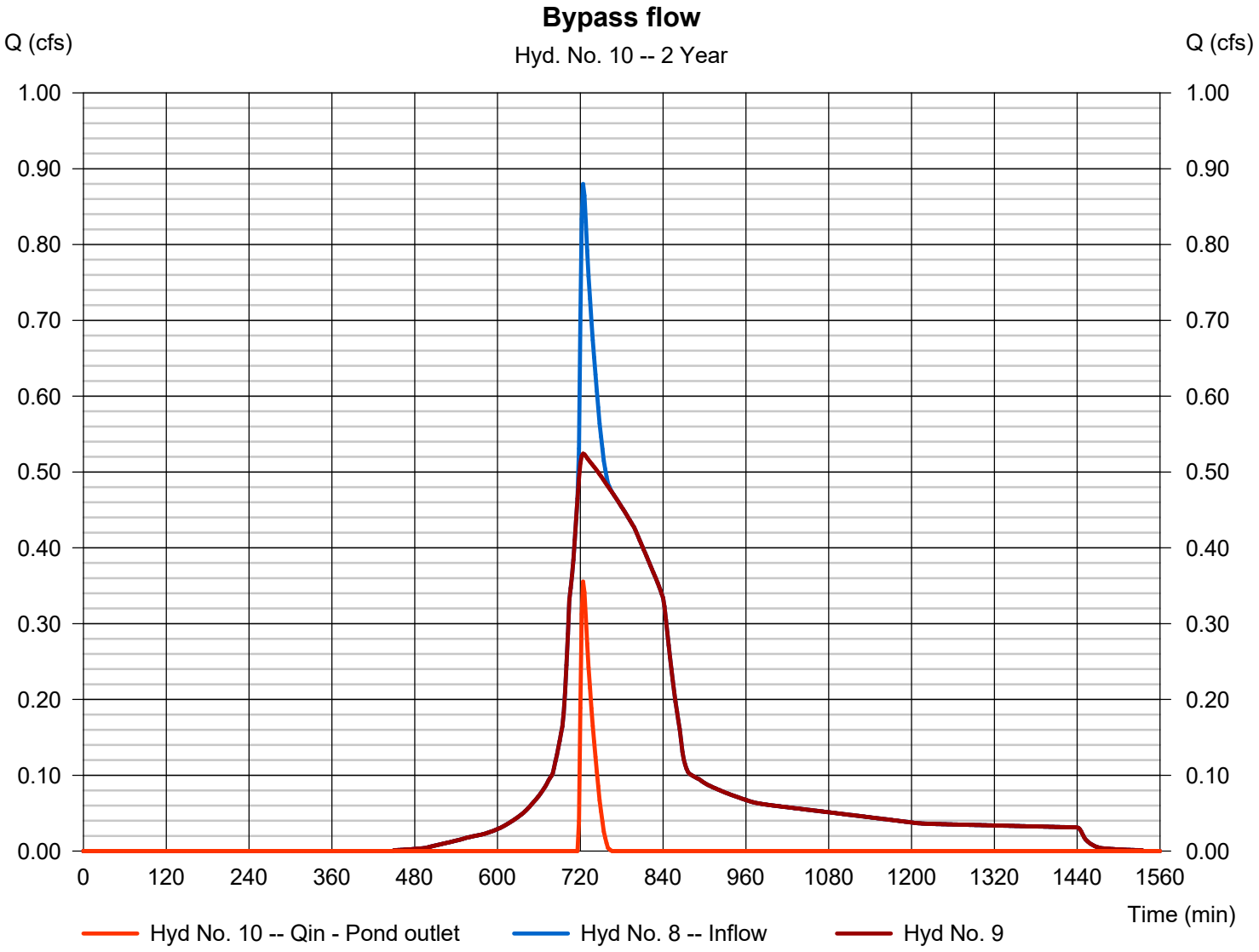


Hydrograph Report

Hyd. No. 10

Bypass flow

Hydrograph type	= Diversion2	Peak discharge	= 0.356 cfs
Storm frequency	= 2 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 397 cuft
Inflow hydrograph	= 8 - Route Array	2nd diverted hyd.	= 9
Diversion method	= Pond - Array	Pond structure	= Culv/Orf A

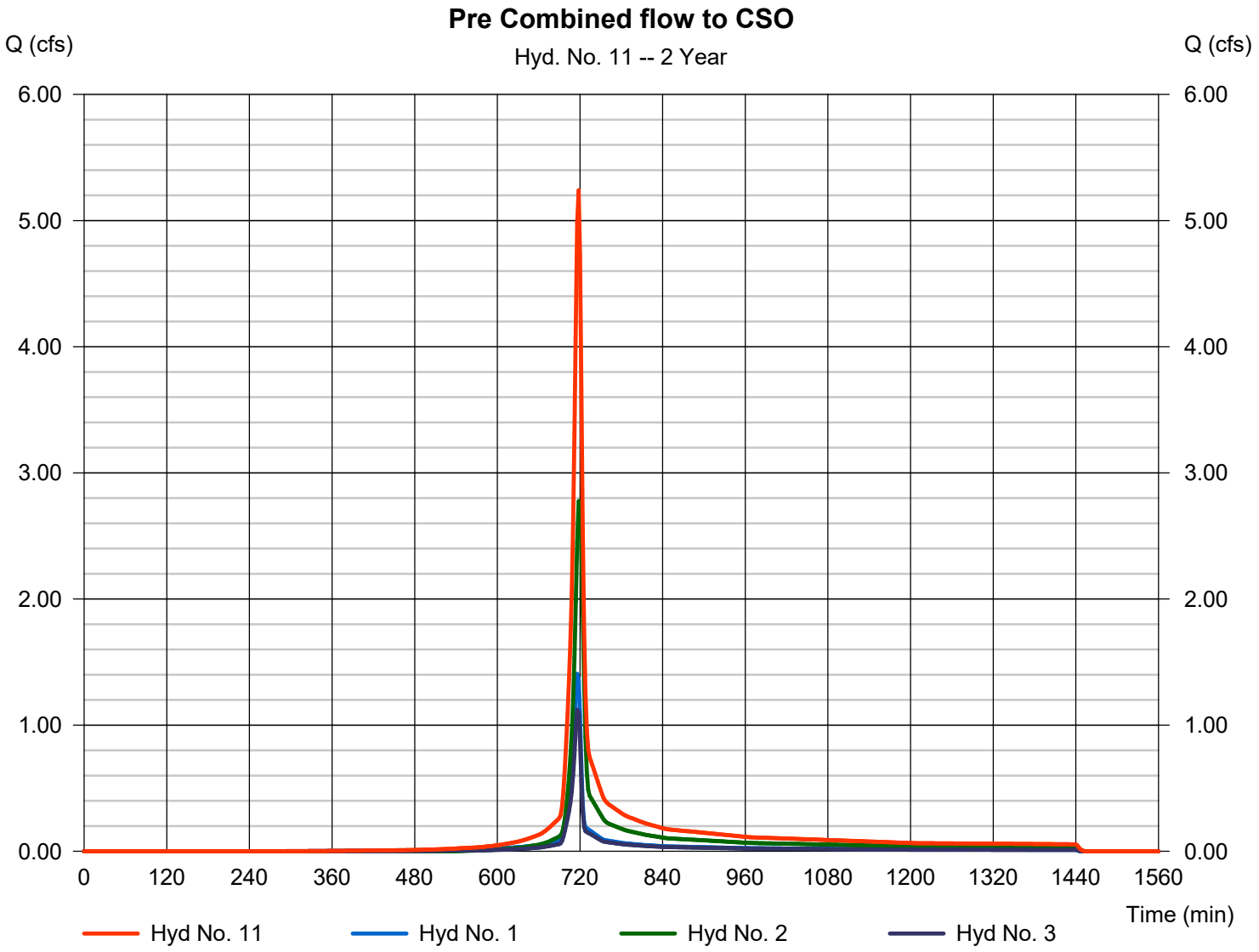


Hydrograph Report

Hyd. No. 11

Pre Combined flow to CSO

Hydrograph type	=	Combine	Peak discharge	=	5.240 cfs
Storm frequency	=	2 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	11,607 cuft
Inflow hyds.	=	1, 2, 3	Contrib. drain. area	=	2.633 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

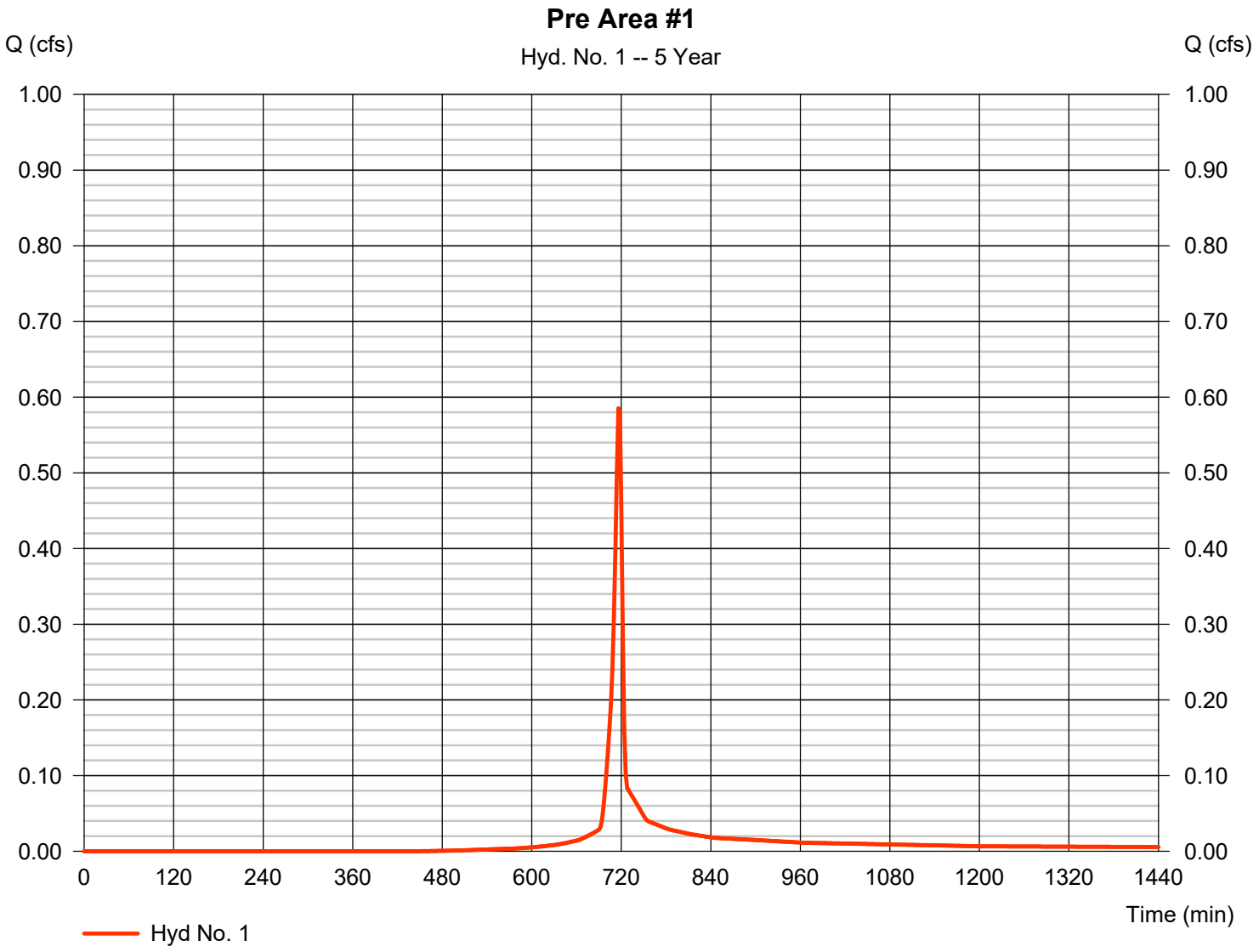
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.585	2	716	1,187	------	------	------	Pre Area #1
2	SCS Runoff	0.751	2	720	1,795	------	------	------	Pre Area #2
3	SCS Runoff	0.386	2	718	773	------	------	------	Pre Area #3
4	SCS Runoff	0.242	2	718	486	------	------	------	Post Area #1
5	SCS Runoff	0.312	2	718	631	------	------	------	Post Area #2
6	SCS Runoff	0.231	2	718	462	------	------	------	Post Area #3
7	SCS Runoff	1.143	2	718	2,286	------	------	------	Post Area #1A
8	Reservoir	0.375	2	724	2,284	7	93.01	581	Route Array
9	Diversion1	0.375	2	724	2,284	8	------	------	Flow to WQv
10	Diversion2	0.000	2	708	0	8	------	------	Bypass flow
11	Combine	1.681	2	718	3,754	1, 2, 3,	------	------	Pre Combined flow to CSO
12	Combine	1.140	2	718	3,862	4, 5, 6, 9, 10,	------	------	Post Combined flow to CSO

Hydrograph Report

Hyd. No. 1

Pre Area #1

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.585 cfs
Storm frequency	=	5 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	1,187 cuft
Drainage area	=	0.519 ac	Curve number	=	94
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	6.20 min
Total precip.	=	1.20 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

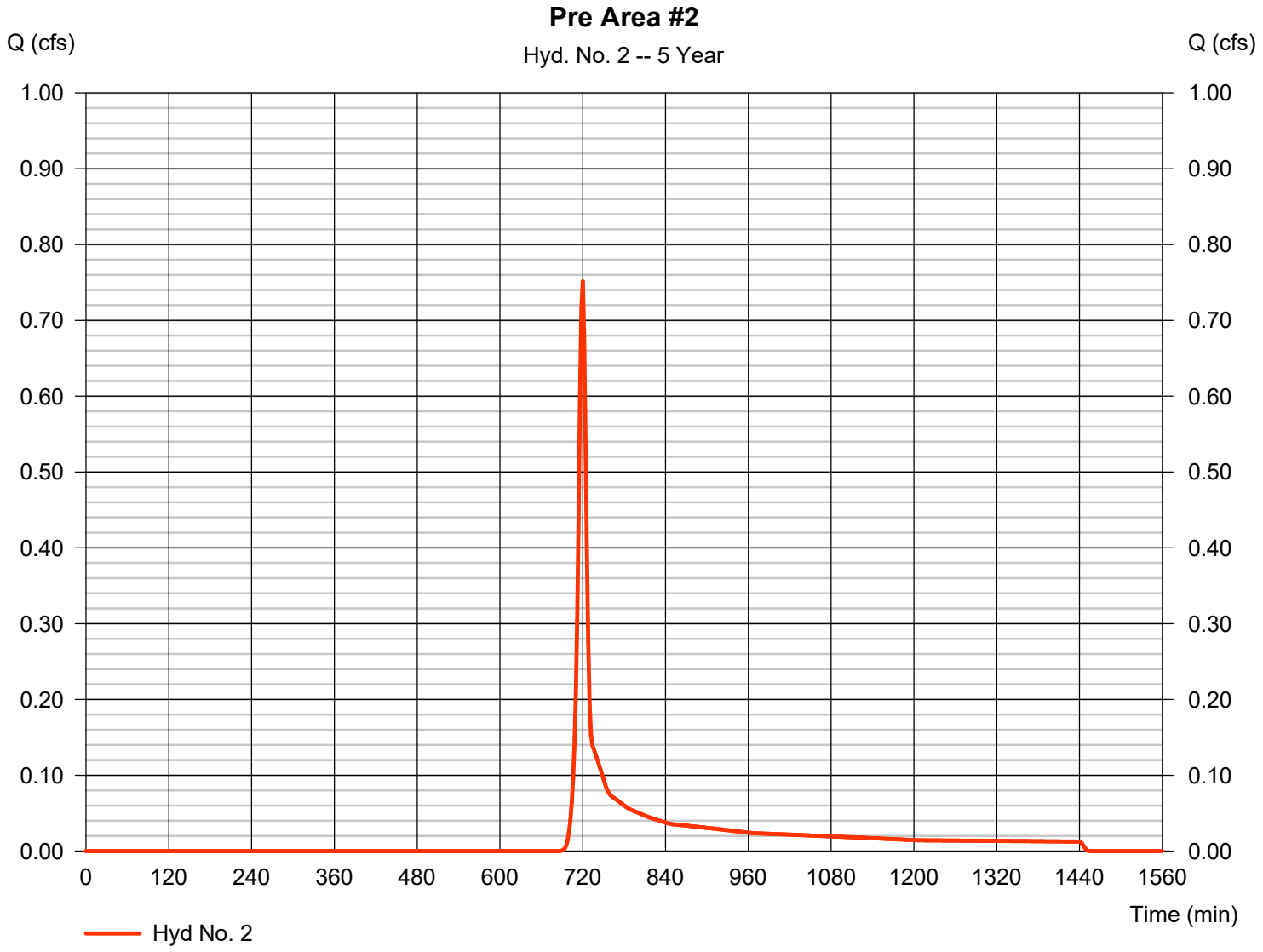


Hydrograph Report

Hyd. No. 2

Pre Area #2

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.751 cfs
Storm frequency	=	5 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	1,795 cuft
Drainage area	=	1.618 ac	Curve number	=	86
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	7.90 min
Total precip.	=	1.20 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

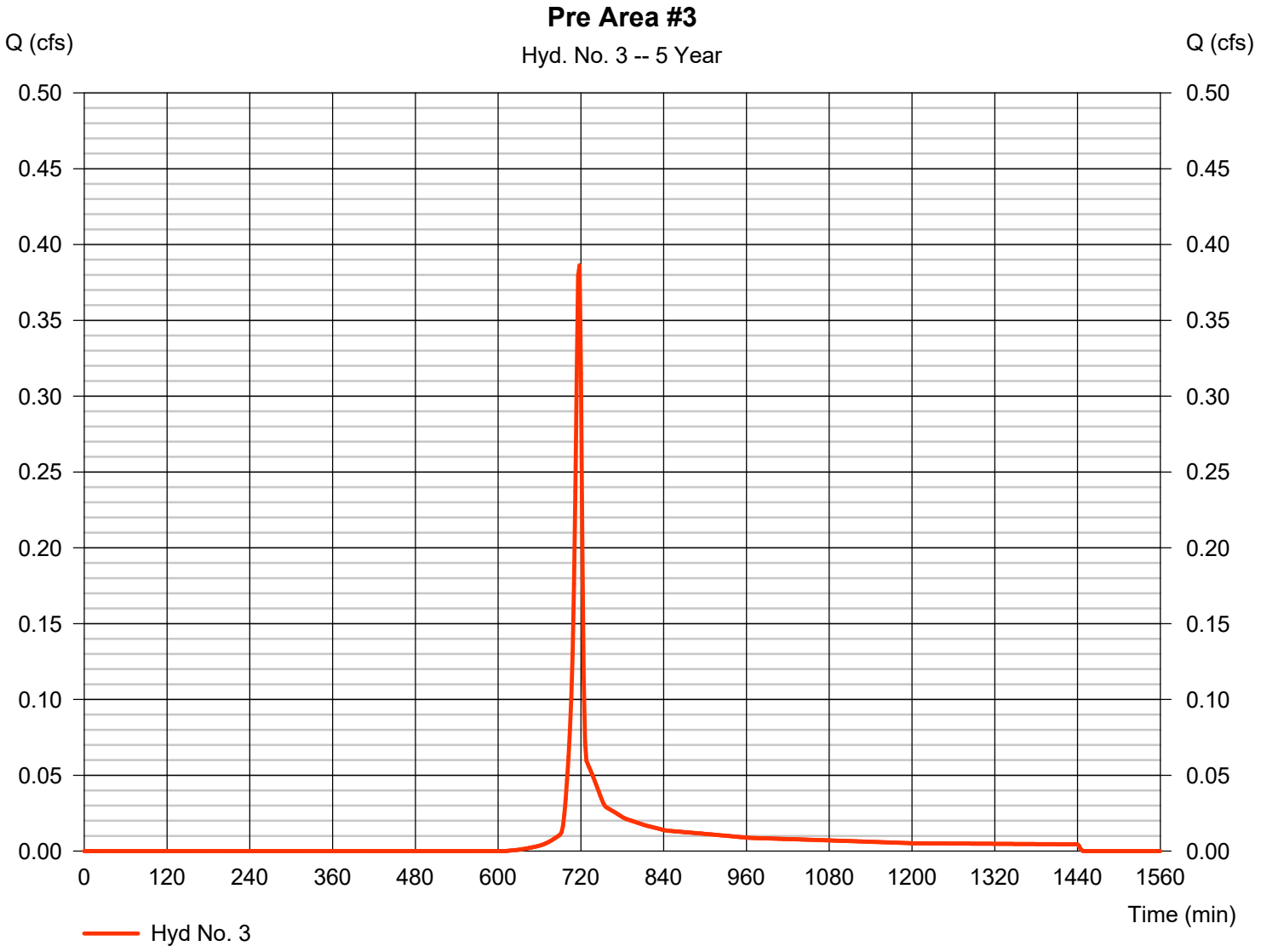


Hydrograph Report

Hyd. No. 3

Pre Area #3

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.386 cfs
Storm frequency	=	5 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	773 cuft
Drainage area	=	0.496 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	6.10 min
Total precip.	=	1.20 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

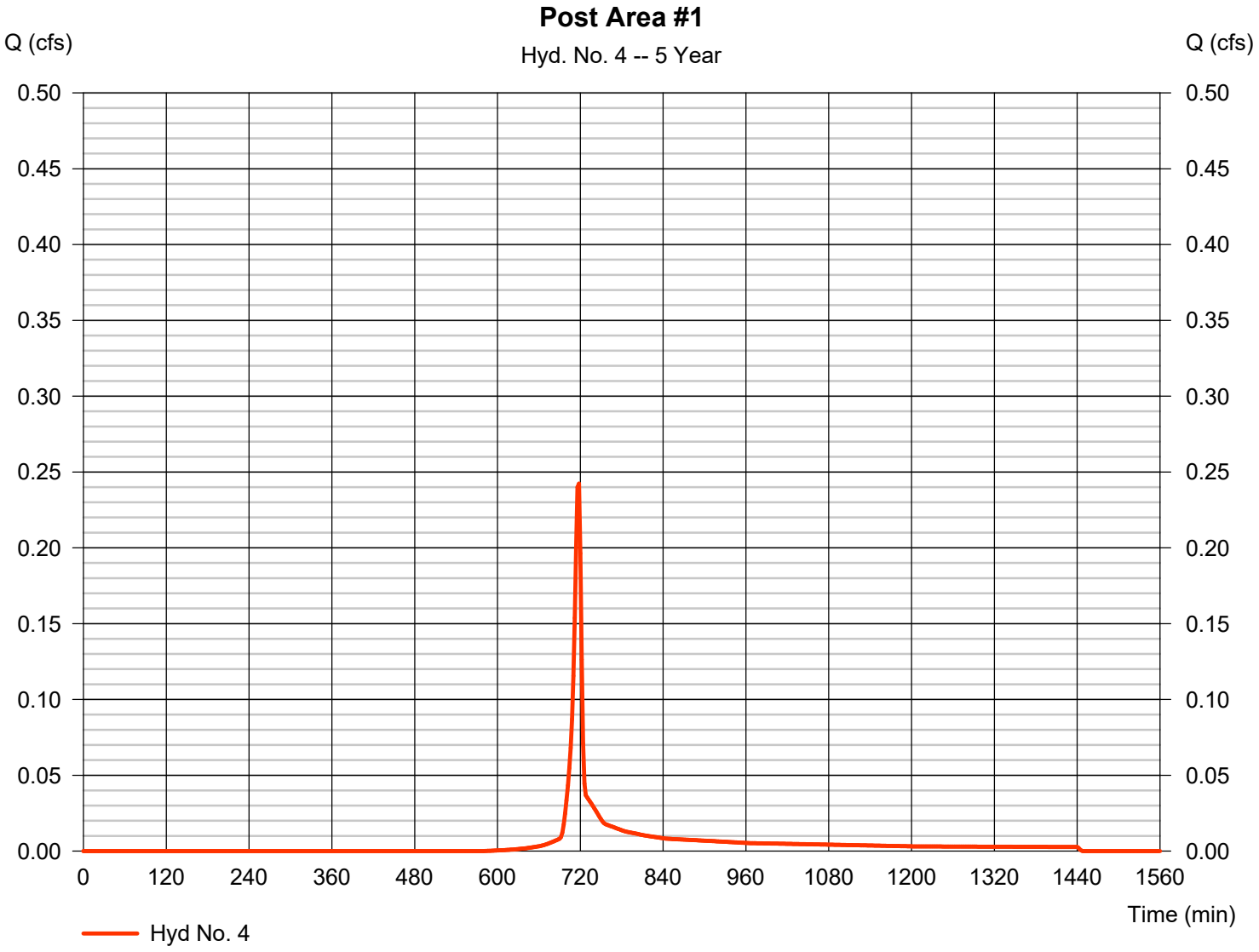


Hydrograph Report

Hyd. No. 4

Post Area #1

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.242 cfs
Storm frequency	=	5 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	486 cuft
Drainage area	=	0.283 ac	Curve number	=	91
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	1.20 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

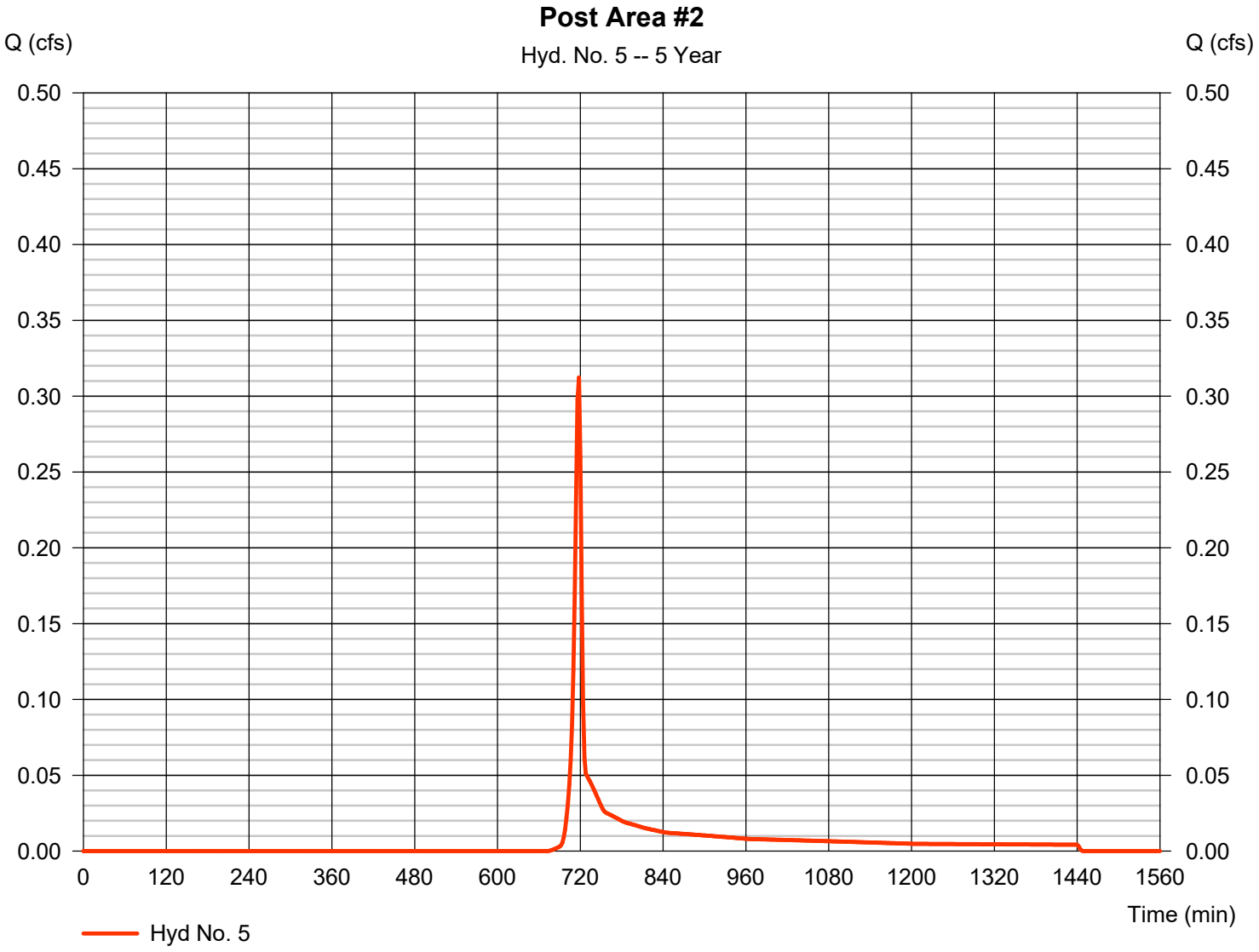


Hydrograph Report

Hyd. No. 5

Post Area #2

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.312 cfs
Storm frequency	=	5 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	631 cuft
Drainage area	=	0.547 ac	Curve number	=	87
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	1.20 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

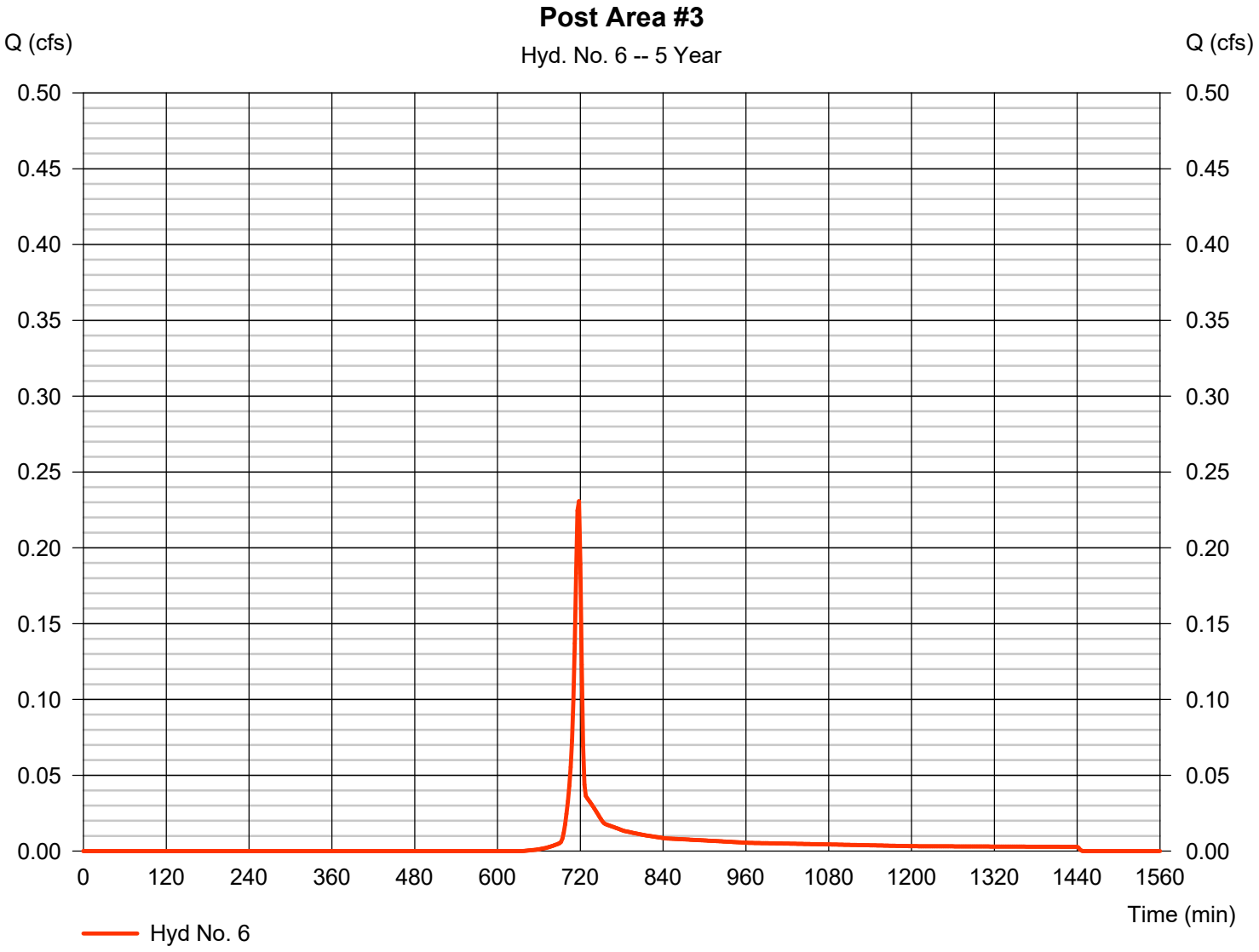


Hydrograph Report

Hyd. No. 6

Post Area #3

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.231 cfs
Storm frequency	=	5 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	462 cuft
Drainage area	=	0.327 ac	Curve number	=	89
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	1.20 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

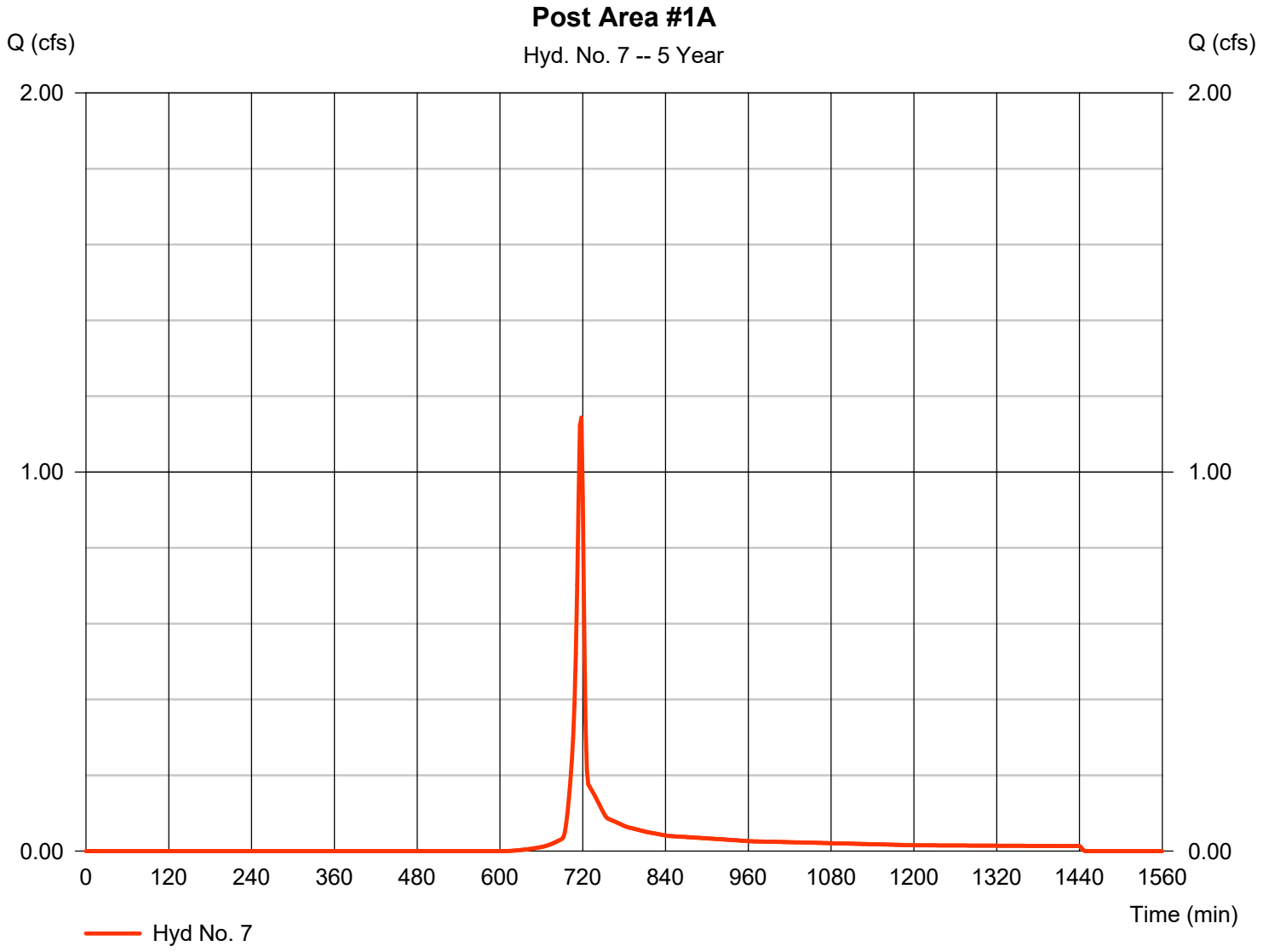


Hydrograph Report

Hyd. No. 7

Post Area #1A

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.143 cfs
Storm frequency	=	5 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	2,286 cuft
Drainage area	=	1.468 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	1.20 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



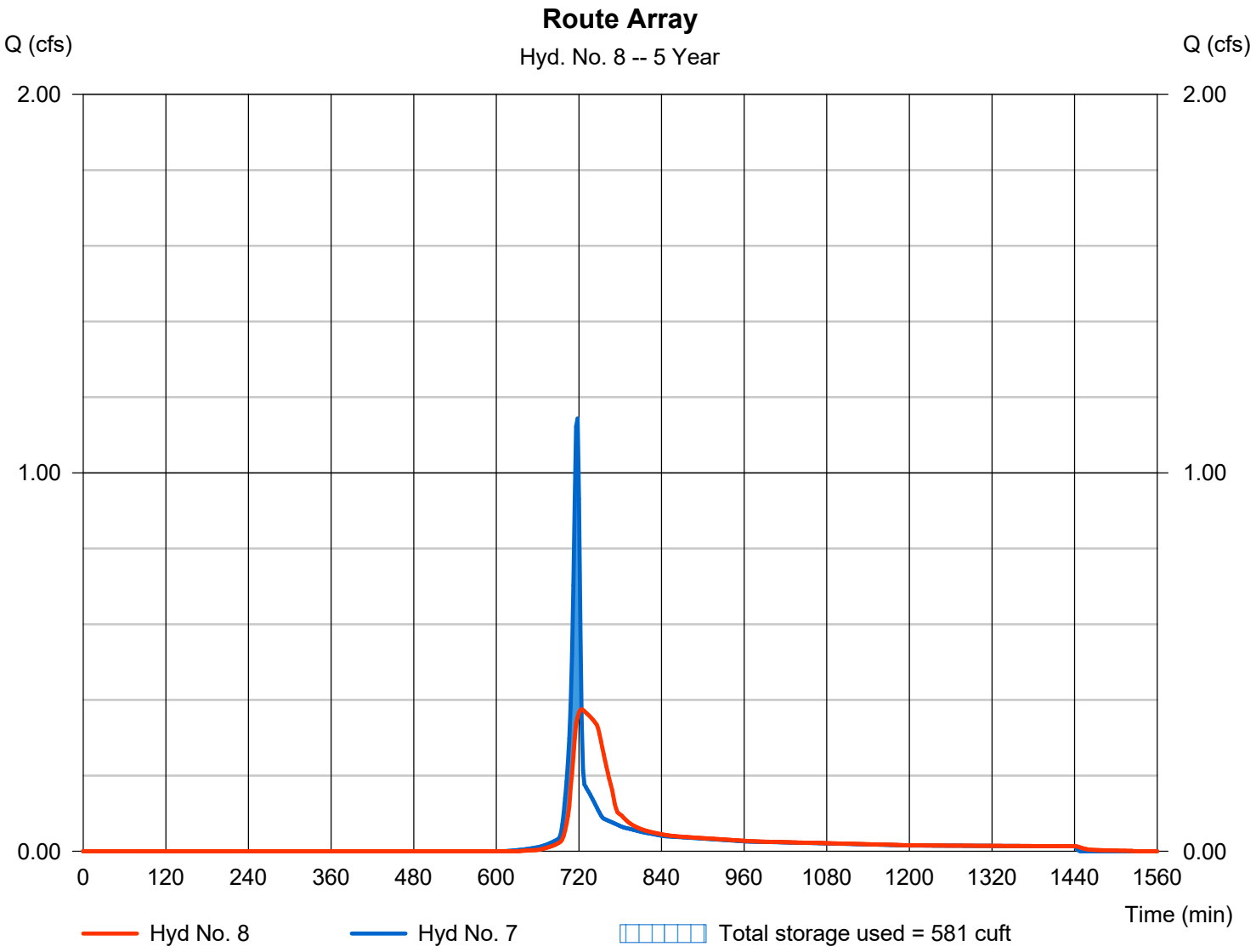
Hydrograph Report

Hyd. No. 8

Route Array

Hydrograph type	=	Reservoir	Peak discharge	=	0.375 cfs
Storm frequency	=	5 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	2,284 cuft
Inflow hyd. No.	=	7 - Post Area #1A	Max. Elevation	=	93.01 ft
Reservoir name	=	Array	Max. Storage	=	581 cuft

Storage Indication method used.

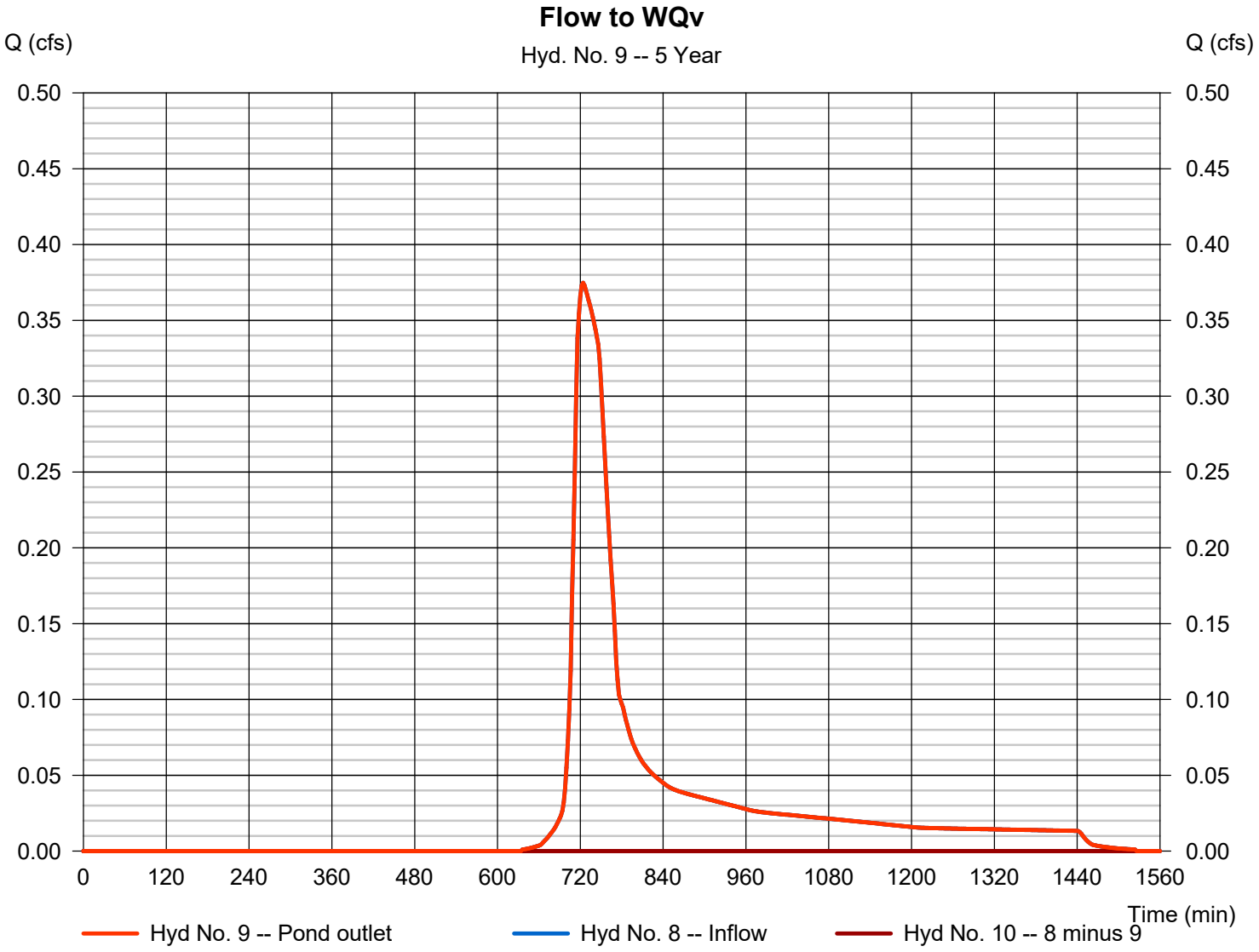


Hydrograph Report

Hyd. No. 9

Flow to WQv

Hydrograph type	= Diversion1	Peak discharge	= 0.375 cfs
Storm frequency	= 5 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 2,284 cuft
Inflow hydrograph	= 8 - Route Array	2nd diverted hyd.	= 10
Diversion method	= Pond - Array	Pond structure	= Culv/Orf A

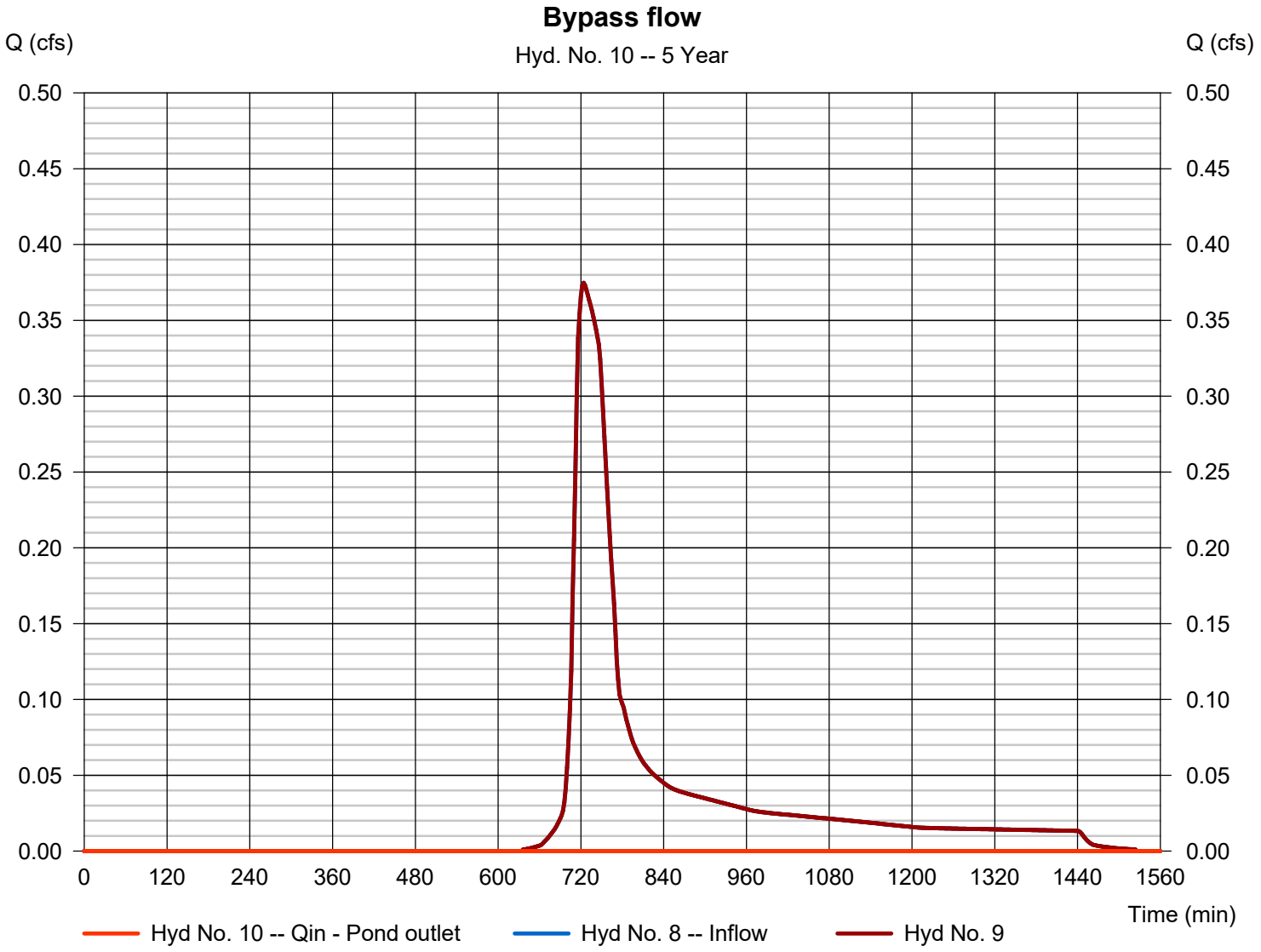


Hydrograph Report

Hyd. No. 10

Bypass flow

Hydrograph type	= Diversion2	Peak discharge	= 0.000 cfs
Storm frequency	= 5 yrs	Time to peak	= 708 min
Time interval	= 2 min	Hyd. volume	= 0 cuft
Inflow hydrograph	= 8 - Route Array	2nd diverted hyd.	= 9
Diversion method	= Pond - Array	Pond structure	= Culv/Orf A

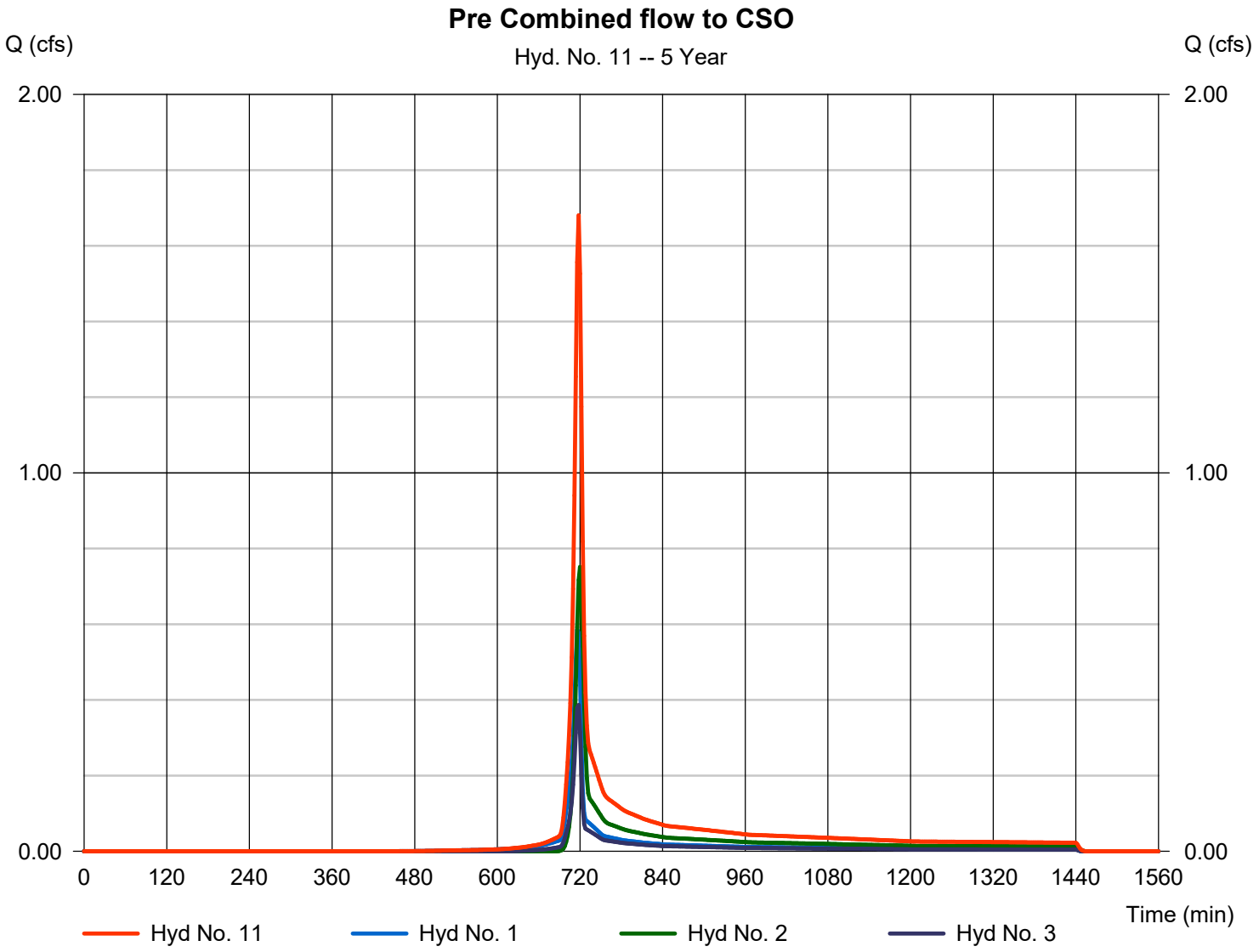


Hydrograph Report

Hyd. No. 11

Pre Combined flow to CSO

Hydrograph type	=	Combine	Peak discharge	=	1.681 cfs
Storm frequency	=	5 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	3,754 cuft
Inflow hyds.	=	1, 2, 3	Contrib. drain. area	=	2.633 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

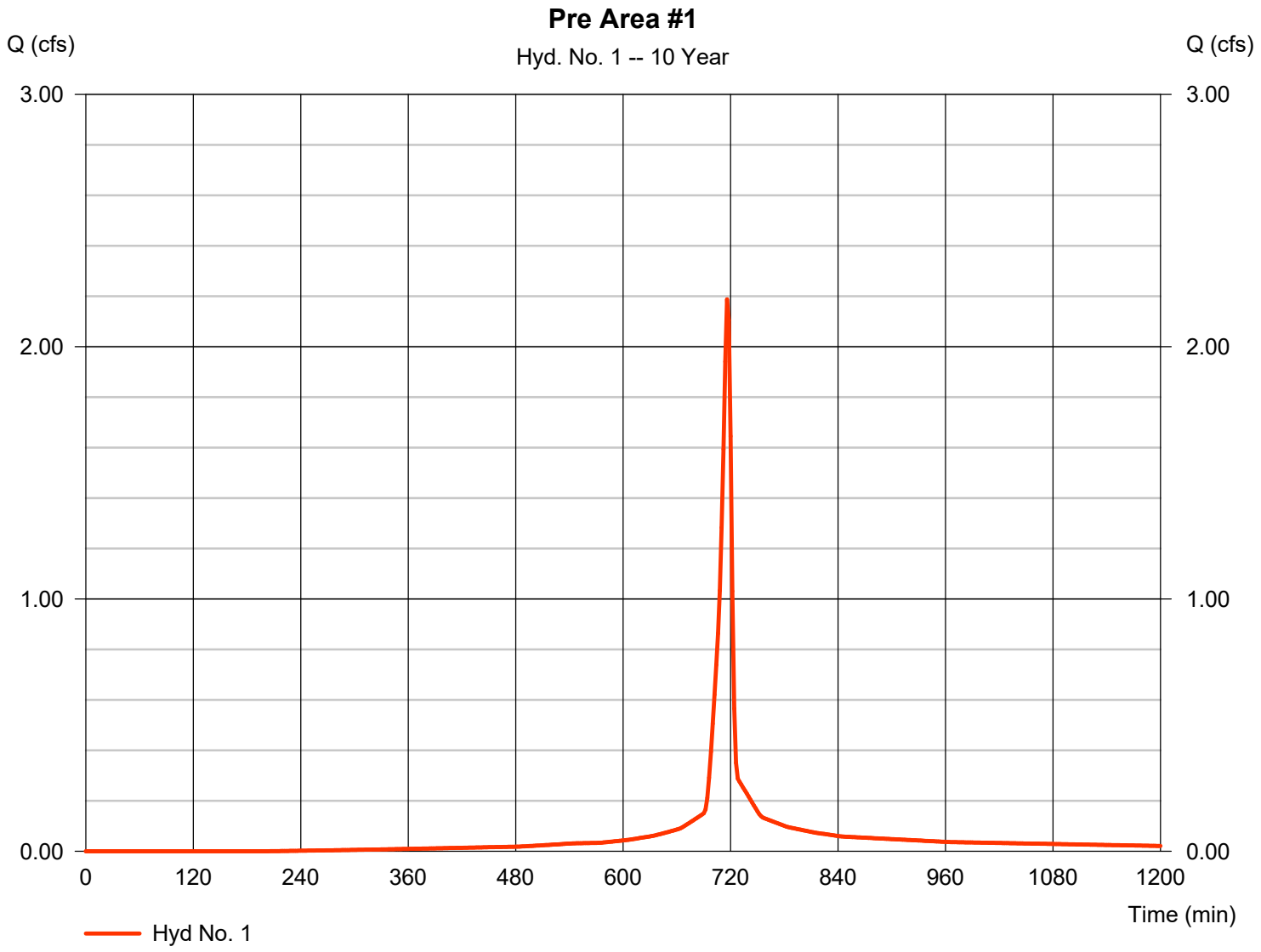
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	2.188	2	716	4,750	------	------	------	Pre Area #1
2	SCS Runoff	5.025	2	718	11,548	------	------	------	Pre Area #2
3	SCS Runoff	1.871	2	716	3,896	------	------	------	Pre Area #3
4	SCS Runoff	1.101	2	716	2,311	------	------	------	Post Area #1
5	SCS Runoff	1.864	2	716	3,813	------	------	------	Post Area #2
6	SCS Runoff	1.194	2	716	2,469	------	------	------	Post Area #3
7	SCS Runoff	5.537	2	716	11,530	------	------	------	Post Area #1A
8	Reservoir	2.731	2	722	11,527	7	94.22	3,498	Route Array
9	Diversion1	0.595	2	722	9,009	8	------	------	Flow to WQv
10	Diversion2	2.136	2	722	2,519	8	------	------	Bypass flow
11	Combine	8.949	2	718	20,194	1, 2, 3,	------	------	Pre Combined flow to CSO
12	Combine	6.080	2	718	20,120	4, 5, 6, 9, 10,	------	------	Post Combined flow to CSO

Hydrograph Report

Hyd. No. 1

Pre Area #1

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.188 cfs
Storm frequency	=	10 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	4,750 cuft
Drainage area	=	0.519 ac	Curve number	=	94
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	6.20 min
Total precip.	=	3.35 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

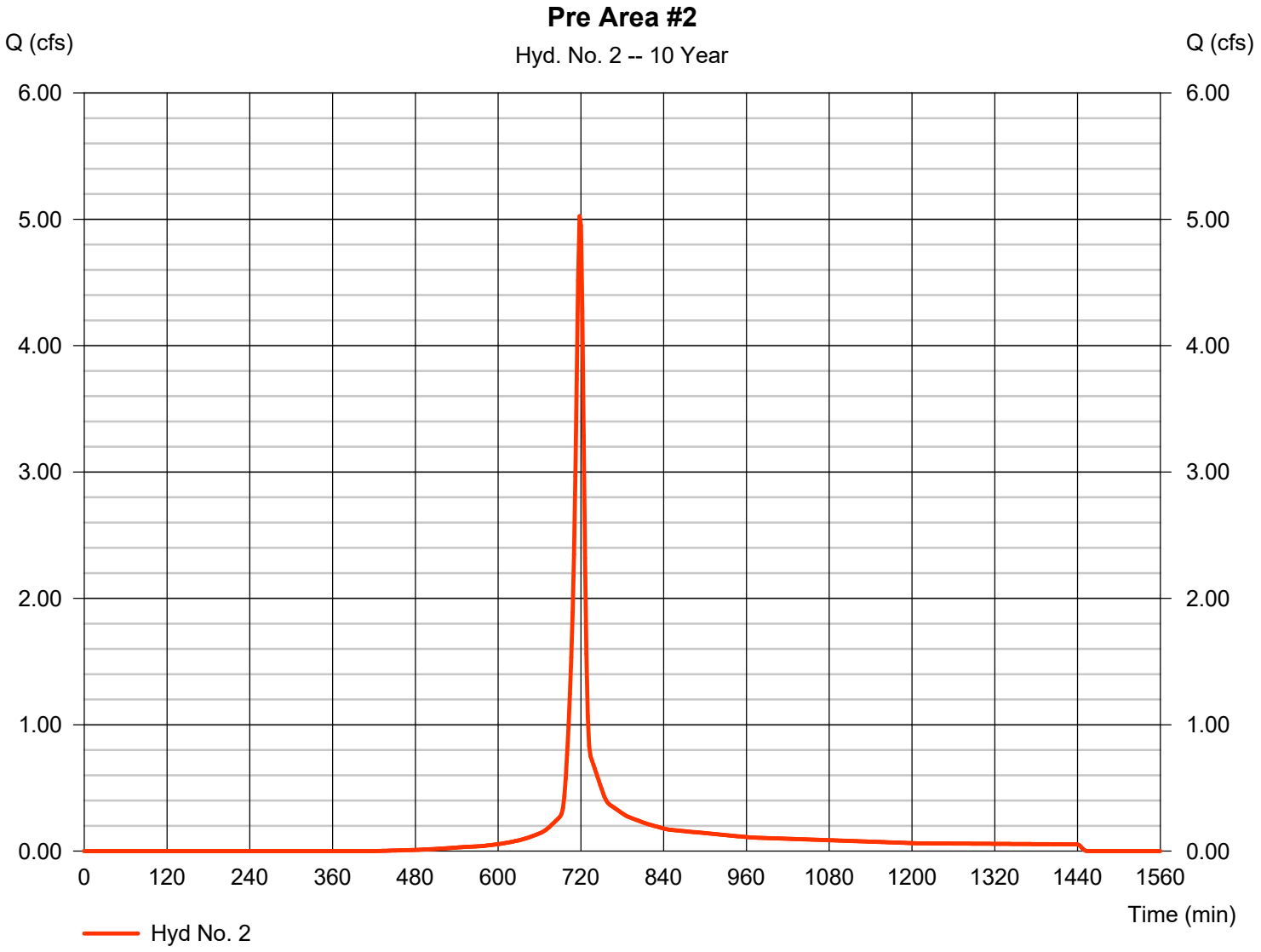


Hydrograph Report

Hyd. No. 2

Pre Area #2

Hydrograph type	=	SCS Runoff	Peak discharge	=	5.025 cfs
Storm frequency	=	10 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	11,548 cuft
Drainage area	=	1.618 ac	Curve number	=	86
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	7.90 min
Total precip.	=	3.35 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

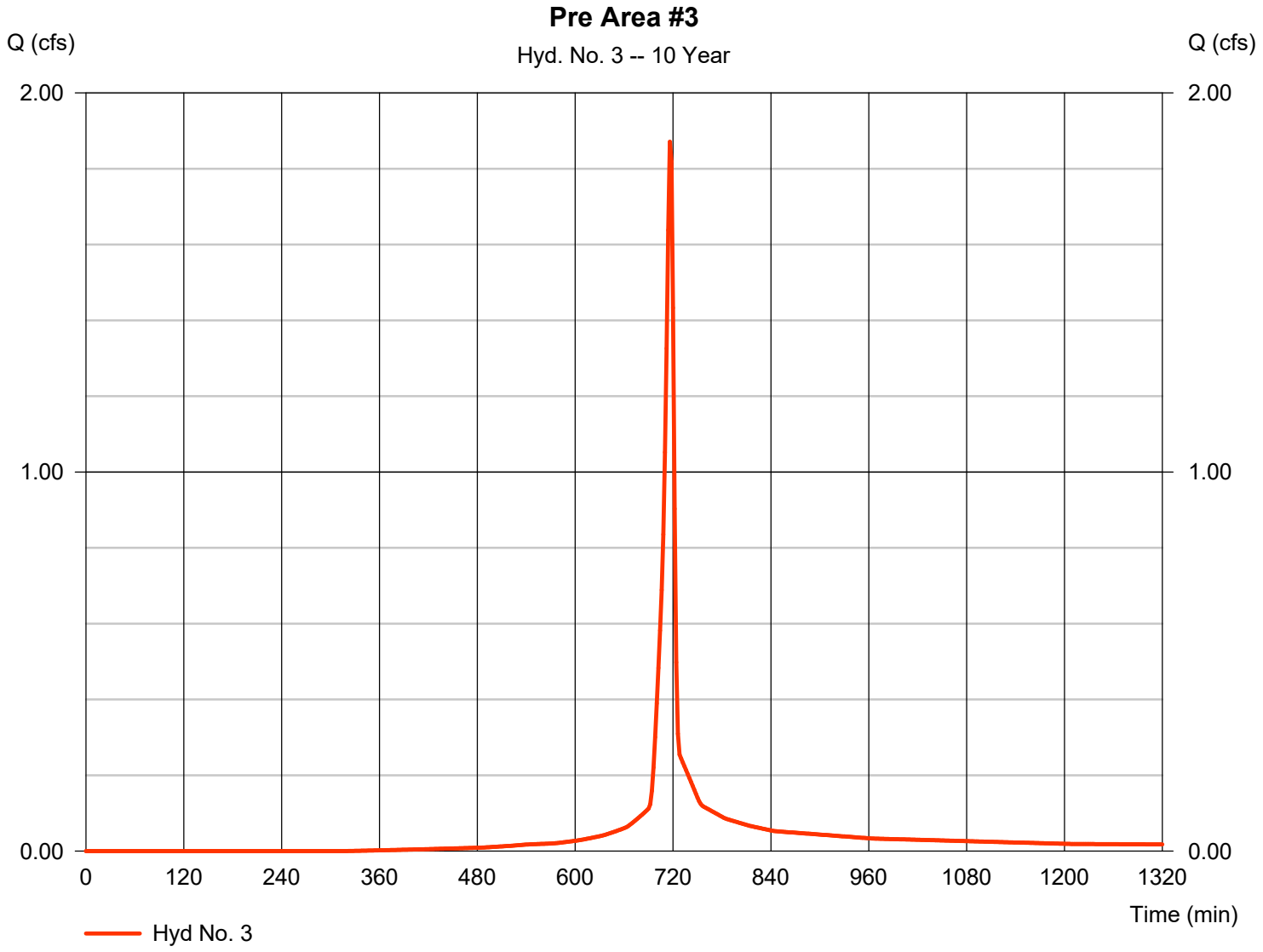


Hydrograph Report

Hyd. No. 3

Pre Area #3

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.871 cfs
Storm frequency	=	10 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	3,896 cuft
Drainage area	=	0.496 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	6.10 min
Total precip.	=	3.35 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

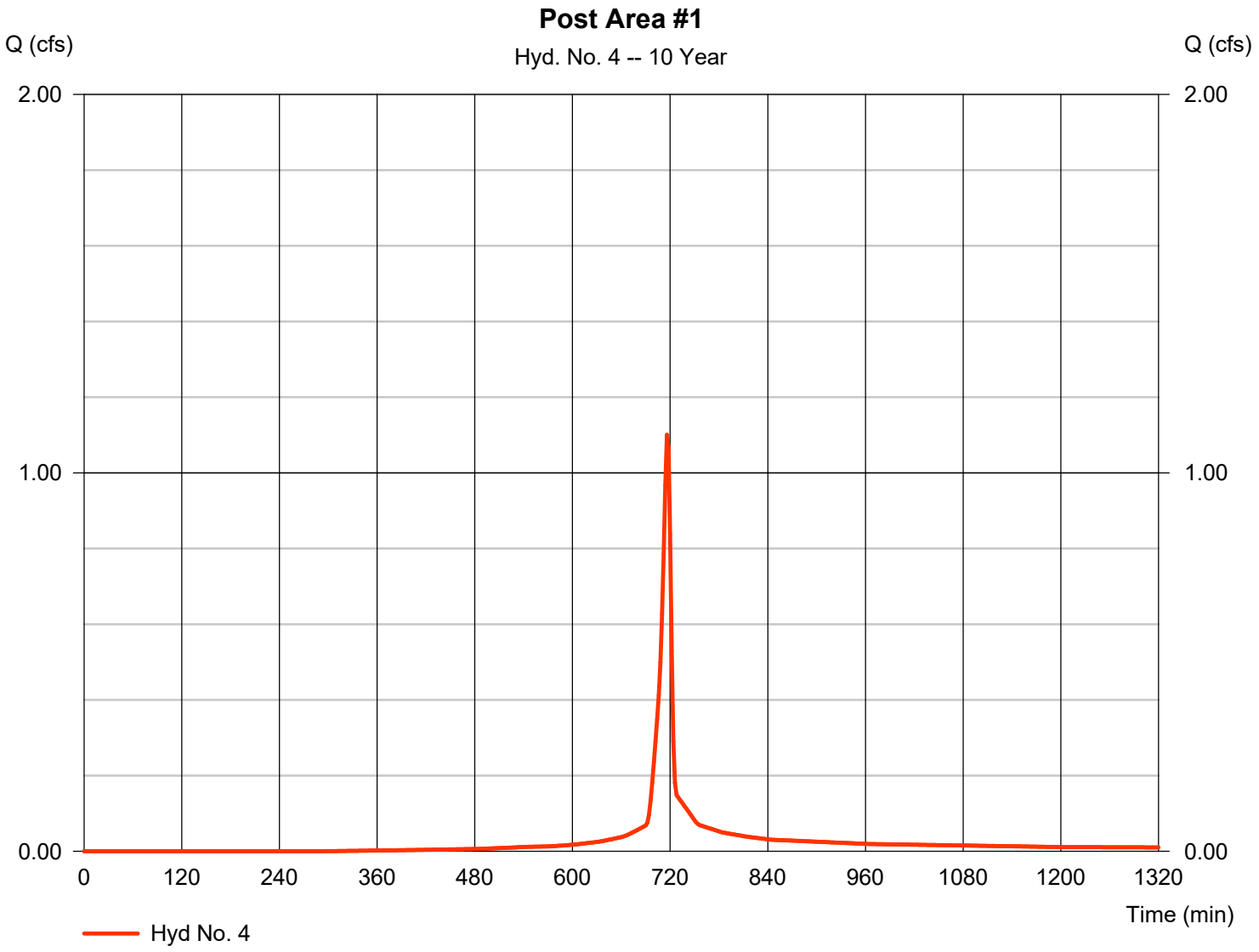


Hydrograph Report

Hyd. No. 4

Post Area #1

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.101 cfs
Storm frequency	=	10 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	2,311 cuft
Drainage area	=	0.283 ac	Curve number	=	91
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	3.35 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

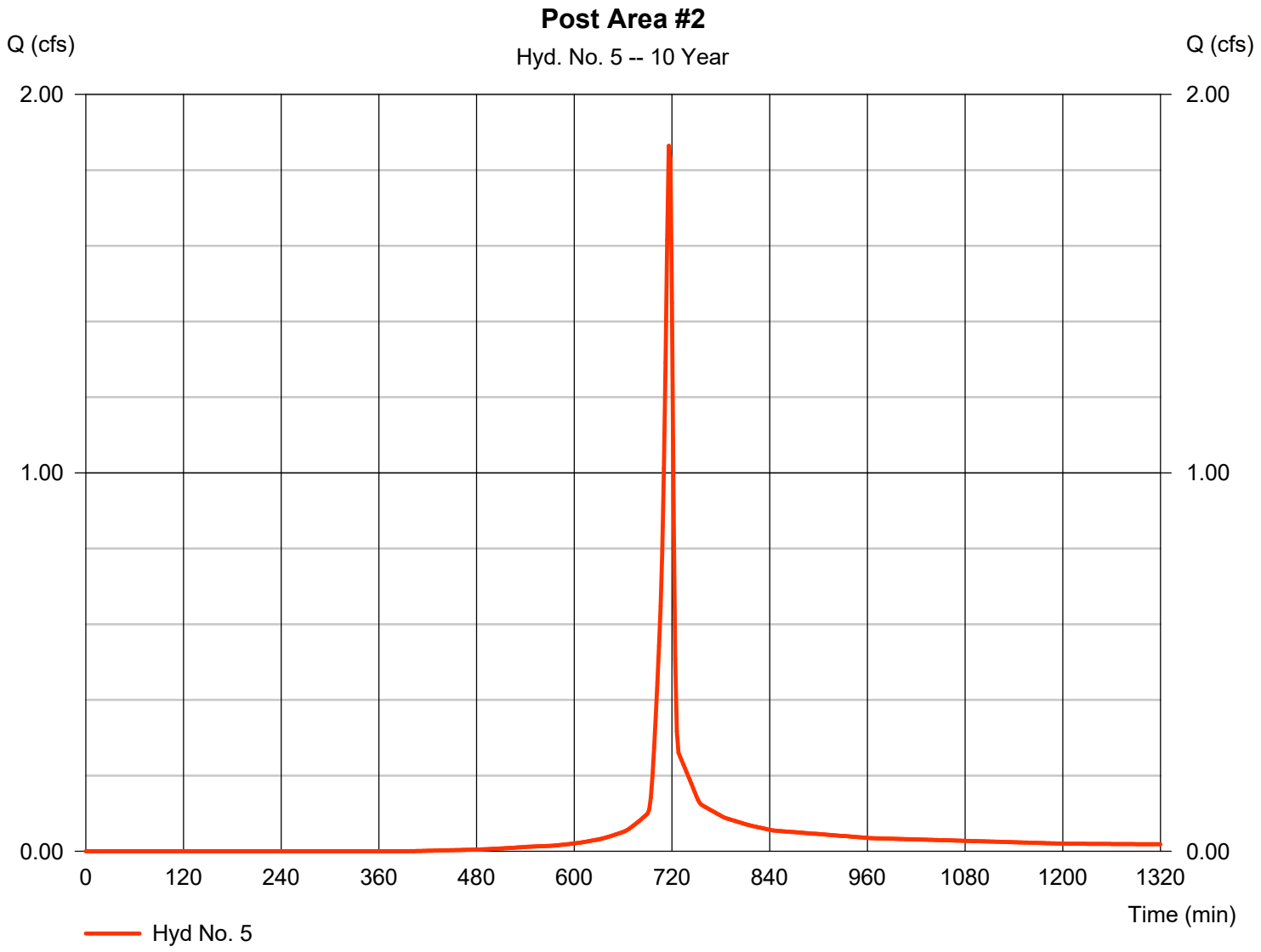


Hydrograph Report

Hyd. No. 5

Post Area #2

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.864 cfs
Storm frequency	=	10 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	3,813 cuft
Drainage area	=	0.547 ac	Curve number	=	87
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	3.35 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

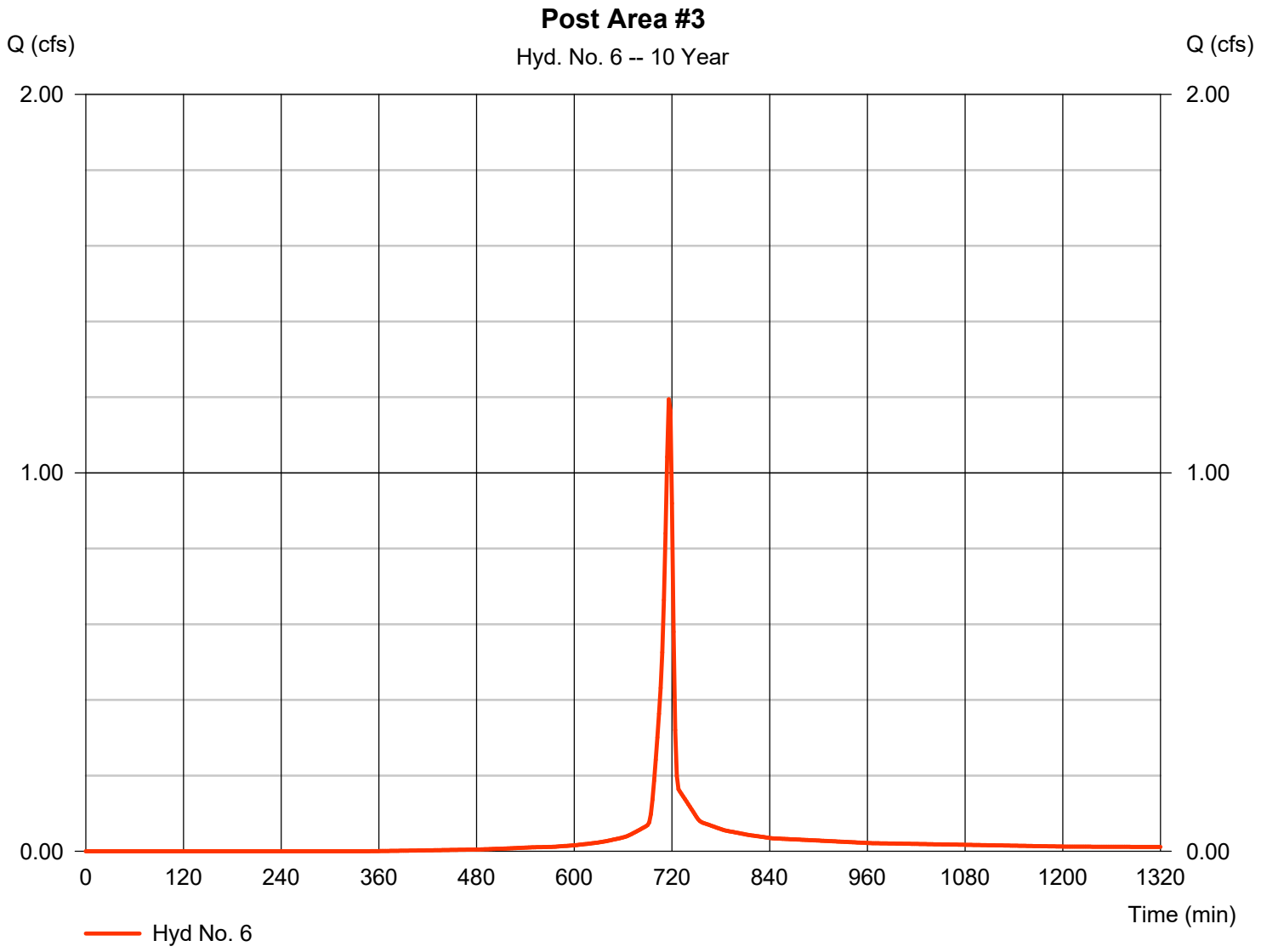


Hydrograph Report

Hyd. No. 6

Post Area #3

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.194 cfs
Storm frequency	=	10 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	2,469 cuft
Drainage area	=	0.327 ac	Curve number	=	89
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	3.35 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

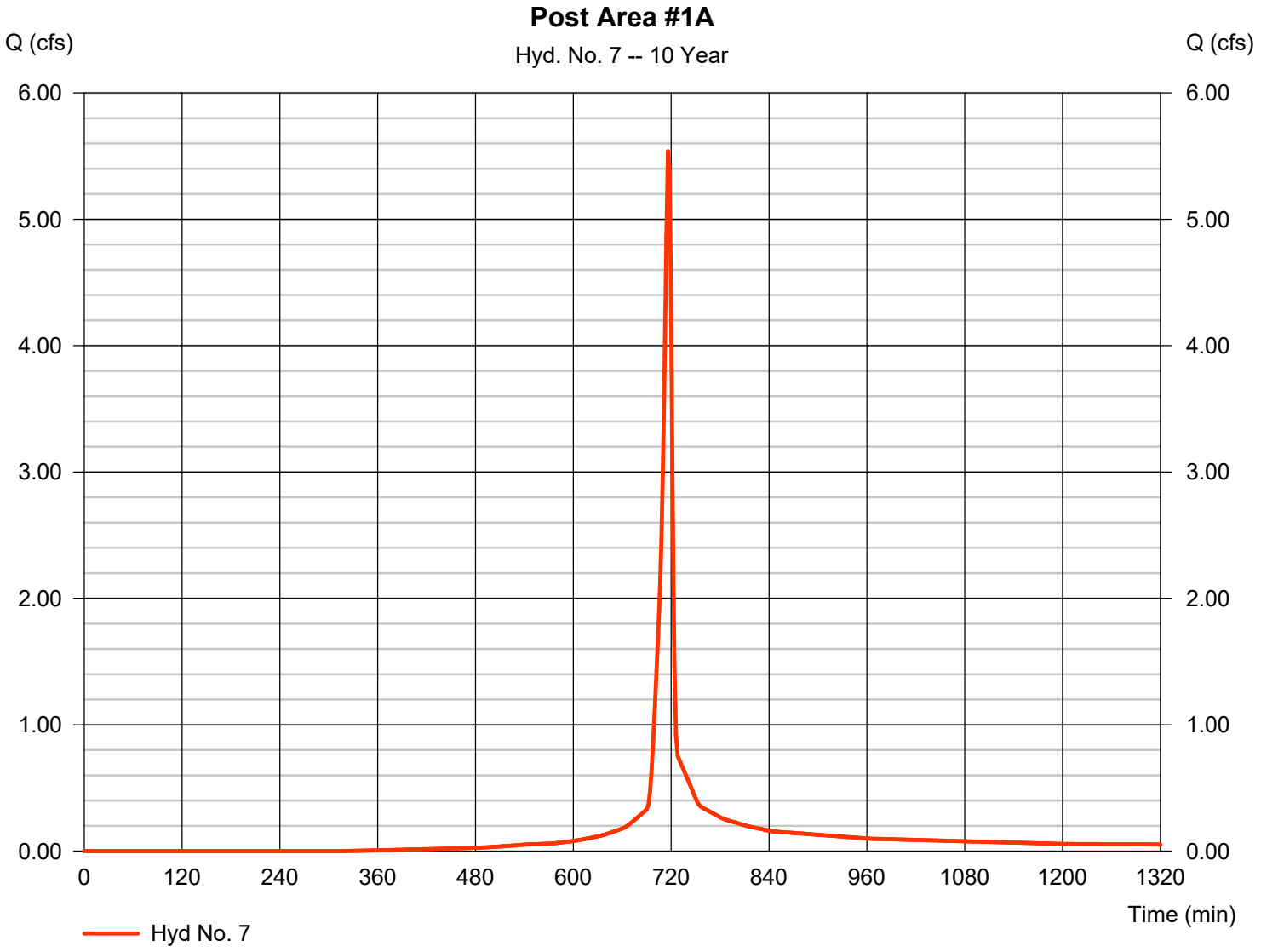


Hydrograph Report

Hyd. No. 7

Post Area #1A

Hydrograph type	=	SCS Runoff	Peak discharge	=	5.537 cfs
Storm frequency	=	10 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	11,530 cuft
Drainage area	=	1.468 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	3.35 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



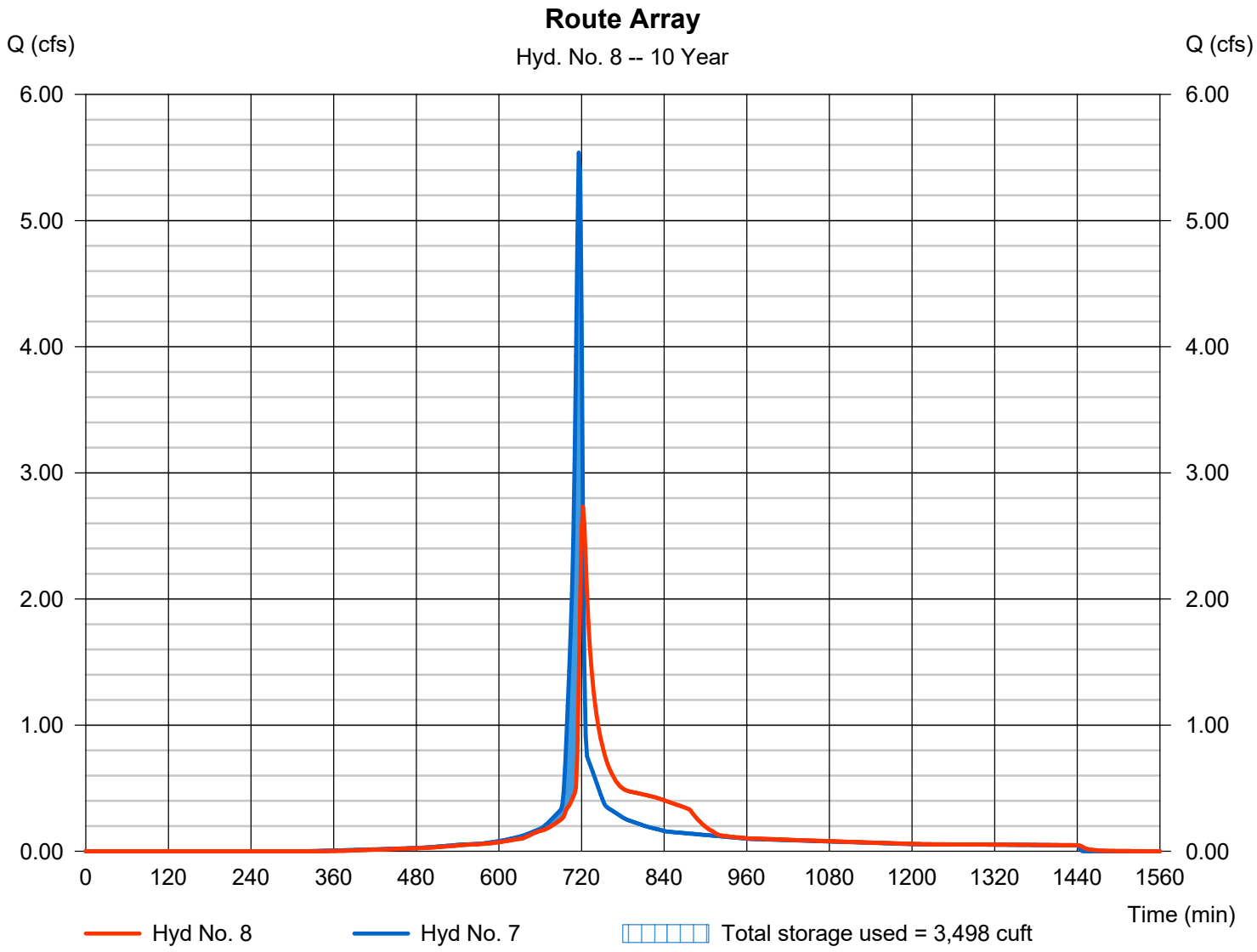
Hydrograph Report

Hyd. No. 8

Route Array

Hydrograph type	=	Reservoir	Peak discharge	=	2.731 cfs
Storm frequency	=	10 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	11,527 cuft
Inflow hyd. No.	=	7 - Post Area #1A	Max. Elevation	=	94.22 ft
Reservoir name	=	Array	Max. Storage	=	3,498 cuft

Storage Indication method used.

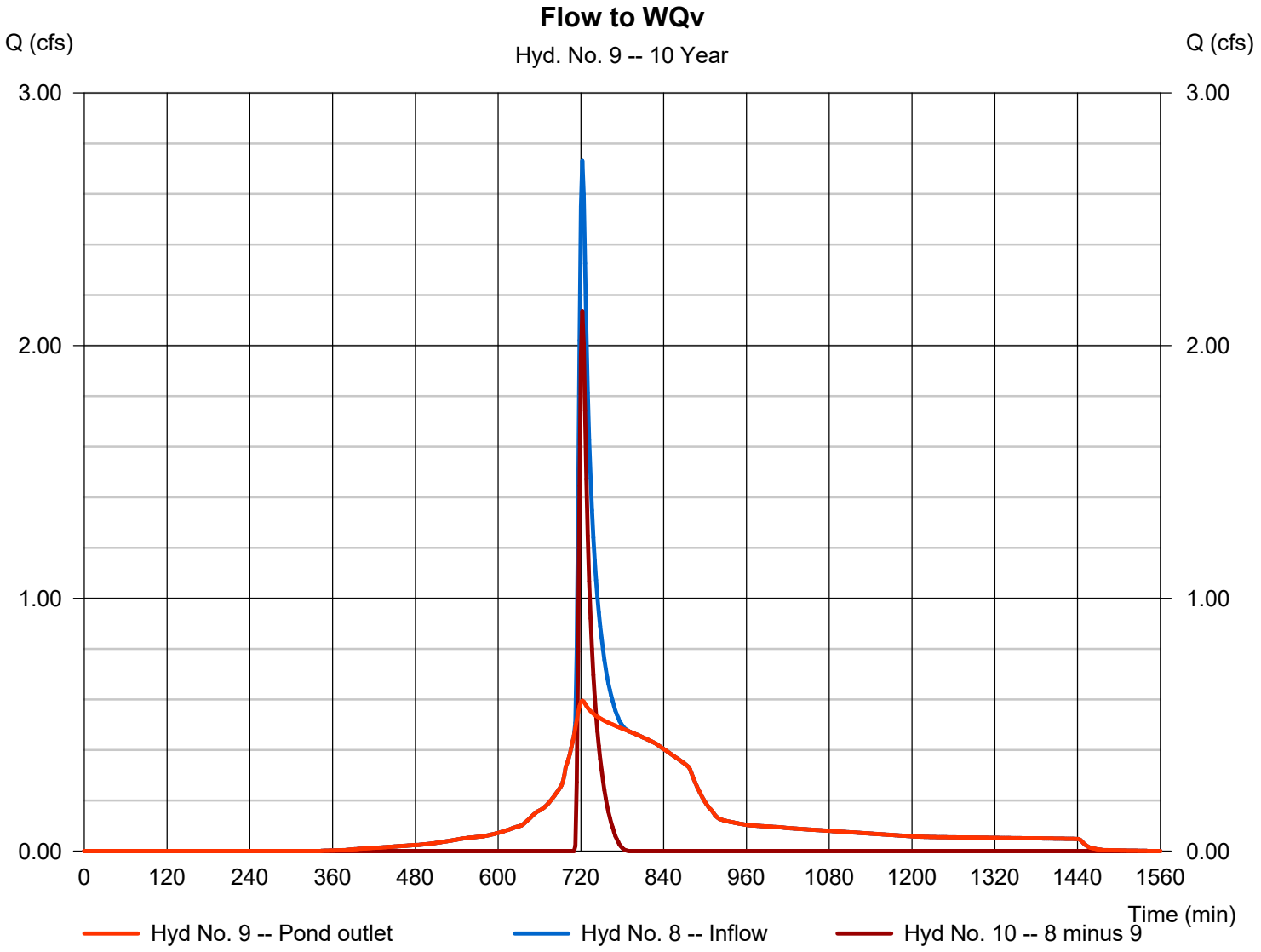


Hydrograph Report

Hyd. No. 9

Flow to WQv

Hydrograph type	= Diversion1	Peak discharge	= 0.595 cfs
Storm frequency	= 10 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 9,009 cuft
Inflow hydrograph	= 8 - Route Array	2nd diverted hyd.	= 10
Diversion method	= Pond - Array	Pond structure	= Culv/Orf A

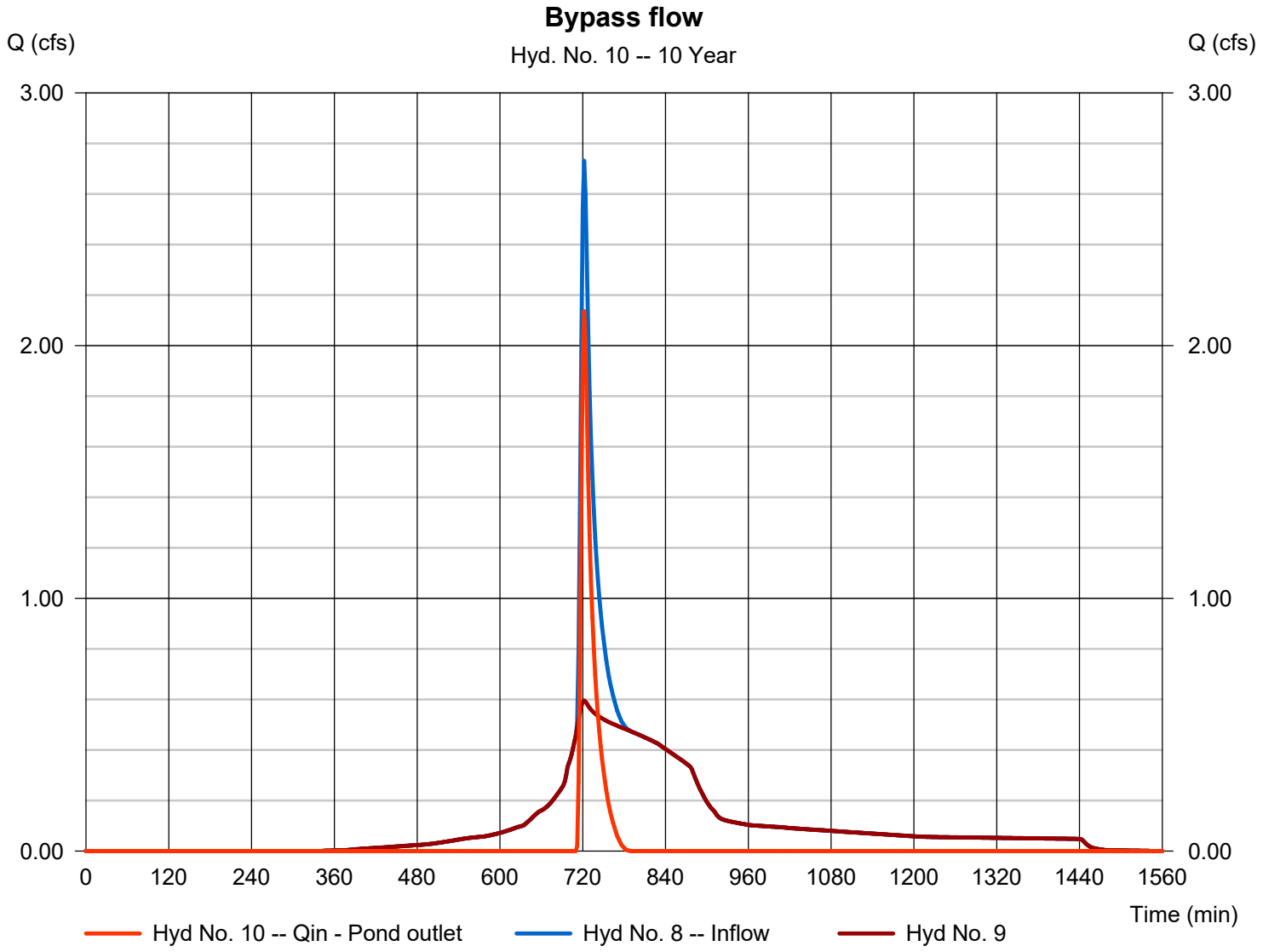


Hydrograph Report

Hyd. No. 10

Bypass flow

Hydrograph type	= Diversion2	Peak discharge	= 2.136 cfs
Storm frequency	= 10 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 2,519 cuft
Inflow hydrograph	= 8 - Route Array	2nd diverted hyd.	= 9
Diversion method	= Pond - Array	Pond structure	= Culv/Orf A

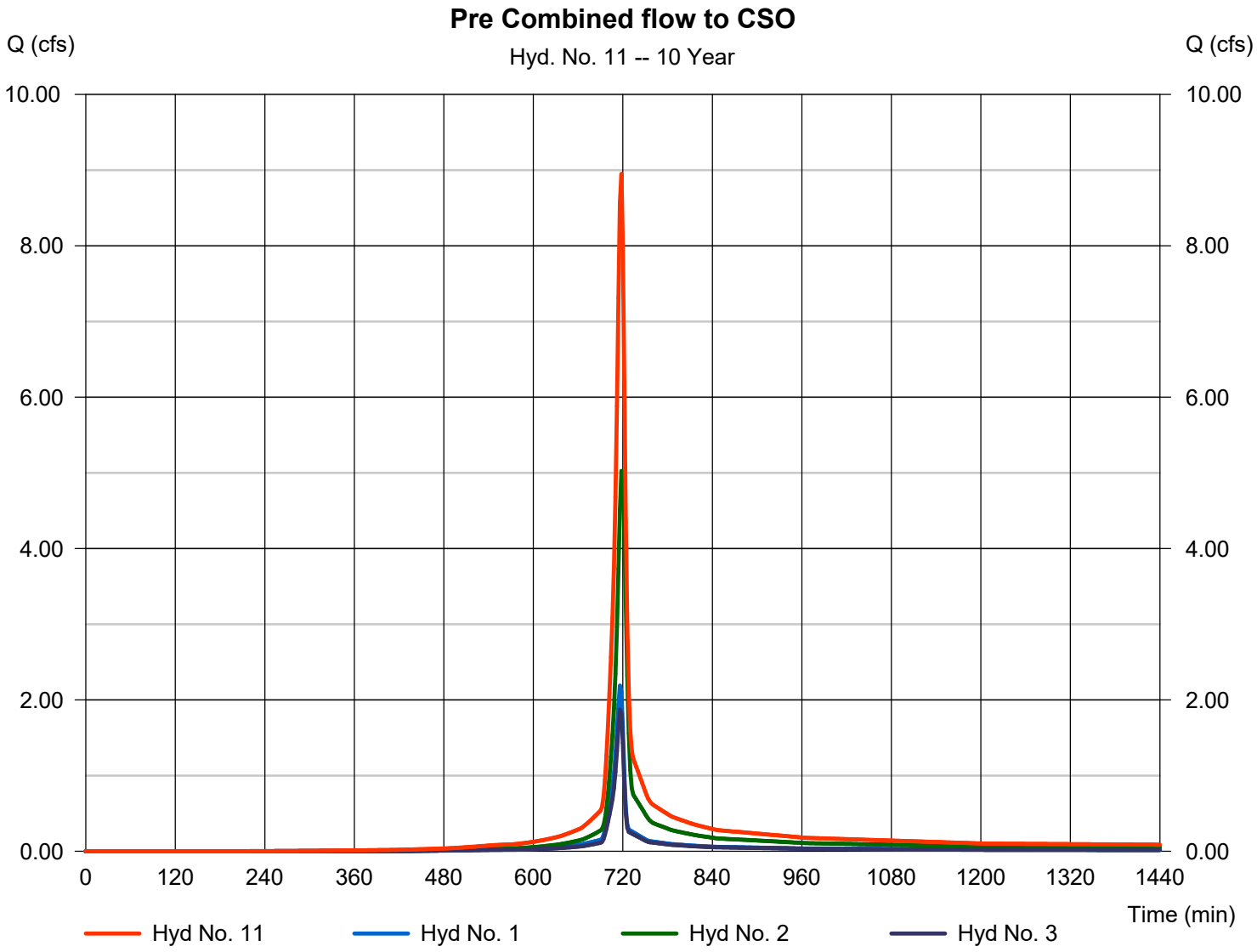


Hydrograph Report

Hyd. No. 11

Pre Combined flow to CSO

Hydrograph type	=	Combine	Peak discharge	=	8.949 cfs
Storm frequency	=	10 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	20,194 cuft
Inflow hyds.	=	1, 2, 3	Contrib. drain. area	=	2.633 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

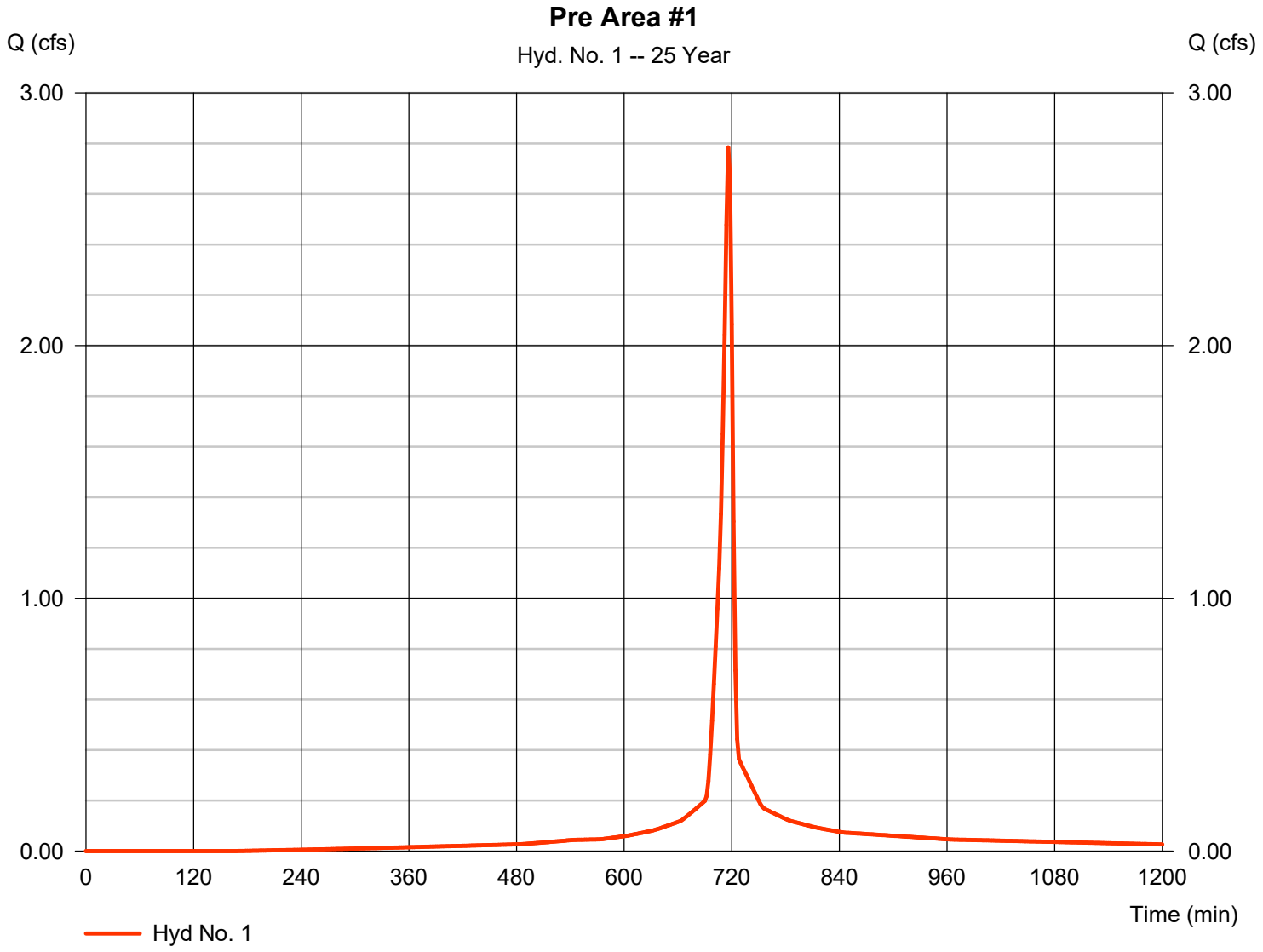
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	2.784	2	716	6,149	------	------	------	Pre Area #1
2	SCS Runoff	6.816	2	718	15,809	------	------	------	Pre Area #2
3	SCS Runoff	2.451	2	716	5,184	------	------	------	Pre Area #3
4	SCS Runoff	1.431	2	716	3,054	------	------	------	Post Area #1
5	SCS Runoff	2.502	2	716	5,182	------	------	------	Post Area #2
6	SCS Runoff	1.577	2	716	3,309	------	------	------	Post Area #3
7	SCS Runoff	7.254	2	716	15,343	------	------	------	Post Area #1A
8	Reservoir	4.279	2	722	15,340	7	94.51	4,268	Route Array
9	Diversion1	0.636	2	722	10,884	8	------	------	Flow to WQv
10	Diversion2	3.642	2	722	4,457	8	------	------	Bypass flow
11	Combine	11.86	2	718	27,142	1, 2, 3,	------	------	Pre Combined flow to CSO
12	Combine	8.967	2	718	26,885	4, 5, 6, 9, 10,	------	------	Post Combined flow to CSO

Hydrograph Report

Hyd. No. 1

Pre Area #1

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.784 cfs
Storm frequency	=	25 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	6,149 cuft
Drainage area	=	0.519 ac	Curve number	=	94
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	6.20 min
Total precip.	=	4.16 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

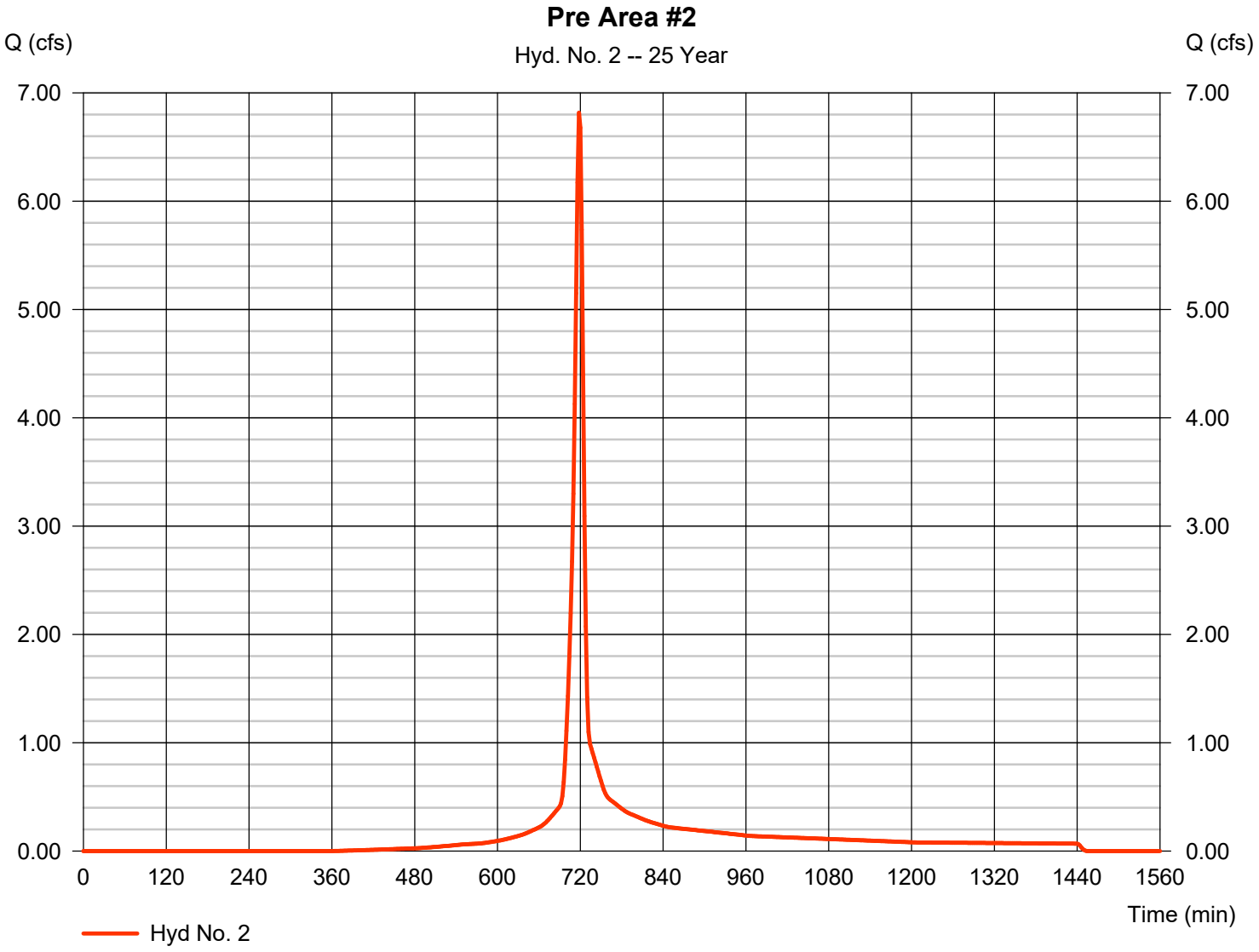


Hydrograph Report

Hyd. No. 2

Pre Area #2

Hydrograph type	=	SCS Runoff	Peak discharge	=	6.816 cfs
Storm frequency	=	25 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	15,809 cuft
Drainage area	=	1.618 ac	Curve number	=	86
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	7.90 min
Total precip.	=	4.16 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

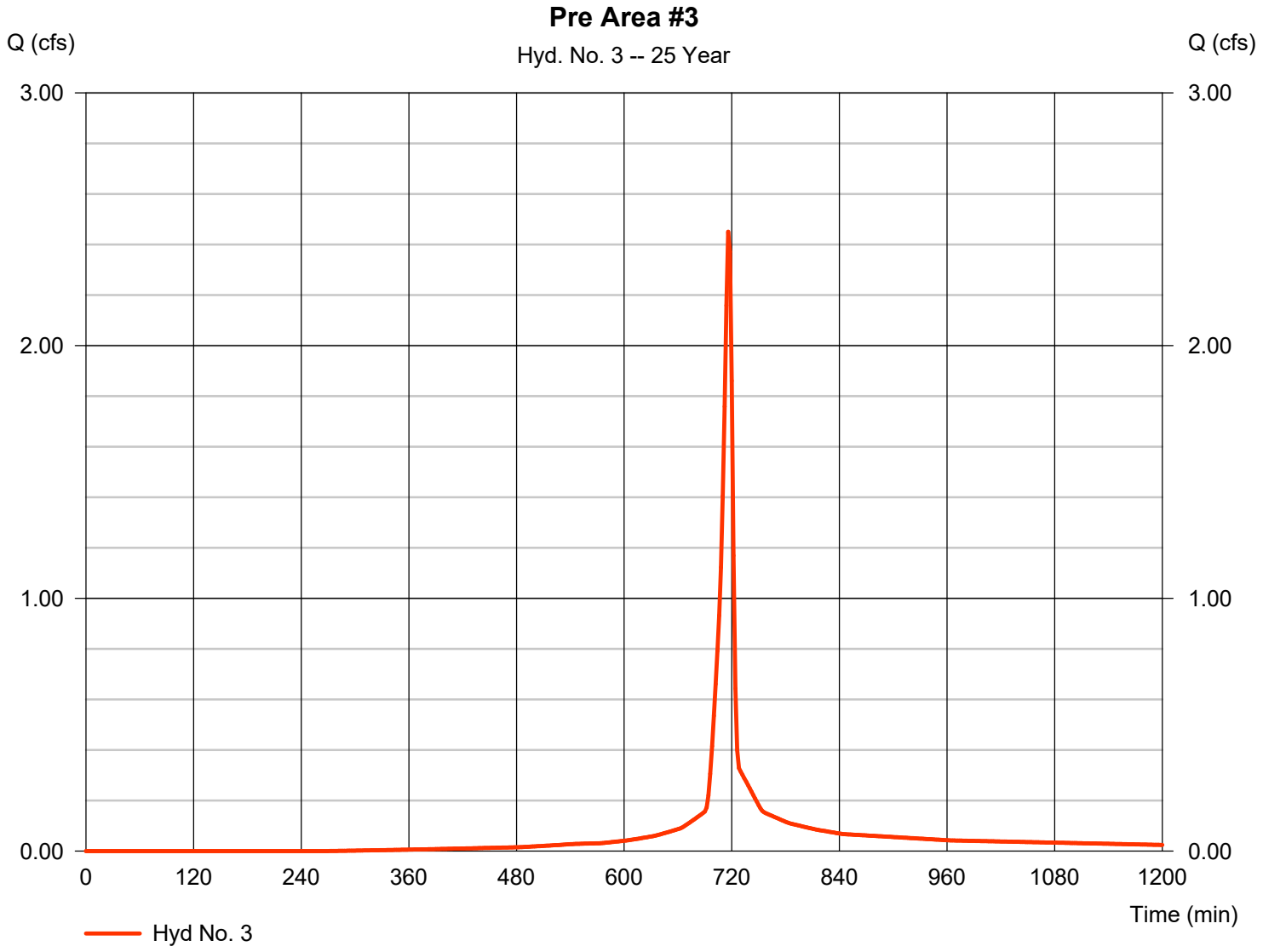


Hydrograph Report

Hyd. No. 3

Pre Area #3

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.451 cfs
Storm frequency	=	25 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	5,184 cuft
Drainage area	=	0.496 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	6.10 min
Total precip.	=	4.16 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

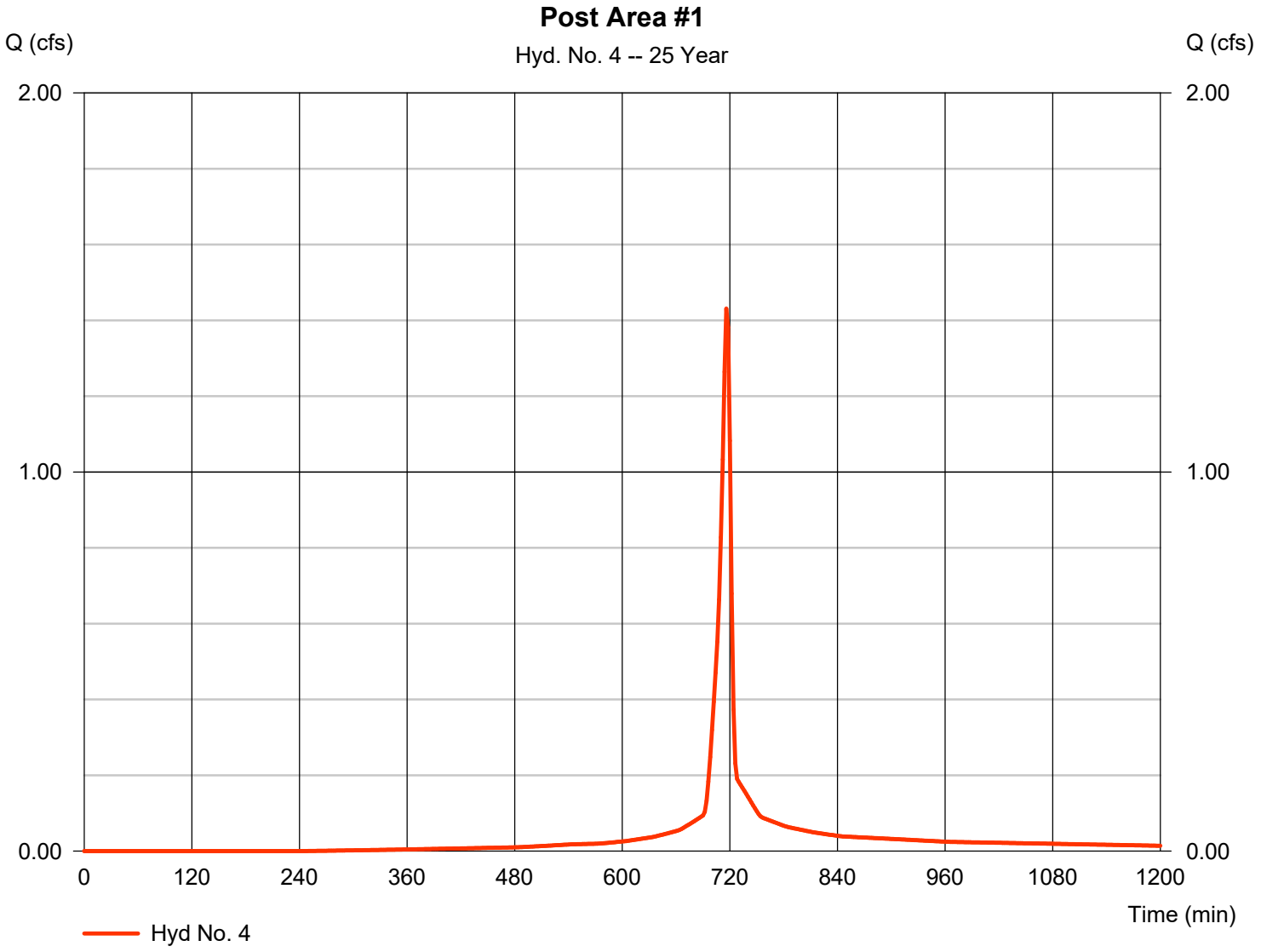


Hydrograph Report

Hyd. No. 4

Post Area #1

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.431 cfs
Storm frequency	=	25 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	3,054 cuft
Drainage area	=	0.283 ac	Curve number	=	91
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	4.16 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

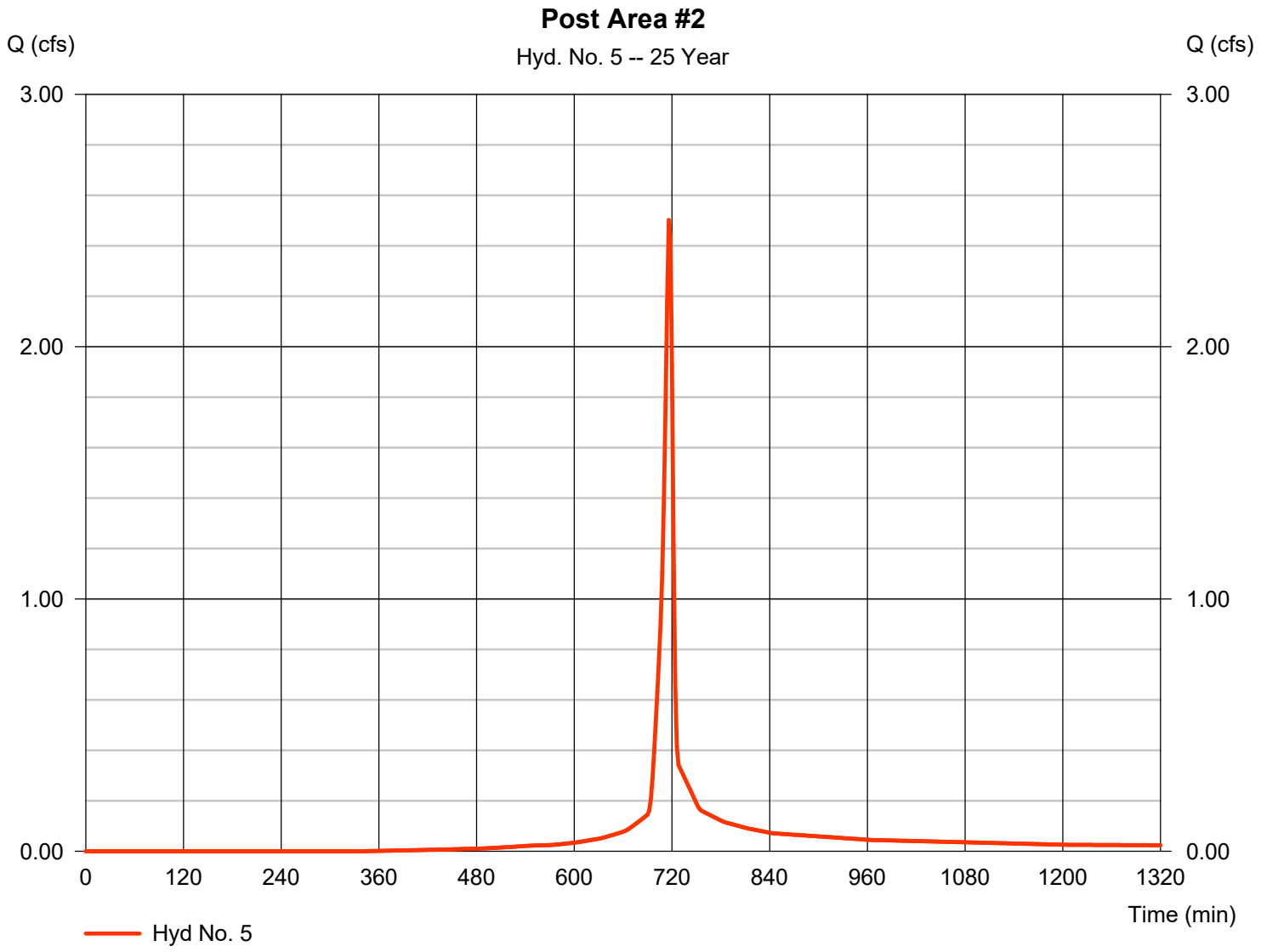


Hydrograph Report

Hyd. No. 5

Post Area #2

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.502 cfs
Storm frequency	=	25 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	5,182 cuft
Drainage area	=	0.547 ac	Curve number	=	87
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	4.16 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

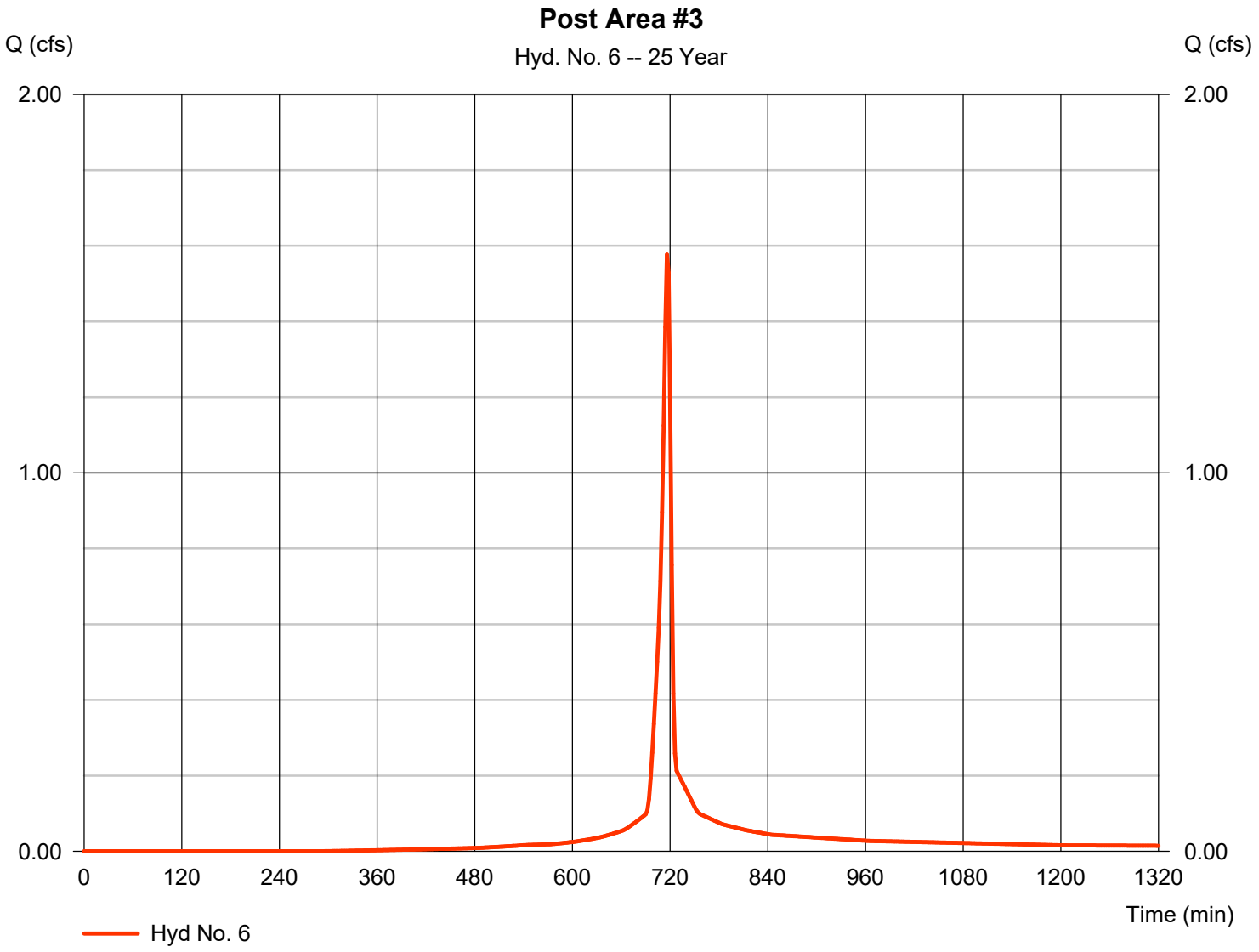


Hydrograph Report

Hyd. No. 6

Post Area #3

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.577 cfs
Storm frequency	=	25 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	3,309 cuft
Drainage area	=	0.327 ac	Curve number	=	89
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	4.16 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

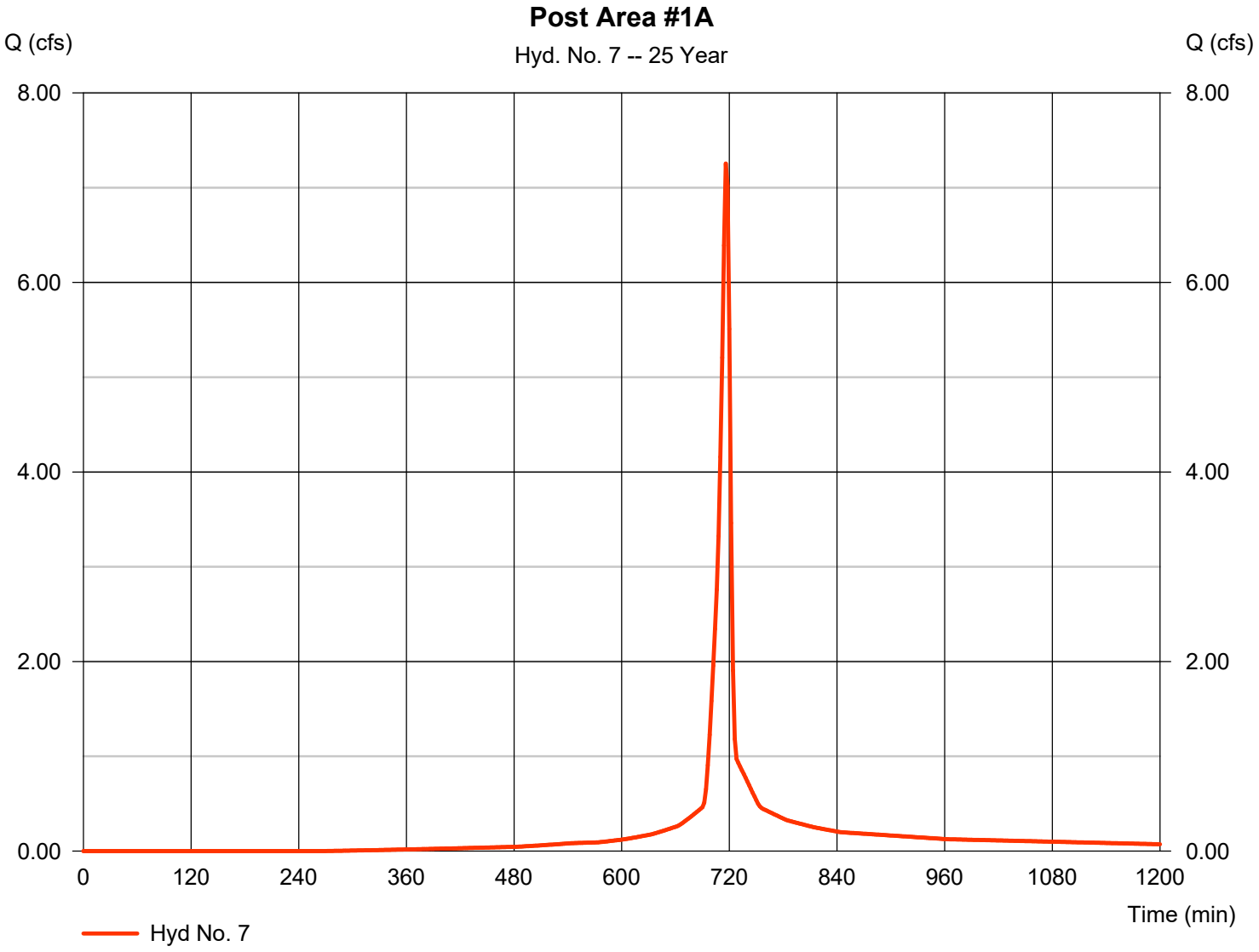


Hydrograph Report

Hyd. No. 7

Post Area #1A

Hydrograph type	=	SCS Runoff	Peak discharge	=	7.254 cfs
Storm frequency	=	25 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	15,343 cuft
Drainage area	=	1.468 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	4.16 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



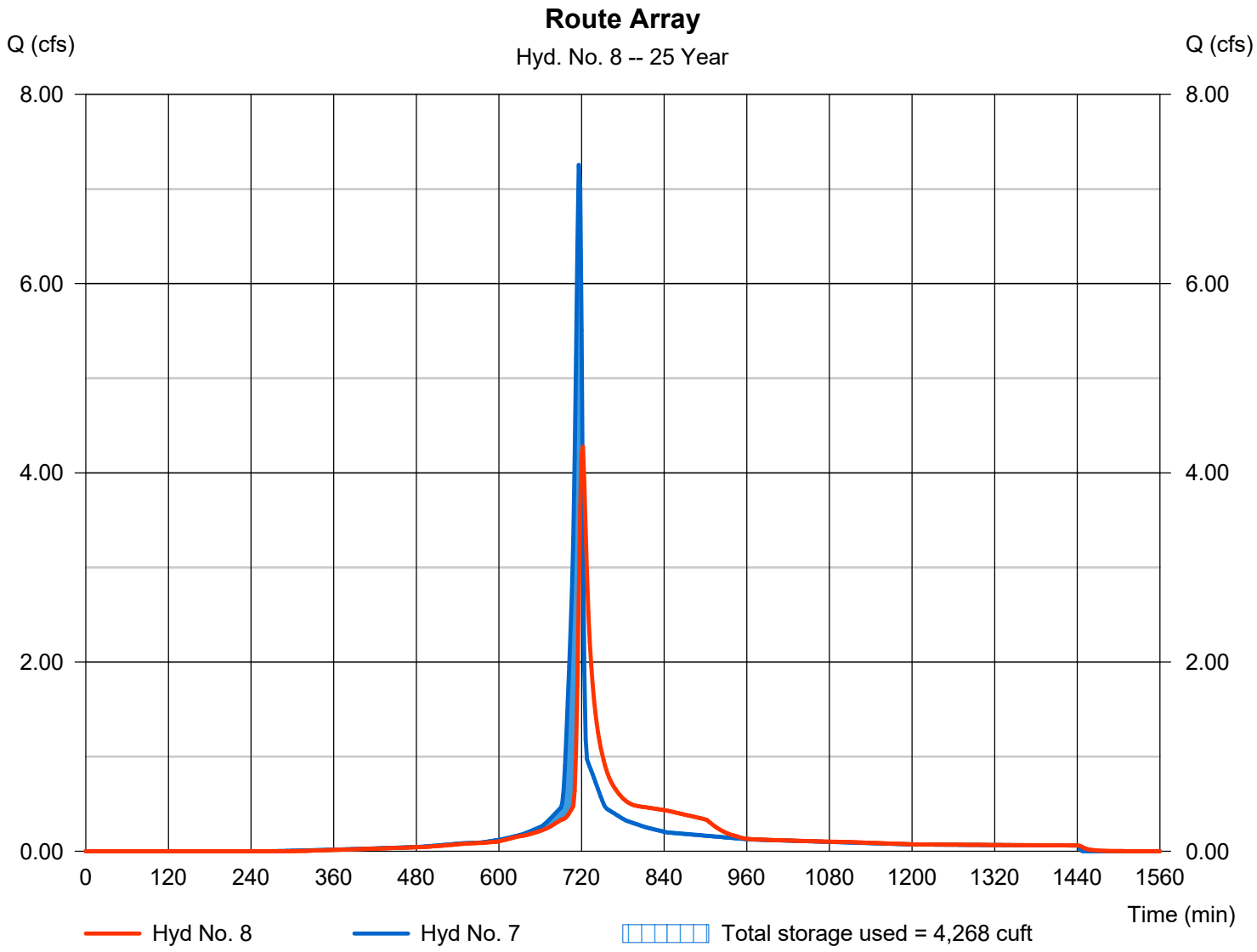
Hydrograph Report

Hyd. No. 8

Route Array

Hydrograph type	=	Reservoir	Peak discharge	=	4.279 cfs
Storm frequency	=	25 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	15,340 cuft
Inflow hyd. No.	=	7 - Post Area #1A	Max. Elevation	=	94.51 ft
Reservoir name	=	Array	Max. Storage	=	4,268 cuft

Storage Indication method used.

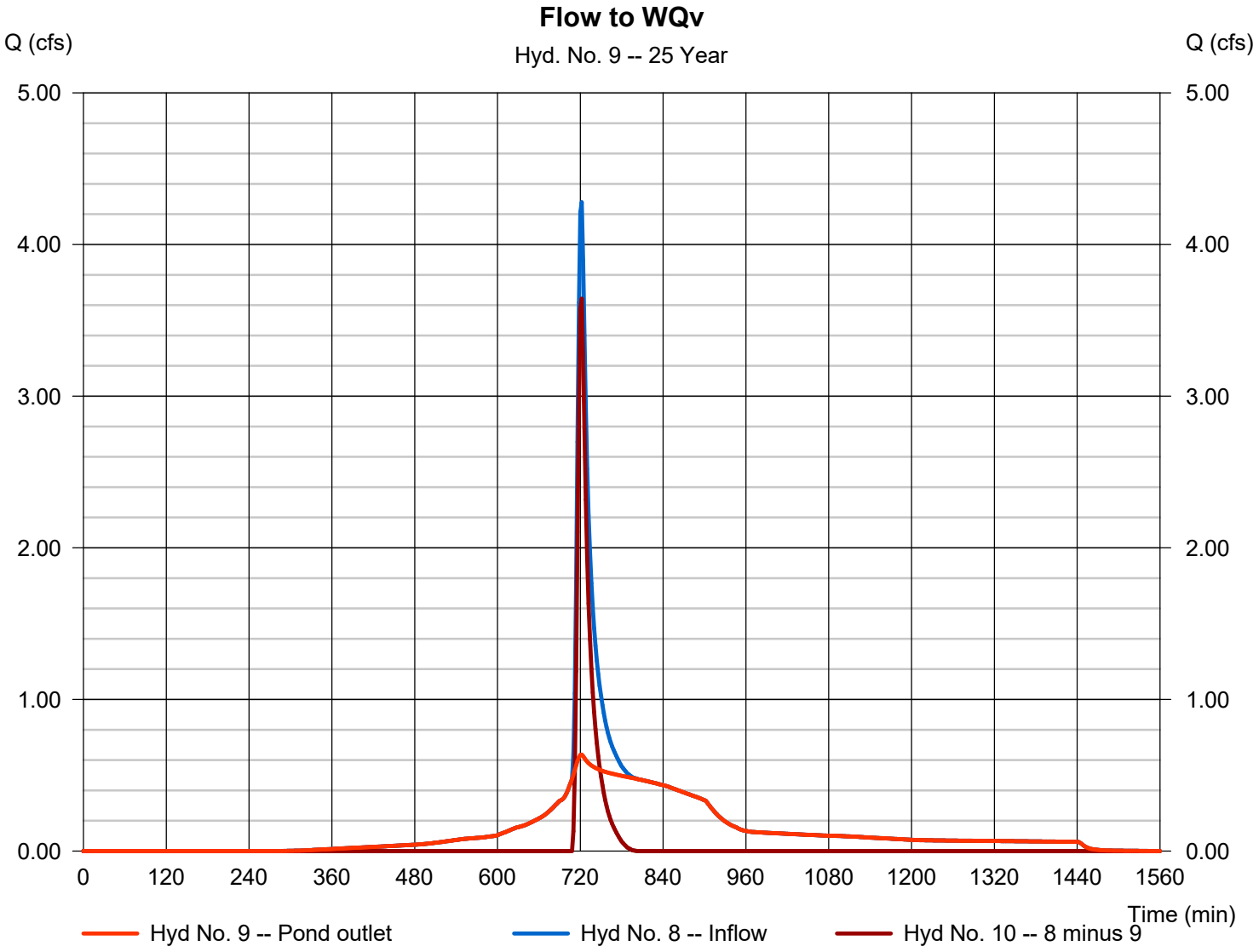


Hydrograph Report

Hyd. No. 9

Flow to WQv

Hydrograph type	= Diversion1	Peak discharge	= 0.636 cfs
Storm frequency	= 25 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 10,884 cuft
Inflow hydrograph	= 8 - Route Array	2nd diverted hyd.	= 10
Diversion method	= Pond - Array	Pond structure	= Culv/Orf A

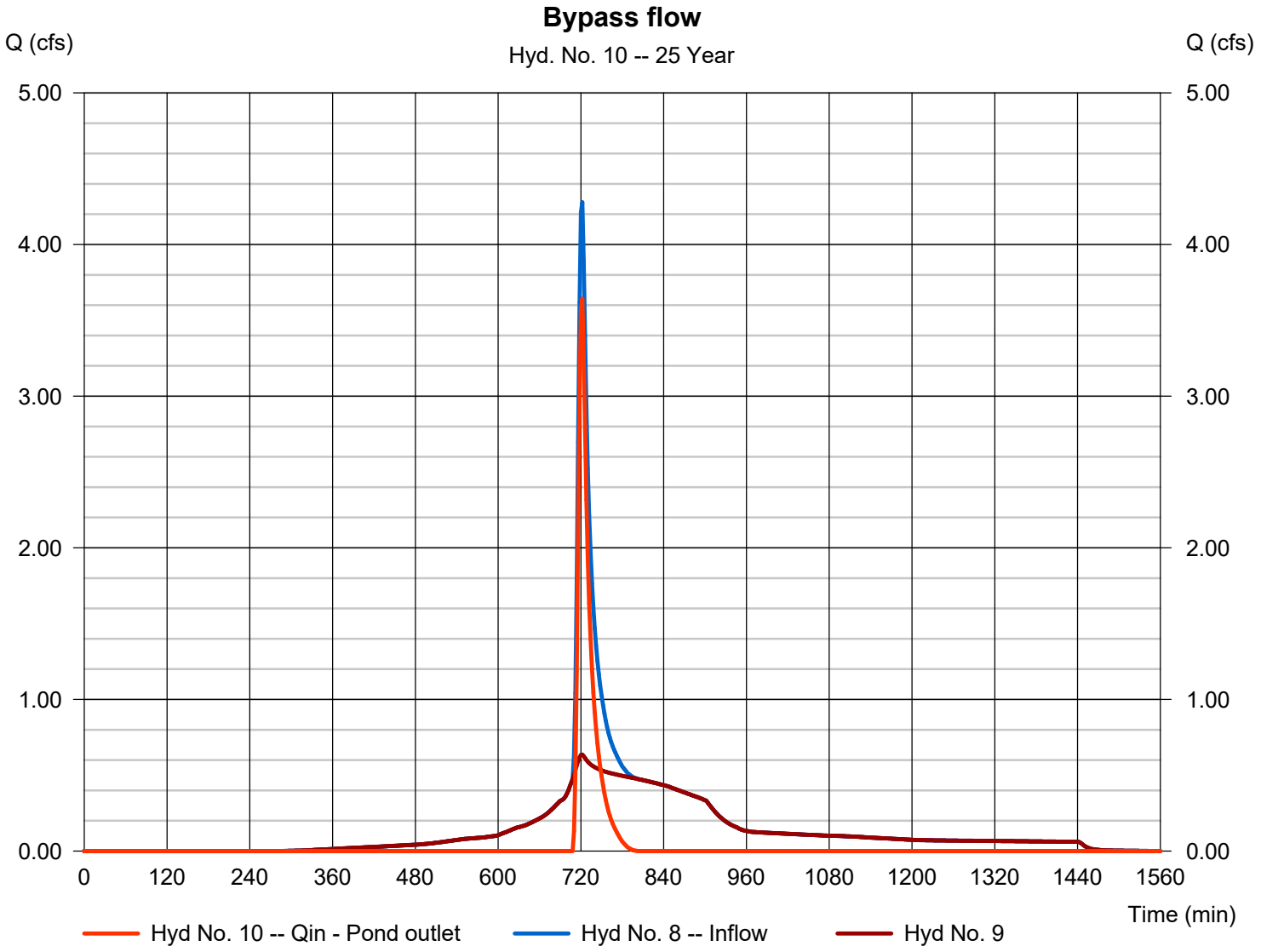


Hydrograph Report

Hyd. No. 10

Bypass flow

Hydrograph type	= Diversion2	Peak discharge	= 3.642 cfs
Storm frequency	= 25 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 4,457 cuft
Inflow hydrograph	= 8 - Route Array	2nd diverted hyd.	= 9
Diversion method	= Pond - Array	Pond structure	= Culv/Orf A

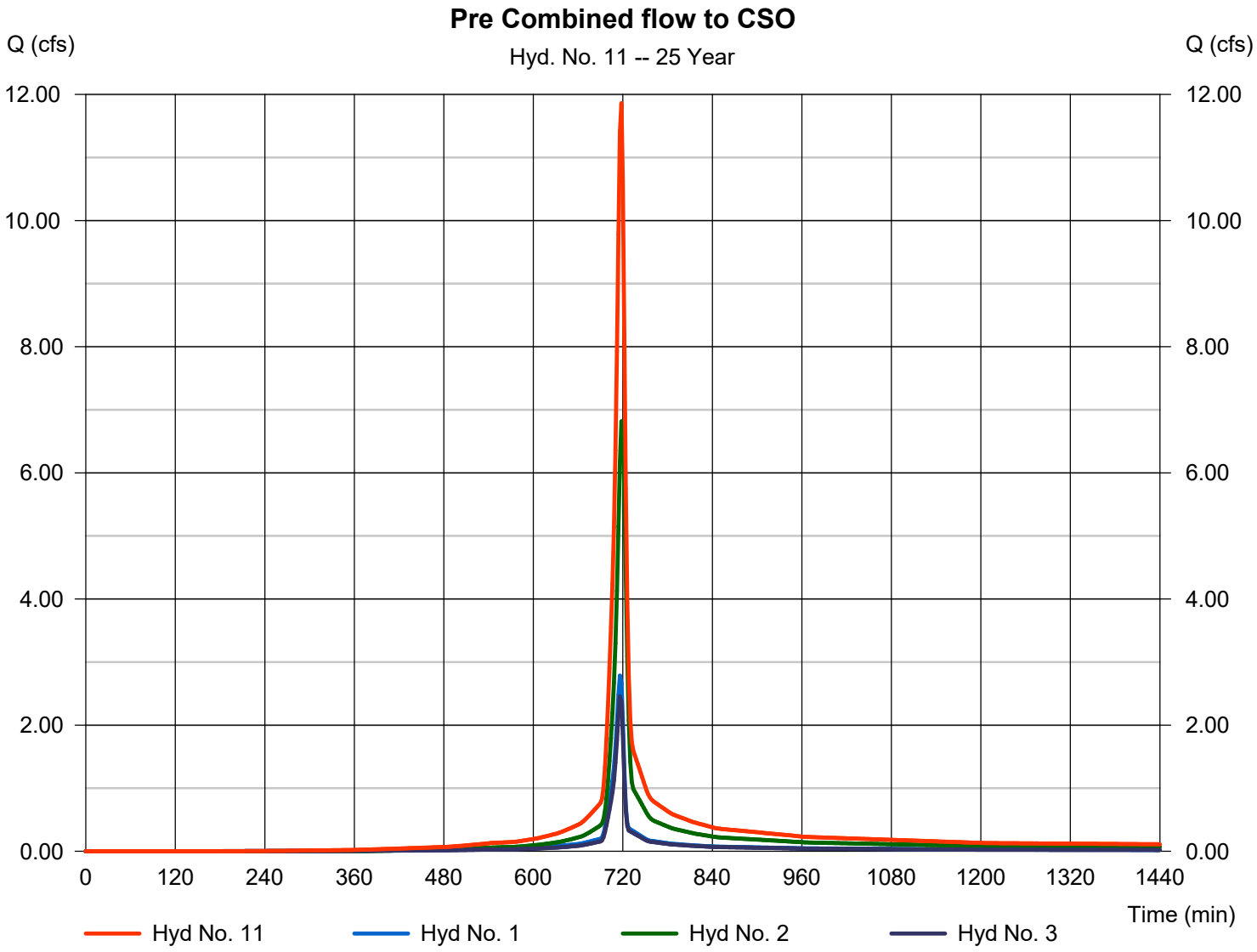


Hydrograph Report

Hyd. No. 11

Pre Combined flow to CSO

Hydrograph type	=	Combine	Peak discharge	=	11.86 cfs
Storm frequency	=	25 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	27,142 cuft
Inflow hyds.	=	1, 2, 3	Contrib. drain. area	=	2.633 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

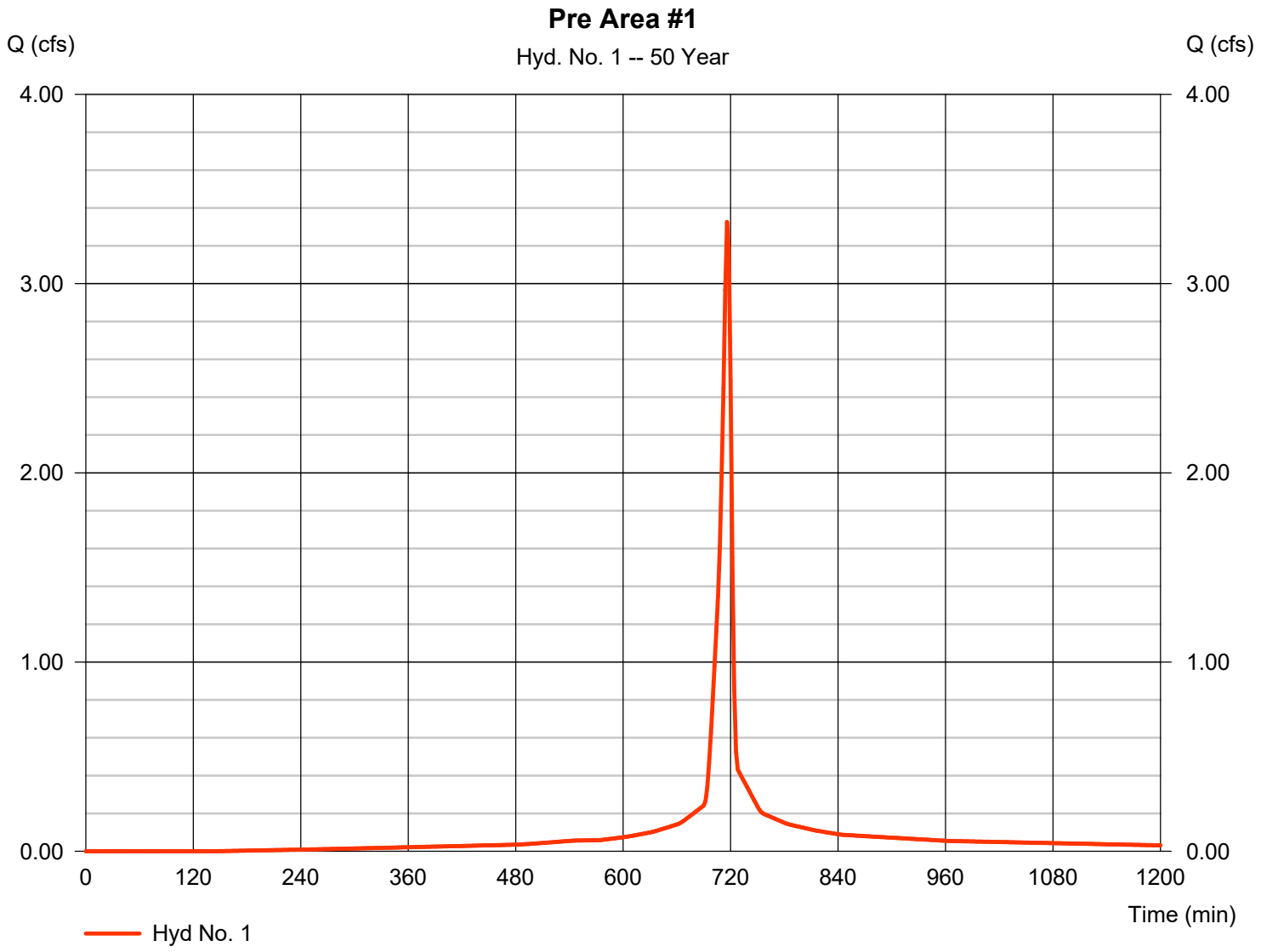
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	3.326	2	716	7,435	------	------	------	Pre Area #1
2	SCS Runoff	8.466	2	718	19,815	------	------	------	Pre Area #2
3	SCS Runoff	2.979	2	716	6,380	------	------	------	Pre Area #3
4	SCS Runoff	1.731	2	716	3,742	------	------	------	Post Area #1
5	SCS Runoff	3.087	2	716	6,465	------	------	------	Post Area #2
6	SCS Runoff	1.926	2	716	4,091	------	------	------	Post Area #3
7	SCS Runoff	8.816	2	716	18,884	------	------	------	Post Area #1A
8	Reservoir	5.514	2	720	18,881	7	94.80	4,924	Route Array
9	Diversion1	0.675	2	720	12,530	8	------	------	Flow to WQv
10	Diversion2	4.840	2	720	6,351	8	------	------	Bypass flow
11	Combine	14.53	2	718	33,630	1, 2, 3,	------	------	Pre Combined flow to CSO
12	Combine	11.61	2	718	33,179	4, 5, 6, 9, 10,	------	------	Post Combined flow to CSO

Hydrograph Report

Hyd. No. 1

Pre Area #1

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.326 cfs
Storm frequency	=	50 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	7,435 cuft
Drainage area	=	0.519 ac	Curve number	=	94
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	6.20 min
Total precip.	=	4.90 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

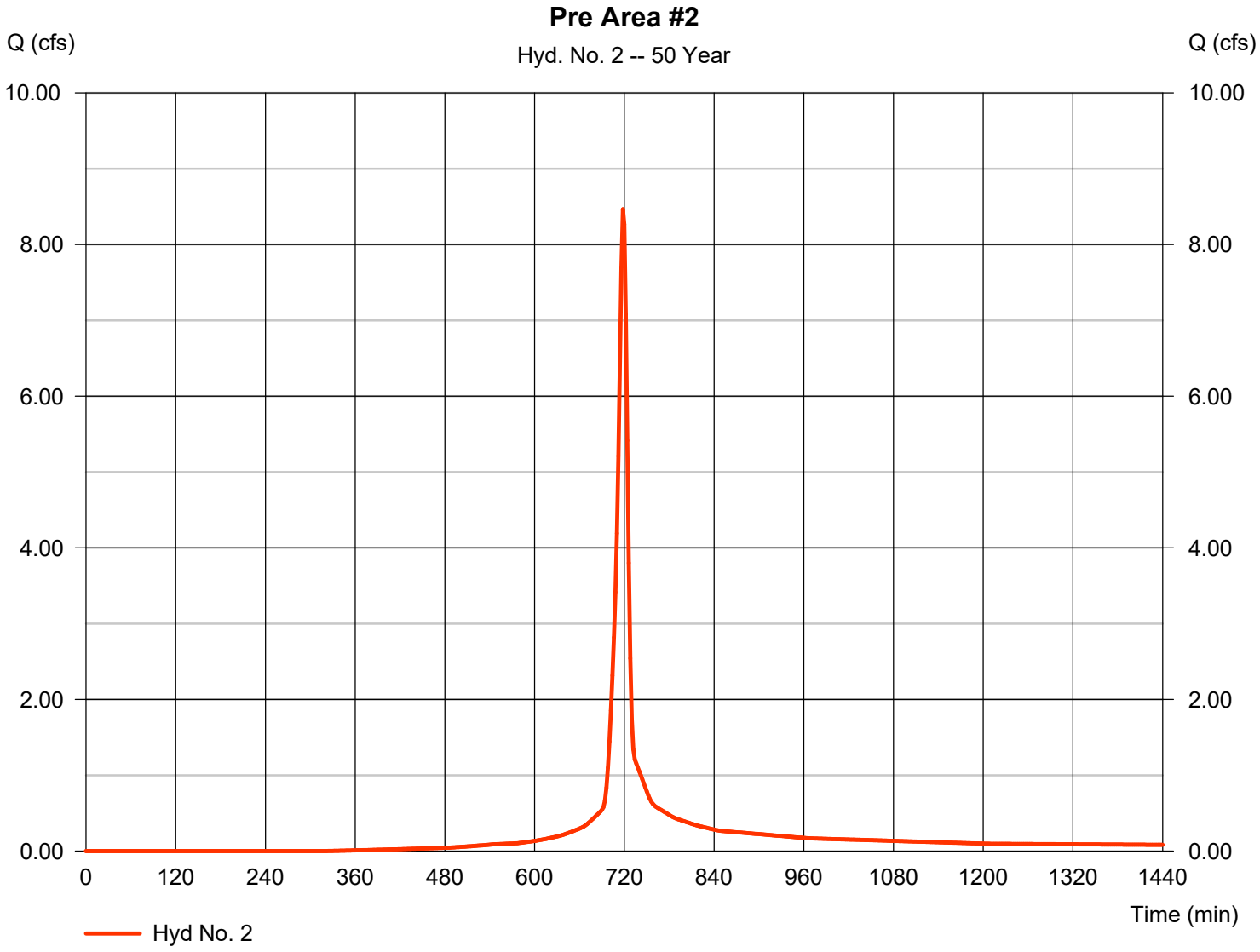


Hydrograph Report

Hyd. No. 2

Pre Area #2

Hydrograph type	=	SCS Runoff	Peak discharge	=	8.466 cfs
Storm frequency	=	50 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	19,815 cuft
Drainage area	=	1.618 ac	Curve number	=	86
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	7.90 min
Total precip.	=	4.90 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

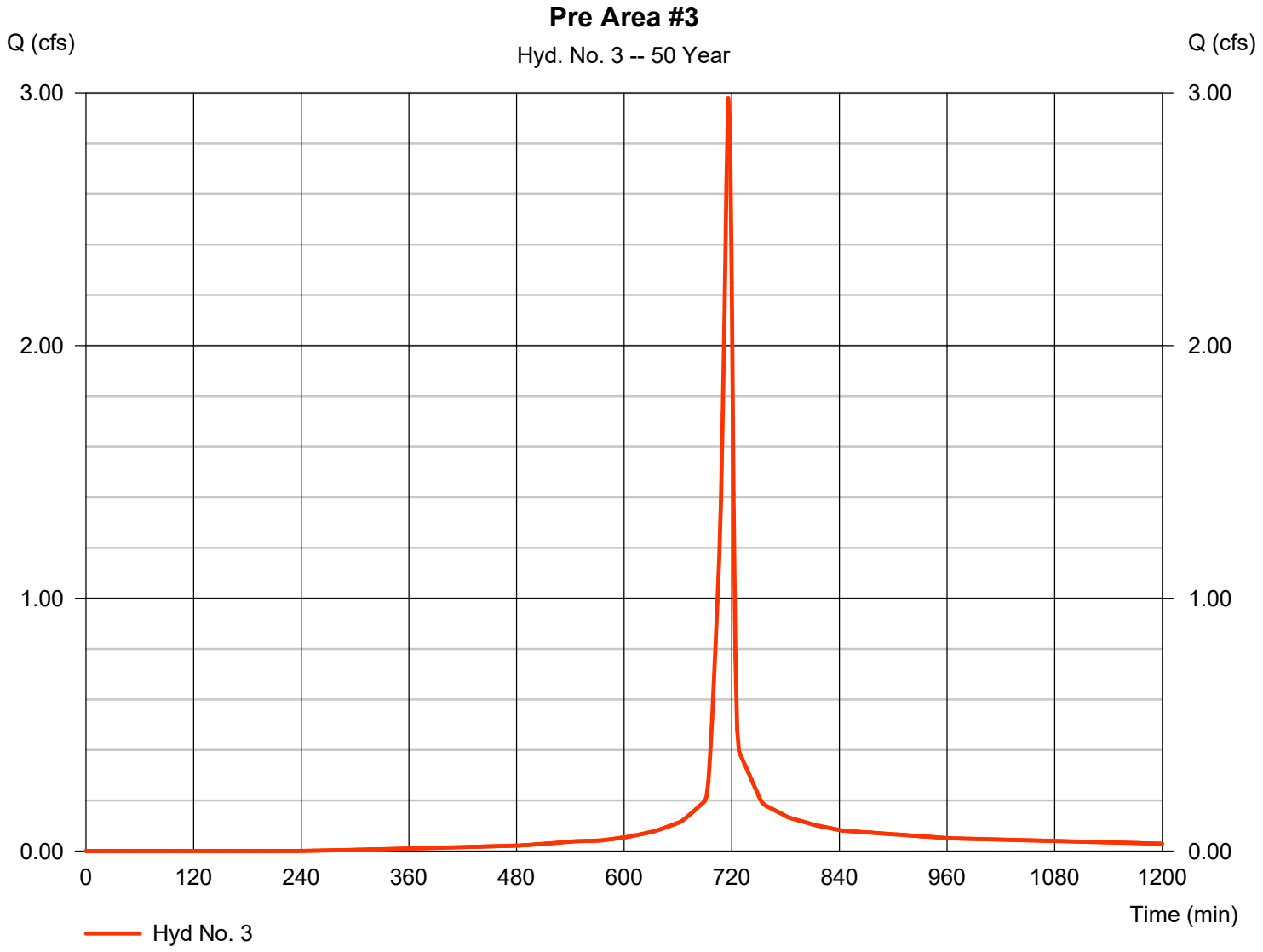


Hydrograph Report

Hyd. No. 3

Pre Area #3

Hydrograph type	= SCS Runoff	Peak discharge	= 2.979 cfs
Storm frequency	= 50 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 6,380 cuft
Drainage area	= 0.496 ac	Curve number	= 90
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 6.10 min
Total precip.	= 4.90 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

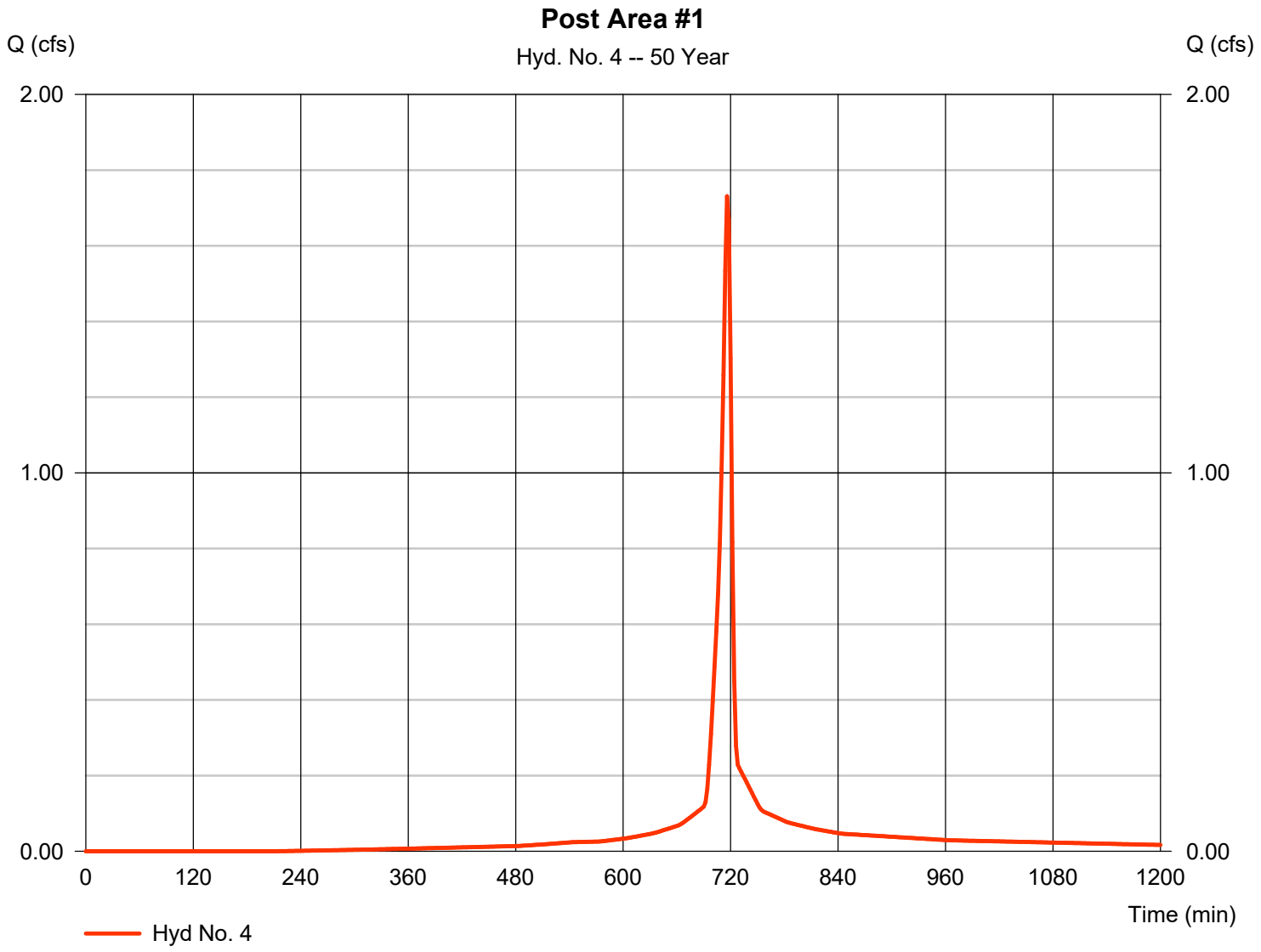


Hydrograph Report

Hyd. No. 4

Post Area #1

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.731 cfs
Storm frequency	=	50 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	3,742 cuft
Drainage area	=	0.283 ac	Curve number	=	91
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	4.90 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

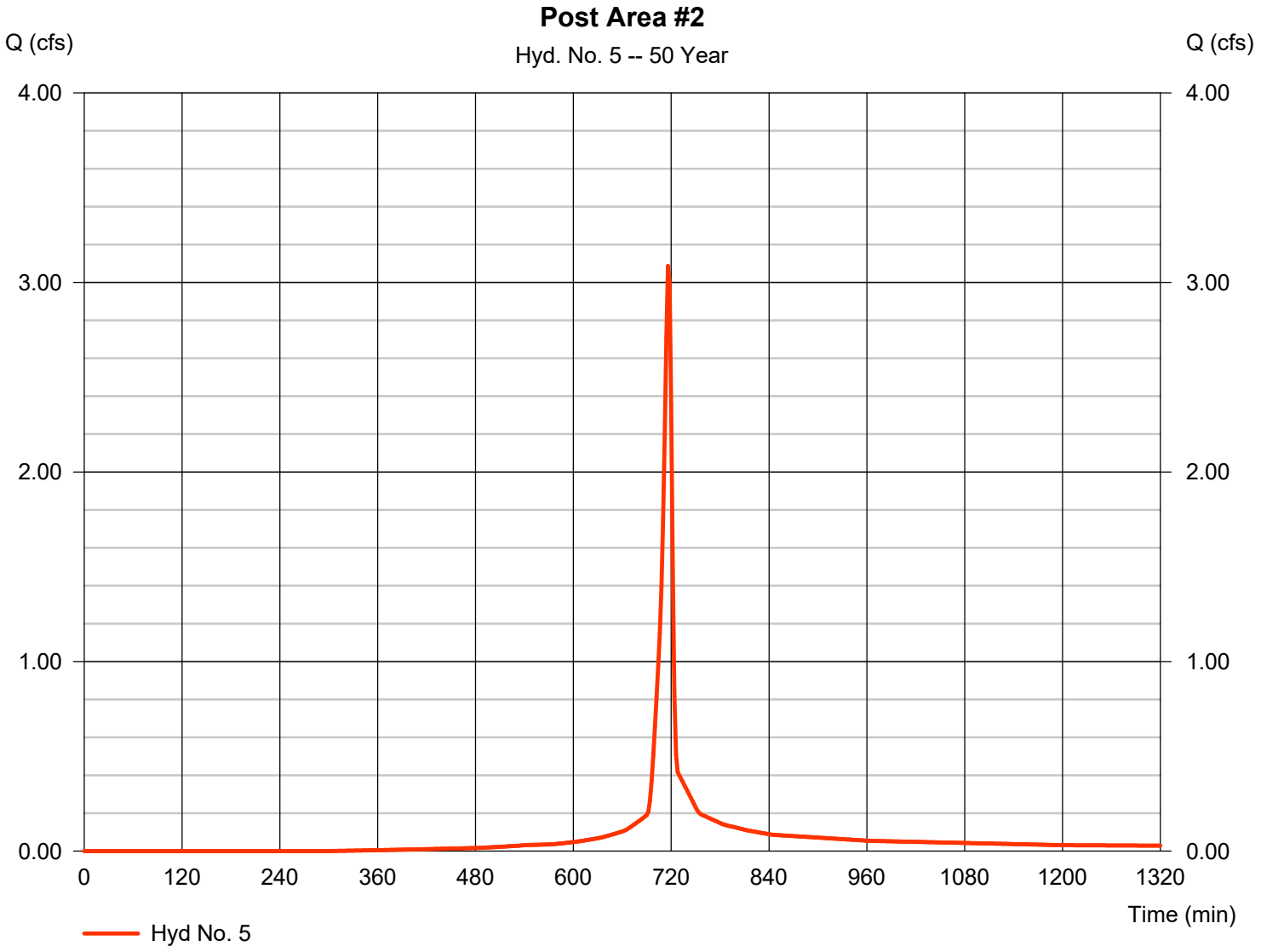


Hydrograph Report

Hyd. No. 5

Post Area #2

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.087 cfs
Storm frequency	=	50 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	6,465 cuft
Drainage area	=	0.547 ac	Curve number	=	87
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	4.90 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

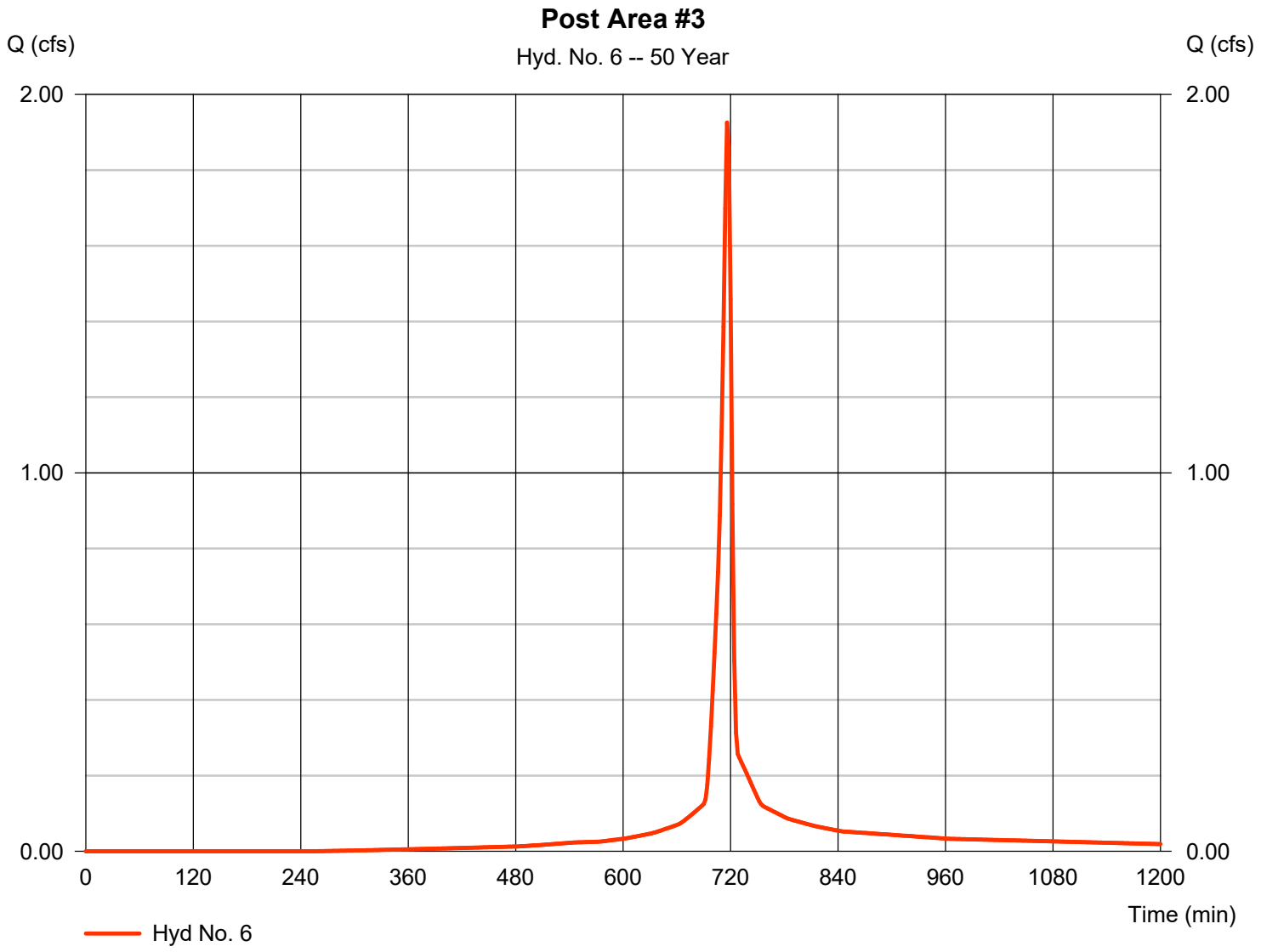


Hydrograph Report

Hyd. No. 6

Post Area #3

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.926 cfs
Storm frequency	=	50 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	4,091 cuft
Drainage area	=	0.327 ac	Curve number	=	89
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	4.90 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

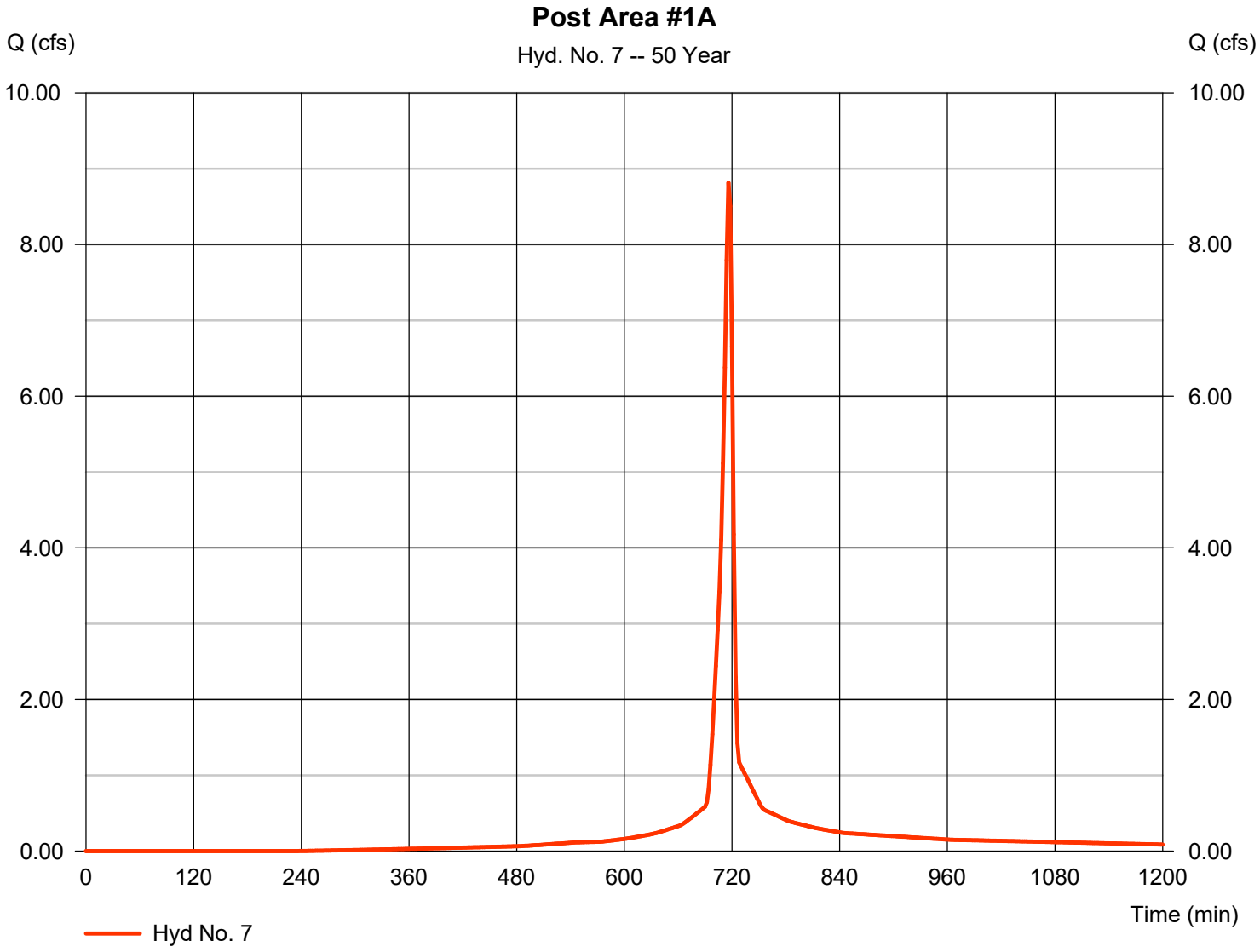


Hydrograph Report

Hyd. No. 7

Post Area #1A

Hydrograph type	=	SCS Runoff	Peak discharge	=	8.816 cfs
Storm frequency	=	50 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	18,884 cuft
Drainage area	=	1.468 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	4.90 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



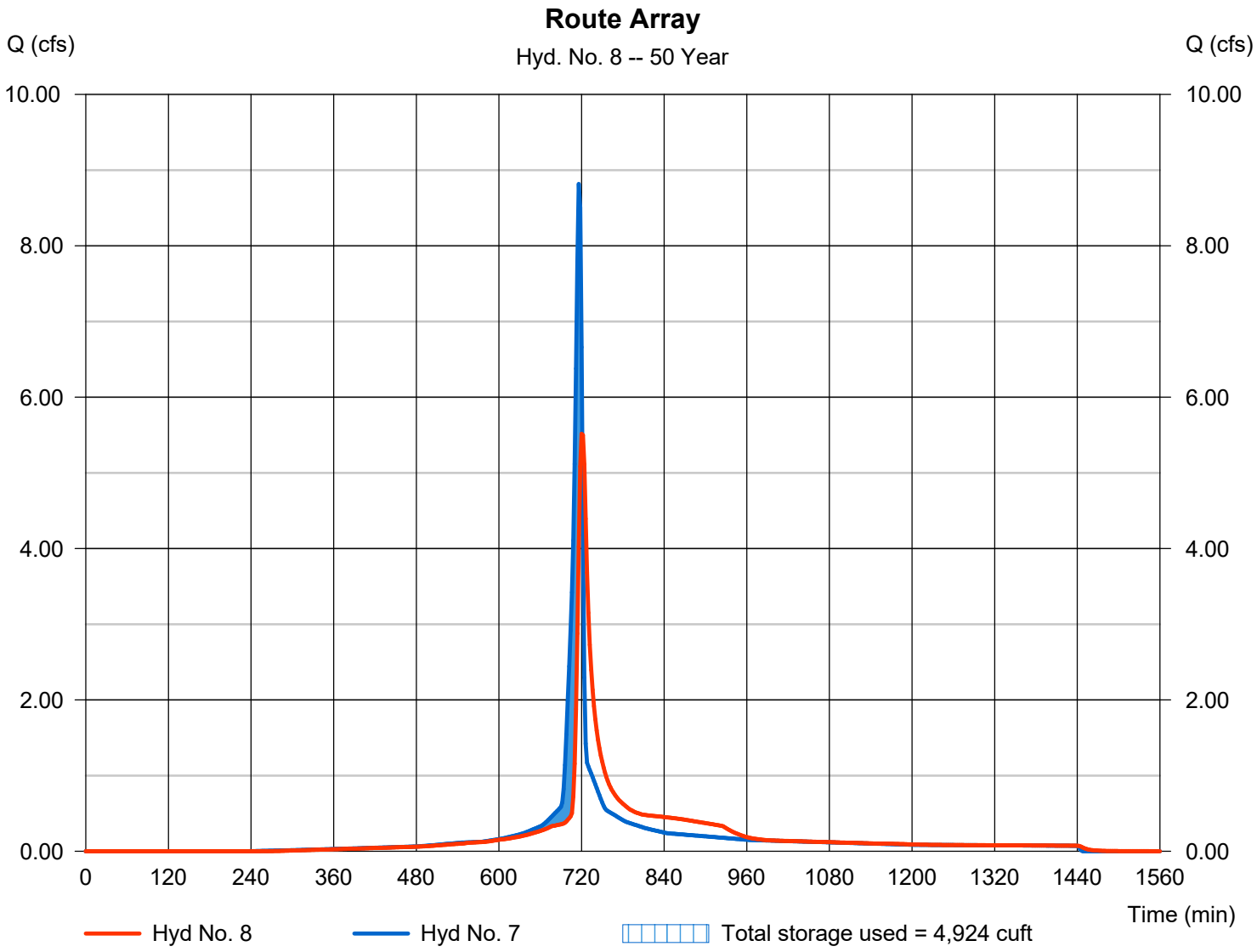
Hydrograph Report

Hyd. No. 8

Route Array

Hydrograph type	=	Reservoir	Peak discharge	=	5.514 cfs
Storm frequency	=	50 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	18,881 cuft
Inflow hyd. No.	=	7 - Post Area #1A	Max. Elevation	=	94.80 ft
Reservoir name	=	Array	Max. Storage	=	4,924 cuft

Storage Indication method used.

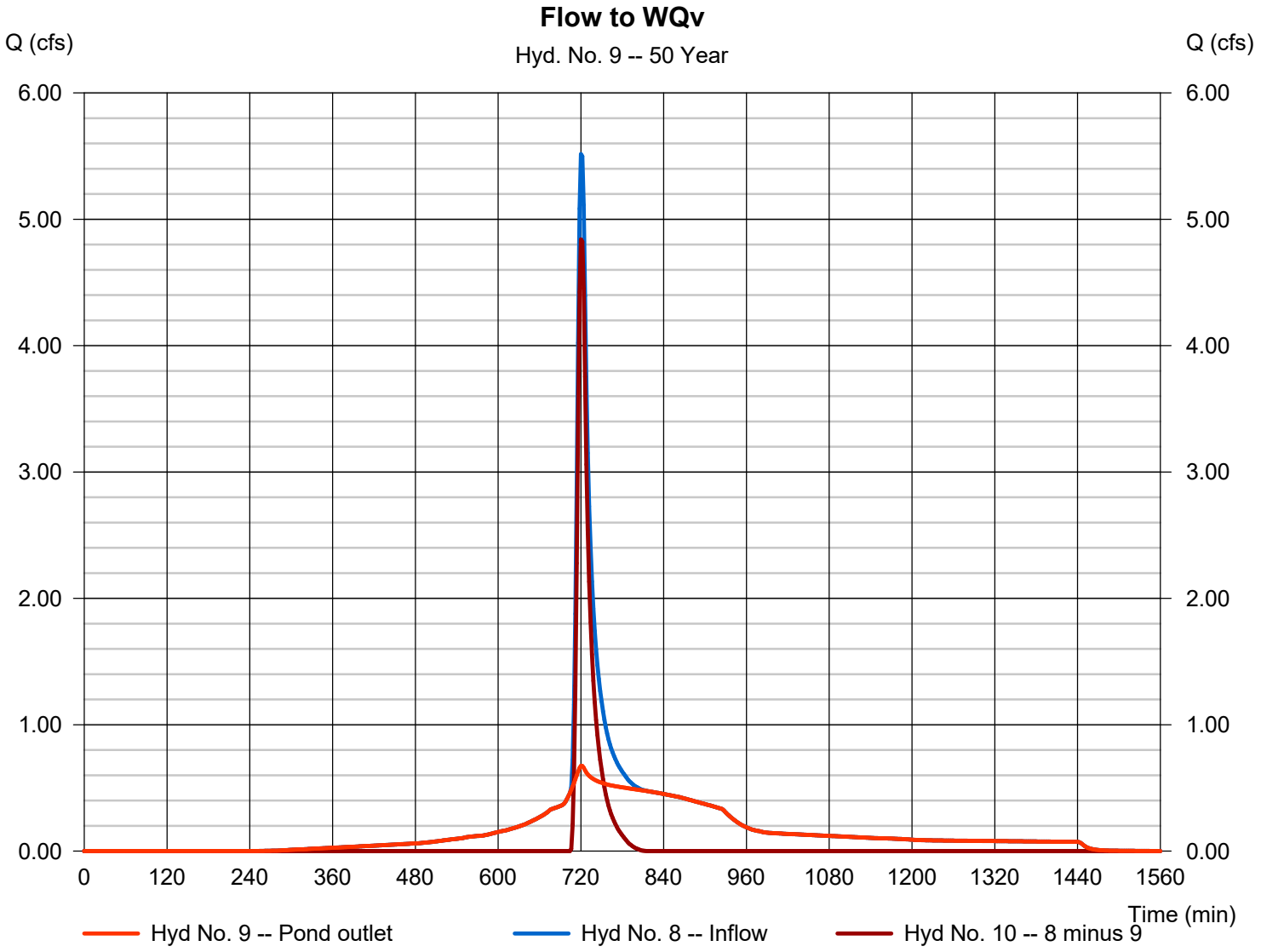


Hydrograph Report

Hyd. No. 9

Flow to WQv

Hydrograph type	= Diversion1	Peak discharge	= 0.675 cfs
Storm frequency	= 50 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 12,530 cuft
Inflow hydrograph	= 8 - Route Array	2nd diverted hyd.	= 10
Diversion method	= Pond - Array	Pond structure	= Culv/Orf A

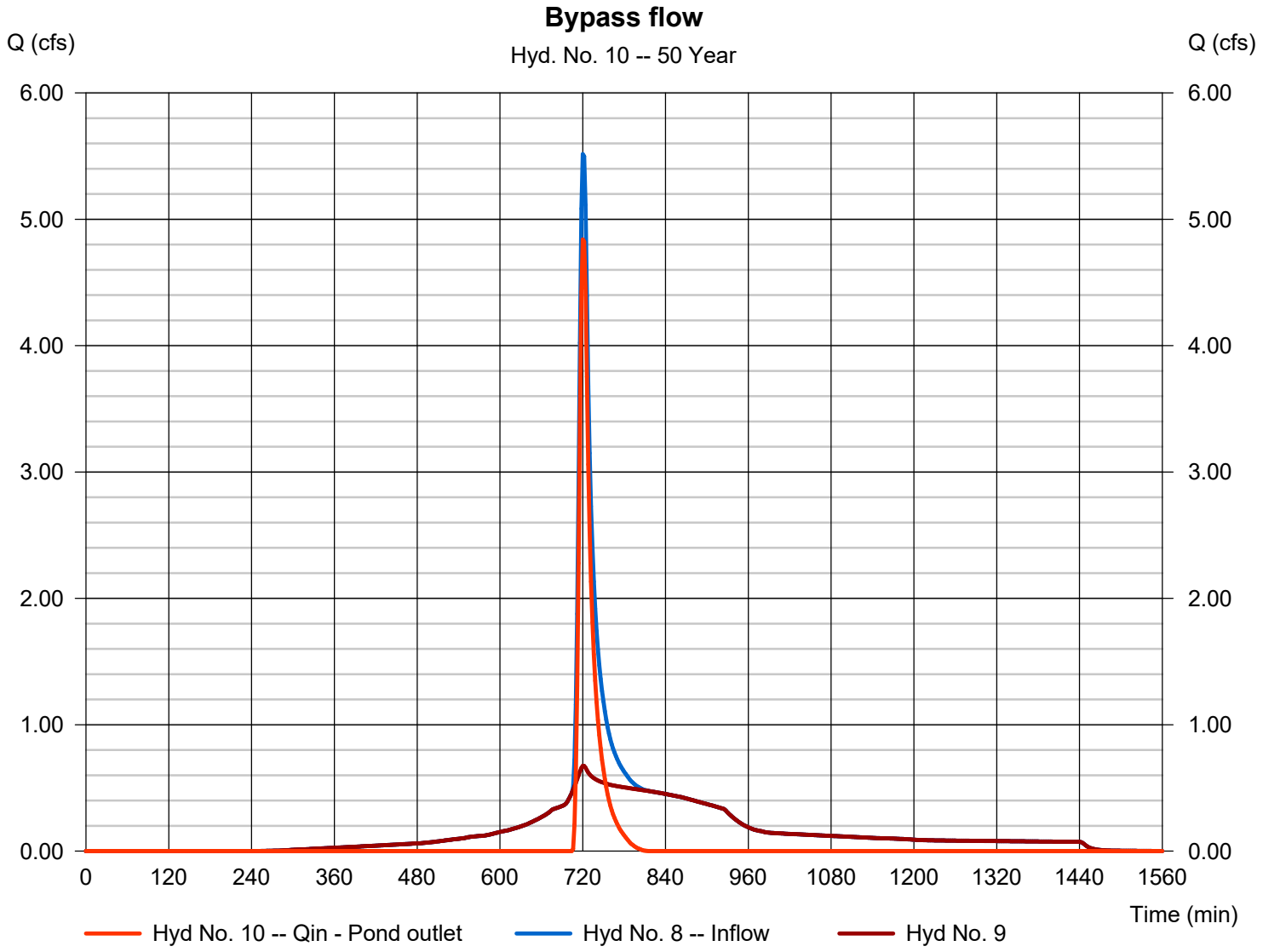


Hydrograph Report

Hyd. No. 10

Bypass flow

Hydrograph type	= Diversion2	Peak discharge	= 4.840 cfs
Storm frequency	= 50 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 6,351 cuft
Inflow hydrograph	= 8 - Route Array	2nd diverted hyd.	= 9
Diversion method	= Pond - Array	Pond structure	= Culv/Orf A

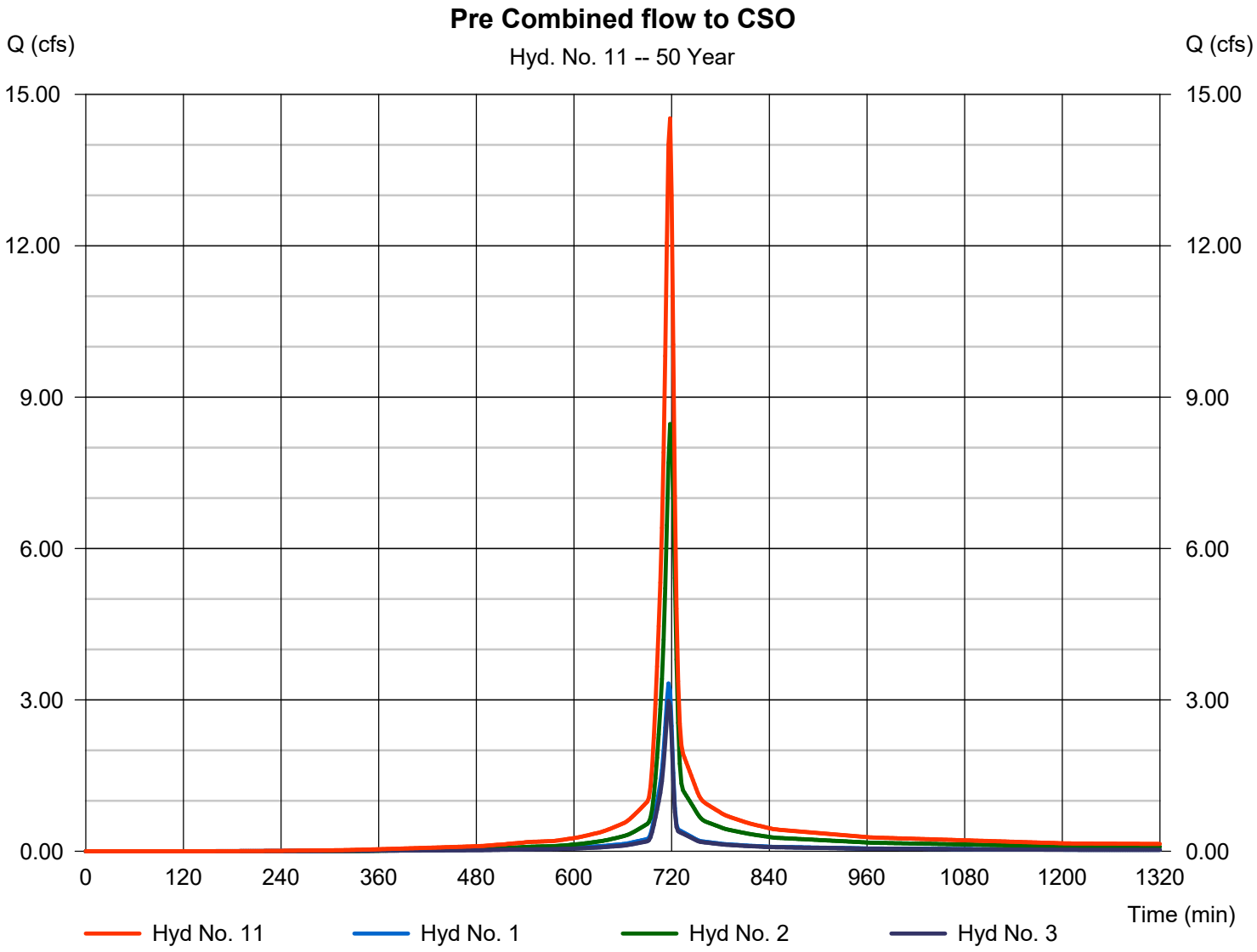


Hydrograph Report

Hyd. No. 11

Pre Combined flow to CSO

Hydrograph type	=	Combine	Peak discharge	=	14.53 cfs
Storm frequency	=	50 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	33,630 cuft
Inflow hyds.	=	1, 2, 3	Contrib. drain. area	=	2.633 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

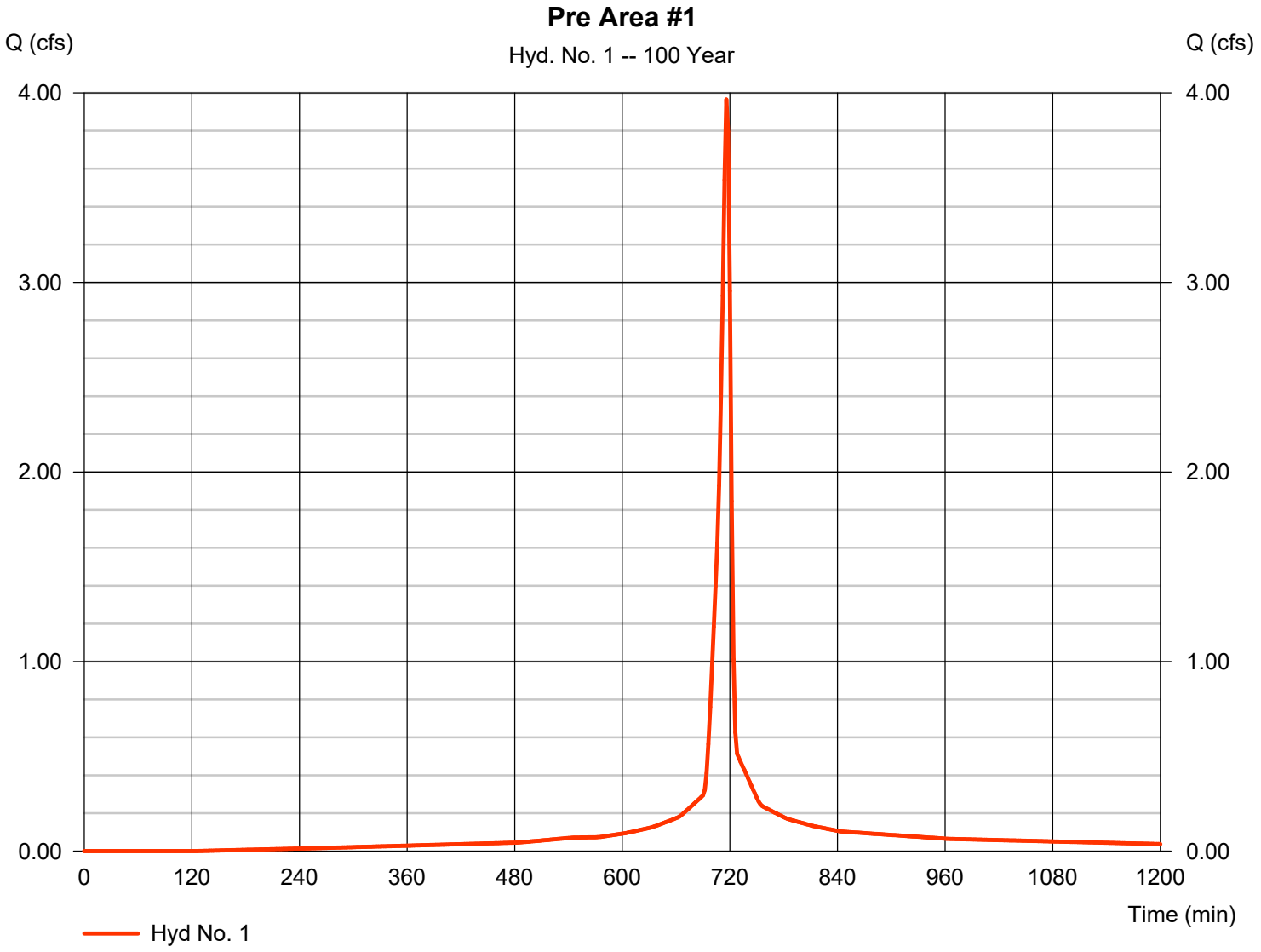
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	3.966	2	716	8,970	------	------	------	Pre Area #1
2	SCS Runoff	10.43	2	718	24,672	------	------	------	Pre Area #2
3	SCS Runoff	3.603	2	716	7,818	------	------	------	Pre Area #3
4	SCS Runoff	2.085	2	716	4,567	------	------	------	Post Area #1
5	SCS Runoff	3.781	2	716	8,018	------	------	------	Post Area #2
6	SCS Runoff	2.339	2	716	5,033	------	------	------	Post Area #3
7	SCS Runoff	10.66	2	716	23,139	------	------	------	Post Area #1A
8	Reservoir	6.988	2	720	23,137	7	95.25	5,713	Route Array
9	Diversion1	0.731	2	720	14,421	8	------	------	Flow to WQv
10	Diversion2	6.257	2	720	8,715	8	------	------	Bypass flow
11	Combine	17.69	2	718	41,461	1, 2, 3,	------	------	Pre Combined flow to CSO
12	Combine	14.38	2	718	40,754	4, 5, 6, 9, 10,	------	------	Post Combined flow to CSO

Hydrograph Report

Hyd. No. 1

Pre Area #1

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.966 cfs
Storm frequency	=	100 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	8,970 cuft
Drainage area	=	0.519 ac	Curve number	=	94
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	6.20 min
Total precip.	=	5.78 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

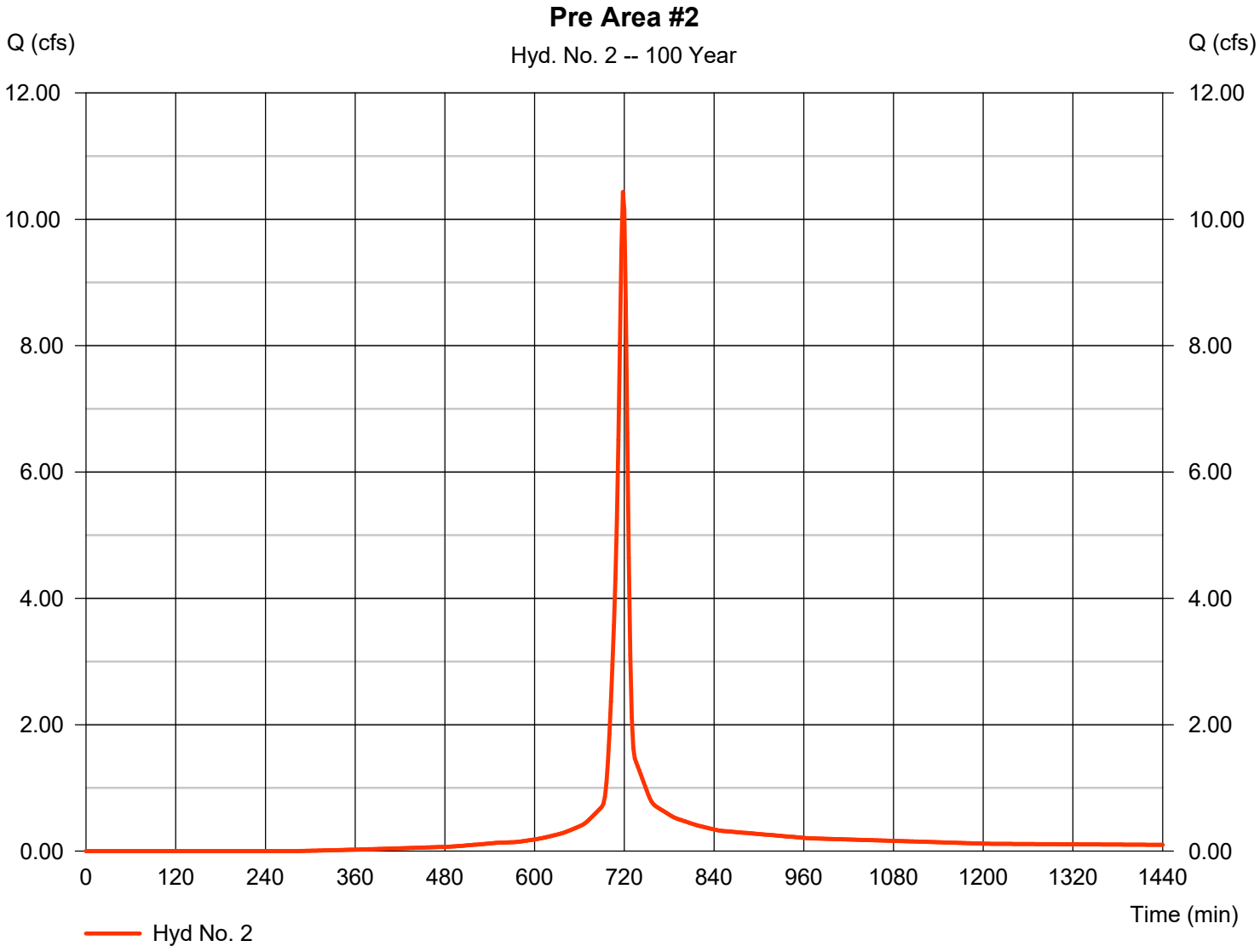


Hydrograph Report

Hyd. No. 2

Pre Area #2

Hydrograph type	=	SCS Runoff	Peak discharge	=	10.43 cfs
Storm frequency	=	100 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	24,672 cuft
Drainage area	=	1.618 ac	Curve number	=	86
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	7.90 min
Total precip.	=	5.78 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

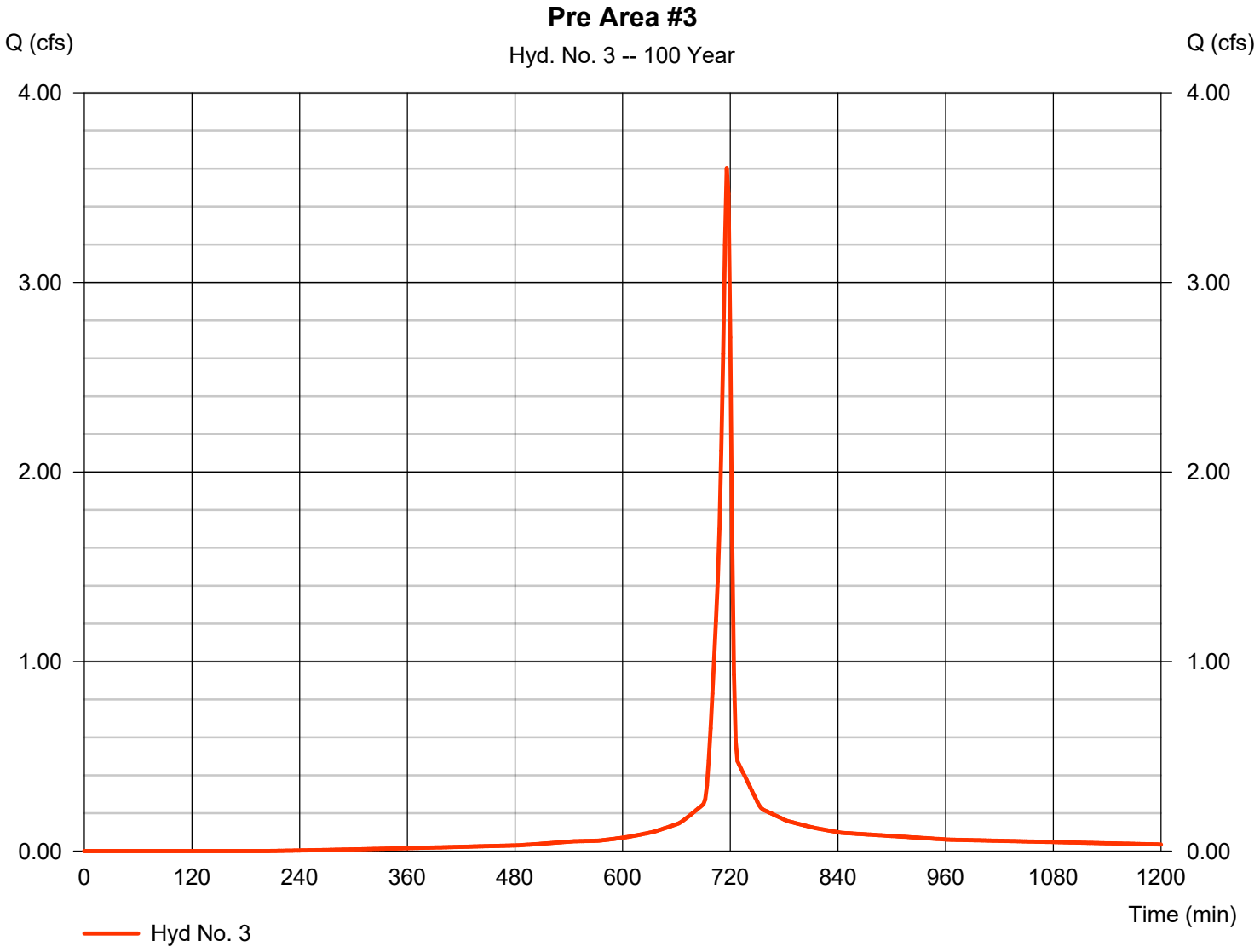


Hydrograph Report

Hyd. No. 3

Pre Area #3

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.603 cfs
Storm frequency	=	100 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	7,818 cuft
Drainage area	=	0.496 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	6.10 min
Total precip.	=	5.78 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

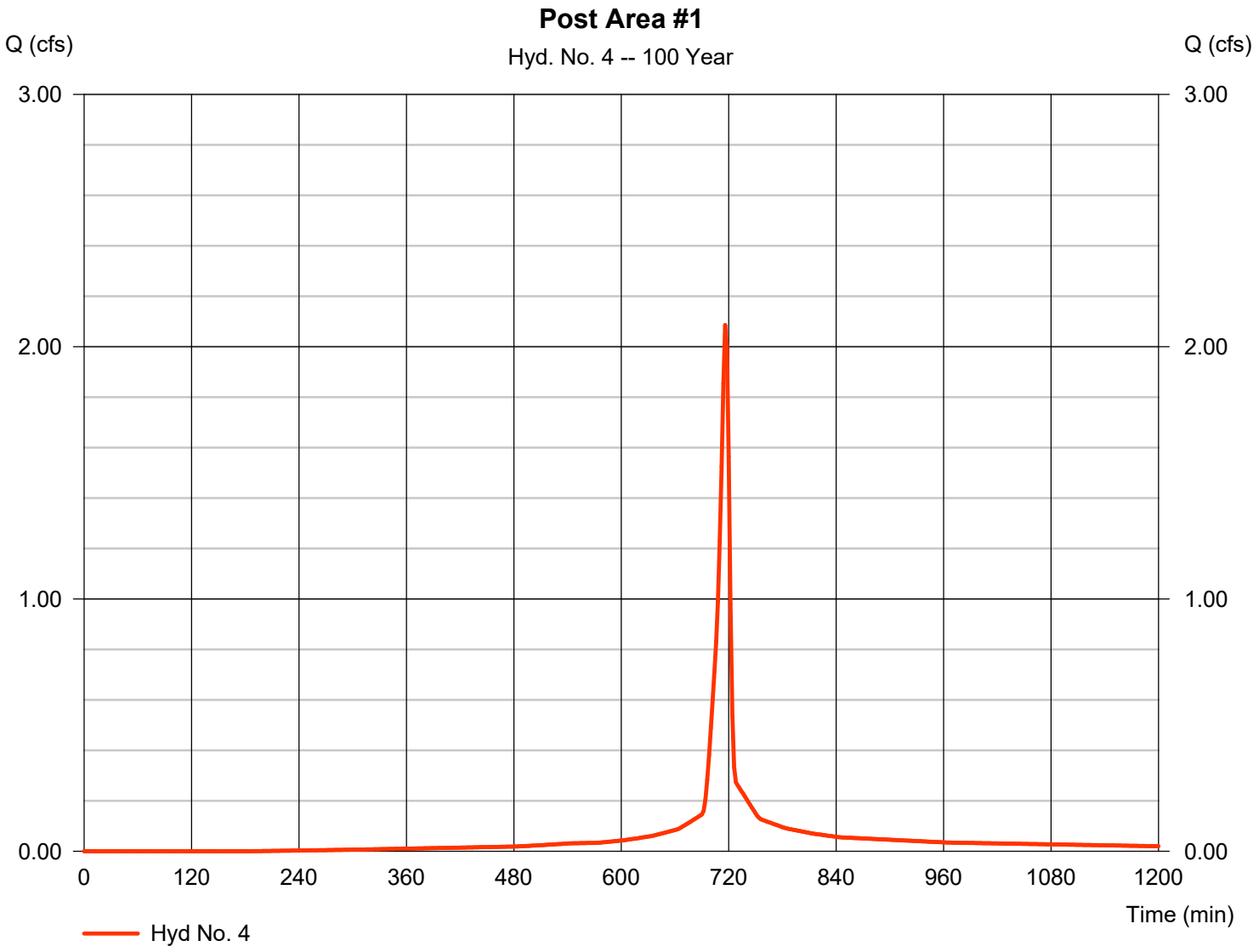


Hydrograph Report

Hyd. No. 4

Post Area #1

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.085 cfs
Storm frequency	=	100 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	4,567 cuft
Drainage area	=	0.283 ac	Curve number	=	91
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	5.78 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

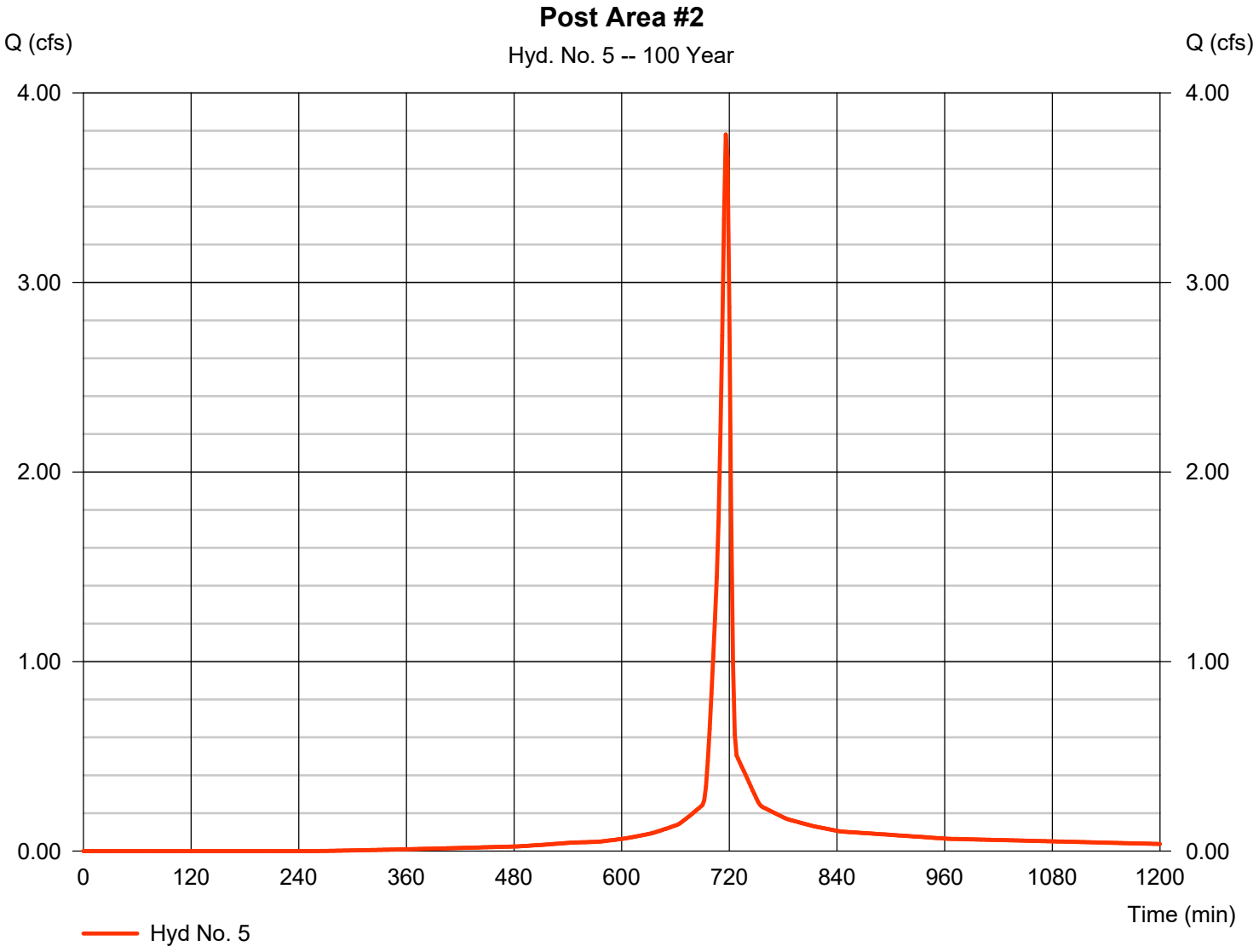


Hydrograph Report

Hyd. No. 5

Post Area #2

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.781 cfs
Storm frequency	=	100 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	8,018 cuft
Drainage area	=	0.547 ac	Curve number	=	87
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	5.78 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

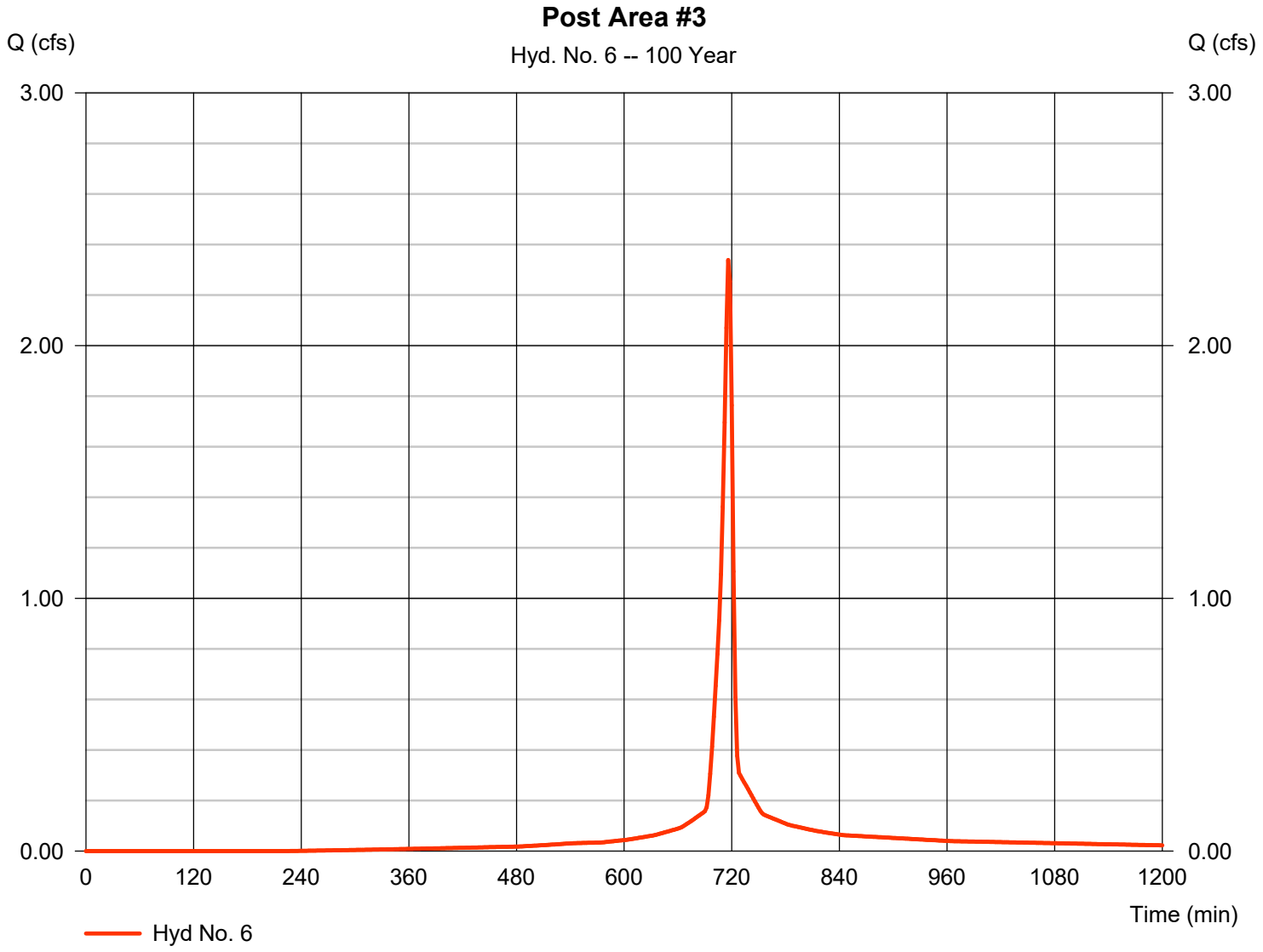


Hydrograph Report

Hyd. No. 6

Post Area #3

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.339 cfs
Storm frequency	=	100 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	5,033 cuft
Drainage area	=	0.327 ac	Curve number	=	89
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	5.78 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

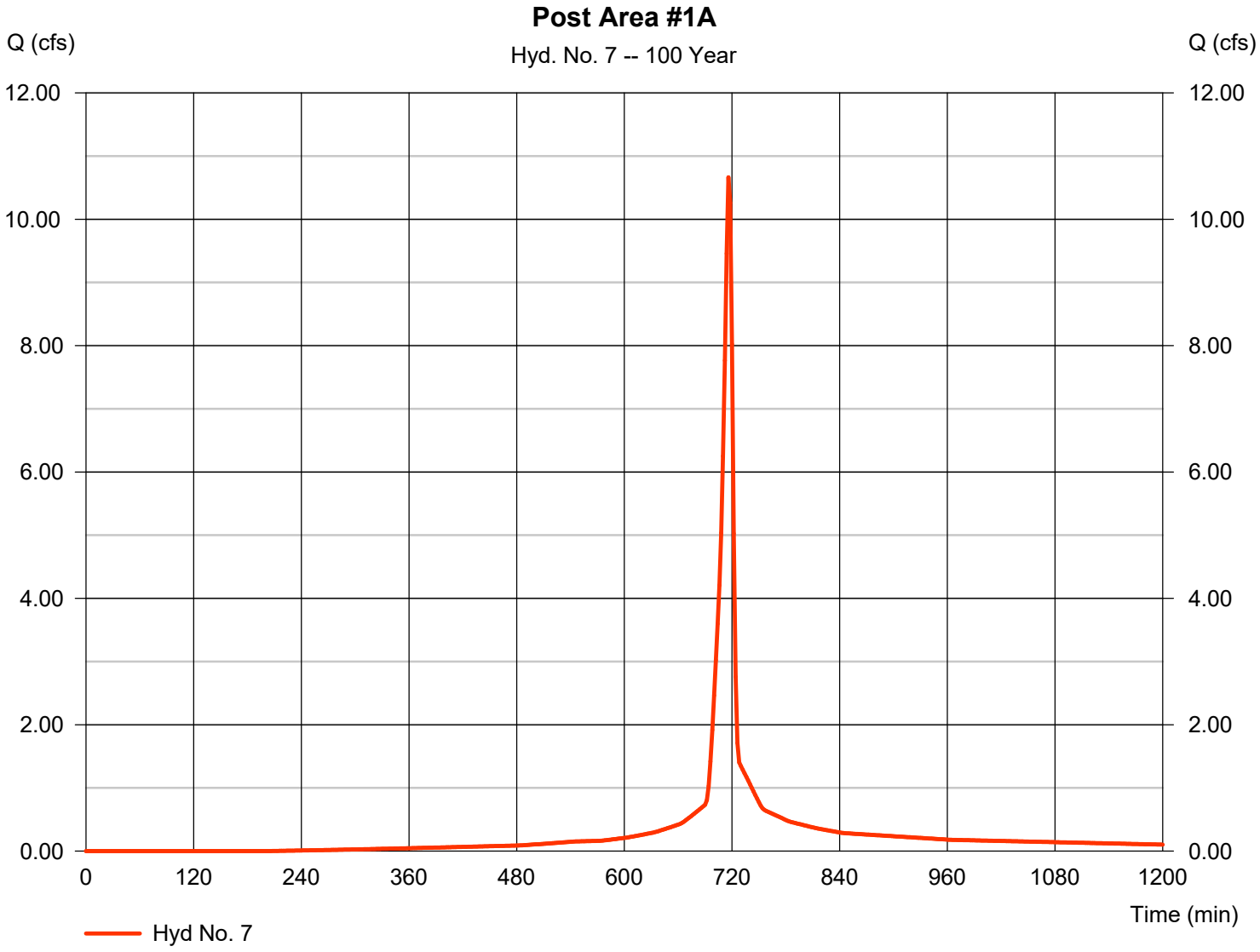


Hydrograph Report

Hyd. No. 7

Post Area #1A

Hydrograph type	=	SCS Runoff	Peak discharge	=	10.66 cfs
Storm frequency	=	100 yrs	Time to peak	=	716 min
Time interval	=	2 min	Hyd. volume	=	23,139 cuft
Drainage area	=	1.468 ac	Curve number	=	90
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	5.78 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



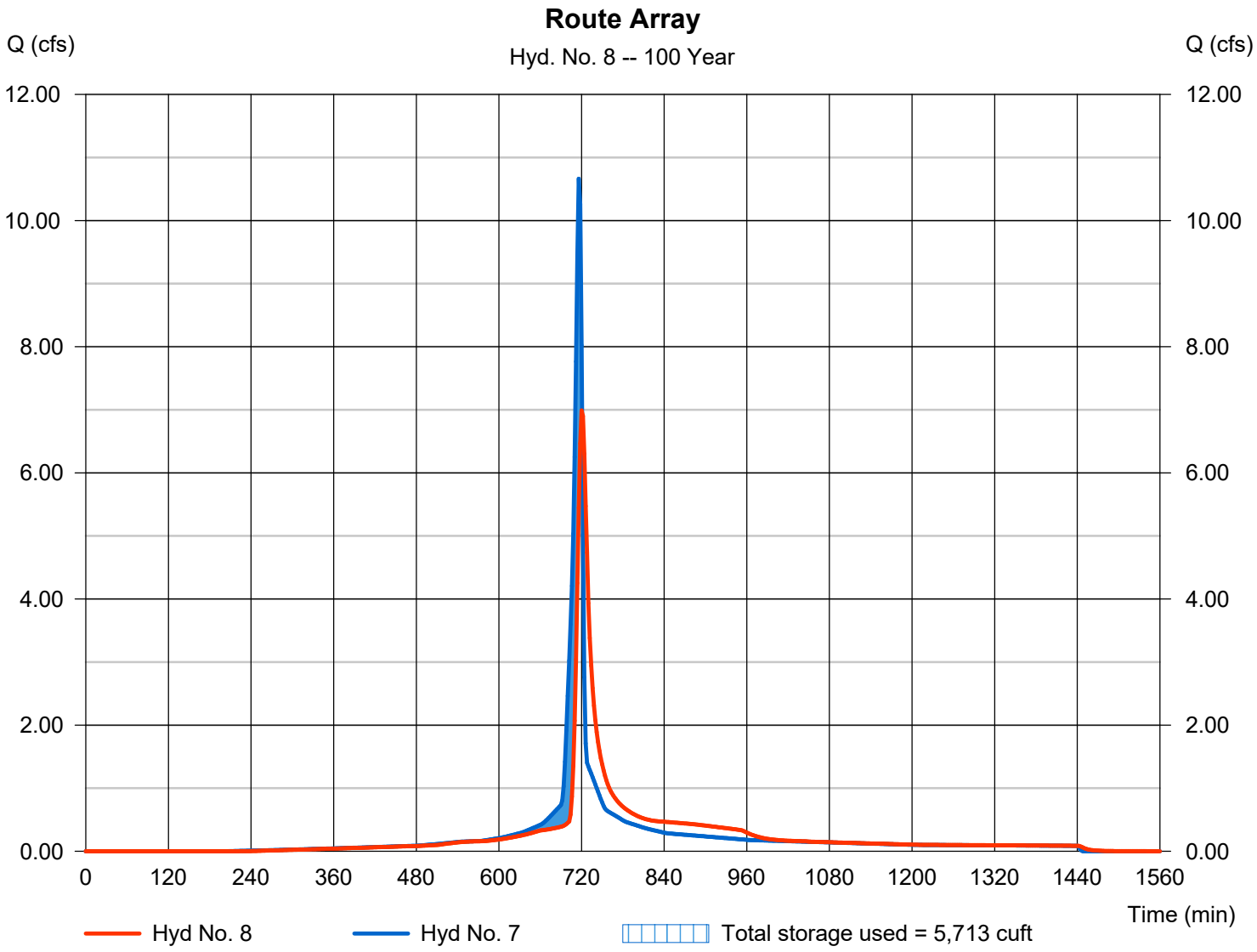
Hydrograph Report

Hyd. No. 8

Route Array

Hydrograph type	=	Reservoir	Peak discharge	=	6.988 cfs
Storm frequency	=	100 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	23,137 cuft
Inflow hyd. No.	=	7 - Post Area #1A	Max. Elevation	=	95.25 ft
Reservoir name	=	Array	Max. Storage	=	5,713 cuft

Storage Indication method used.

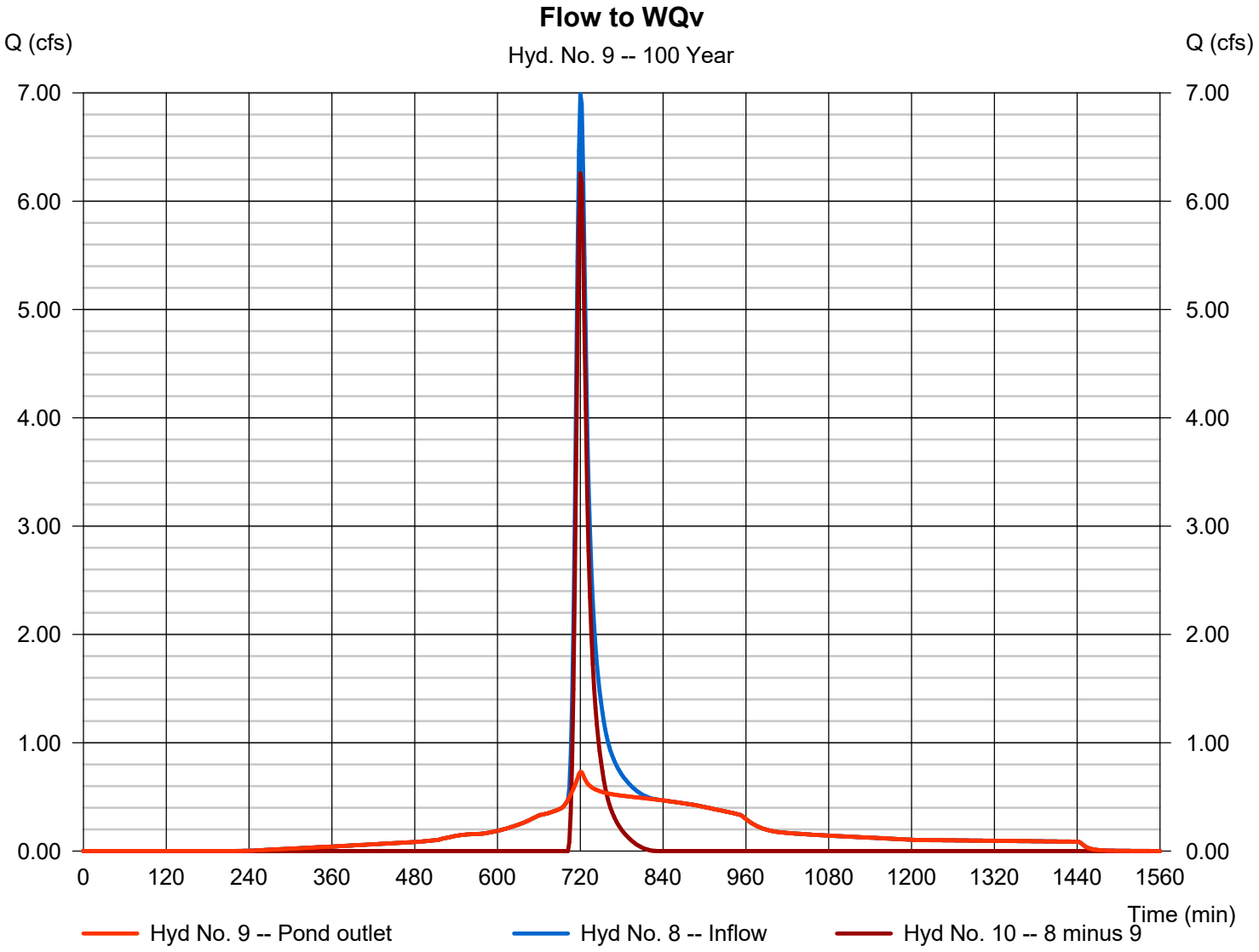


Hydrograph Report

Hyd. No. 9

Flow to WQv

Hydrograph type	= Diversion1	Peak discharge	= 0.731 cfs
Storm frequency	= 100 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 14,421 cuft
Inflow hydrograph	= 8 - Route Array	2nd diverted hyd.	= 10
Diversion method	= Pond - Array	Pond structure	= Culv/Orf A

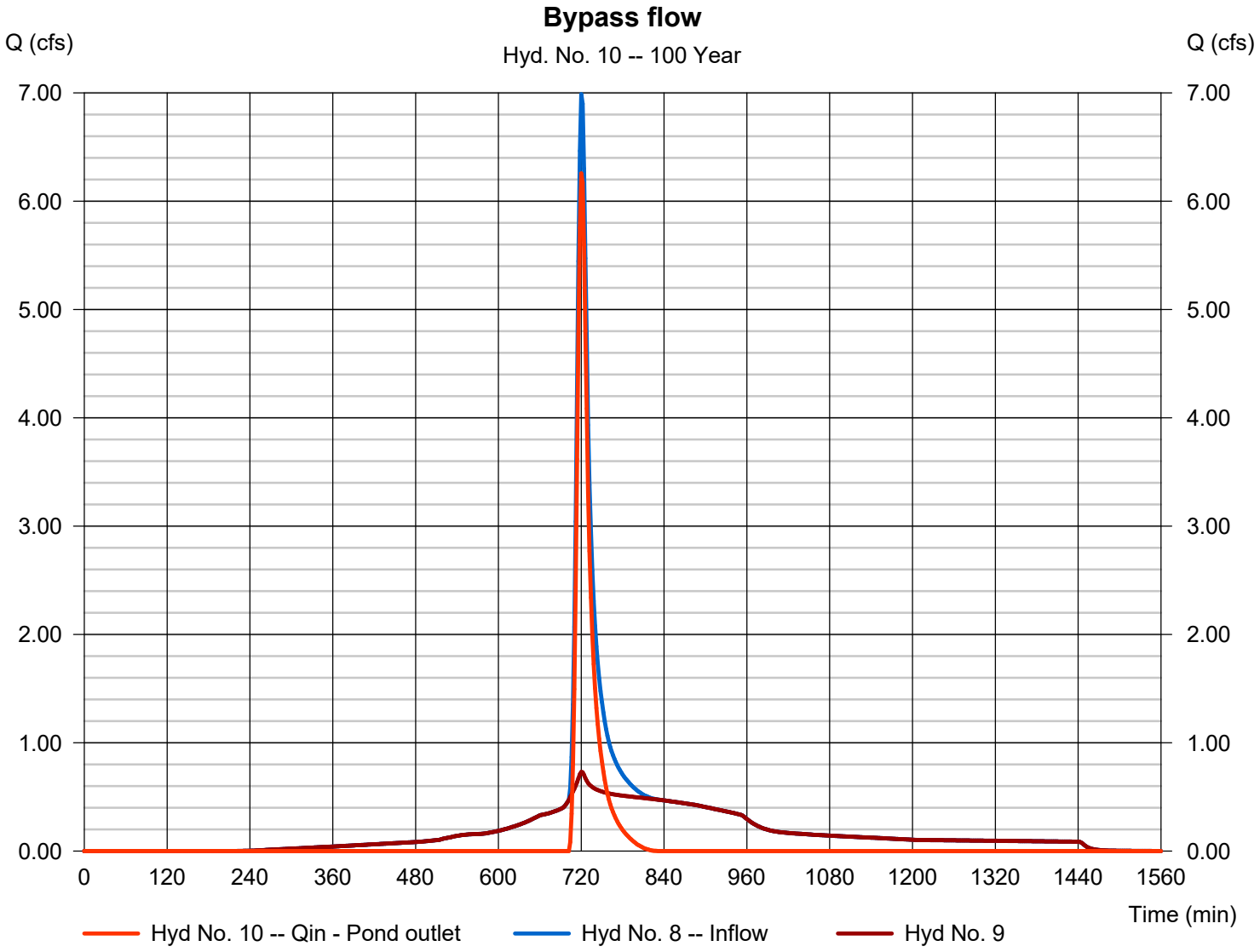


Hydrograph Report

Hyd. No. 10

Bypass flow

Hydrograph type	= Diversion2	Peak discharge	= 6.257 cfs
Storm frequency	= 100 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 8,715 cuft
Inflow hydrograph	= 8 - Route Array	2nd diverted hyd.	= 9
Diversion method	= Pond - Array	Pond structure	= Culv/Orf A

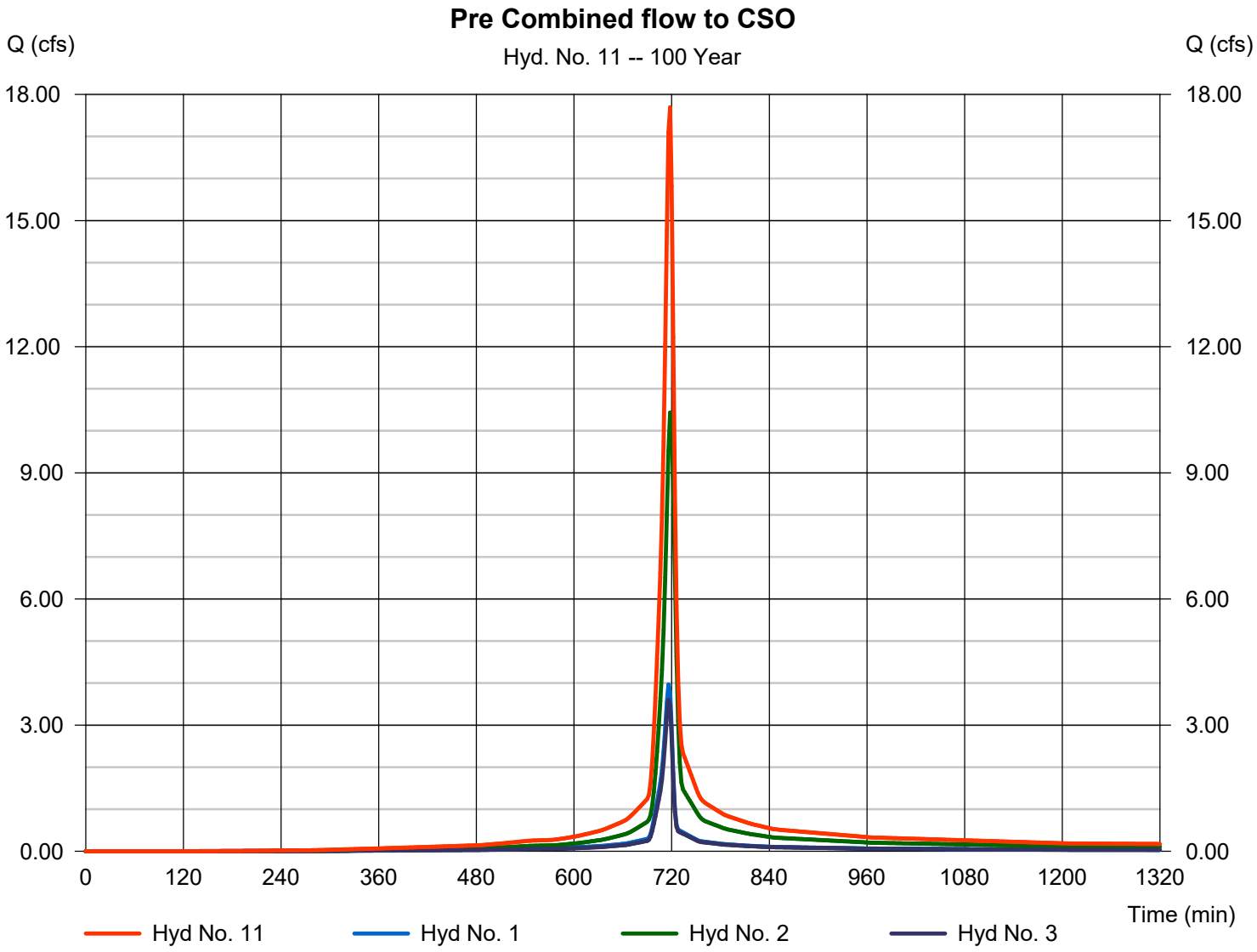


Hydrograph Report

Hyd. No. 11

Pre Combined flow to CSO

Hydrograph type	=	Combine	Peak discharge	=	17.69 cfs
Storm frequency	=	100 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	41,461 cuft
Inflow hyds.	=	1, 2, 3	Contrib. drain. area	=	2.633 ac



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	69.8703	13.1000	0.8658	--------
3	0.0000	0.0000	0.0000	--------
5	79.2597	14.6000	0.8369	--------
10	88.2351	15.5000	0.8279	--------
25	102.6072	16.5000	0.8217	--------
50	114.8193	17.2000	0.8199	--------
100	127.1596	17.8000	0.8186	--------

File name: SampleFHA.idf

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	5.69	4.61	3.89	3.38	2.99	2.69	2.44	2.24	2.07	1.93	1.81	1.70
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	6.57	5.43	4.65	4.08	3.65	3.30	3.02	2.79	2.59	2.42	2.27	2.15
10	7.24	6.04	5.21	4.59	4.12	3.74	3.43	3.17	2.95	2.77	2.60	2.46
25	8.25	6.95	6.03	5.34	4.80	4.38	4.02	3.73	3.48	3.26	3.07	2.91
50	9.04	7.65	6.66	5.92	5.34	4.87	4.49	4.16	3.88	3.65	3.44	3.25
100	9.83	8.36	7.30	6.50	5.87	5.36	4.94	4.59	4.29	4.03	3.80	3.60

Tc = time in minutes. Values may exceed 60.

022-09 Dunkirk-Regan\03-Admin\Reports\Storm Report\Site 1 (East 4th St.)\Exhibit C-Hydrographs\Dunkirk Rainfall.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	1.91	2.30	0.00	1.20	3.35	4.16	4.90	5.78
SCS 6-Hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Exhibit D – Drainage Calculations

.1 Pipe Capacities and Expected Flows

EP LAND SERVICES

PROJECT # 2022-09E | SHEET # 1 OF: 1 | PAGE # OF:

MADE BY: JWE | DATE: 9/20/2023

PROJECT: 220 Wahington | CHKD BY: | DATE:

SUBJECT: Flow to Catch Basins | REVISED BY: | DATE:

CHKD BY: | DATE:

Drainage Strucure	Drainage Area (sf) To CB	Upstream Area (sf)	Percentage of Watershed	Expected 10-year Peak Flow (cfs) to CB	Expected Velocity (fps) At Peak Flow in Pipes	Allowable Flow in Pipe (cfs)	Proposed Pipe Size and Slope	% FULL
POST DEVELOPMENT AREA #1A								
FI#2 to FI#1	5000		7.82%	0.43	3.40	1.71	8" SDR @ 1.7%	38%
FI#1 to STMH#1		5000	7.82%	0.43	4.67	2.63	8" SDR @ 4.0%	30%
CB#1 to Array	26500		41.45%	2.29	See Hydraulic Model			
CB#2 to Array	27432		42.91%	2.37	See Hydraulic Model			
FI#4 to FI#3	5000		7.82%	0.43	3.01	1.31	8" SDR @ 1.0%	50%
FI#3 to STMH#3		5000	7.82%	0.43	3.40	1.71	8" SDR @ 1.7%	38%
Totals	**63932**		100.00%	5.54	10 yr Peak=5.53 cfs for entire watershed			

Expected flow calculations in Pipe Runs

$$Q = \frac{\text{Drainage area to CB}}{\text{Total Area of Watershed (Post Development Area \#1)}} \times \text{10 year peak discharge}$$

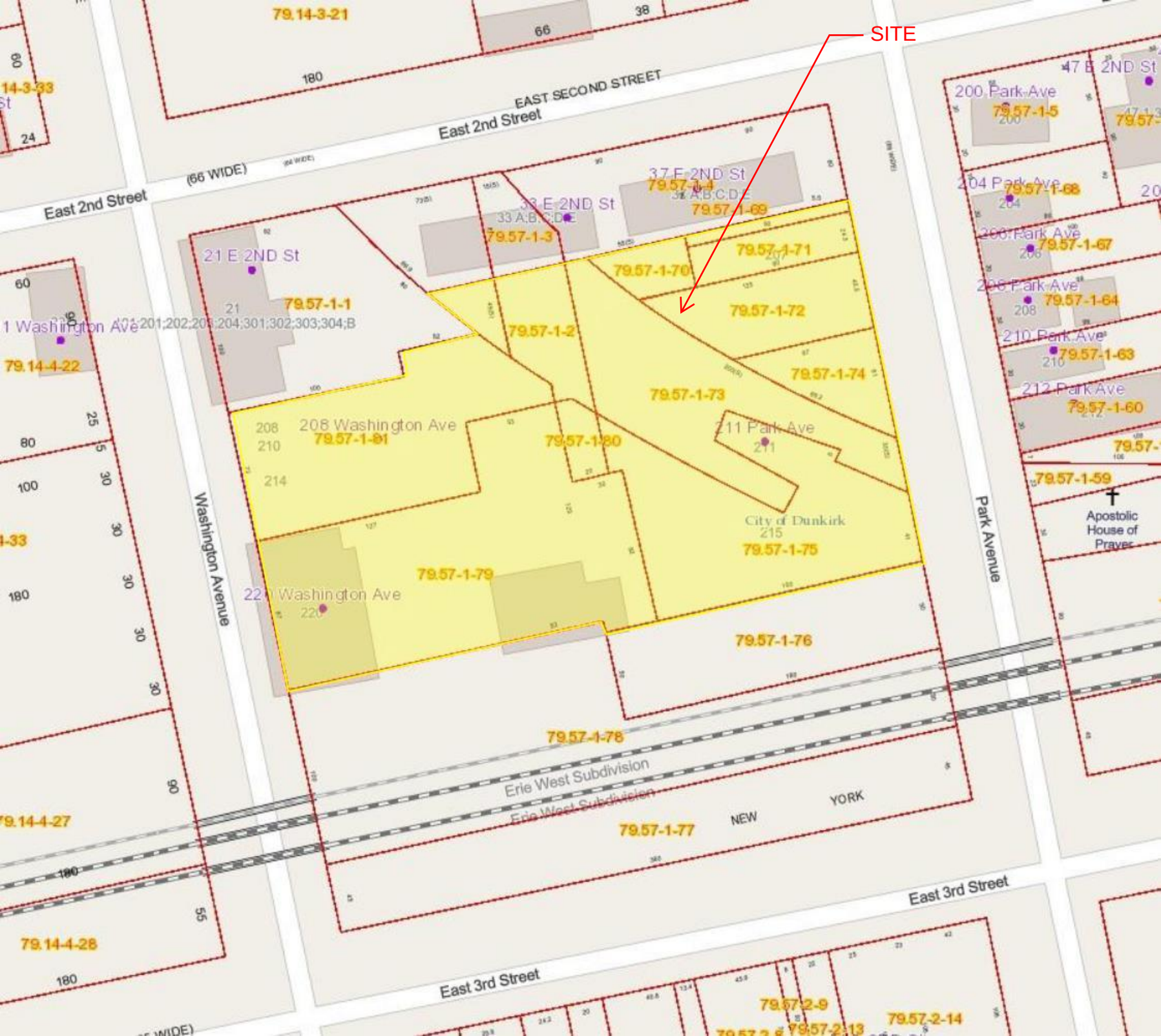
Exhibit E – Maps

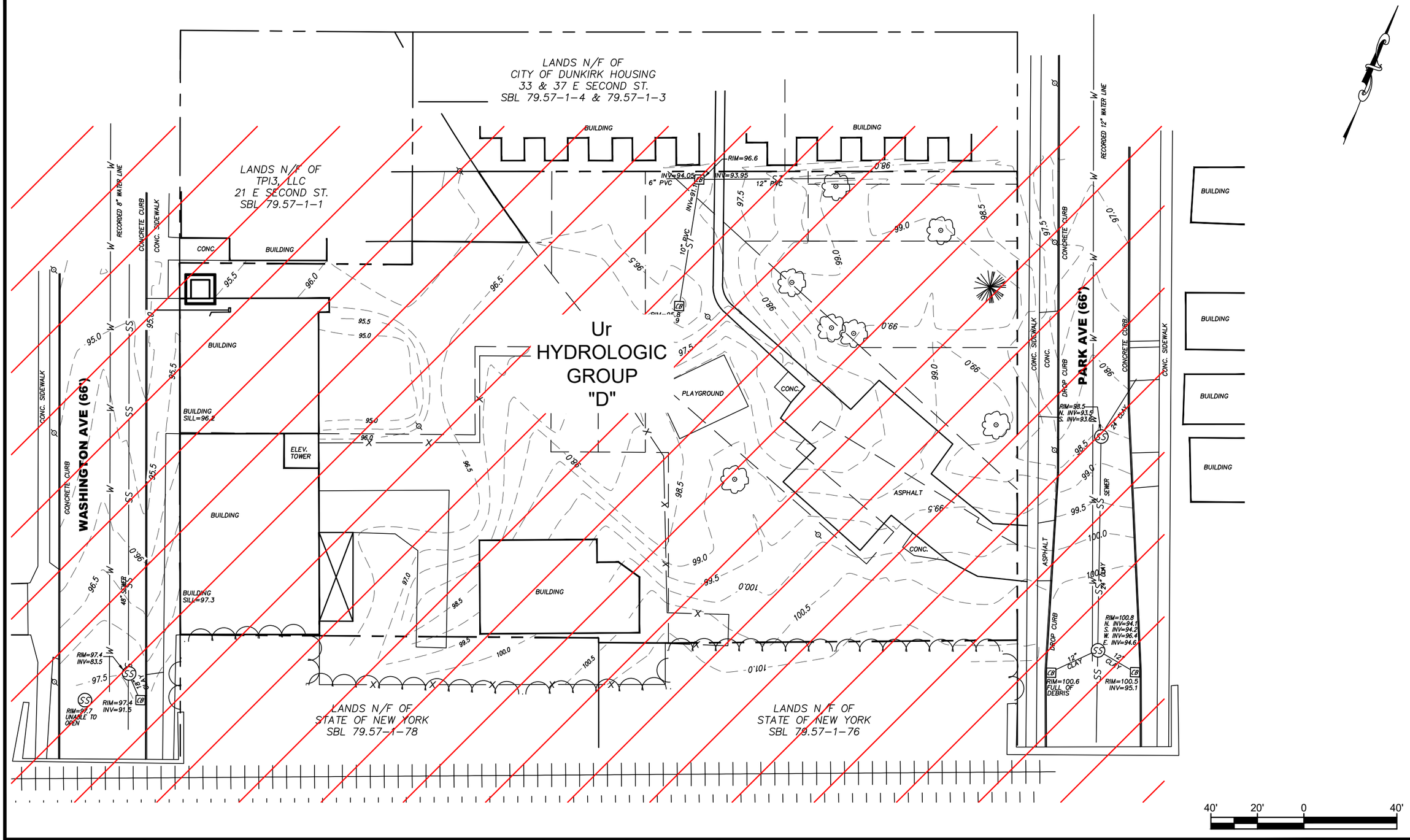
.1 Project Location Map

.2 Soil Map (Figure 1)

.3 Pre-Development Watersheds (Figure 2)

.4 Post Development Watersheds (Figure 3)


SITE
EAST SECOND STREET
East 2nd Street
(66 WIDE)
East 2nd Street
79.14-3-21
66
38
180
37 E 2ND St
79.57-1-4
37 A,B,C,D,E
79.57-1-69
33 E 2ND St
33 A,B,C,D,E
79.57-1-3
21 E 2ND St
21
79.57-1-1
79.57-1-70
79.57-1-71
79.57-1-72
79.57-1-2
79.57-1-74
79.57-1-73
208 Washington Ave
208
210
214
79.57-1-81
79.57-1-80
211 Park Ave
211
City of Dunkirk
215
79.57-1-75
79.57-1-79
220 Washington Ave
220
79.57-1-76
79.57-1-78
Erie West Subdivision
79.57-1-77
NEW YORK
East 3rd Street
East 3rd Street
Washington Avenue
Park Avenue
200 Park Ave
79.57-1-5
204 Park Ave
79.57-1-68
206 Park Ave
79.57-1-67
208 Park Ave
79.57-1-64
210 Park Ave
79.57-1-63
212 Park Ave
79.57-1-60
79.57-1-59
Apostolic House of Prayer
79.14-4-22
79.14-4-27
79.14-4-28
79.57-2-9
79.57-2-14
79.57-2-13



File Name: I:\Engineering Projects\Other Clients\2022\2022-09 Dunkirk-Regan\04-Cad File\Stormwater Site 2.dwg (Layout: SOIL)
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SUBMITTAL / REVISIONS

No.	DATE	DESCRIPTION	BY

PROJ. MANAGER:	JWE
CHIEF DESIGNER:	JWE
DESIGNED BY:	JWE
DRAWN BY:	JWE

SEAL

EP LAND SERVICES LLC
621 COLUMBIA STREET- COHOES, NY 12047
PHONE: 518-785-9000

REGAN DEVELOPMENT

SOILS MAP

208-220 WASHINGTON AVE

CITY OF DUNKIRK NEW YORK

SCALE: 1"=40'
PROJ. No.: 2022-09E
DATE: SEPTEMBER 2023

Fig-1

PRE DEVELOPMENT AREA #2

DISCHARGE POINT #2

PRE DEVELOPMENT AREA #3

DISCHARGE POINT #3

DISCHARGE POINT #1

PRE DEVELOPMENT AREA #1

LANDS N/F OF
TPI3, LLC
21 E SECOND ST.
SBL 79.57-1-1

LANDS N/F OF
CITY OF DUNKIRK HOUSING
33 & 37 E SECOND ST.
SBL 79.57-1-4 & 79.57-1-3

139' SHALLOW CONC. FLOW

74' SHALLOW CONC. FLOW

183' SHALLOW CONC. FLOW

108' SHEET FLOW

150' SHEET FLOW

104' SHEET FLOW

LANDS N/F OF
STATE OF NEW YORK
SBL 79.57-1-78

LANDS N/F OF
STATE OF NEW YORK
SBL 79.57-1-76

NEW YORK CENTRAL RAILROAD TRACKS

WASHINGTON AVE (66')

PARK AVE (66')

40' 20' 0 40'

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PHONE: 518-785-9000

REGAN DEVELOPMENT

PRE-DEVELOPMENT WATERSHED MAP

208-220 WASHINGTON AVE

CITY OF DUNKIRK NEW YORK

SCALE: 1"=40'
PROJ. No.: 2022-09E
DATE: SEPTEMBER 2023

Fig-2

File Name: I:\Engineering Projects\Other Clients\2022\2022-09 Dunkirk-Regan\04-Cad File\Stormwater Site 2.dwg (Layout: PRE)
Date: Wed, Sep 27, 2023 - 10:47 AM (Name: jleaston)

POST DEVELOPMENT AREA #2

DISCHARGE POINT #2

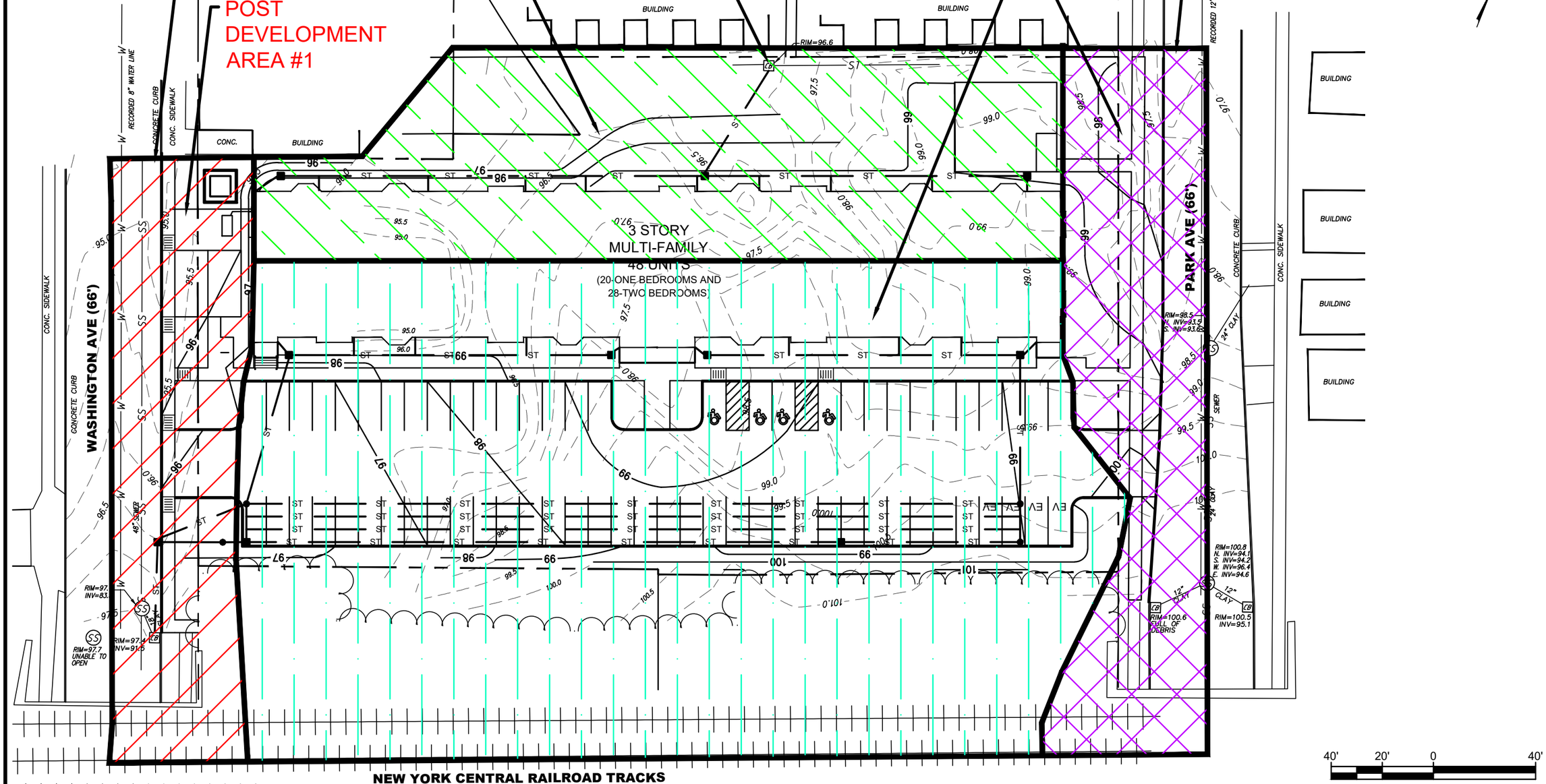
POST DEVELOPMENT AREA #3

DISCHARGE POINT #3

DISCHARGE POINT #1

POST DEVELOPMENT AREA #1

POST DEVELOPMENT AREA #1A



File Name: I:\Engineering Projects\Other Clients\2022\2022-09 Dunkirk-Regan\04-Cad File\Stormwater Site 2.dwg (Layout: POST)
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DRAWN BY:	JWE

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EP LAND SERVICES LLC
621 COLUMBIA STREET- COHOES, NY 12047
PHONE: 518-785-9000

REGAN DEVELOPMENT

POST DEVELOPMENT WATERSHED MAP

208-220 WASHINGTON AVE

CITY OF DUNKIRK NEW YORK

SCALE: 1"=40'
PROJ. No.: 2022-09E
DATE: SEPTEMBER 2023

Fig-3

Post Construction Maintenance Manual
For
(Part II)

220 Washington Ave
Tax Parcels 79.57-1.81, 80, 79, 75, 74, 73, 72, 71, 70 69 and 2

City of Dunkirk
Chautauqua County, New York

September 19, 2023



Prepared by:

EP
LAND SERVICES

EP Land Services LLC
621 Columbia Street Ext.
Cohoes, NY 12047
(518) 785-9000

POST CONSTRUCTION STORMWATER MAINTENANCE MANUAL
for
220 WASHINGTON AVE

CITY OF DUNKIRK, CHAUTAUQUA COUNTY, NY

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.3 Estimated O & M Costs 9

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1.0 OPERATION AND MAINTENANCE INFORMATION

Site Address	220 Washington Ave
Descriptive Site Location	Located between East 2nd and East 3rd streets and between Park Ave and Washington Ave
Property Owner	Regan Development Corpooration 1055 Saw Mill Road Ardsley NY 10502
Property Management (if different than Owner)	SAME AS OWNER

2.0 DESIGN AND CONSTRUCTION INFORMATION

Maintenance Mechanism	☒ Maintenance Agreement ☒ Commercial Property ☐ Homeowners Association ☐ Maintenance Assumed by Government Entity List:
Required Inspections	• Inspection by a licensed professional engineer is required in accordance with Inspection forms in Exhibit G. • Local municipality has authority to enter the site to inspect the stormwater management practices. The frequency of municipal inspection has not been determined.
Providers of Maintenance Services	Coordinator of maintenance activities and inspections: ***Regan Development*** Landscaping and snow removal activities: ***TO BE DETERMINED*** _____ ***(List Company)*** Stormwater Management Practice (SMP) Maintenance: ***TO BE DETERMINED*** _____ ***(List Company)*** SMP inspections and party required to submit required reports to the local municipality: ***TO BE DETERMINED*** _____ ***(List Company)***
Emergency Contact **(Local government authority to contact in case of failure of the stormwater treatment practice that threatens public safety)**	City of Dunkirk, Department of Public Works Department of Public Works Suite 340 – Stearns Building 338 Central Ave Dunkirk, NY 14048 Phone: (716) 366-9832 If calling off-hours for an emergency, please call the Police Department at 716-366-2266.

3.0 MAINTENANCE AND INSPECTION RESPONSIBILITIES

Permitting Authority	City of Dunkirk Planning Board Second floor-Stearns Building 338 Central Ave, Dunkirk NY 14048 Phone: (716) 366-9876
Design Engineer	EP Land Services LLC 621 Columbia Street Ext. Cohoes, NY 12047 Phone: 518-785-9000
Contractor	***TO BE DETERMINED*** _____***(List Company)***
Emergency Contact (Local government authority to contact in case of failure of the stormwater treatment practice that threatens public safety)	City of Dunkirk, Department of Public Works Department of Public Works Suite 340 – Stearns Building 338 Central Ave Dunkirk, NY 14048 Phone: (716) 366-9832 If calling off-hours for an emergency, please call the Police Department at 716-366-2266.

4.0 FUNDING MECHANISM

	☐ Maintenance performed by Municipality and Funded through: ☐ General Revenues ☐ Stormwater Utility of other fee assessment --- OR --- ☒ Maintenance performed by Owner and Funded or guaranteed through: ☐ Performance Bond ☐ Letter of Credit ☐ Escrow Account ☒ Private Funds ☒ Maintenance Agreement, See Attached
Estimated Annual O & M Costs	The estimated cost of maintenance of the stormwater management practice (SMP) excluding landscaping costs are: **$ 3,600** per year. The estimated annual cost is in terms of year 2023 dollars. The anticipated annual cost for subsequent years may be estimated from the attached inflation worksheet. An inflation rate of 3.0% per year has been used. A cost projection is attached that includes a detailed estimate of the annual routine maintenance cost and the cost of infrequent maintenance items.

5.0 POST-CONSTRUCTION STORMWATER MANAGEMENT FACILITIES (PRACTICES)

Practice A: Hydrodynamic Unit (Contech)	
Site Map identifying location of practice	Refer to Construction Plans
Practice Type	Pre-fabricated hydrodynamic unit
Contributing Drainage Area	Post Area #1A (1.46 acres)
Attachments	• See Exhibit F.1 for location of Practice A. • See Exhibit F.2 for Contech Maintenance Literature for required activities, timing, methods and inspection.
Frequency	• Exhibit F.2 shall be completed least once a year or if the rainfall within a 24-hour time frame exceeds 3.0 inches by a certified inspector. • Sediment removal shall be performed per the Contech Operation and Maintenance manual dictates.
Special Needs or Requirements	• Testing of sediment must be performed per NYSDEC to determine levels of toxic elements with the soil before sediment within the stilling and infiltration basin is removed and properly disposed of. • Vacuum Truck for sediment removal. • Inspectors and maintenance staff may need to be certified in confined space entry.

Practice B: Private Closed Drainage System and Array	
Site Map identifying location of practice	Refer to Construction Plans
Practice Type	N/A
Contributing Drainage Area	Post Area #1A (1.46 acres)
Private Drainage System Location	Throughout project site – see construction drawings
Attachments	None
Frequency	• Private Closed drainage system and catch basins shall be cleaned when maximum 6" sediment occurs within the closed drainage system. Estimated at every 10-years. • Private Catch basin, manholes, outlet structure, flared end sections and piping shall be repaired, replaced or fixed. • Private Closed drainage system and catch basins shall be cleaned when a maximum 6" sediment occurs within the closed drainage system. Estimated at every 10-years.
Special Needs or Requirements	• High Pressure Water to clean underground closed drainage system. • A vacuum truck may be needed for removal of sediment to wash out location. • Catch basins/ manhole frame and grates, mortar or pipe.

6.0 ATTACHMENTS TO MAINTENANCE PLAN

The following items shall be kept with the Post-Construction Maintenance Plan:

Present	*Item*	**Description**
☐	***As-Built Plans***	
☐	***Final Landscaping Plans***	Refer to Construction Drawings
☒	***Design Calculations Report***	Owner shall keep a copy of the Stormwater Management Report, including design calculations, with the Maintenance Plan.
☐	***Specifications for Potential Repair Items***	No detailed specifications have been developed for this project. Owner is referred to construction drawing set.
☒	***Operation, Maintenance and Inspection Checklist***	Attached document(s) list the estimated frequencies for maintenance and inspection items anticipated with this development project. The checklist is presented as an estimated frequency for activities. Actual site conditions may require more (or less) frequent assessment and maintenance.
☐	***Manuals and Warranties***	Any documentation or instructions for proprietary products and mechanical components, such as valves, pumps, aerators, etc.
☐	***Bid Specifications***	Detailed bid specifications have not been developed for this project. Owner is referred to construction drawing set.
☐	***Easements***	Owner shall keep a copy of all recorded stormwater related easements with the Maintenance Plan.
☐	***Covenants***	Not Applicable. Owner shall keep a copy of all stormwater related covenants with the Maintenance Plan. Typically developed for projects with Homeowners Associations.
☒	***Maintenance Agreement***	Owner shall keep a copy of the stormwater related Maintenance Agreement with the Maintenance Plan. See attached Agreement between Municipality and Owner regarding upkeep of Stormwater Management Practice.
☒	***Detailed Cost Estimate***	Detailed cost estimates are provided, showing anticipated costs for routine and infrequent maintenance aspects related to the Stormwater management practice.
☒	***Maintenance and Tracking Log***	Owner shall keep copies of all maintenance, inspection and regulatory correspondence related to the stormwater practice. Correspondence and records shall be made available to regulatory agencies upon request.

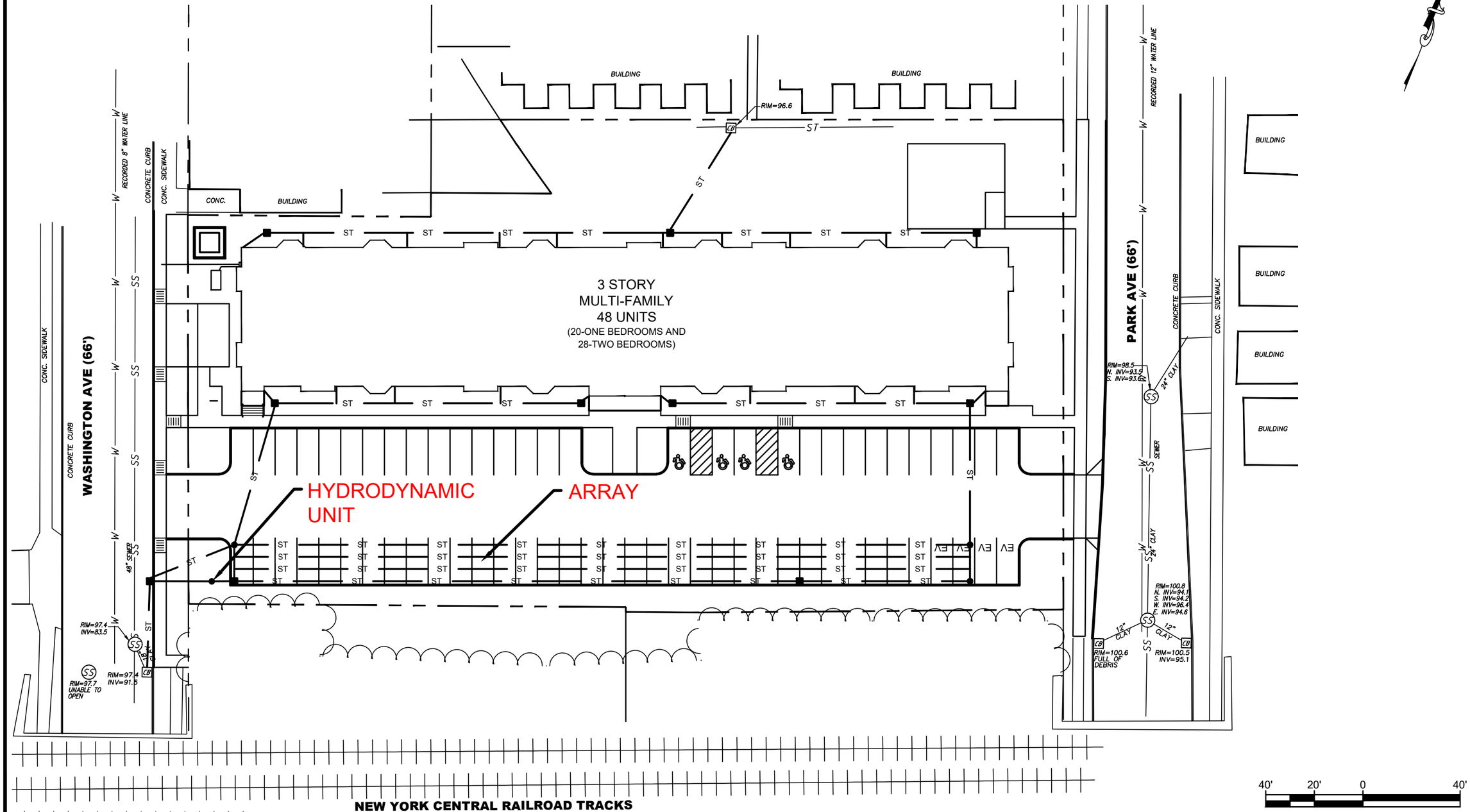
Exhibits

Exhibit F – Post Construction Maintenance Information

.1 Location Map

.2 Hydrodynamic Maintenance Information

.3 Estimated O & M Costs



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DESIGNED BY:	JWE
DRAWN BY:	JWE

SEAL

EP LAND SERVICES LLC
621 COLUMBIA STREET- COHOES, NY 12047
PHONE: 518-785-9000

REGAN DEVELOPMENT

STORMWATER MAINTENANCE MAP

208-220 WASHINGTON AVE

CITY OF DUNKIRK NEW YORK

SCALE: 1"=40'
PROJ. No.: 2022-09E
DATE: SEPTEMBER 2023

Fig-1

File Name: I:\Engineering Projects\Other Clients\2022\2022-09 Dunkirk-Regan\04-Cad File\Stormwater Site 2.dwg (Layout: POST (2))
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CONTECH®
ENGINEERED SOLUTIONS

CDS Guide
Operation, Design, Performance and Maintenance



CDS®

Using patented continuous deflective separation technology, the CDS system screens, separates and traps debris, sediment, and oil and grease from stormwater runoff. The indirect screening capability of the system allows for 100% removal of floatables and neutrally buoyant material without blinding. Flow and screening controls physically separate captured solids, and minimize the re-suspension and release of previously trapped pollutants. Inline units can treat up to 6 cfs, and internally bypass flows in excess of 50 cfs (1416 L/s). Available precast or cast-in-place, offline units can treat flows from 1 to 300 cfs (28.3 to 8495 L/s). The pollutant removal capacity of the CDS system has been proven in lab and field testing.

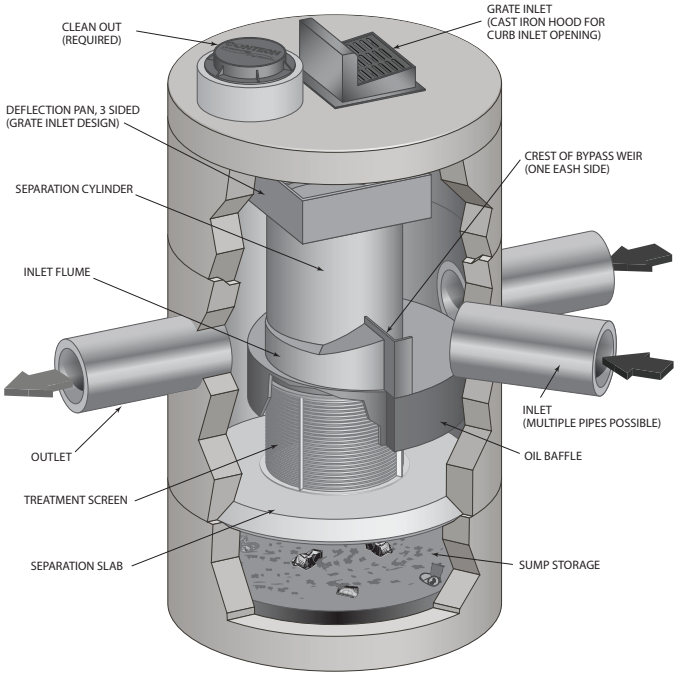
Operation Overview

Stormwater enters the diversion chamber where the diversion weir guides the flow into the unit's separation chamber and pollutants are removed from the flow. All flows up to the system's treatment design capacity enter the separation chamber and are treated.

Swirl concentration and screen deflection force floatables and solids to the center of the separation chamber where 100% of floatables and neutrally buoyant debris larger than the screen apertures are trapped.

Stormwater then moves through the separation screen, under the oil baffle and exits the system. The separation screen remains clog free due to continuous deflection.

During the flow events exceeding the treatment design capacity, the diversion weir bypasses excessive flows around the separation chamber, so captured pollutants are retained in the separation cylinder.



Design Basics

There are three primary methods of sizing a CDS system. The Water Quality Flow Rate Method determines which model size provides the desired removal efficiency at a given flow rate for a defined particle size. The Rational Rainfall Method™ or the and Probabilistic Method is used when a specific removal efficiency of the net annual sediment load is required.

Typically in the Unites States, CDS systems are designed to achieve an 80% annual solids load reduction based on lab generated performance curves for a gradation with an average particle size (d50) of 125 microns (μm). For some regulatory environments, CDS systems can also be designed to achieve an 80% annual solids load reduction based on an average particle size (d50) of 75 microns (μm) or 50 microns (μm).

Water Quality Flow Rate Method

In some cases, regulations require that a specific treatment rate, often referred to as the water quality design flow (WQQ), be treated. This WQQ represents the peak flow rate from either an event with a specific recurrence interval, e.g. the six-month storm, or a water quality depth, e.g. 1/2-inch (13 mm) of rainfall.

The CDS is designed to treat all flows up to the WQQ. At influent rates higher than the WQQ, the diversion weir will direct most flow exceeding the WQQ around the separation chamber. This allows removal efficiency to remain relatively constant in the separation chamber and eliminates the risk of washout during bypass flows regardless of influent flow rates.

Treatment flow rates are defined as the rate at which the CDS will remove a specific gradation of sediment at a specific removal efficiency. Therefore the treatment flow rate is variable, based on the gradation and removal efficiency specified by the design engineer.

Rational Rainfall Method™

Differences in local climate, topography and scale make every site hydraulically unique. It is important to take these factors into consideration when estimating the long-term performance of any stormwater treatment system. The Rational Rainfall Method combines site-specific information with laboratory generated performance data, and local historical precipitation records to estimate removal efficiencies as accurately as possible.

Short duration rain gauge records from across the United States and Canada were analyzed to determine the percent of the total annual rainfall that fell at a range of intensities. US stations' depths were totaled every 15 minutes, or hourly, and recorded in 0.01-inch increments. Depths were recorded hourly with 1-mm resolution at Canadian stations. One trend was consistent at all sites; the vast majority of precipitation fell at low intensities and high intensity storms contributed relatively little to the total annual depth.

These intensities, along with the total drainage area and runoff coefficient for each specific site, are translated into flow rates using the Rational Rainfall Method. Since most sites are relatively small and highly impervious, the Rational Rainfall Method is appropriate. Based on the runoff flow rates calculated for each intensity, operating rates within a proposed CDS system are

determined. Performance efficiency curve determined from full scale laboratory tests on defined sediment PSDs is applied to calculate solids removal efficiency. The relative removal efficiency at each operating rate is added to produce a net annual pollutant removal efficiency estimate.

Probabilistic Rational Method

The Probabilistic Rational Method is a sizing program Contech developed to estimate a net annual sediment load reduction for a particular CDS model based on site size, site runoff coefficient, regional rainfall intensity distribution, and anticipated pollutant characteristics.

The Probabilistic Method is an extension of the Rational Method used to estimate peak discharge rates generated by storm events of varying statistical return frequencies (e.g. 2-year storm event). Under the Rational Method, an adjustment factor is used to adjust the runoff coefficient estimated for the 10-year event, correlating a known hydrologic parameter with the target storm event. The rainfall intensities vary depending on the return frequency of the storm event under consideration. In general, these two frequency dependent parameters (rainfall intensity and runoff coefficient) increase as the return frequency increases while the drainage area remains constant.

These intensities, along with the total drainage area and runoff coefficient for each specific site, are translated into flow rates using the Rational Method. Since most sites are relatively small and highly impervious, the Rational Method is appropriate. Based on the runoff flow rates calculated for each intensity, operating rates within a proposed CDS are determined. Performance efficiency curve on defined sediment PSDs is applied to calculate solids removal efficiency. The relative removal efficiency at each operating rate is added to produce a net annual pollutant removal efficiency estimate.

Treatment Flow Rate

The inlet throat area is sized to ensure that the WQQ passes through the separation chamber at a water surface elevation equal to the crest of the diversion weir. The diversion weir bypasses excessive flows around the separation chamber, thus preventing re-suspension or re-entrainment of previously captured particles.

Hydraulic Capacity

The hydraulic capacity of a CDS system is determined by the length and height of the diversion weir and by the maximum allowable head in the system. Typical configurations allow hydraulic capacities of up to ten times the treatment flow rate. The crest of the diversion weir may be lowered and the inlet throat may be widened to increase the capacity of the system at a given water surface elevation. The unit is designed to meet project specific hydraulic requirements.

Performance

Full-Scale Laboratory Test Results

A full-scale CDS system (Model CDS2020-5B) was tested at the facility of University of Florida, Gainesville, FL. This CDS unit was evaluated under controlled laboratory conditions of influent flow rate and addition of sediment.

Two different gradations of silica sand material (UF Sediment & OK-110) were used in the CDS performance evaluation. The particle size distributions (PSDs) of the test materials were analyzed using standard method "Gradation ASTM D-422 "Standard Test Method for Particle-Size Analysis of Soils" by a certified laboratory.

UF Sediment is a mixture of three different products produced by the U.S. Silica Company: "Sil-Co-Sil 106", "#1 DRY" and "20/40 Oil Frac". Particle size distribution analysis shows that the UF Sediment has a very fine gradation (d50 = 20 to 30 μm) covering a wide size range (Coefficient of Uniformity, C averaged at 10.6). In comparison with the hypothetical TSS gradation specified in the NJDEP (New Jersey Department of Environmental Protection) and NJCAT (New Jersey Corporation for Advanced Technology) protocol for lab testing, the UF Sediment covers a similar range of particle size but with a finer d50 (d50 for NJDEP is approximately 50 μm) (NJDEP, 2003).

The OK-110 silica sand is a commercial product of U.S. Silica Sand. The particle size distribution analysis of this material, also included in Figure 1, shows that 99.9% of the OK-110 sand is finer than 250 microns, with a mean particle size (d50) of 106 microns. The PSDs for the test material are shown in Figure 1.

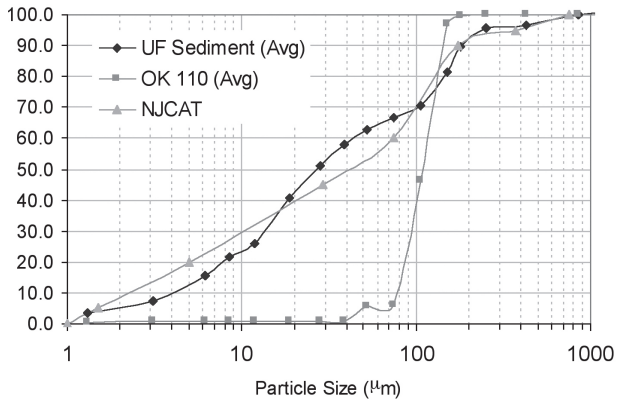


Figure 1. Particle size distributions

Tests were conducted to quantify the performance of a specific CDS unit (1.1 cfs (31.3-L/s) design capacity) at various flow rates, ranging from 1% up to 125% of the treatment design capacity of the unit, using the 2400 micron screen. All tests were conducted with controlled influent concentrations of approximately 200 mg/L. Effluent samples were taken at equal time intervals across the entire duration of each test run. These samples were then processed with a Dekaport Cone sample splitter to obtain representative sub-samples for Suspended Sediment Concentration (SSC) testing using ASTM D3977-97 "Standard Test Methods for Determining Sediment Concentration in Water Samples", and particle size distribution analysis.

Results and Modeling

Based on the data from the University of Florida, a performance model was developed for the CDS system. A regression analysis was used to develop a fitting curve representative of the scattered data points at various design flow rates. This model, which demonstrated good agreement with the laboratory data, can then be used to predict CDS system performance with respect

to SSC removal for any particle size gradation, assuming the particles are inorganic sandy-silt. Figure 2 shows CDS predictive performance for two typical particle size gradations (NJCAT gradation and OK-110 sand) as a function of operating rate.

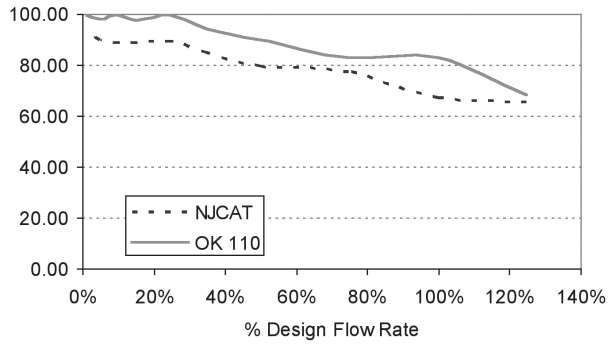


Figure 2. CDS stormwater treatment predictive performance for various particle gradations as a function of operating rate.

Many regulatory jurisdictions set a performance standard for hydrodynamic devices by stating that the devices shall be capable of achieving an 80% removal efficiency for particles having a mean particle size (d50) of 125 microns (e.g. Washington State Department of Ecology — WASDOE - 2008). The model can be used to calculate the expected performance of such a PSD (shown in Figure 3). The model indicates (Figure 4) that the CDS system with 2400 micron screen achieves approximately 80% removal at the design (100%) flow rate, for this particle size distribution (d50 = 125 μm).

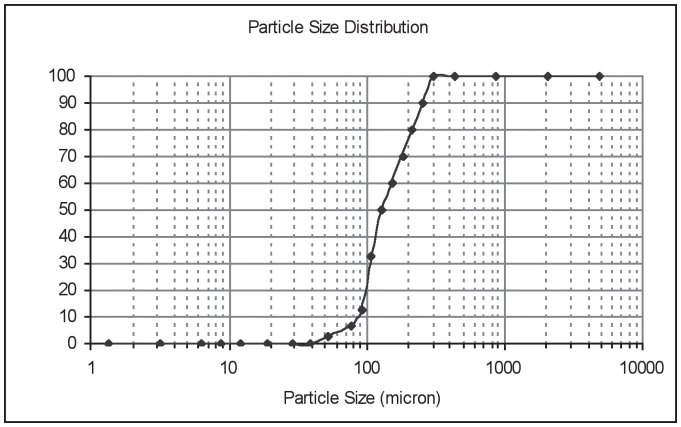


Figure 3. WASDOE PSD

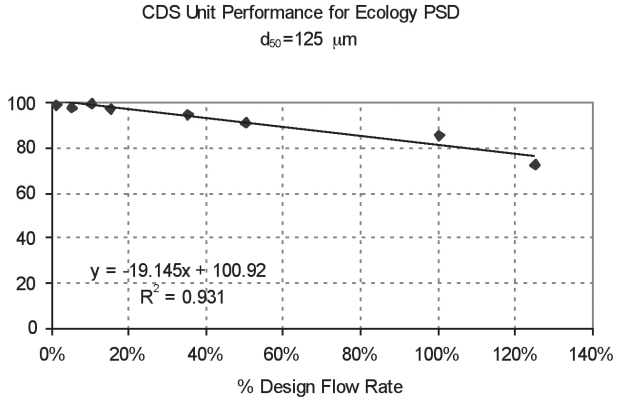


Figure 4. Modeled performance for WASDOE PSD.

Maintenance

The CDS system should be inspected at regular intervals and maintained when necessary to ensure optimum performance. The rate at which the system collects pollutants will depend more heavily on site activities than the size of the unit. For example, unstable soils or heavy winter sanding will cause the grit chamber to fill more quickly but regular sweeping of paved surfaces will slow accumulation.

Inspection

Inspection is the key to effective maintenance and is easily performed. Pollutant transport and deposition may vary from year to year and regular inspections will help ensure that the system is cleaned out at the appropriate time. At a minimum, inspections should be performed twice per year (e.g. spring and fall) however more frequent inspections may be necessary in climates where winter sanding operations may lead to rapid accumulations, or in equipment washdown areas. Installations should also be inspected more frequently where excessive amounts of trash are expected.

The visual inspection should ascertain that the system components are in working order and that there are no blockages or obstructions in the inlet and separation screen. The inspection should also quantify the accumulation of hydrocarbons, trash, and sediment in the system. Measuring pollutant accumulation can be done with a calibrated dipstick, tape measure or other measuring instrument. If absorbent material is used for enhanced removal of hydrocarbons, the level of discoloration of the sorbent material should also be identified



during inspection. It is useful and often required as part of an operating permit to keep a record of each inspection. A simple form for doing so is provided.

Access to the CDS unit is typically achieved through two manhole access covers. One opening allows for inspection and cleanout of the separation chamber (cylinder and screen) and isolated sump. The other allows for inspection and cleanout of sediment captured and retained outside the screen. For deep units, a single manhole access point would allows both sump cleanout and access outside the screen.

The CDS system should be cleaned when the level of sediment has reached 75% of capacity in the isolated sump or when an appreciable level of hydrocarbons and trash has accumulated. If absorbent material is used, it should be replaced when significant discoloration has occurred. Performance will not be impacted until 100% of the sump capacity is exceeded however it is recommended that the system be cleaned prior to that for easier removal of sediment. The level of sediment is easily determined by measuring from finished grade down to the top of the sediment pile. To avoid underestimating the level of sediment in the chamber, the measuring device must be lowered to the top of the sediment pile carefully. Particles at the top of the pile typically offer less resistance to the end of the rod than consolidated particles toward the bottom of the pile. Once this measurement is recorded, it should be compared to the as-built drawing for the unit to determine weather the height of the sediment pile off the bottom of the sump floor exceeds 75% of the total height of isolated sump.

Cleaning

Cleaning of a CDS systems should be done during dry weather conditions when no flow is entering the system. The use of a vacuum truck is generally the most effective and convenient method of removing pollutants from the system. Simply remove the manhole covers and insert the vacuum hose into the sump. The system should be completely drained down and the sump fully evacuated of sediment. The area outside the screen should also be cleaned out if pollutant build-up exists in this area.

In installations where the risk of petroleum spills is small, liquid contaminants may not accumulate as quickly as sediment. However, the system should be cleaned out immediately in the event of an oil or gasoline spill. Motor oil and other hydrocarbons that accumulate on a more routine basis should be removed when an appreciable layer has been captured. To remove these pollutants, it may be preferable to use absorbent pads since they are usually less expensive to dispose than the oil/water emulsion that may be created by vacuuming the oily layer. Trash and debris can be netted out to separate it from the other pollutants. The screen should be cleaned to ensure it is free of trash and debris.

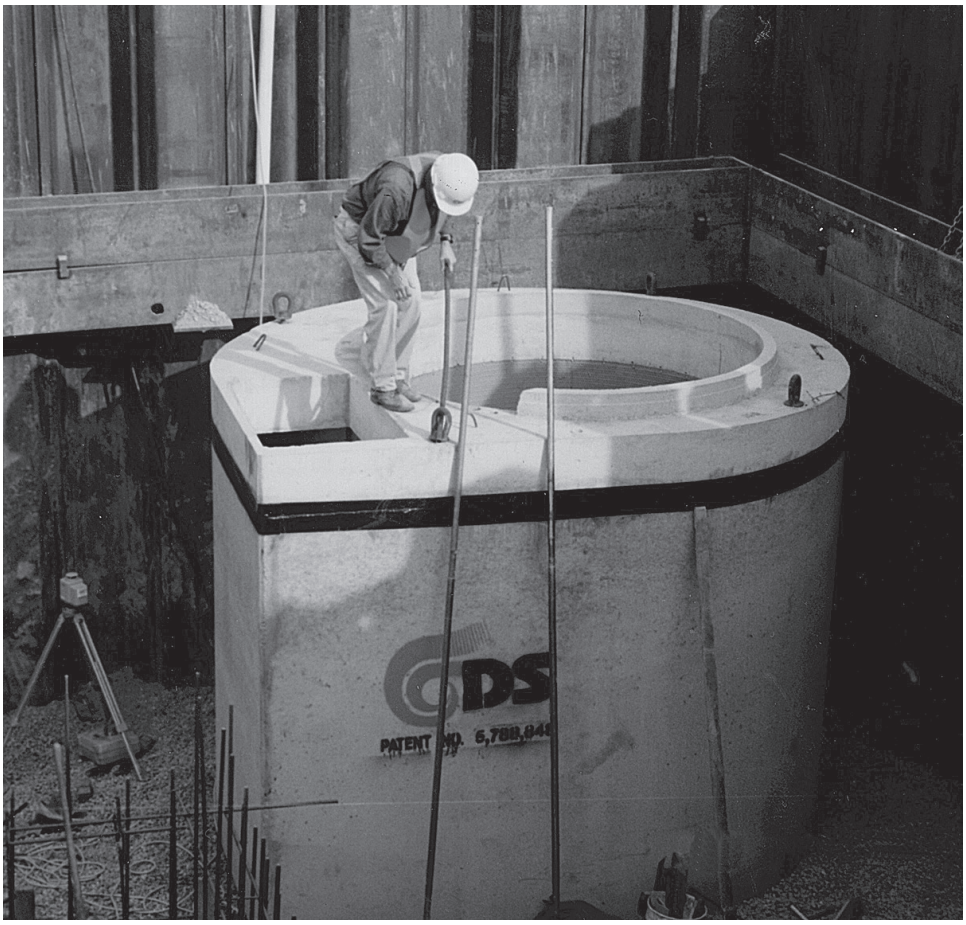
Manhole covers should be securely seated following cleaning activities to prevent leakage of runoff into the system from above and also to ensure that proper safety precautions have been followed. Confined space entry procedures need to be followed if physical access is required. Disposal of all material removed from the CDS system should be done in accordance with local regulations. In many jurisdictions, disposal of the sediments may be handled in the same manner as the disposal of sediments removed from catch basins or deep sump manholes. Check your local regulations for specific requirements on disposal.



CDS Model	Diameter		Distance from Water Surface to Top of Sediment Pile		Sediment Storage Capacity	
	ft	m	ft	m	yd3	m3
CDS2015-4	4	1.2	3.0	0.9	0.5	0.4
CDS2015	5	1.5	3.0	0.9	1.3	1.0
CDS2020	5	1.5	3.5	1.1	1.3	1.0
CDS2025	5	1.5	4.0	1.2	1.3	1.0
CDS3020	6	1.8	4.0	1.2	2.1	1.6
CDS3030	6	1.8	4.6	1.4	2.1	1.6
CDS3035	6	1.8	5.0	1.5	2.1	1.6
CDS4030	8	2.4	4.6	1.4	5.6	4.3
CDS4040	8	2.4	5.7	1.7	5.6	4.3
CDS4045	8	2.4	6.2	1.9	5.6	4.3

Table 1: CDS Maintenance Indicators and Sediment Storage Capacities

Note: To avoid underestimating the volume of sediment in the chamber, carefully lower the measuring device to the top of the sediment pile. Finer silty particles at the top of the pile may be more difficult to feel with a measuring stick. These finer particles typically offer less resistance to the end of the rod than larger particles toward the bottom of the pile.



CDS Inspection & Maintenance Log

CDS Model: _____ Location: _____

Date	Water depth to sediment[1]	Floatable Layer Thickness[2]	Describe Maintenance Performed	Maintenance Personnel	Comments

1. The water depth to sediment is determined by taking two measurements with a stadia rod: one measurement from the manhole opening to the top of the sediment pile and the other from the manhole opening to the water surface. If the difference between these measurements is less than the values listed in table 1 the system should be cleaned out. **Note: to avoid underestimating the volume of sediment in the chamber, the measuring device must be carefully lowered to the top of the sediment pile**.

2. For optimum performance, the system should be cleaned out when the floating hydrocarbon layer accumulates to an appreciable thickness. In the event of an oil spill, the system should be cleaned immediately.

EP LAND SERVICES

PROJECT # 2029-09E

SHEET # 1 OF: 2 PAGE # 1 OF: 2

MADE BY: JWE DATE: 9/26/2023

PROJECT: 220 Washington

CHKD BY: DATE:

SUBJECT: Estimated Operation and Maintenance Costs

REVISED BY: DATE:

CHKD BY: DATE:

Estimated Annual Operation and Maintenance Costs associated with the Stormwater Management Practices (SMP)

Estimated Frequency	Maintenance Item	Unit of Measurement	Unit Cost	Estimated Quantity	Cost	Maintenance Interval (years)	Frequency (per year)	Annual Cost
Annual	Inspection & Report by Qualified Professional	Each	$ 1,500	1	$ 1,500	1	1.00	$ 1,500
	Rain event inspection (3 inches in 24 hr storm)	Each	$ 1,000	1	$ 1,000	1	1.00	$ 1,000
					$ -	1	1.00	$ -
10-Year [2]	Clean, Remove and dispose of sediment from Closed Drainage System and hyrodnamic unit	Crew Day	$ 5,000	1	$ 5,000	10	0.10	$ 500
		Disposal	$ 1,500	1	$ 1,500	10	0.10	$ 150

Subtotal: $ 3,150

Contingency (15%): $ 473

Total: $ 3,623

Estimated Total Annual Cost[3], say: $ 3,600

Notes:

(1) Included in landscaping contract

(2) Detailed maintenance guidelines are provided in NYS Stormwater Management Design Manual and Stormwater Pollution Prevention Plan developed for this project.

(3) Estimated annual costs should be adjusted for inflation, recommend 3% annually. Costs are in 2023 dollars.

Suggested Annual funding, accounting for inflation

Estimated Total Annual Cost: $ 3,623

Year	Inflation Rate 2.50%	2.75%	3.00%	4.00%
2023	$ 3,623	$ 3,623	$ 3,623	$ 3,623
2024	$ 3,713	$ 3,722	$ 3,731	$ 3,767
2025	$ 3,806	$ 3,824	$ 3,843	$ 3,918
2026	$ 3,901	$ 3,930	$ 3,958	$ 4,075
2027	$ 3,999	$ 4,038	$ 4,077	$ 4,238
2028	$ 4,099	$ 4,149	$ 4,199	$ 4,407
2029	$ 4,201	$ 4,263	$ 4,325	$ 4,584
2030	$ 4,306	$ 4,380	$ 4,455	$ 4,767
2031	$ 4,414	$ 4,501	$ 4,589	$ 4,958
2032	$ 4,524	$ 4,624	$ 4,727	$ 5,156
2033	$ 4,637	$ 4,751	$ 4,868	$ 5,362
2034	$ 4,753	$ 4,882	$ 5,014	$ 5,577
2035	$ 4,872	$ 5,016	$ 5,165	$ 5,800
2036	$ 4,994	$ 5,154	$ 5,320	$ 6,032
2037	$ 5,118	$ 5,296	$ 5,479	$ 6,273
2038	$ 5,246	$ 5,442	$ 5,644	$ 6,524
2039	$ 5,378	$ 5,591	$ 5,813	$ 6,785
2040	$ 5,512	$ 5,745	$ 5,987	$ 7,056
2041	$ 5,650	$ 5,903	$ 6,167	$ 7,339
2042	$ 5,791	$ 6,065	$ 6,352	$ 7,632
2043	$ 5,936	$ 6,232	$ 6,543	$ 7,937
2044	$ 6,084	$ 6,404	$ 6,739	$ 8,255
2045	$ 6,236	$ 6,580	$ 6,941	$ 8,585
2046	$ 6,392	$ 6,761	$ 7,149	$ 8,928
2047	$ 6,552	$ 6,947	$ 7,364	$ 9,286
2048	$ 6,716	$ 7,138	$ 7,585	$ 9,657
2049	$ 6,884	$ 7,334	$ 7,812	$ 10,043
2050	$ 7,056	$ 7,536	$ 8,047	$ 10,445
2051	$ 7,232	$ 7,743	$ 8,288	$ 10,863
2052	$ 7,413	$ 7,956	$ 8,537	$ 11,297
2053	$ 7,598	$ 8,175	$ 8,793	$ 11,749

Appendix H

Site-Specific Remedial Work Plan

FULL SERVICE GENERAL CONTRACTORS - CONSTRUCTION MANAGEMENT - SITE DEVELOPMENT

SITE-SPECIFIC REMEDIAL WORK PLAN

TRACK IV CLEANUP

The Homesteads at Dunkirk Landing
Building 2
208-220 Washington Avenue,
Dunkirk, NY 14048

Prepared for:

BE3 - Brydges Engineering

960 Busti Avenue, Suite B-150

Buffalo, NY 14213

716-249-6880

Prepared by:

Building WNY since 1962.

2 Wendling Court,

Lancaster, NY 14086

Prepared By:	Signature:	Date:	Title:
Frank Schreiber	*Frank Schreiber*	6/8/26	Director of Site Operations

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EXHIBITS

Exhibit AA – Notes

Exhibit A – 9A Trucking Permit

Exhibit B – Erosion & Sediment Control Plan

Exhibit C – Excavation Sequence

Exhibit D – Kulback Inc. HASP

Exhibit E – Map to Hospital

Exhibit F – Fencing Location

1. PROJECT OVERVIEW

1.1 Site Description

The 1.36-acre site is composed of eleven parcels as follows:

- 220 Washington – SBL#79.57-1-79
- 208-214 Washington – 79.57-1-81
- Park Ave. Rear - 79.57-1-80
- E. Second - 79.57-1-2
- E. Second St - 79.57-1-73
- 215 Park Ave. -79.57-1-75
- 211 Park Ave. - 79.57-1-74
- Park Ave. - 79.57-1-72
- 207 Park Ave. - 79.57-1-71
- E. Second St - 79.57-1-70
- E. Second St. - 79.57-1-69

Only two of the 11 parcels have buildings. 220 Washington Avenue (SBL #79.57-1-79) and 208-214 Washington Avenue (SBL #79.57-1-81) have a two and three-story former manufacturing facility respectively that share a common wall. A barn also occupies the southeast portion of 220 Washington Avenue. The building historically operated as one manufacturing facility. Most recently, the 220 Washington Avenue property was occupied by a fence and sign storage facility. Currently, the building is vacant. The 208-214 Washington Avenue facility is vacant, condemned and not safely accessible. The remaining parcels within the Site boundary are composed of vacant undeveloped land or contain parking/walk areas (approximately 80% of total site area) supporting off-site residential units within the same block along East second Street.

A review of historical records, including street directories and Sanborn Maps, established that the Site has a history of manufacturing component parts for automobiles (springs, drive shafts, and rubber tires) and later of manufacturing car bodies and dinners. Other parcels within the Site were associated with coal storage and rail use as well as other commercial uses.

The purpose of the remedial activities is to address soil contamination identified during prior environmental investigations and to achieve applicable Soil Cleanup Objectives (SCOs) in accordance with 6 New York Codes, Rules and Regulations (NYCRR) Part 375.

1.2 Background and Remedial Objectives

Previous environmental investigations identified the presence of contaminated soils exceeding applicable SCOs. A list of contaminants of concern (COCs) is included in Section 2.3.1 of the RAWP.

The remedial objective is to excavate and properly dispose of impacted soil exceeding applicable SCOs, confirm attainment of remedial goals through confirmatory sampling, and restore the Site with an approved clean backfill cap suitable for its intended end use.

The Remedial Action (RA) for the Site is a Track 4 (Restricted Residential) cleanup. Removal includes all soils above final grade requirements and an additional 2 feet of removal in non-hardscaped areas. The hardscaped areas (i.e., building footprint, parking lot and sidewalks) will be composed of approximately one foot of material which will function as a component of the cover system. All non-hardscaped/greenspace areas will be covered with 2 feet of clean imported fill meeting the provisions of NYSDEC DER-10 Subdivision 5.4, as outlined in **Appendix E** of the RAWP.

2. SCOPE OF WORK

Kulback's, Inc. (K.I.), in collaboration with BE3, shall perform all work necessary to complete the soil remediation in accordance with NYSDEC requirements, including but not limited to:

- Mobilization of personnel and equipment
- Installation of erosion and sediment controls
- Establishment of work limits and site controls
- Excavation and off-site disposal of contaminated soil
- Management of groundwater, if encountered
- Confirmatory soil sampling and laboratory analysis by BE3's Qualified Environmental Professional (QEP)
- Importation and placement of approved clean backfill
- Site grading and stabilization
- Demobilization and restoration

All work shall be performed in accordance with applicable federal, state, and local regulations.

3. CONSTRUCTION SCHEDULE

The remedial contractor shall complete the work in accordance with the overall project schedule outlined in the contract documents. Major milestones include mobilization, installation of controls, excavation activities, confirmatory sampling, backfilling, and final restoration. A sequenced construction schedule is provided in **Exhibit C**. Each numbered item represents a projected day of work. The total length of work should be approximately 3 weeks and is subject to change due to inclement weather and unforeseen situations.

4. SEQUENCE AND METHODS OF WORK

4.1 Excavation Approach

Remedial excavation activities will be conducted utilizing a phased, work area-based approach to ensure controlled removal of impacted soil while maintaining environmental compliance and site stability. ***[Exhibit C]***

The identified excavation footprint will be divided into manageable work areas based on site layout, depth of contamination, operational efficiency and future site plans. The size of each work area is provided in **Exhibit C**. This will allow for effective excavation, sampling, and backfilling without leaving excessive open areas.

Prior to excavation, former building foundations and slabs will be removed and sent to an approved recycler. An import request form will be completed, and the former basements will be backfilled with clean imported fill to required design depths.

Excavation will proceed sequentially from one work area to the next. Each work area will be excavated to the required depth based on prior site characterization data and future site plans. All contaminated soils/fill across the Site above final grade requirements and an additional 2 feet of material in non-hardscape/greenspace areas will be removed and disposed of at an approved landfill.

A physical inspection (visual/olfactory) along with photoionization detector (PID) screening will be conducted by BE3's Qualified Environmental Professional during excavation operations at the excavation bottom and sidewalls of each work area to assess if there are hot spots below the proposed grade excavation limits that will require removal. See Section 4.1.4 of the RAWP for information regarding confirmatory sampling requirements.

This phased approach will:

- Minimize the area of open excavation at any one time
- Improve control of groundwater and stormwater
- Reduce potential for off-site migration of contaminants
- Enhance site safety and operational efficiency

4.2 Excavation Methods

Excavation within each work area will be performed using hydraulic excavators and appropriate earthmoving equipment suitable for the anticipated depth and soil conditions.

Excavated soil will be directly loaded into covered trucks for off-site transport to the approved disposal facility. Temporary stockpiling is not anticipated; however, if short-term staging is required due to logistical constraints, stockpiled materials will be placed on and covered by polyethylene sheeting to prevent runoff and dust generation.

Excavation depths and limits will be guided by pre-characterized contamination boundaries and field observations including staining, odor, and soil characteristics. BE3's QEP will provide oversight to confirm that removal limits are consistent with the approved remedial objectives.

4.3 Excavation Controls

To maintain environmental compliance and public protection during excavation activities, the following controls will be implemented:

- Continuous dust suppression through water application as necessary
- Stabilized construction entrance to prevent off-site soil tracking (see Section 9 – Construction Entrance – for more information)
- Perimeter erosion and sediment controls maintained and inspected regularly
- Controlled management of groundwater if encountered
- Compliance with OSHA excavation safety requirements including sloping or shoring if required.

All excavation slopes will be maintained in accordance with applicable OSHA trenching and excavation standards. If the DEC or DOH determines the proposed mitigation methods to be insufficient, implementation of additional mitigation measures may be required before additional remedial activities continue.

4.4 Backfilling and Restoration

All non-hardscaped/greenspace areas will be covered with 2 feet of clean imported fill meeting the provisions of NYSDEC DER-10 Subdivision 5.4(e) Appendix 5. The remaining hardscaped areas (i.e., building footprint, parking lot and sidewalks) will be composed of approximately one foot of material which will function as the remaining component of the cover system. Prior to placement of final cover material, a demarcation layer will be placed at the bottom of the excavations (utilities, footings, etc.) or on top of the existing fill material in areas where cover material is placed above the existing grade to meet new development requirements.

Backfill will be placed in controlled lifts and compacted to 95% as required to achieve subgrade conditions suitable for the Site’s intended future use. Final grading will restore the Site to approved design elevations in accordance with the project grading plan.

.

5. SOIL HANDLING AND DISPOSAL

5.1 Soil Characterization

Excavated soil will be managed in accordance with laboratory analytical results and regulatory classification. Soil characterization data will be used to establish waste profiles for disposal facility acceptance. BE3 will collect waste characterization samples prior to the beginning of remediation.

5.2 Disposal Facility

Contaminated soil will be transported to a properly permitted and authorized disposal facility that meets all regulatory requirements. Iroquois Construction Services are the contractors that have been selected to facilitate waste hauling and trucking. Please see attached ***[Exhibit A]*** 9A Trucking Permit with each facility listed. Documentation of facility approval and acceptance will be submitted to the NYSDEC once obtained.

5.3 Transportation and Tracking

All soil will be transported by a licensed and permitted waste hauler in accordance with 6 NYCRR Part 364 requirements. Trucks will be lined and covered in accordance with 6 NYCRR Part 364 prior to leaving the Site. Bills of Lading and disposal receipts will be maintained for all loads removed from the Site.

A daily log documenting truck counts, destination, and volume will be maintained throughout remediation activities.

6. GROUNDWATER MANAGEMENT

If groundwater is encountered during excavation activities, it will be managed in a controlled manner to prevent off-site migration and environmental impact.

Groundwater will be pumped to temporary storage tanks or frac tanks for settling and characterization sampling. Water will be disposed of at a permitted facility or managed in accordance with applicable SPDES requirements. No uncontrolled discharge to the ground surface, storm drains, or adjacent properties will occur.

If groundwater conditions materially affect excavation operations, the Environmental Professional and NYSDEC will be notified.

7. EROSION AND SEDIMENT CONTROL

Erosion and sediment controls will be installed prior to commencement of earth-disturbing activities and maintained throughout construction.

Controls will include, at a minimum:

- Perimeter silt sock
- Stabilized construction entrance
- Storm drain inlet protection
- Stockpile containment and covering if stockpiling occurs.
- Temporary stabilization measures

The Erosion and Sediment Control Plan is included with this submission. Please see attached ***[Exhibit B].***

Routine inspections will be conducted and documented to ensure proper functioning of controls.

8. DUST CONTROL AND AIR MONITORING

Dust suppression measures will be implemented throughout remediation activities to minimize airborne particulate migration. These measures will include:

- Water spray or misting during excavation and loading
- Covering of trucks prior to departure
- Limiting soil drop heights
- Temporary cessation of work during high wind events if necessary

Community Air Monitoring will be conducted in accordance with the NYSDOH Community Air Monitoring Plan (CAMP). Monitoring will include real-time particulate and volatile organic compound (VOC) measurements at the Site perimeter. Action levels and response procedures are described in the HASP provided by BE3. BE3 will be responsible for all CAMP Measures and providing Daily Field Reports and Daily CAMP Monitoring Reports to DEC and DOH project managers.

Access to water will be through a City of Dunkirk Fire Hydrant with an approved backflow preventor. The water from the hydrant will fill the water truck. The water truck will be onsite for the duration of the excavation and backfilling work. If water use is extended beyond this portion, it can be prolonged until it is no longer needed.
See below locations of fire hydrants related to the site. A hydrant permit will be obtained through the City of Dunkirk Water Department and submitted to the NYSDEC for review.



9. CONSTRUCTION ENTRANCE

A stabilized construction entrance will be installed at the Site access point along Washington Ave to prevent tracking of soil and sediment onto adjacent roadways. The entrance will be a minimum of 50 feet in length and consist of geotextile fabric overlain with crushed stone of sufficient thickness (minimum 6-inches) to support construction traffic. As trucks exit the site, crushed stone facilitates the removal of adhered mud or other debris from tires and undercarriages prior to entering public roadways. A truck wash station will not be utilized.

Entrances will be inspected daily and maintained as needed. Street sweeping will be performed if soil tracking occurs.

Please see ***[Exhibit** B & **C]*** for more information. The construction entrance will be constructed prior to start of construction. Within the construction site we will utilize previous completed work areas so our trucks can be directly loaded on a level surface as we excavate the proposed cells. Any contaminated soils that are spilled during loading activities must be addressed.

10. PLANNED TRUCK ROUTES

All trucks transporting soil from the Site will follow designated haul routes approved by the appropriate municipal authorities. Routes will prioritize major roadways and minimize travel through residential neighborhoods to the extent practicable.

Planned on-site truck routes are shown on the figure included in **Exhibit C.** Routes will begin on the southern portion of the site as that is the first area that will be remediated. The routes will advance east as each work area is completed.

11. CLEAN FILL IMPORTATION (DER-10 COMPLIANCE)

All imported fill materials used to backfill excavations, establish site grades or compose the cover system shall be obtained from virgin sources and be tested to ensure they meet imported soil requirements outlined in DER-10 Appendix 5 – Allowable Constituent Levels for Imported Fill. The owner's environmental consultant and NYSDEC will approve all backfill material and sources before being brought to the Site. Stone/gravel from a permitted/ approved NYSDOT/NYSDEC quarry may be used for backfill without analytical testing, provided the material contains less than 10 percent by weight of material which would pass through a size 100 sieve. See ***[Exhibit C]*** for locations, types and thicknesses of imported fill placement. Although imported fill is not anticipated to be stockpiled on-site, should inclement weather or unforeseen situations occur, material stockpiling may be required. If required, clean imported fill will either be staged on "like materials" (i.e., clean stone, approved topsoil, etc.) or placed on polyethylene sheeting.

Documentation including laboratory analytical results and source location will be provided prior to material importation. Please see attached ***[Exhibit AA].***

Delivery tickets and quantity tracking logs will be maintained.

12. CONFIRMATORY SAMPLING (BE3)

Sampling locations, analytes and frequency have been determined in the RAWP prepared for this site by BE3. Analytical results will be compared to applicable SCOs. See Section 4.1.4 in the RAWP for further information.

All analytical data will be included in the Final Engineer Report (FER) submitted to NYSDEC.

13. HEALTH AND SAFETY

All work will be conducted in accordance with the Site-Specific Health and Safety Plan (HASP), which complies with OSHA 29 CFR 1910.120, 29 CFR 1926, and applicable state regulations.

The Kulback's, Inc. HASP includes hazard identification, required personal protective equipment, decontamination procedures, spill response measures, and emergency response procedures. Please see attached ***[Exhibit D].*** The RAWP HASP must be met or exceeded by all personnel on-site.

14. DOCUMENTATION AND REPORTING

The remedial contractor will maintain comprehensive documentation including:

- Daily field activity reports by BE3
- Waste transport documentation and disposal receipts by BE3
- Erosion and sediment control inspection logs
- Photographic records by BE3
- Confirmatory sampling data and Air monitoring logs will be provided by BE3's QEP.
- Import Requests by BE3
- Disposal Manifests by BE3

All documentation will be compiled into a Final Engineering Report (FER) for submission to NYSDEC following completion of the remedial activities by BE3.

15. CONTINGENCY PLAN

If previously unidentified contamination, underground storage tanks, or other unexpected conditions are encountered, work in the affected area will be temporarily suspended.

The Qualified Environmental Professional and Owner will be notified immediately, and NYSDEC will be contacted as required. Remedial actions will be modified as necessary upon regulatory concurrence.

EXHIBIT AA

NOTES:

- Kulback's, Inc. (K.I.) will be contacting UDIGNY (811) and will have all existing subsurface utilities marked.

- The established work limits will be designated with the temporary fence installed on the perimeter of the job site. Please see attached ***[Exhibit F].***

- The locations of off-site fill sources and clean verification, per DER-10 requirements, are in progress and will be supplied once received. No fill materials will be brought onto site until submittal and department approval has been made.

- Means and Methods refers to the contractor's responsibility to determine, control, and implement the procedures, equipment, sequencing, techniques, and personnel used to perform the work with the consultation of the NYSDEC Project Manager and the Qualified Environmental Professional (BE3) that will be on site.

Exhibit A

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF MATERIALS MANAGEMENT

PART 364
WASTE TRANSPORTER PERMIT NO. 9A-759

Pursuant to Article 27 ,Titles 3 and 15 of the Environmental Conservation Law and 6 NYCRR 364

PERMIT ISSUED TO:

IROQUOIS BAR CORPORATION
155 COMMERCE DR.
LACKAWANNA, NY 14218

CONTACT NAME: ARNOLD COLLIER / AMANDA BOGDAN
COUNTY: ERIE
TELEPHONE NO: (716)270-0433

PERMIT TYPE:

☐ NEW
☐ RENEWAL
■ MODIFICATION

EFFECTIVE DATE 03/05/2026
EXPIRATION DATE **11/23/2026**
US EPA ID NUMBER

AUTHORIZED WASTE TYPES BY DESTINATION FACILITY:
The Permittee is Authorized to Transport the Following Waste Type(s) to the Destination Facility listed

Destination Facility	Location	Waste Type(s)	Note
Allied Waste Niagara Falls Landfill	Niagara Falls , NY	Non-Hazardous Industrial/Commercial Asbestos Petroleum Contaminated Soil Waste Tires Grease Trap Waste	
Auburn Landfill No 2	Auburn , NY	Non-Hazardous Industrial/Commercial Asbestos Petroleum Contaminated Soil	
AUSTIN MASTER SERVICES	MARTINS FERRY , OH	Non-Hazardous Industrial/Commercial	
Biotreatment Facility	Tonawanda , NY	Non-Hazardous Industrial/Commercial	
CARBON LIMESTONE LANDFILL, LLC	LOWELVILLE , OH	Non-Hazardous Industrial/Commercial	
Chaffee Landfill	Chaffee , NY	Non-Hazardous Industrial/Commercial Asbestos Petroleum Contaminated Soil	
Chautauqua Landfill	Ellery , NY	Non-Hazardous Industrial/Commercial Asbestos Petroleum Contaminated Soil Waste Tires Grease Trap Waste	
Genesee Soil Recycling	Lancaster , NY	Non-Hazardous Industrial/Commercial	Restricted / LUF

*** AUTHORIZED WASTE TYPES BY DESTINATION FACILITY LISTING (continued on next page) ***

NOTE: By acceptance of this permit, the permittee agrees that the permit is contingent upon strict compliance with the Environmental Conservation Law, all applicable regulations, and the General Conditions printed on the back of this page.

ADDRESS:
New York State Department of Environmental Conservation
Division of Materials Management - Waste Transporter Program
625 Broadway, 9th Floor
Albany, NY 12233-7251

AUTHORIZED SIGNATURE: Laura Stevens Digitally signed by Laura Stevens Date: 2026.03.03 11:07:20 -05'00' Date: ____/____/____

Exhibit A

WASTE TRANSPORTER PERMIT

GENERAL CONDITIONS

The permittee must:

1. Carry a copy of this waste transporter permit in each vehicle to transport waste. Failure to produce a copy of the permit upon request is a violation of the permit.

2. Display the full name of the transporter on both sides of each vehicle and display the waste transporter permit number on both sides and rear of each vehicle containing waste. The displayed name and permit number must be in characters at least three inches high and of a color that contrasts sharply with the background.

3. Transport waste only in authorized vehicles. An authorized vehicle is one that is listed on this permit.

4. Submit to the Department a modification application for additions/deletions to the authorized fleet of vehicles. The permittee must wait for a modified permit before operating the vehicles identified in the modification application.

5. Submit to the Department a modification application to add a new waste category or a new destination facility, or to change the current waste or destination facility category. The permittee must wait for a modified permit before transporting new waste types or transporting to new destination facilities.

6. Submit to the Department a modification application for change of address or company name.

7. Comply with requirements for placarding and packaging as set forth in New York State Transportation Law as well as any applicable federal rules and regulations.

8. Contain all wastes in the vehicle so there is no leaking, blowing, or other discharge of waste.

9. Use vehicles to transport only materials not intended for human or animal consumption unless the vehicle is properly cleaned.

10. Comply with requirements for manifesting hazardous waste, regulated medical waste, or low-level radioactive waste as set forth in the New York State Environmental Conservation Law and the implementing regulations. Transporters who provide a pre-printed manifest to a generator/shipper/offeror of regulated waste shall ensure that all information is correct and clearly legible on all copies of the manifest.

11. Deliver waste only to transfer, storage.. treatment and disposal facilities authorized to accept such waste. Permittee must demonstrate that facilities are so authorized if requested to do so.

12. Maintain liability insurance as required by New York State Environmental Conservation Law.

13. Maintain records of the amount of each waste type transported to each destination facility on a calendar-year basis. The transporter is obligated to provide a report of this information to the Department at the time of permit renewal, or to any law enforcement officer, if requested to do so.

14. Pay regulatory fees on an annual basis. Non-payment may be cause for revocation or suspension of permit.

15. This permit is not transferrable. A change of ownership will invalidate this permit.

16. This permit does not relieve the permittee from the obligation to obtain any other approvals or permits, or from complying with any other applicable federal, state, or local requirement.

17. Renewal applications must be submitted no less than 30 days prior to the expiration date of the permit to:

New York State Department of Environmental Conservation
Division of Materials Management, Waste Transporter Program
625 Broadway, 9th Floor
Albany, NY 12233-7251

Exhibit A

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF MATERIALS MANAGEMENT

PART 364
WASTE TRANSPORTER PERMIT NO. 9A-759

Pursuant to Article 27 ,Titles 3 and 15 of the Environmental Conservation Law and 6 NYCRR 364

PERMIT ISSUED TO:

IROQUOIS BAR CORPORATION
155 COMMERCE DR.
LACKAWANNA, NY 14218

PERMIT TYPE:

☐ NEW
☐ RENEWAL
■ MODIFICATION

CONTACT NAME:	ARNOLD COLLIER / AMANDA BOGDAN	EFFECTIVE DATE	03/05/2026
COUNTY:	ERIE	EXPIRATION DATE	**11/23/2026**
TELEPHONE NO:	(716)270-0433	US EPA ID NUMBER	

AUTHORIZED WASTE TYPES BY DESTINATION FACILITY: (Continued)
The Permittee is Authorized to Transport the Following Waste Type(s) to the Destination Facility listed

Destination Facility	Location	Waste Type(s)	Note
High Acres Western Expansion Landfill	Fairport , NY	Non-Hazardous Industrial/Commercial Asbestos Petroleum Contaminated Soil	
Hyland Landfill	Angelica , NY	Non-Hazardous Industrial/Commercial	
MAHONING LANDFILL	NEW SPRINGFIELD , OH	Non-Hazardous Industrial/Commercial	
Mill Seat SLF	Riga , NY	Non-Hazardous Industrial/Commercial Asbestos Petroleum Contaminated Soil	
Modern Landfill, Inc.	Model City , NY	Non-Hazardous Industrial/Commercial Asbestos Petroleum Contaminated Soil Waste Tires	
Ontario County Sanitary Landfill	Stanley , NY	Non-Hazardous Industrial/Commercial Asbestos Petroleum Contaminated Soil Sludge from Sewage or Water Supply Treatment Plant	
Seneca Meadows LF	Waterloo , NY	Petroleum Contaminated Soil	
Tonawanda Bioremediation Facility	Tonawanda , NY	Non-Hazardous Industrial/Commercial Petroleum Contaminated Soil	
Triad Recycling and Energy Corp	Tonawanda , NY	Petroleum Contaminated Soil	

Exhibit A

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF MATERIALS MANAGEMENT

PART 364
WASTE TRANSPORTER PERMIT NO. 9A-759

Pursuant to Article 27 ,Titles 3 and 15 of the Environmental Conservation Law and 6 NYCRR 364

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155 COMMERCE DR.
LACKAWANNA, NY 14218

PERMIT TYPE:

☐ NEW
☐ RENEWAL
■ MODIFICATION

CONTACT NAME:	ARNOLD COLLIER / AMANDA BOGDAN	EFFECTIVE DATE	03/05/2026
COUNTY:	ERIE	EXPIRATION DATE	**11/23/2026**
TELEPHONE NO:	(716)270-0433	US EPA ID NUMBER	

AUTHORIZED VEHICLES:
The Permittee is Authorized to Operate the Following Vehicles to Transport Waste

(Vehicles enclosed in <>'s are authorized to haul Residential Raw Sewage and/or Septage only)

31 (Thirty One) Permitted Vehicle(s)

NY 13317NG
NY 21777MN
NY 26839NA
NY 30627NC
NY 30628NC
NY 30631NC
NY 30634NC
NY 30635NC
NY 30638NC
NY 30639NC
NY 30640NC
NY 30998NC
NY 31714NF
NY 32292NC
NY 32442NB
NY 35705MG
NY 43015MM
NY 43213NE
NY 43473NE
NY 43661MM
NY 57295NG
NY 58278NA
NY 60957NF
NY 60971NF
NY 60972NF
NY 60973NF
NY 74243NF
NY 74405NF
NY 74407NF
NY 74418NF
NY 74419NF
End of List

Exhibit A

Name	License Plate	Make	Model	Year	Vin	Asset Photos
Dump 037	26839NA	KENWORTH	W9 SERIES	2019	1NKWXPTX2KR257066	
Dump 065	74405NF	KENWORTH	T880	2025	1NKZXPTX8SJ184569	
Dump 031	35705MG	KENWORTH	W9 SERIES	2015	1NKWXPTX9FJ455602	
Dump 014 (Sold)	79286KA OLD / 31772NF NEW	KENWORTH	T8 SERIES	2011	1NKDXUTX3BJ283809	
History 034 - Dump - not used anymore	43014MM	KENWORTH	W9 SERIES	2017	1NKWXPTX8HJ140163	
Dump 040	21777MN	KENWORTH	W9 SERIES	2020	1NKWXPTX0LR399580	
Dump 038	57295NG	KENWORTH	W9 SERIES	2019	1NKWXPTX9KR257064	
Dump 035	43661MM	KENWORTH	W9 SERIES	2017	1NKWXPTXXHJ140164	
History 013 - Dump - not used anymore	38794JY	WESTERN STAR	4900	2007	5KKMAECV77PX62342	
Dump 030 - Sold	35704MG -OLD / 74419NF - NEW	KENWORTH	W9 SERIES	2015	1NKWXPTX7FJ455601	
History 011 - Dump - not used anymore	53546JW	WESTERN STAR	4900	2007	5KKMAECV27PW94841	
Dump 016	79286KA OLD / 43015MM NEW	KENWORTH	W9 SERIES	2012	1NKWX7EX1CJ303046	
Dump 041	58278NA	KENWORTH	W9 SERIES	2021	1NKWXPTX0MR451002	
History 036 - Dump - not used anymore	66995MH	KENWORTH	W9 SERIES	2017	1NKWXPTX1HJ140165	
Dump 043	30998NC	KENWORTH	T880	2023	1NKZLP0X7PJ217701	
Dump 055	30634NC	PETERBILT	567	2020	1NPCX4EX5LD638515	
Dump 067	74243NF	KENWORTH	T880	2025	1NKZXPTX6SJ184568	
Dump 053	30639NC	PETERBILT	389	0	1NPXGGGG40D333566	
Dump 056	30627NC	PETERBILT	567	2020	1NPCX4EX4LD633919	
Dump 052	30640NC	KENWORTH	W9 SERIES	2011	1NKWX00X6BJ275869	
Dump 049	30635NC	KENWORTH	T8 SERIES	2007	1NKDLUOX67J214524	
Dump 048 (Sold)	30632NC	WESTERN STAR	4900	2007	5KKMAEAV67PX82486	
Dump 044	32292NC	KENWORTH	T880	2023	3BKZLK0X3PF255220	
Dump 054	30638NC	PETERBILT	367	2019	1NPTXPEX6KD269180	
Dump 058	30628NC	PETERBILT	389	0	1NPXGGGG70D410284	
Dump 051	30631NC	KENWORTH	T8 SERIES	2011	1NKDL00X3BJ280160	
Dump 046	30363NC	KENWORTH	T880	2025	1NKZLK0X4SJ175175	
Dump 050 (Sold)	30630NC	KENWORTH	W9 SERIES	2010	1NKWX0EX6AJ267746	
History Dump 013 (Sold)	38794JY	KENWORTH	T880	2025	1NKZXPTX1SJ137724	
Dump 034	43014MM OLD / 74418NF NEW	KENWORTH	W9 SERIES	2017	1NKWXPTX8HJ140163	
Dump 036	66995MH - OLD/ 13317NG - NEW	KENWORTH	W9 SERIES	2017	1NKWXPTX1HJ140165	
History 030 Dump not used anymore	35704MG	KENWORTH	W9 SERIES	2015	1NKWXPTX7FJ455601	
Dump 059	43473NE	KENWORTH	T880	2024	1NKZXPTX0RJ347242	
Dump 039	43213NE	KENWORTH	W9 SERIES	2019	1NKWXPTX0KR257065	
Roll Off 060	31714NF	KENWORTH	T480	2024	2NK5LJ0X2RM259491	
Dump 062	60957NF	KENWORTH	T880	2025	1NKZXPTX8SJ137722	
Dump 061	60972NF	KENWORTH	T880	2025	1NKZXPTX6SJ137721	
Dump 063	60971NF	KENWORTH	T880	2025	1NKZXPTXXSJ137723	
Dump 064	60973NF	KENWORTH	T880	2025	1NKZXPTX1SJ137724	
Dump 042	32442NB	KENWORTH	T880	2022	1NKZXPTX8NJ482186	
Dump 066	74407NF	KENWORTH	T880	2025	1NKZXPTX4SJ184567	
Dump 031	74443NF	KENWORTH	W9 SERIES	2015	1NKWXPTX9FJ455602	
Dump 069	57356NG	KENWORTH	T880	2026	1NKZXPTX7TJ231673	
Dump 070	57357NG	KENWORTH	T880	2026	1NKZXPTX9TJ231674	
Dump 068	57355NG	KENWORTH	T880	2026	1NKZXPTX5TJ231672	

Exhibit-B

EAST SECOND AVE (66')

LANDS N/F OF
CITY OF DUNKIRK HOUSING
33 & 37 E SECOND ST.
SBL 79.57-1-4 & 79.57-1-3

LANDS N/F OF
TPI3, LLC
21 E SECOND ST.
SBL 79.57-1-1

LANDS N/F OF
STATE OF NEW YORK
SBL 79.57-1-78

LANDS N/F OF
STATE OF NEW YORK
SBL 79.57-1-76

NEW YORK CENTRAL RAILROAD TRACKS

PARK AVE (66')

WASHINGTON AVE

Property Boundary

Note: Construction entrance

26'x50'x6" min crushed gravel

Note: Silt Soxx @ perimeter

185 LF ON ALUMINUM FENCING. SEE DETAIL ON D-1.

REPLACE SIDEWALK TO EXISTING CONTROL JOINT (TYP.)

PLAYGROUND STRUCTURE MODEL "PLAY SMART 16" BY BYO RECREATION. INSTALLED PER MANUFACTURE'S SPECIFICATIONS.

KID KUSHION PLAYGROUND TILES BY ENVIRONMENTAL MODELING CONCEPTS. INSTALL PER MANUFACTURES SPECIFICATIONS OR APPROVED EQUAL.

5' SIDE BLDG. SETBACK

142 LF ON ALUMINUM FENCING. SEE DETAIL ON D-1 WITH 36-INCH GATE WITH SELF CLOSING HARDWARE, LATCH AND HANDLE.

8'X15' CONCRETE PAD. SEE SIDEWALK DETAIL ON THIS SHEET.

BENCH. SEE DETAIL ON D-1

GENERATOR PAD. SEE DETAIL ON C-8

3 STORY
MULTI-FAMILY
48 UNITS
(20-ONE BEDROOMS AND
28-TWO BEDROOMS)
FFE=100.25

20' FRONT BLDG. SETBACK

BIKE RACK. SEE DETAIL ON D-1

CONCRETE STAIRCASE AND RAILING. SEE DETAIL ON D-1

CONCRETE CURB AND SIDEWALK. SEE DETAIL ON THIS SHEET

BENCH. SEE DETAIL ON D-1

ADA RAMP #2. SEE DETAIL ON ON THIS SHEET

BENCH. SEE DETAIL ON D-1

20' FRONT BLDG. SETBACK

CONCRETE CURB AND SIDEWALK IN CITY R.O.W. SEE DETAIL ON THIS SHEET.

DROP CURB DRIVEWAY #2. SEE DETAIL ON THIS SHEET.

DROP CURB DRIVEWAY #1. SEE DETAIL ON THIS SHEET.

ADA RAMP #1. SEE DETAIL ON THIS SHEET.

CONCRETE CURB (TYP.). SEE DETAIL ON ON THIS SHEET.

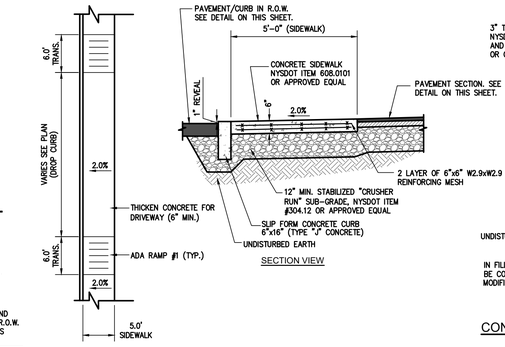
ASPHALT PAVEMENT (TYP.) SEE DETAIL ON THIS SHEET.

36.0' DROP CURB

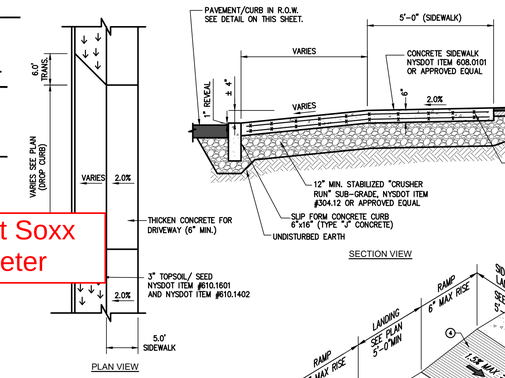
DUMPSTER ENCLOSURE SEE DETAIL ON D-1

CONNECT TO EXISTING SIDEWALK

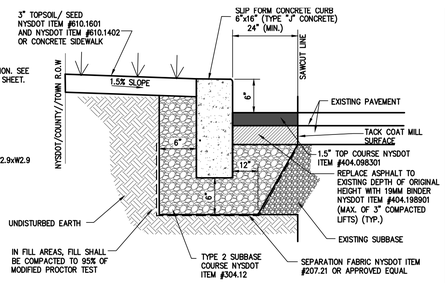
5' SIDE BLDG. SETBACK



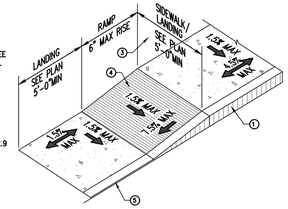
DRIVEWAY ENTRANCE #1
N.T.S.



DRIVEWAY ENTRANCE #2
N.T.S.

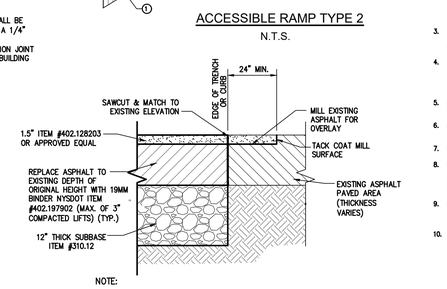


CONCRETE CURB NEXT TO EXISTING PAVEMENT IN CITY R.O.W
N.T.S.



ACCESSIBLE RAMP TYPE 1
N.T.S.

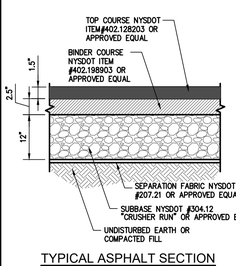
1. CURB, SEE PLANS FOR MATERIALS
2. TACTILE WARNING. NYSDOT ITEM #608.2100003
3. SIDEWALK, SEE PLANS FOR MATERIALS
4. BROOM FINISH PERPENDICULAR TO SLOPE
5. DROP CURB, 2" MAX VERTICAL ELEVATION CHANGE



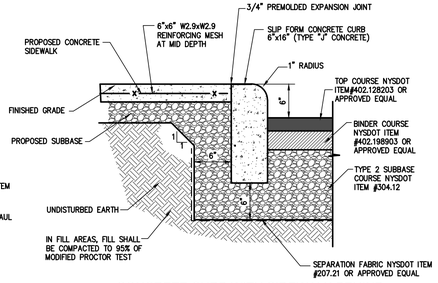
ACCESSIBLE RAMP TYPE 2
N.T.S.

ACCESSIBLE SIDEWALKS AND CURB RAMP NOTES:

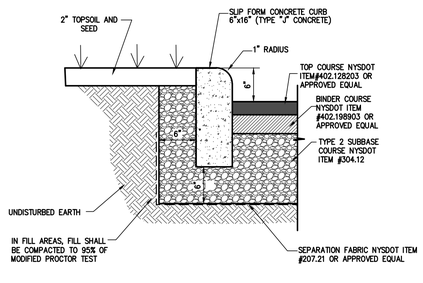
1. DIMENSIONS SHOWN IN THE DETAILS AS MINIMUMS AND MAXIMUMS ARE THE LIMITS FOR DESIGN AND FIELD LAYOUT. FACILITIES SHALL NOT BE CONSTRUCTED WITH VALUES OUTSIDE THE LIMITS FOR WORK ACCEPTANCE. SEE TABLE "DESIGN ELEMENT TOLERANCES".
2. TO CHECK FIELD LAYOUT AND TO VERIFY WORK ACCEPTANCE, ALL SLOPES AND GRADES WILL BE MEASURED WITH A 4 FOOT LONG DIGITAL LEVEL USING AT LEAST TWO READINGS. WHERE THE READINGS VARY, THE MEASUREMENTS WILL BE AVERAGED. GRADE (RUNNING SLOPE) WILL BE MEASURED ALONG THE CENTERLINE AND OFFSET 12" TO 18" FROM THE CENTERLINE. CROSS SLOPES WILL BE MEASURES PERPENDICULAR TO CENTERLINE AT 5' TO 10' INTERVALS.
3. GRADES (RUNNING SLOPES) ARE MEASURED IN THE DIRECTION OF PEDESTRIAN TRAVEL. CROSS SLOPES ARE MEASURED PERPENDICULAR TO THE DIRECTION OF PEDESTRIAN TRAVEL.
4. JOINTS BETWEEN SIDEWALKS, CURB RAMPS, TURNING SPACES AND ROADWAYS SHALL BE FLUSH AND FREE FROM ABRUPT VERTICAL CHANGES GREATER THAN ¼". VERTICAL SURFACE DISCONTINUITIES BETWEEN ¼" TO ½" SHALL BE BEVELED WITH A SLOPE NOT STEEPER THAN 1:2. THE BEVEL SHALL BE APPLIED ACROSS THE ENTIRE JOINT.
5. THE CROSS SLOPE OF PEDESTRIAN ACCESS ROUTES SHALL BE 1.5% MAXIMUM FOR DESIGN AND LAYOUT, AND 2% MAXIMUM FOR WORK ACCEPTANCE.
6. THE RUNNING SLOPE OF PEDESTRIAN ACCESS ROUTES SHALL BE 4.5% MAXIMUM FOR DESIGN AND LAYOUT, AND 5% MAXIMUM FOR WORK ACCEPTANCE.
7. THE MINIMUM WIDTH OF A CURB RAMP SHALL BE 4'.
8. THE GRADE (RUNNING SLOPE) OF A CURB RAMP SHALL BE A MINIMUM OF 5% THE GRADE FOR DESIGN AND LAYOUT SHALL BE A MAXIMUM OF 7.5%, THE GRADE FOR ADA ACCESSIBILITY AND WORK ACCEPTANCE SHALL BE A MAXIMUM OF 8.3% THE MAXIMUM VERTICAL RISE OVER THE LENGTH OF THE CURB RAMP FOR ACCEPTANCE SHALL BE 6".
9. THE CROSS SLOPE OF THE CURB RAMP SHALL BE AS FLAT AS POSSIBLE AND STILL PROVIDE POSITIVE DRAINAGE. THE CROSS SLOPE OF A CURB RAMP SHALL BE 1.5% MAXIMUM FOR DESIGN AND LAYOUT, AND 2% MAXIMUM FOR WORK ACCEPTANCE.
10. WHERE A PEDESTRIAN CIRCULATION PATH CROSSES A CURB RAMP, FLARED SIDES SHALL BE INSTALLED WITH A MAXIMUM SLOPE OF 9.5% FOR DESIGN AND LAYOUT, AND 10% MAXIMUM FOR WORK ACCEPTANCE. THE SLOPE OF THE FLARED SIDES IS MEASURED PARALLEL TO THE CURB LINE.



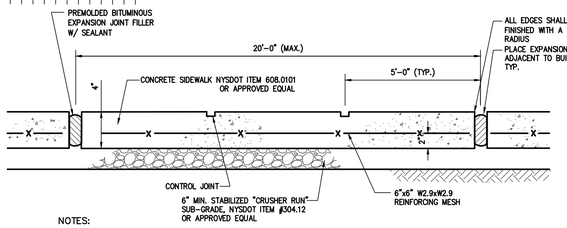
TYPICAL ASPHALT SECTION
N.T.S.



CONCRETE CURB WITH SIDEWALK BEHIND
N.T.S.



CONCRETE CURB WITH GRASS BEHIND
N.T.S.



NOTES:

1. THE CONCRETE USED SHALL BE PORTLAND CEMENT, AIR-ENTRAINED, CLASS "A" CONCRETE WITH AN AIR CONTENT OF 5% MIN., TO 7% MAX., AND A SLUMP OF THREE INCHES, MIN., TO FIVE INCHES, MAX.
2. ALL CONCRETE SIDEWALK REPLACEMENT SHALL BE TO FULL PANEL LIMITS, PARTIAL PANEL REPLACEMENT SHALL NOT BE ALLOWED.
3. ALL CURBING SHALL BE RESET OR REPLACED IN KIND AS REQUIRED, CONSISTENT IN EVERY RESPECT WITH CITY SPECIFICATION.
4. ALL SIDEWALKS SHALL BE FINISHED WITH A MAGNESIUM FLOAT FINISH UNLESS DIRECTED OTHERWISE BY THE CITY.
   EXPANSION JOINTS TO BE PLACED BETWEEN ADJACENT SLABS, AT BUILDING LINE, AT CURBS, OR AT PENETRATING STRUCTURES.

CONCRETE SIDEWALK SECTION (WITHIN PROPERTY)
N.T.S.

NOTE:

1. ALL JOINTS TO BE SEALED WITH ASPHALT EMULSION (AS-2)) NYSDOT ITEM 702-0500 (TYP.) PRIOR TO PLACEMENT OF PROPOSED NEW ASPHALT PAVEMENT.

ASPHALT SAWCUT
N.T.S.

30' 15' 0 30'

THE ALTERATION OF THIS MATERIAL IN ANY WAY, UNLESS DONE UNDER THE DIRECTION OF A COMPARABLE PROFESSIONAL, (I.E.) ARCHITECT FOR AN ARCHITECT, ENGINEER FOR AN ENGINEER OR LANDSCAPE ARCHITECT FOR A LANDSCAPE ARCHITECT, IS A VIOLATION OF THE NEW YORK STATE EDUCATION LAW AND/OR REGULATIONS AND IS A CLASS "A" MISDEMEANOR.

SUBMITTAL / REVISIONS

No.	DATE	DESCRIPTION	BY
1	5/30/25	REVISION TO PLANS BASED UPON REVISED BUILDING PLANS	JWE

PROJ. MANAGER:	JWE
CHIEF DESIGNER:	JWE
DESIGNED BY:	JWE
DRAWN BY:	JWE

STATE OF NEW YORK
JAMES W. EASTON
081902
LICENSED PROFESSIONAL ENGINEER
SEAL

EP LAND SERVICES LLC
621 COLUMBIA STREET- COHOES, NY 12047
PHONE: 518-785-9000

REGAN DEVELOPMENT

LAYOUT PLAN

208 TO 220 WASHINGTON AVE.
TAX PARCELS 79.57-1-81, 80, 79, 75, 74, 73, 72, 71, 70, 2

THE CITY OF DUNKIRK NEW YORK

SCALE: 1"=30'
PROJ. No.: 2022-08E
DATE: JUNE 2023

C-4

File Name: C:\Users\jeaston\OneDrive - Prime Companies\jeaston\Engineering Projects\Other Clients\2022\2022-09 Dunkirk-Regan\04-Cad File\Civil Site Plan (Washington 5-30-25).dwg (Layout: C-4)
Date: Thu, May 29, 2025 - 9:42 AM (Name: JamieEaston)

April 15th, 2026

Exhibit C

BE3 Corp.
960 Busti Avenue, Suite B-150
Buffalo, New York, 14213
jbrydges@be3corp.com
Attn: Mr. Jason Brydges

Re: Track IV Remediation, Soil Removal & Replacement
208-220 Washington Ave,
Dunkirk, NY 14048

Sequence:

Construction entrance off Washington Avenue to be constructed prior to the store of the Track IV remediation. Area per drawing C-3 attached.

1) **Asphalt Area's:** 1) 18' x 26' x 1.07' 19 cy's±. Asphalt Area 2) 70' x 100' x 1.78' to subgrade, 202 cy's ± and portion of asphalt area 3) 40' x 70' x 1.08' to subgrade, 112 cy's totaling 333 cy's ± material excavated, load, and hauled to landfill. Subgrade to be graded and compacted, installation of demarcation material, stabilization fabric, and 12" gravel compacted to 95%. Having established an entrance and staging area for the completion of the soil remediation.

2) Excavated, load, and haul to landfill asphalt area 3) 25' x 70' x 1.08' to subgrade, 70 cy's±, Asphalt area 4) 70' x 80' x 1.24' to subgrade, 257 cy's ± totaling 327 cy's ±. Subgrade to be graded and compacted, installation of demarcation material, stabilization fabric, and 12" gravel compacted to 95%.

3) Excavated, load, and haul to landfill remainder of asphalt area 5) 70' x 80' x 1.64' to subgrade, 340 cy's±, Asphalt Area 6) 18' x 26' x 1.28' to subgrade, 22 cy's± totaling 362 cy's. Subgrade to be graded and compacted, installation of demarcation material, stabilization fabric, and 12" gravel compacted to 95%.

4) **Building Areas**: No excavation and haul off fill required, portion of building area 1) 30' x 75' subgrade to be graded and compacted, installation of demarcation material, of approved dirt fill compacted to 95%, 312 cy's ± installation of stabilization fabric and 56 cy's± 8" depth, gravel compacted to 95%.

5) Fill required additional portion of building area 1) 30' x 75' subgrade to be graded and compacted. Installation of demarcation material, approved dirt fill compacted to 95%, 312 cy's ± installation of stabilization fabric, and 56 cy's± 8" depth, gravel compacted to 95%.

Exhibit C

6) Fill required remainder of building area 1) 25' x 75' subgrade to be graded and compacted. Installation of demarcation material, approved dirt fill compacted to 95%, 260 cy's ± installation of stabilization fabric, and 47 cy's± 8" depth, gravel compacted to 95%.

7) Fill required portion of building area 2) 30' x 75' subgrade to be graded and compacted. Installation of demarcation material, approved dirt fill compacted to 95%, 271 cy's ± installation of stabilization fabric, and 56 cy's± 8" depth, gravel compacted to 95%.

8) Fill required additional portion of building area 2) 30' x 75' subgrade to be graded and compacted. Installation of demarcation material, approved dirt fill compacted to 95%, 271 cy's ± installation of stabilization fabric, and 56 cy's± 8" depth, gravel compacted to 95%.

9) Fill required remainder of building area 2) 25' x 75' subgrade to be graded and compacted. Installation of demarcation material, approved dirt fill compacted to 95%, 225 cy's ± installation of stabilization fabric, and 47 cy's± 8" depth, gravel compacted to 95%.

10) Fill required at building area 3) 50' x 75' subgrade to be graded and compacted. Installation of demarcation material, approved dirt fill compacted to 95%, 285 cy's ± installation of stabilization fabric, and 93 cy's± 8" depth, gravel compacted to 95%.

11) Fill required at building area 4) 55' x 75' subgrade to be graded and compacted. Installation of demarcation material, approved dirt fill compacted to 95%, 195 cy's ± installation of stabilization fabric, and 102 cy's± 8" depth, gravel compacted to 95%.

12) Fill required at building area 5) 55' x 75' subgrade to be graded and compacted. Installation of demarcation material, approved dirt fill compacted to 95%,118 cy's ± installation of stabilization fabric, and 102 cy's± 8" depth, gravel compacted to 95%.

13) **Lawn Areas:** Excavated, load, and haul to landfill portion of Lawn Area 1) 50' x 85' x 2.05' to subgrade, 323 cy's ±, subgrade to be graded and compacted, installation of demarcation material, and 18" of approved dirt fill graded & compacted, 236 cy's ±, 6" of approved topsoil rough graded to ± 1" of finish grade 79 cy's ±.

14) Excavated, load, and haul to landfill portion of Lawn Area 2) 50' x 55' x 1.79' to subgrade, 182 cy's ±. Lawn Area 3) 50' x 134' x .92' to subgrade, 228 cy's totaling 410 cy's±. Subgrade to be graded and compacted, installation of demarcation material, and 18" of approved dirt fill graded & compacted, 524 cy's ± , 6" of approved topsoil rough graded to ± 1" of finish grade 175 cy's ±.

Exhibit C

15) Excavated, load, and haul to landfill Lawn Area 4) 10’ x 100’ x 1.04' to subgrade, 39 cy’s ±, Lawn Area 5) 24’ x 77’ x 1.17' to subgrade, 80 cy’s ±, Lawn Area 6) 18’ x 18’ x 1.05' to subgrade, 13 cy’s±. Lawn Area 7) 18’ x 35’ x 1.61' to subgrade, 38 cy’s ±, Lawn Area 8) 10’ x 195’ x 1.92' to subgrade, 139 cy’s. Totaling 309 cy’s± . Subgrade to be graded and compacted, installation of demarcation material, and 18” of approved dirt fill graded & compacted, 320 cy’s ± , 6” of approved topsoil rough graded to ± 1” of finish grade 107 cy’s ±.

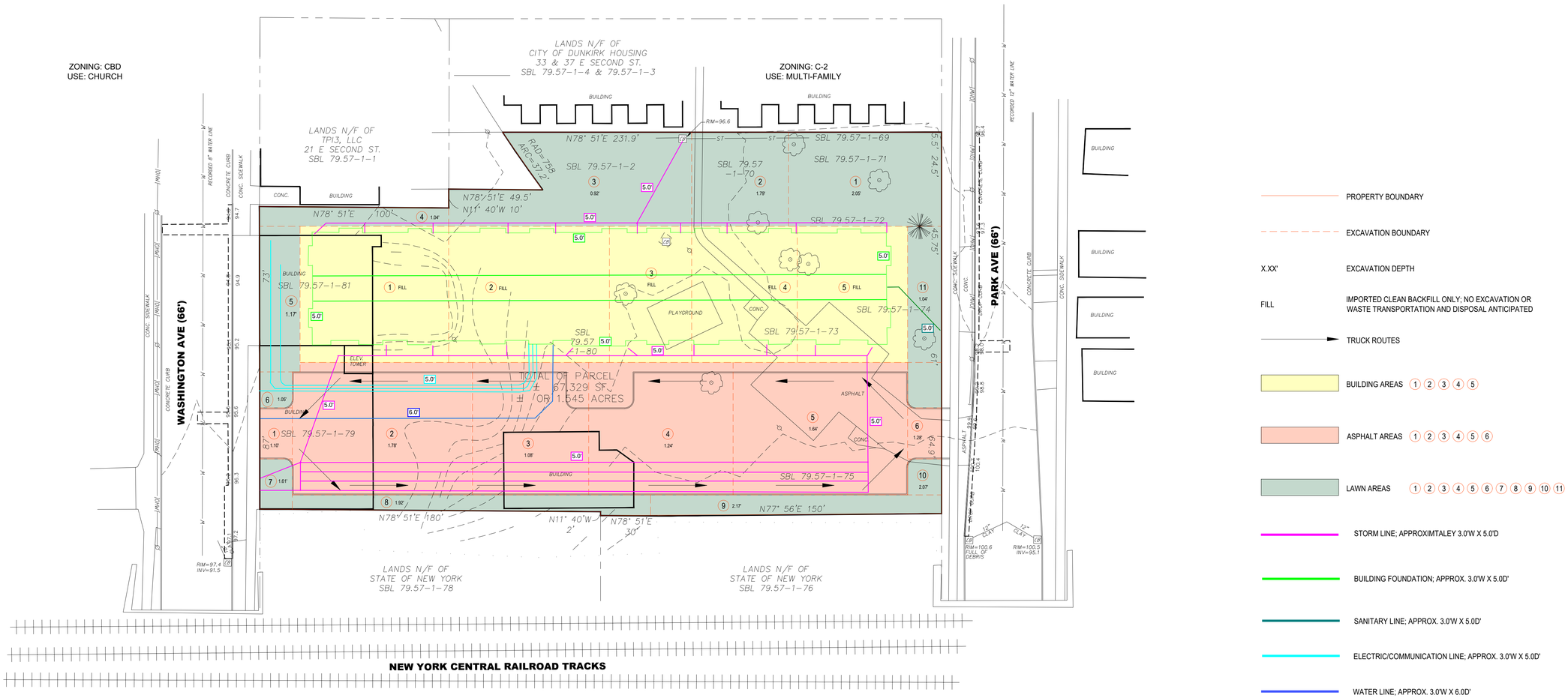
16) Excavated, load, and haul to landfill Lawn Area 9) 11’ x 165’ x 2.17' to subgrade, 146 cy’s ±, Lawn Area 10) 18’ x 18’ x 2.07' to subgrade, 25 cy’s ±, Lawn Area 11) 17’ x 95’ x 1.04' to subgrade, 62 cy’s±. Totaling 223 cy’s±. Subgrade to be graded and compacted, installation of demarcation material, and 18” of approved dirt fill graded & compacted, 208 cy’s ±, 6” of approved topsoil rough graded to ± 1” of finish grade 70 cy’s ±.

The above sequence is based on projected daily production. Subject to change due to inclement weather and unforeseen situations. Material will be stockpiled and covered when required.

It is important to note that the soil cover system in green space areas will be 2-feet thick after any compaction has occurred.

All additional foundation and utility excavations will occur in segments in correlation with the sequenced work schedule. These excavations will occur when work is being done in the corresponding work area. See the attached figure in this exhibit for all excavation depths and locations.

EXHIBIT C



PROPERTY BOUNDARY

EXCAVATION BOUNDARY

X.XX' EXCAVATION DEPTH

FILL IMPORTED CLEAN BACKFILL ONLY; NO EXCAVATION OR WASTE TRANSPORTATION AND DISPOSAL ANTICIPATED

TRUCK ROUTES

BUILDING AREAS (1) (2) (3) (4) (5)

ASPHALT AREAS (1) (2) (3) (4) (5) (6)

LAWN AREAS (1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11)

STORM LINE; APPROXIMTALEY 3.0'W X 5.0'D

BUILDING FOUNDATION; APPROX. 3.0'W X 5.0D'

SANITARY LINE; APPROX. 3.0'W X 5.0D'

ELECTRIC/COMMUNICATION LINE; APPROX. 3.0'W X 5.0D'

WATER LINE; APPROX. 3.0'W X 6.0D'

EXHIBIT D

The Homesteads at Dunkirk

Job Hazard Analysis

Kulback's, Inc.



Daily Trenching Log

DAILY TRENCHING LOG

DATE:	SIGNATURE:
WEATHER:	PROJECT:

Was One Call System contacted:	Yes _____	No _____
Protective system:	Trench shield (box) _____ Sloping _____	Wood shoring _____ Other _____
Purpose of trenching:	Drainage _____ Sewer _____ Other _____	Water _____ Gas _____
Were visual soil tests made: If yes, what type?	Yes _____	No _____
Were manual soil tests made: If yes, what type?	Yes _____	No _____
Type of soil:	Stable Rock _____ Type A _____	Type B _____ Type C _____
Surface encumbrances: If yes, what type?	Yes _____	No _____
Water conditions:	Wet _____ Dry _____	Submerged _____
Hazardous atmosphere exists: ***(If yes, follow confined space entry procedures policy; complete Confined Space Entry Permit; monitor for toxic gas(es))***	Yes _____	No _____
Is trenching or excavation exposed to public vehicular traffic (exhaust emission): ***(If yes, refer to confined space entry procedures; complete Confined Space Entry Permit; monitor for toxic gas(es))***	Yes _____	No _____
Measurements of trench: Depth _____	Length _____	Width _____
Is ladder within 25 feet of all workers:	Yes _____	No _____
Is excavated material stored two feet or more from edge of excavation:	Yes _____	No _____
Are employees exposed to public vehicular traffic: ***(If yes, warning vests required)***	Yes _____	No _____
Are other utilities protected: ***(Water, sewer, gas or other structures)***	Yes _____	No _____
Are sewer or natural gas lines exposed: ***(If yes, refer to confined space entry procedures policy; complete Confined Space Entry Permit; monitor for toxic gas(es))***	Yes _____	No _____
Periodic inspection:	Yes _____	No _____
Did employees receive training in excavating:	Yes _____	No _____

Job Orientation Guide

Company: *Kulback's, Inc.* Employee: _____
Trainer: _____ Hire Date: _____
Date _____ Position: _____

This checklist is a guideline for conducting employee safety orientations for employees new to *Kulback's, Inc.*. Once completed and signed by both supervisor and employee, it serves as documentation that orientation has taken place.

		Date	Initials
1.	Explain the company safety program, including:		
	Orientation	_____	_____
	On-the-job training	_____	_____
	Safety meetings	_____	_____
	Accident investigation	_____	_____
	Disciplinary action	_____	_____
2.	Use and care of personal protective equipment, (Hard hat, fall protection, eye protection, etc.)	_____	_____
3.	Line of communication and responsibility for immediately reporting accidents.		
	A. When to report an injury	_____	_____
	B. How to report an injury	_____	_____
	C. Who to report an injury to	_____	_____
	D. Filling out accident report forms	_____	_____
4.	General overview of operation, procedures, methods and hazards as they relate to the specific job	_____	_____
5.	Pertinent safety rules of the company and WISHA	_____	_____
6.	First aid supplies, equipment and training		
	A. Obtaining treatment	_____	_____
	B. Location of Facilities	_____	_____
	C. Location and names of First-aid trained personnel	_____	_____
7.	Emergency plan		
	A. Exit location and evacuation routes	_____	_____
	B. Use of fire fighting equipment (extinguishers, hose)	_____	_____
	C. Specific procedures (medical, chemical, etc.)	_____	_____
8.	Vehicle safety	_____	_____
9.	Personal work habits		
	A. Serious consequences of horseplay	_____	_____
	B. Fighting	_____	_____
	C. Inattention	_____	_____
	D. Smoking policy	_____	_____
	E. Good housekeeping practices	_____	_____
	F. Proper lifting techniques	_____	_____

NOTE TO EMPLOYEES: Do not sign unless ALL items are covered and ALL questions are satisfactorily answered.

The signatures below document that the appropriate elements have been discussed to the satisfaction of both parties, and that both the supervisor and the employee accept responsibility for maintaining a safe and healthful work environment.

Date: _____ Supervisor's Signature: _____

Date: _____ Employee's Signature: _____

JOB SAFETY ANALYSIS WORKSHEET

TITLE OF JOB OPERATION: The Homesteads at Dunkirk Date: 04/10/26

Title of person who does job: _____

Employee observed: _____ Location: _____

Analysis made by: _____ Analysis approved by: _____

Sequence of basic job steps	Potential accidents or hazards	Recommended safe job procedures
Equipment Safety	Struck-by hazard potential	Audible backup alarms
Weather Conditions	Cold Stress Hazards	Ice Melt/Proper PPE
Access by public	Pedestrian/public access to site	Site fencing and posted signs and spotters to be used.
Site work	Excavations	Competent person will inspect daily.
Personal protective equipment required for this position: Hardhats, eye protection, work boots, hearing protection		

Other hazards that may develop and will be addressed in our safety meetings:

Employee's signature Date

Equipment Safety Inspection Checklist

Date: _____

Project: _____

Equipment: _____

All guards and fenders	_____	OK	_____	Needs Repair
Brakes	_____	OK	_____	Needs Repair
Lights – front, rear, side, dash	_____	OK	_____	Needs Repair
Back-up alarm – horn	_____	OK	_____	Needs Repair
Ladders, stairs, hand holds	_____	OK	_____	Needs Repair
ROPS (Roll-over protection)	_____	OK	_____	Needs Repair
Seat belts	_____	OK	_____	Needs Repair
Fire extinguisher	_____	OK	_____	Needs Repair
Glass	_____	OK	_____	Needs Repair
Tires	_____	OK	_____	Needs Repair
Electrical cords	_____	OK	_____	Needs Repair
Ground fault circuit interrupters	_____	OK	_____	Needs Repair
Electrical hand tools	_____	OK	_____	Needs Repair
Powder actuated tools	_____	OK	_____	Needs Repair
Condition of pneumatic hand tools	_____	OK	_____	Needs Repair

Other Items Checked:

Oil level and leaks	____	OK	____	Needs Repair	____	Add	____ Change
Hydraulic oil level and leaks	____	OK	____	Needs Repair	____	Add	____ Change
Anti-freeze level and leaks	____	OK	____	Needs Repair	____	Add	____ Change
Fuel level and leaks	____	OK	____	Needs Repair	____	Add	____ Change
First aid kit	____	OK	____	Needs Repair	____	Add	____ Change

Repaired by: _____

Checked by: _____

Hazard Communication Checklist

1. Have we prepared a list of all the hazardous chemicals in our workplace?

2. Are we prepared to update our hazardous chemical list?

3. Have we obtained or developed a material safety data sheet for each hazardous chemical we use?
4. Have we developed a system to ensure that all incoming hazardous chemicals are checked for proper labels and data sheets?
5. Do we have procedures to ensure proper labeling or warning signs for containers that hold hazardous chemicals?
6. Are our employees aware of the specific information and training requirements of the Hazard Communication Standard?
7. Are our employees familiar with the different types of chemicals and the hazards associated with them?
8. Have our employees been informed of the hazards associate with performing non-routine tasks?
9. Are employees trained about proper work practices and personal protective equipment in relation to the hazardous chemicals in their work area?
10. Does our training program provide information on appropriate first aid, emergency procedures, and the likely symptoms of overexposure?
11. Does our training program include an explanation of labels and warnings that are used in each work area?
12. Does the training describe where to obtain data sheets and how employees may use them?
13. Have we worked out a system to ensure that new employees are trained before beginning work?
14. Have we developed a system to identify new hazardous chemicals before they are introduced into a work area?
15. Do we have a system for informing employees when we learn of new hazards associated with a chemical?

Written Hazard Communication Program

General:

It is the Policy of ***Kulback's, Inc.*** to provide and maintain a safe and healthy workplace for all employees including those who work with potentially hazardous chemicals. This written program will be posted and available 24 hours a day, seven days a week at the following locations:

1.

2.

If you work with or around potentially hazardous chemicals, this program affects you. The HAZARD COMMUNICATION STANDARD is intended to inform you of any potential chemical hazards from products you may come in contact with at this facility.

Container Labeling:

All containers of chemical products received at this company and all containers used as secondary containers will contain a label listing their hazards, both physical and health hazards. If the label is missing, contact ***the job foreman*** so that he/she may determine what the product is that has been received, and where it should be stored. **DO NOT ATTEMPT TO USE ANY CHEMICAL THAT IS NOT READILY IDENTIFIABLE.**

Material Safety Data Sheets:

(Add name of person responsible) has the SDS on file from the various chemical manufacturers for all hazardous chemicals used in connection with this workplace. The SDS list, in English, information available about any particular chemical: health hazards, emergency and first aid procedures, how the chemical could enter the body, the safe handling and use of the chemical, name of manufacturer, etc. The SDS file may be found in these locations:

1.

2.

Employee Training and Information:

The Site Foreman will provide training to all employees and new hires on the proper use of hazardous chemicals and potential hazards. They will be responsible for providing the following informational training to all employees:

1. Hazardous chemicals present in the workplace.
2. Location of various chemicals. What to use. What to avoid.
3. Emergency procedures in case of contact with hazardous chemicals.
4. How to read the labels.
5. Location of the MSDS files and how to read the MSDS.
6. Non-routine tasks that may be encountered.
7. Symptoms of overexposure and personal protective measures to be used.

Hazardous Materials Inventory List:

Examples: acids, aerosols, battery fluids, catalysts, caustics, cleaning agents, degreasing agents, flammables, fuels, fungicides, industrial oils, insecticides, herbicides, office copier chemicals, pesticides, surfactants, solvents, wood preservatives.

Hazard Communication Safety Data Sheets (SDS) *Globally Harmonized System*

The Globally Harmonized System is an internationally agreed system designed to provide a consistent format across international boundaries to ensure chemical hazards can be clearly understood by users
In 2012, OSHA revised the Hazard Communication Standard (HCS) which requires chemical manufacturers, distributors, or importers to provide Safety Data Sheets (SDSs) (formerly known as Material Safety Data Sheets or MSDSs) to communicate the hazards of hazardous chemical products. *As of June 1, 2015, the HCS will require new SDSs to be in a uniform format, and include the section numbers, the headings, and associated information under the headings below*:
Section 1, Identification includes product identifier; manufacturer or distributor name, address, phone number; emergency phone number; recommended use; restrictions on use.
Section 2, Hazard(s) identification includes all hazards regarding the chemical; required label elements.
Section 3, Composition/information on ingredients includes information on chemical ingredients; trade secret claims.
Section 4, First-aid measures includes important symptoms/ effects, acute, delayed; required treatment.
Section 5, Fire-fighting measures lists suitable extinguishing techniques, equipment; chemical hazards from fire.
Section 6, Accidental release measures lists emergency procedures; protective equipment; proper methods of containment and cleanup.
Section 7, Handling and storage lists precautions for safe handling and storage, including incompatibilities.
Section 8, Exposure controls/personal protection lists OSHA's Permissible Exposure Limits (PELs); Threshold Limit Values (TLVs); appropriate engineering controls; personal protective equipment (PPE).
Section 9, Physical and chemical properties lists the chemical's characteristics.
Section 10, Stability and reactivity lists chemical stability and possibility of hazardous reactions.
Section 11, Toxicological information includes routes of exposure; related symptoms, acute and chronic effects; numerical measures of toxicity.
Section 12, Ecological information
Section 13, Disposal considerations
Section 14, Transport information
Section 15, Regulatory information
Section 16, Other information, includes the date of preparation or last revision.
Employers must ensure that SDSs are readily accessible to employees.

The Homesteads at Dunkirk
Site-Specific Safety Training Manual

Kulback's, Inc.



Updated - 04/26 by Chris Gerace

Kulback's, Inc. Policy Letter

SAFETY AND HEALTH POLICY:

The purpose of this policy is to develop a high standard of safety throughout all operations of **Kulback's, Inc.**

We believe that each employee has the right to derive personal satisfaction from his/her job and the prevention of occupational injury or illness is of such consequence to this belief that it will be given top priority at all times.

It is our intention here at ***Kulback's, Inc.*** to initiate and maintain complete accident prevention and safety training programs. Each individual from top management to the working person is responsible for the safety and health of those persons in their charge and coworkers around them. By accepting mutual responsibility to operate safely, we will all contribute to the well being of personnel.

Frank Schreiber

(Frank Schreiber – Director of Site Operations)

EMERGENCY PROCEDURES:

The nearest hospital is Brooks Memorial Hospital - 529 Central Ave, Dunkirk NY

Personnel will call 9-1-1

Kulback's, Inc. has site personnel who have received CPR & First Aid Training.

Kulback's, Inc.
Safety Program

Environmental Policy

Operating within the fields of Project Services Management, Kulback's, Inc., recognizes that its activities have wide-ranging environmental implications in both the long and short term. These can potentially be either beneficial or damaging.

Kulback's, Inc. will therefore pursue a policy aimed at minimizing environmental damage and maximizing opportunities for environmental enhancement.

In all of its activities, including the construction of projects and in its own administration, the company will consider environmental impact as an important part of its decision making process. Kulback's, Inc. will implement the highest ethical standards in environmental matters.

To implement this policy, the company will ensure that employees are aware of the environmental implications of our work. Where necessary, training programs will be implemented, or consultants will be utilized, in order to heighten staff awareness of the relevant issues.

On individual projects, Kulback's, Inc. will endeavor to give or to obtain the best advice for its clients concerning environmental aspects of the project.
Environmental hazards and/or damage, which is uncovered or created by construction operations, will be brought to the client's attention immediately. Where it is appropriate, we will assist in tailoring designs to suit particular environmental concerns consistent with optimum solutions in cost and time. During the execution of projects, Kulback's, Inc. will manage and organize the work in a manner which will reduce, so far as is reasonably practicable, environmental impact from construction operations caused by: disposal of construction debris noise dust and/or fumes generated by construction processes mud on roads or footpaths contaminated and/or sediment laden runoff arising from the work and will take effective precautions to protect occupants of adjacent land or buildings and the general public from any danger, discomfort, disturbance, trespass or nuisance. Such provisions will include secure, well-lit and signed compounds, barriers, or screens as necessary and a well-presented clean site. Kulback's, Inc. will use their best endeavors to protect and maintain existing services and to minimize traffic flow and noise by logistics management and off site fabrication.

In pursuit of this policy, environmental considerations will be taken into account in the selection of trade contractors and subcontractors and when assessing the acquisition of plant and materials from trade sources.

All members of the company's staff will be expected to be aware of and to pursue this policy.

This Safety Management System is designed for use by the Project Management Team for the following purposes:

- Planning for a safe workplace and a safe environment.
- Communicating to employees and workers on the project the need to make safety a top priority.
- Implementing methods and procedures for controlling potential safety and environmental hazards.
- Monitoring job operations to assure compliance with regulatory requirements.
- The manual serves as a basis for establishing a safety program on your job. A current copy of the OSHA Standards should be available on site and consulted before beginning any activity.

The program provides for specific individual *responsibility* assignments to be made to key members of the project management staff for the purpose of monitoring compliance with safety requirements. Applicable pages from this manual should be duplicated to create a site-specific safety manual. Appropriate parts should be copied and given to those personnel who have related responsibilities for monitoring the workplace.

Safety and Environmental Management System - Overview

The Safety and Environmental Management System of consists of:

- **Safety and Environmental Management System** that establishes the necessary framework for the Safety Plan for your project.
- The Project **Chemical Hazard Communication Program**.

Overview

The site specific safety and environmental program formulated from the Safety and Environmental Management System, local, state and client regulations and requirements lays the basic foundation for implementing safety on the jobsite. All members of the project team are involved from the project manager down to the subcontractor's field employees. It is imperative that the site-specific safety and environmental program be used as a launching point and not the cure all. Each project will have specific and unique safety hazards that need to be addressed.

The Safety Management System provides a framework within which management can carry out their duties in respect to occupational safety and health, and improve the effectiveness of project management by providing the tools and training to do the job. The emphasis throughout our company is on ensuring that our projects are carried out

by employees that operate safely.

Protecting The Public

Scope - Protecting the Public

Reference - Local and State Codes

General - Initial safety planning shall include an evaluation of public safety exposures. These shall include:

Measures To Protect Public	Yes/No/N/A	If No, Why?
Is fencing or other type barriers or barricades required?	YES	
Is protection of public walkways required?	YES	
Will routing of general public and vehicular traffic be needed?	YES	
Are controls needed for special operations such as blasting, demolition, etc.?	YES	
Is signage needed for warnings, traffic directions, etc.?	YES	
Will communications to neighborhood residents be necessary?	NO	This will not disturb any residential areas.
Environmental impact?	YES	DEC Brownfield project that will be in the supervision of BE3 and the NYSDEC.
Other Items		

Please note that soil contamination procedures will be addressed by HSO – Jason M. Brydges, P.E. - as per Site-Specific Procedures and State and Federal Regulations will be strictly adhered to, as required.

Safety Program Procedures

Safety Orientation: Each employee will be given a safety orientation by the company site superintendent when first hired. The orientation will cover the following items:

Accident Prevention Program

- We have an accident prevention program. It consists of this safety orientation, safety meetings, and self-inspections.
- We also have basic safety rules that all employees must follow. They are:
- Never do anything that is unsafe in order to get the job done. If a job is unsafe, report it to your supervisor or foreman. We will find a safer way to do that job.
- Do not remove or disable any safety device! Keep guards in place at all times on operating machinery.
- Never operate a piece of equipment unless you have been trained and are authorized.
- Use your personal protective equipment whenever it is required.
- Obey all safety warning signs.
- Working under the influence of alcohol or illegal drugs or using them at work is prohibited.
- Do not bring firearms or explosives onto company property.
- Horseplay, running and fighting are prohibited
- Clean up spills immediately. Replace all tools and supplies after use. Do not allow scraps to accumulate where they will become a hazard. Good housekeeping helps prevent accidents.

Reporting Injuries:

- If you are injured or become ill on the job, report this to your site supervisor
    - If first aid trained personnel are involved in a situation involving blood, they should:
    - Avoid skin contact with blood/other potentially infectious materials by letting the victim help as much as possible, and by using gloves provided in the first aid kit.
    - Remove clothing, etc. with blood on it after rendering help.
    - Wash thoroughly with soap and water to remove blood. A 10% chlorine bleach solution is good for disinfecting areas contaminated with blood (spills, etc.).
    - Report such first aid incidents within the shift to supervisors (time, date, blood presence, exposure, names of others helping).
- **First aid kit locations at this jobsite include:**
    - **The Job trailer or Foreman's Vehicle**

Temperature Extremes

Workers subjected to temperature extremes, radiant heat, humidity, or air velocity combinations which, over a period of time, may produce physical illness. Protection by use of adequate controls, methods or procedures, or use of protective

clothing will be provided to employees working in these conditions. Excessive exposure to heat is referred to as heat stress and excessive exposure to cold is referred to as cold stress.

Heat related illness (HRI) and cold-induced illnesses (Hypothermia/frostbite) are well known, recognized workplace hazards. All work operations involving exposure to temperature extremes, either humidity/heat extremes or cold extremes have the potential for inducing heat stress and heat related illnesses or cold stress resulting in frostbite or hypothermia, therefore, ***Kulback's, Inc.*** has developed a policy to address these issues. All employees will receive training relating to the causes and effects, as well as the personal and environmental factors that may lead to temperature extreme related illnesses. Each employee will be provided with training and materials that include but are not limited to:

- The chosen method or methods to assess the risk for HRI or cold stress.
- A section covering training elements to provide employees information on what the employer will do when working in extreme weather conditions.
- A section on first aid including how to identify HRI symptoms and cold stress systems. The proper first aid application for an individual that is suffering from HRI or cold weather illness, and procedures for summoning medical aid personnel.
- A section identifying where and how adequate drinking water will be supplied.
  An evacuation map for the building is posted. It shows the location of exits, fire extinguishers, first aid kits, and where to assemble outside.

Fire Emergency

- A fire extinguisher or fire extinguishers will be covered as part of this orientation.
- If you discover a fire: Tell another person immediately. Call or have them call 911 and a supervisor.
- If the fire is small (such as a wastebasket fire) and there is minimal smoke, you may try to put it out with a fire extinguisher.
- If the fire grows or there is thick smoke, do not continue to fight the fire.
- Tell other employees in the area to evacuate.
- Go to the designated assembly point outside the building.

Identification of hazardous chemicals used at this location:

- Safe use and emergency actions to take following an accidental exposure.
- We use a limited number of chemicals. You will receive a separate orientation as part of our chemical hazard communication program on the hazards of these chemicals before you work with them or work in an area where they are used.
- Some tasks in our company require an employee to wear PPE to protect against injury.
- You will be instructed by *(your site supervisor in the use and care of PPE)* using the manufacturer's instructions on how to use and care for these PPE.

On-the-job training about what you need to know to perform the job safely:

- Before you are first assigned a task, your site supervisor will show you what to do along with safety instructions and required PPE.
- We have established safety rules and personal protective equipment (PPE) requirements based upon a hazard assessment for each task.
- Do not use equipment or attempt to do any of these tasks until you have received the required training and PPE.

Safety Meetings and Self-Inspections

- **Employee Safety Meetings**
- At the beginning of each job and at least weekly thereafter.

- Review of any walk-around safety inspections conducted since the last safety meeting.
- Review of any citation to assist in correction of hazards.
- Evaluation of any accident investigations conducted since the last meetings to determine if the cause of the unsafe acts or unsafe conditions involved were properly identified and corrected.
- Document attendance and other subjects discussed.
- *Maintain records for one year.*

- **Self-inspections**
- At the beginning of each job, and at least weekly thereafter.
- Include one member of management and one employee, elected by the employees, as their authorized representative.
- Document walk-around safety inspection.
- *Maintain records until the completion of the job.*

Safety Disciplinary Policy

Kulbacks, Inc. believes that a safety and health Accident Prevention Program is unenforceable without some type of disciplinary policy. Our company believes that in order to maintain a safe and healthful workplace, the employees must be cognizant and aware of all company, State, and Federal safety and health regulations as they apply to the specific job duties required. The following disciplinary policy is in effect and will be applied to all safety and health violations.

The following steps will be followed unless the seriousness of the violation would dictate going directly to Step 2 or Step 3.

1. A first time violation will be discussed orally between company supervision and the employee. This will be done as soon as possible.

2. A second time offense will be followed up in written form and a copy of this written documentation will be entered into the employee's personnel folder.

3. A third time violation will result in termination.

If an employee of this company knowingly and willingly violates any of the safety rules or procedures, or puts his/her self in an imminent danger situation, the employee will be immediately discharged.

General Safe Work Practices for Construction

Personal Protective Equipment

- Suitable clothing must be worn; long pants, at least short-sleeved shirts and adequate foot wear.

- Hard hats, safety glasses or goggles must be used when a potential hazard exists. (Safety glasses must be ANSI Z87 or Z87.1 approved).

- Hearing protection (earplugs or earmuffs) must be used in high noise areas.
- Gloves (as needed).

Housekeeping

- Always store materials in a safe manner. Tie down or support materials if necessary to prevent falling, rolling, or shifting.
- Shavings, dust scraps, oil or grease should not be allowed to accumulate. Good housekeeping is a part of the job.
- Trash piles must be removed as soon as possible. Trash is a safety and fire hazard.
- Immediately remove all loose materials from stairs, walkways, ramps, platforms, etc.
- Do not block aisles, traffic lanes, fire exits, gangways, or stairs.

Other general safe work practices

- Avoid shortcuts – use ramps, stairs, walkways, ladders, etc.
- Do not remove, deface or destroy any warning, danger sign, or barricade, or interfere with any form of accident prevention device or practice provided for your use or that is being used by other workers.
- Get help with heavy or bulky materials to avoid injury to yourself or damage to material.
- Do not use tools with split, broken, or loose handles, or burred or mushroomed heads. Keep cutting tools sharp and carry all tools in a container.
- Know the correct use of hand and power tools. Use the right tool for the job.

Fall protection

- Fall hazards of 6 feet or more will be outlined and addressed in our jobsite fall protection work plan.
- Fall hazards of less than 6 feet will be protected by covers, guardrails or other methods and will be addressed in our self-inspections and safety meetings.
- Standard guardrails must be erected around all floor openings and open-sided surfaces. Contact your supervisor for the correct specifications.

Electrical

- Ground-fault circuit interrupters (GFCI) will be used when ever possible.
- Electric cords will be inspected daily and repaired or replaced as necessary.
- Do not operate any power tool or equipment unless you are trained in its operation.
- Use tools only for their designed purpose.

Ladder safety

- Inspect before use for physical defects.
- Ladders are not to be painted except for numbering purposes.
- Do not use ladders for skids, braces, workbenches, or any purpose other than climbing.
- When you are ascending or descending a ladder, do not carry objects that will prevent you from grasping the ladder with both hands.
- Always face the ladder when ascending and descending.
- If you must place a ladder over a doorway, barricade the door to prevent its use and post a warning sign.
- Only one person is allowed on a ladder at a time.
- Do not jump from a ladder when descending.
- All joints between steps, rungs, and side rails must be tight.
- Safety feet must be in good working order and in place.
- Rungs must be free of grease and/or oil.

Stepladders

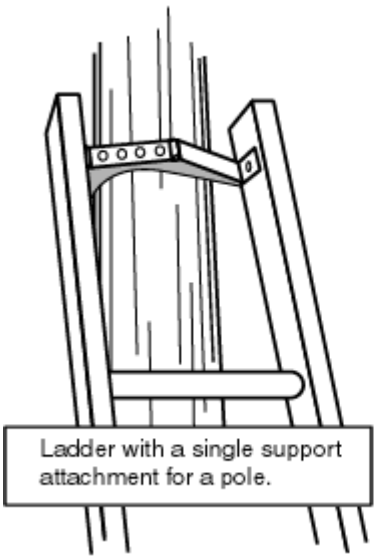
- Do not place tools or materials on the steps or platform of a stepladder
- Do not use the top two steps of a stepladder as a step or stand.
- Always level all four feet and lock spreaders in place.
- Do not use a stepladder as a straight ladder.

Straight type or extension ladders

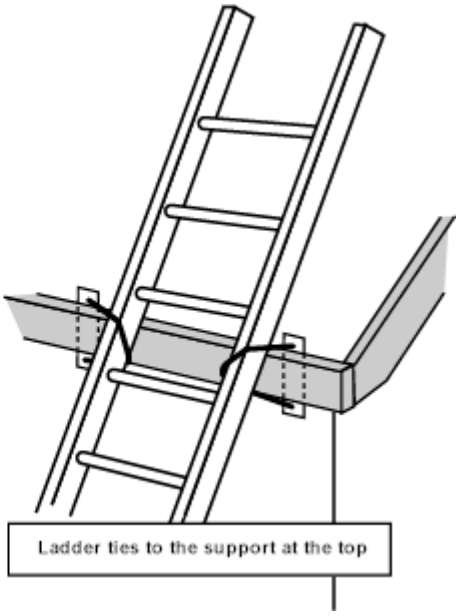
- All straight or extension ladders must extend at least three feet beyond the supporting object when used as an access to an elevated work area.

- After raising the extension portion of a two or more stage ladder to the desired height, check to ensure that the safety dogs or latches are engaged.

- All extension or straight ladders must be secured or tied off at the top.

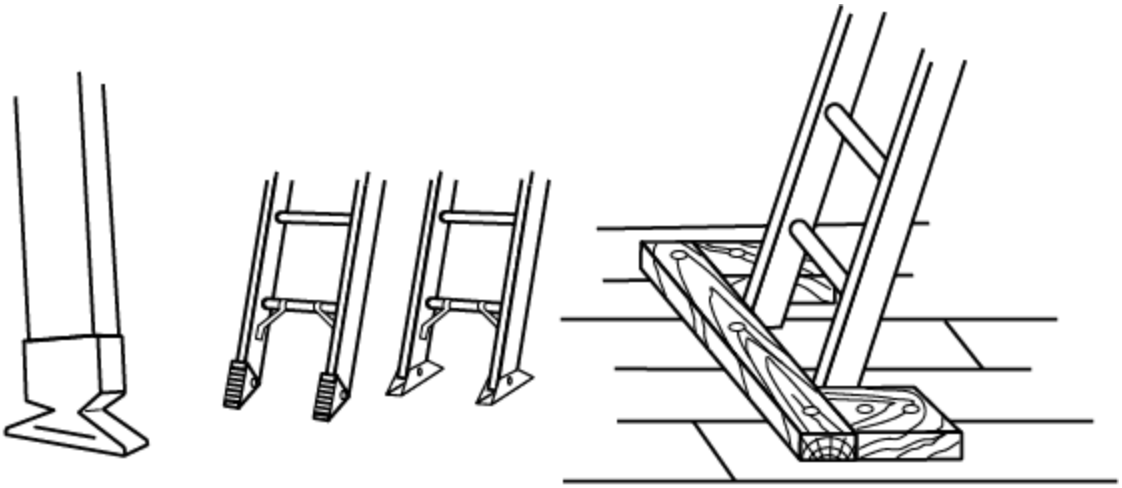


Ladder with a single support attachment for a pole.



Ladder ties to the support at the top

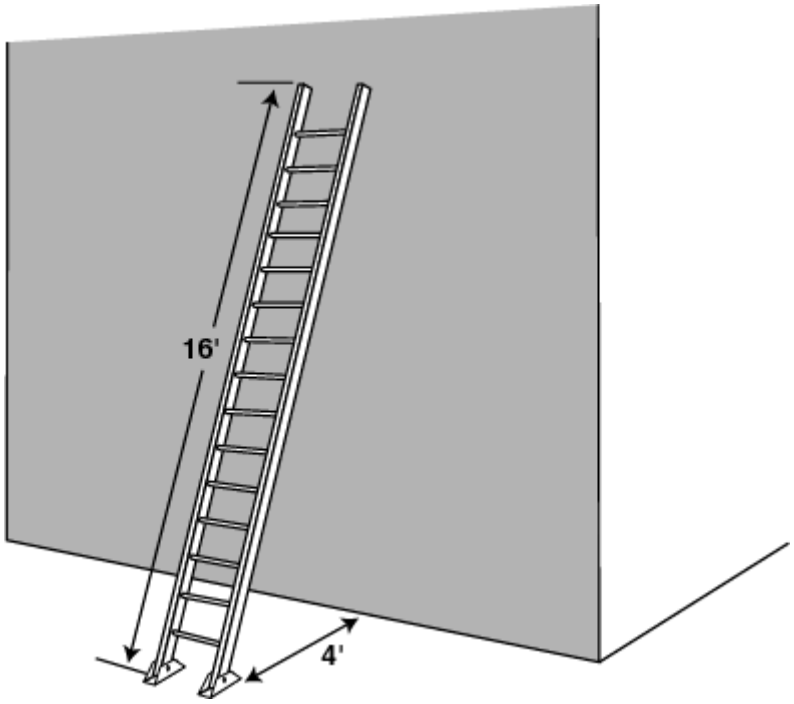
- All ladders must be equipped with safety (non-skid) feet.



Rubber Safety Feet | Spikes | Cleats Nailed to the Floor

Ladders with supports on the bottom.

- Portable ladders must be used at such a pitch that the horizontal distance from the top support to the foot of the ladder is about one-quarter of the working length of the ladder.



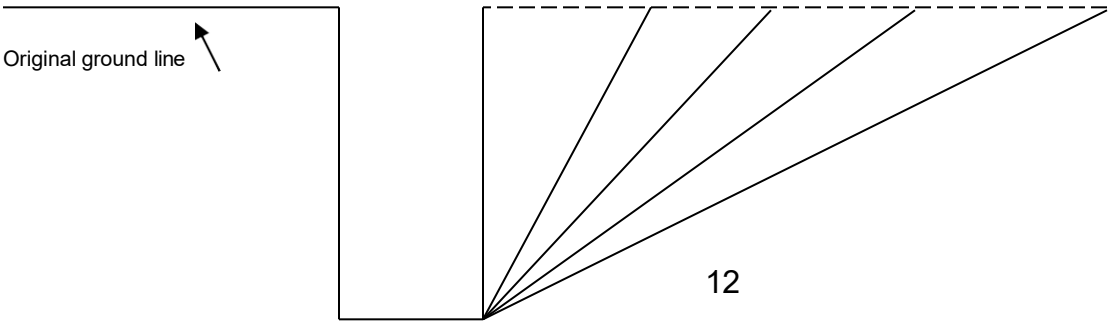
Trenching and Excavating

1. The determination of the angle of repose and design of the supporting system shall be based on careful evaluation of pertinent factors, such as:

    a. Depth and/or cut/soils classification
    b. Possible variation in water content of the material while excavation is open
    c. Anticipated changes in materials from exposure to air, sun, water, or freezing
    d. Loading imposed by structures, equipment, or overlaying or stored material
    e. Vibration from equipment, blasting, traffic, or other sources

Approximate Angle of Repose
For sloping of sides of excavations

Note:	Solid rock and compact shale (90°)	Compacted angular gravels, glacial till ½:1 (63°26')	Recommended slope For Average soils 1:1 (45°)	Compacted sharp sand 1 ½:1 (33°41')	Well rounded loose sand 2:1 (26°34')
Clays, silts, loams or non-homogenous soils require shoring and bracing The presence of ground water requires special treatment					



2. Walkways or bridges with standard railings **must be provided** when employees or equipment are required to cross over excavations.

3. The walls and faces of all excavations in which employees are exposed to danger from moving ground **must be guarded** by a shoring system, sloping of the ground, or some other equivalent means.

4. **No person must be permitted** under loads handled by power shovels, derricks, or hoists.

5. **All employees must be protected** with personal protective equipment for the protection of the head, eyes, respiratory system, hands, feet, and other parts of the body.

Daily Trenching Log

DAILY TRENCHING LOG

DATE:	SIGNATURE:
WEATHER:	PROJECT:

Was One Call System contacted:	Yes _____	No _____
Protective system:	Trench shield (box) _____ Sloping _____	Wood shoring _____ Other _____
Purpose of trenching:	Drainage _____ Sewer _____ Other _____	Water _____ Gas _____
Were visual soil tests made: If yes, what type?	Yes _____	No _____
Were manual soil tests made: If yes, what type?	Yes _____	No _____
Type of soil:	Stable Rock _____ Type A _____	Type B _____ Type C _____
Surface encumbrances: If yes, what type?	Yes _____	No _____
Water conditions:	Wet _____ Dry _____	Submerged _____
Hazardous atmosphere exists: ***(If yes, follow confined space entry procedures policy; complete Confined Space Entry Permit; monitor for toxic gas(es))***	Yes _____	No _____
Is trenching or excavation exposed to public vehicular traffic (exhaust emission): Yes _____ No _____ ***(If yes, refer to confined space entry procedures; complete Confined Space Entry Permit; monitor for toxic gas(es))***		
Measurements of trench: Depth _____	Length _____	Width _____

Is ladder within 25 feet of all workers: Yes _____ No _____	
Is excavated material stored two feet or more from edge of excavation: Yes _____ No _____	
Are employees exposed to public vehicular traffic: Yes _____ No _____ ***(If yes, warning vests required)***	
Are other utilities protected: Yes _____ No _____ ***(Water, sewer, gas or other structures)***	
Are sewer or natural gas lines exposed: Yes _____ No _____ ***(If yes, refer to confined space entry procedures policy; complete Confined Space Entry Permit; monitor for toxic gas(es))***	
Periodic inspection: Yes _____ No _____	
Did employees receive training in excavating: Yes _____ No _____	

Scaffold Safety Rules

1. General

   Before starting work on a scaffold, inspect it for the following:

   a. Are guardrails, toeboards, and planking in place and secure?

   b. Are locking pins at each joint in place?

   c. Are all wheels on moveable scaffolds locked?

2. Do not attempt to gain access to a scaffold by climbing on it (unless it is specifically designed for climbing – always use a ladder.

3. Scaffolds and their components must be capable of supporting four times the maximum intended load.

4. Any scaffold, including accessories such as braces, brackets, trusses, screw legs, ladders, etc., damaged or weakened in any way, must be immediately repaired or replaced.

5. Scaffold planks must extend over their end supports not less than 6 inches or more than 12 inches, unless otherwise specifically required.

6. Scaffold platforms must be at least 18 inches wide unless otherwise specifically required or exempted.

7. Where persons are required to work or pass under the scaffold, scaffolds shall be provided with a screen between the toeboard and guardrail, extending along the entire opening. The screen must be made of No. 18 gauge U.S. Standard wire, ½ inch mesh or equivalent protection.

8. All scaffolds must be erected level and plumb, and on a solid footing.

9. Do not change or remove scaffold members unless authorized.

10. Do not allow workers to ride on a rolling scaffold when it is being moved. Remove or secure all materials and tools on deck before moving.

11. Do not alter any scaffold member by welding, burning, cutting, drilling, or bending.

Motorized vehicles and equipment

1. Do not ride on motorized vehicles or equipment unless a proper seat is provided for each rider.

2. Always be seated when riding authorized vehicles (unless they are designed for standing).

3. Do not operate any motorized vehicle or equipment unless you are specifically authorized to do so by your supervisor.

4. Always use your seat belts in the correct manner.

5. Obey all speed limits and other traffic regulations.

6. Always be aware of pedestrians and give them the right-of-way.

7. Always inspect your vehicle or equipment before and after daily use.

8. Never mount or dismount any vehicles or equipment while they are still in motion.

9. Do not dismount any vehicle without first shutting down the engine, setting the parking brake and securing the load.

10. Do not allow other persons to ride the hook or block, dump box, forks, bucket or shovel of any equipment.

11. Each operator must be knowledgeable of all hand signals and obey them.

12. Each operator is responsible for the stability and security of his/her load.

Forklift safety

Prior to performing work on or around Powered Industrial Trucks (forklifts) employees will receive training in:

- Forklift safety hazards
- Types of forklifts (powered industrial trucks)
- Forklift operator training requirements

Job Orientation Guide

Company: *Kulback's, Inc.* Employee: _____
Trainer: _____ Hire Date: _____
Date _____ Position: _____

This checklist is a guideline for conducting employee safety orientations for employees new to *Kulback's, Inc.*. Once completed and signed by both supervisor and employee, it serves as documentation that orientation has taken place.

		Date	Initials
1.	Explain the company safety program, including:		
	Orientation	_____	_____
	On-the-job training	_____	_____
	Safety meetings	_____	_____
	Accident investigation	_____	_____
	Disciplinary action	_____	_____
2.	Use and care of personal protective equipment, (Hard hat, fall protection, eye protection, etc.)	_____	_____
3.	Line of communication and responsibility for immediately reporting accidents.		
	A. When to report an injury	_____	_____
	B. How to report an injury	_____	_____
	C. Who to report an injury to	_____	_____
	D. Filling out accident report forms	_____	_____
4.	General overview of operation, procedures, methods and hazards as they relate to the specific job	_____	_____
5.	Pertinent safety rules of the company and WISHA	_____	_____
6.	First aid supplies, equipment and training		
	A. Obtaining treatment	_____	_____
	B. Location of Facilities	_____	_____
	C. Location and names of First-aid trained personnel	_____	_____
7.	Emergency plan		
	A. Exit location and evacuation routes	_____	_____
	B. Use of fire fighting equipment (extinguishers, hose)	_____	_____
	C. Specific procedures (medical, chemical, etc.)	_____	_____
8.	Vehicle safety	_____	_____
9.	Personal work habits		
	A. Serious consequences of horseplay	_____	_____
	B. Fighting	_____	_____
	C. Inattention	_____	_____
	D. Smoking policy	_____	_____
	E. Good housekeeping practices	_____	_____
	F. Proper lifting techniques	_____	_____

NOTE TO EMPLOYEES: Do not sign unless ALL items are covered and ALL questions are satisfactorily answered.

The signatures below document that the appropriate elements have been discussed to the satisfaction of both parties, and that both the supervisor and the employee accept responsibility for maintaining a safe and healthful work environment.

Date: _____ Supervisor's Signature: _____

Date: _____ Employee's Signature: _____

JOB SAFETY ANALYSIS WORKSHEET

TITLE OF JOB OPERATION: _____ Date: _____

Title of person who does job: _____

Employee observed: _____ Location: _____

Analysis made by: _____ Analysis approved by: _____

Sequence of basic job steps	Potential accidents or hazards	Recommended safe job procedures
Personal protective equipment required for this position:		
Other hazards that may develop and will be addressed in our safety meetings:		

FALL PROTECTION WORK PLAN

COMPANY:_____ DATE: _____
SITE ADDRESS:_____
REPORT PREPARED BY:_____ TITLE:_____

1) SPECIFIC WORK AREA:_____
2) ACTIVITIES:_____
3) IDENTIFY ALL FALL HAZARDS IN THIS AREA:_____

4) CHECK THE METHOD OF FALL RESTRAINT OR ARREST TO BE UTILIZED:

慌 STANDARD GUARDRAIL	慌 FULL BODY HARNESS	慌 SCISSOR LIFT
慌 SECURED TO EXISTING STRUCTURE	慌 TIE-OFF POINT CAPABLE OF 5000 LB/PERSON	慌 BOOM LIFT
慌 SHOCK ABSORBING LANYARD	慌 RETRACTABLE LANYARD	慌 FORKLIFT BASKET
慌 SCAFFOLD W/GUARDRAIL	慌 OTHER (SPECIFY)	
慌 WARNING LINE	慌 WARNING LINE & SAFETY MONITOR (See WAC 296-155-24521)	

5) DESCRIBE PROCEDURES FOR ASSEMBLY, MAINTENANCE, INSPECTION AND DIASSEMPLY OF THE SYSTEM (IF ADDITIONAL SPACE IS REQUIRED, COMPLETE ON THE BACK OR THIS FORM OR ATTACH A SEPARATE SHEET.)

6) DESCRIBE PROCEDURES FOR HANDLING AND SECURING TOOLS, EQUIPMENT AND MATERIALS AND FOR PROVIDING OVERHEAD PROTECTION FOR WORKERS (IF ADDITIONAL SPACE IS REQUIRED, COMPLETE ON THE BACK OF THIS FORM OR SEPARATE SHEET):

7) DESCRIBE THE METHOD FOR PROMPT, SAFE REMOVAL OF INJURED WORKER(S):
(Calling 911 is not sufficient as a means of rescue)

8) I CERTIFY THAT I HAVE RECEIVED FALL PROTECTION ORIENTATION INCLUDING THE MATERIAL COVERED IN THIS FALL PROTECTION WORK PLAN.

EMPLOYEE NAME:	DATE:
_____	_____
_____	_____
_____	_____

SAFETY MEETING

Firm Name		Address
Date	Time	# of employees
Subject discussed		

Minutes:

Crew Leader Comments:

Walk-Around Safety Inspection

- ☐ **Power lines**: Minimum 10' clearance / insulate – de-energize, under 50 kw; over 50 kw – refer to Chapter 155
- ☐ **Trench/excavation**: Any trench five feet or more be sloped, shored or braced
- ☐ **Guardrails**: Any opening four feet or more above ground level must be guarded
- ☐ **Standard guardrail**: Top rail = 39" to 45" above working surface. Midrail = halfway between top rail and floor. Toeboard = 4".
- ☐ **Scaffold**: Fully planked
- ☐ **Scaffold**: Fall protection provided if fall hazards over 10 feet exist
- ☐ **Stairs**: Four or more risers must have handrails
- ☐ **Fall protection**: Any exposure to fall hazards of 10' or greater must be eliminated by the use of safety harness/belt, lanyard or lifeline, horizontal lines, or cantenary lines. Positive fall restraint/protection must be utilized at all times. Two lanyards may be necessary at the beam/upright traverse points. No exposure at any time is allowed.
- ☐ **Fall protection work plan**: Job specific, in writing; available on-site for all fall hazards above 10'.
- ☐ **Open belts and pulleys, chains and sprockets, points of operation** must be guarded to prevent accidental contact. Air compressors and electric motor pulleys are the most common hazards.
- ☐ **Radial saws**: Cutting head must return easily to start position when released; blade must not extend past the edge of the worktable; off/on switch should be at front of operator's position.
- ☐ **Table saws**: Upper hood guard; anti-kickback, push stick, belt and pulley guarded
- ☐ **Circular saws**: Blade guard instantly returns to covering position
- ☐ **Never wedge or pin a guard.**
- ☐ **Ladders**: Extended 36" above landing and secured to prevent displacement
- ☐ **Floor holes/openings**: Covered and secured; be sure no tripping hazards in the area.
- ☐ **Extension cords/electric power tools**: Marked/covered by Assured Grounding Program
- ☐ **Clothing**: Minimum of short sleeve shirts, long pants, and substantial footwear; no recreational shoes
- ☐ **Hard hats**: readily accessible at all times; worn when overhead hazard exists
- ☐ **Oxygen/acetylene storage areas**: Cylinders chained and separated
- ☐ **Personal protective equipment**: Head, eye, ear, respiratory, and leg protection – high visibility vests when required
- ☐ **Housekeeping**: Workers are responsible for their own area of exposure
- ☐ **First aid/fire extinguishers**: Available and readily accessible

Other hazards observed: _____

_____

_____

_____

_____

_____ _____

Supervisor's signature Date

_____ _____

Employee's signature Date

Equipment Safety Inspection Checklist

Date: _____

Project: _____

Equipment: _____

All guards and fenders	_____	OK	_____	Needs Repair
Brakes	_____	OK	_____	Needs Repair
Lights – front, rear, side, dash	_____	OK	_____	Needs Repair
Back-up alarm – horn	_____	OK	_____	Needs Repair
Ladders, stairs, hand holds	_____	OK	_____	Needs Repair
ROPS (Roll-over protection)	_____	OK	_____	Needs Repair
Seat belts	_____	OK	_____	Needs Repair
Fire extinguisher	_____	OK	_____	Needs Repair
Glass	_____	OK	_____	Needs Repair
Tires	_____	OK	_____	Needs Repair
Electrical cords	_____	OK	_____	Needs Repair
Ground fault circuit interrupters	_____	OK	_____	Needs Repair
Electrical hand tools	_____	OK	_____	Needs Repair
Powder actuated tools	_____	OK	_____	Needs Repair
Condition of pneumatic hand tools	_____	OK	_____	Needs Repair

Other Items Checked:

Oil level and leaks	____	OK	____	Needs Repair	____ Add	____ Change
Hydraulic oil level and leaks	____	OK	____	Needs Repair	____ Add	____ Change
Anti-freeze level and leaks	____	OK	____	Needs Repair	____ Add	____ Change
Fuel level and leaks	____	OK	____	Needs Repair	____ Add	____ Change
First aid kit	____	OK	____	Needs Repair	____ Add	____ Change

Repaired by: _____

Checked by: _____

Hazard Communication Checklist

1. Have we prepared a list of all the hazardous chemicals in our workplace?

2. Are we prepared to update our hazardous chemical list?

3. Have we obtained or developed a material safety data sheet for each hazardous chemical we use?
4. Have we developed a system to ensure that all incoming hazardous chemicals are checked for proper labels and data sheets?
5. Do we have procedures to ensure proper labeling or warning signs for containers that hold hazardous chemicals?
6. Are our employees aware of the specific information and training requirements of the Hazard Communication Standard?
7. Are our employees familiar with the different types of chemicals and the hazards associated with them?
8. Have our employees been informed of the hazards associate with performing non-routine tasks?
9. Are employees trained about proper work practices and personal protective equipment in relation to the hazardous chemicals in their work area?
10. Does our training program provide information on appropriate first aid, emergency procedures, and the likely symptoms of overexposure?
11. Does our training program include an explanation of labels and warnings that are used in each work area?
12. Does the training describe where to obtain data sheets and how employees may use them?
13. Have we worked out a system to ensure that new employees are trained before beginning work?
14. Have we developed a system to identify new hazardous chemicals before they are introduced into a work area?
15. Do we have a system for informing employees when we learn of new hazards associated with a chemical?

Written Hazard Communication Program

General:

It is the Policy of ***Kulback's, Inc.*** to provide and maintain a safe and healthy workplace for all employees including those who work with potentially hazardous chemicals. This written program will be posted and available 24 hours a day, seven days a week at the following locations:

1.
2.

If you work with or around potentially hazardous chemicals, this program affects you. The HAZARD COMMUNICATION STANDARD is intended to inform you of any potential chemical hazards from products you may come in contact with at this facility.

Container Labeling:

All containers of chemical products received at this company and all containers used as secondary containers will contain a label listing their hazards, both physical and health hazards. If the label is missing, contact ***the job foreman*** so that he/she may determine what the product is that has been received, and where it should be stored. **DO NOT ATTEMPT TO USE ANY CHEMICAL THAT IS NOT READILY IDENTIFIABLE.**

Safety Data Sheets:

The Site Foreman has the SDSs on file from the various chemical manufacturers for all hazardous chemicals used in connection with this workplace. The SDSs list, in English, information available about any particular chemical: health hazards, emergency and first aid procedures, how the chemical could enter the body, the safe handling and use of the chemical, name of manufacturer, etc. The SDS file may be found in these locations:

1.
2.

Employee Training and Information:

The Site Foreman will provide training to all employees and new hires on the proper use of hazardous chemicals and potential hazards. They will be responsible for providing the following informational training to all employees:

1. Hazardous chemicals present in the workplace.
2. Location of various chemicals. What to use. What to avoid.
3. Emergency procedures in case of contact with hazardous chemicals.
4. How to read the label.
5. Location of the SDS files and how to read the SDS.
6. Non-routine tasks that may be encountered.
7. Symptoms of overexposure and personal protective measures to be used.

Hazardous Materials Inventory List:

Examples: acids, aerosols, battery fluids, catalysts, caustics, cleaning agents, degreasing agents, flammables, fuels, fungicides, industrial oils, insecticides, herbicides, office copier chemicals, pesticides, surfactants, solvents, wood preservatives.

Hazard Communication Safety Data Sheets (SDS) *Globally Harmonized System*

The Globally Harmonized System is an internationally agreed system designed to provide a consistent format across international boundaries to ensure chemical hazards can be clearly understood by users In 2012, OSHA revised the Hazard Communication Standard (HCS) which requires chemical manufacturers, distributors, or importers to provide Safety Data Sheets (SDSs) (formerly known as Material Safety Data Sheets or SDSs) to communicate the hazards of hazardous chemical products. *As of June 1, 2015, the HCS will require new SDSs to be in a uniform format, and include the section numbers, the headings, and associated information under the headings below*: **Section 1, Identification** includes product identifier; manufacturer or distributor name, address, phone number; emergency phone number; recommended use; restrictions on use.

Section 2, Hazard(s) identification includes all hazards regarding the chemical; required label elements. **Section 3, Composition/information on ingredients** includes information on chemical ingredients; trade secret claims.

Section 4, First-aid measures includes important symptoms/ effects, acute, delayed; required treatment. **Section 5, Fire-fighting measures** lists suitable extinguishing techniques, equipment; chemical hazards from fire. **Section 6, Accidental release measures** lists emergency procedures; protective equipment; proper methods of containment and cleanup.

Section 7, Handling and storage lists precautions for safe handling and storage, including incompatibilities. **Section 8, Exposure controls/personal protection** lists OSHA's Permissible Exposure Limits (PELs); Threshold Limit Values (TLVs); appropriate engineering controls; personal protective equipment (PPE).

Section 9, Physical and chemical properties lists the chemical's characteristics.

Section 10, Stability and reactivity lists chemical stability and possibility of hazardous reactions.

Section 11, Toxicological information includes routes of exposure; related symptoms, acute and chronic effects; numerical measures of toxicity.

Section 12, Ecological information Section 13, Disposal considerations Section 14, Transport information Section 15, Regulatory information

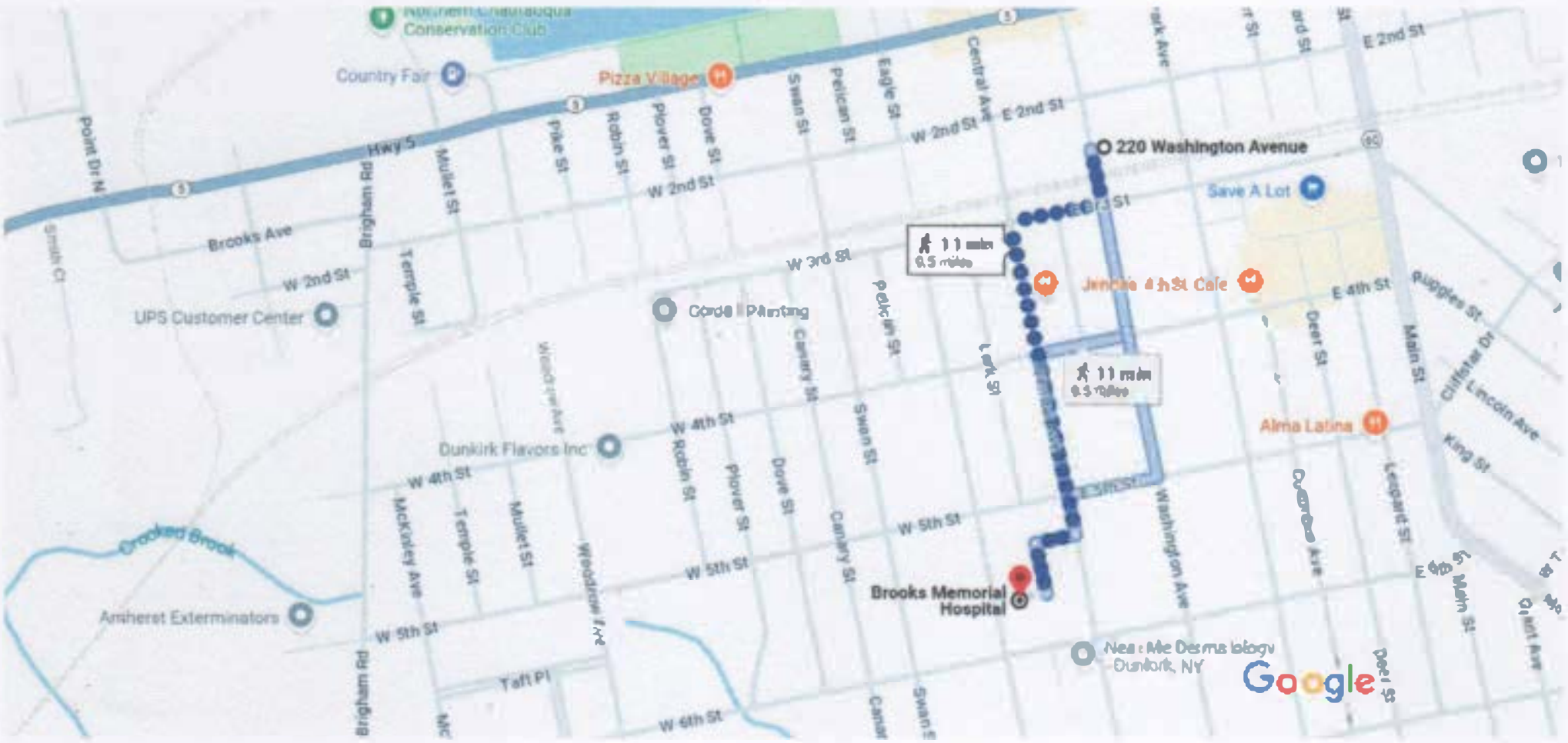
Section 16, Other information, includes the date of preparation or last revision.

Employers must ensure that SDSs are readily accessible to employee

Google Maps

220 Washington Ave, Dunkirk, NY 14048 to Brooks Mem Hospital, 529 Central Ave, Dunkirk, NY 14048

Walk 0.5 mile, 11 min

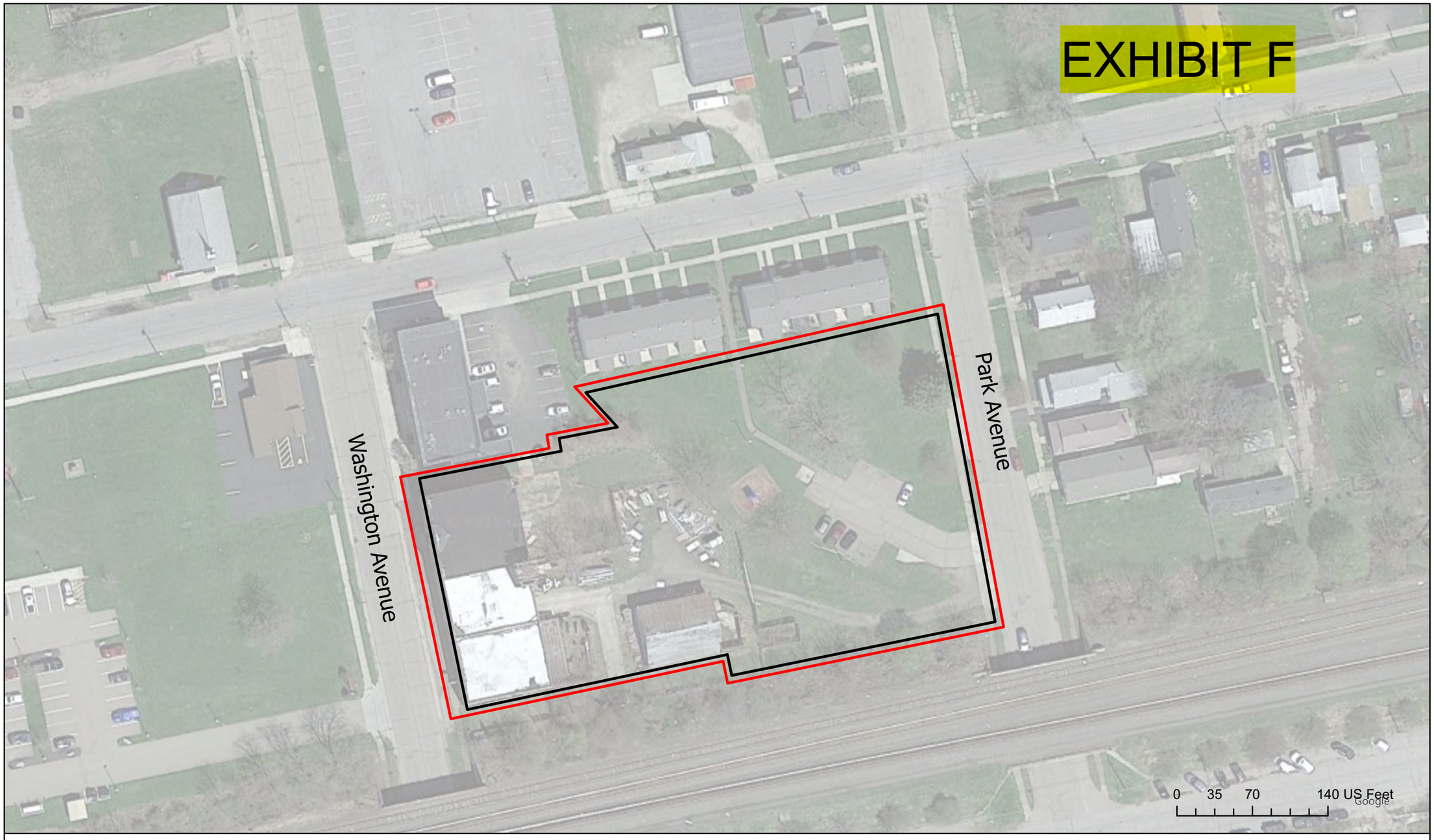


via Central Ave	11 min	0.5 mile
via Washington Ave and Central Ave	11 min	0.5 mile
via Washington Ave	11 min	0.5 mile

All routes are mostly flat

EXHIBIT E

EXHIBIT F



LEGEND

- Property Boundary
- Planned Fencing

NOTES

BRYDGES ENGINEERING
IN ENVIRONMENT AND ENERGY, DPC

960 Busti Avenue
Buffalo, NY 14213
716.249.6880
jbrydges@be3corp.com

CLIENT: REGAN DEVELOPMENT

Planned Fence Locations

Block of Washington, East 2nd and Park
Dunkirk, NY 14048

N
W E
S

DATE ISSUED:
July 31, 2025
△
△
△

SCALE: 1:1,094

Appendix I

Permits

CHAUTAUQUA COUNTY DEPARTMENT OF PUBLIC FACILITIES
DIVISION OF SOLID WASTE

Paul M. Wendel, Jr.
County Executive

Tim Card
Director of Public Facilities

December 31, 2025

Empire Building Diagnostics
400 Ingham Avenue
Lackawanna, New York 14218

Attention: Chris McMahan, Compliance Manager

Reference: Special Waste Stream – Friable Asbestos Material
Permit: **251230ACM7** [One-Time Permit]
Site: **208-214 Washington Avenue, Dunkirk, New York 14048**
Expiration Date: 12/31/2025

Dear Mr. McMahan:

This department has reviewed your application for disposal of friable asbestos containing building material from asbestos abatement. Your waste is characterized as regulated asbestos containing material pursuant to 12 NYCRR 56 and 40 CFR 61, Subpart M. It is our understanding this waste is from controlled-demolition project at the above referenced site. Permitted waste includes asbestos containing waste, polyethylene and personal protective equipment and shall be handled in accordance with state and federal regulations (12 NYCRR 56, 29 CFR 1926.1101 and 40 CFR 61 Subpart M) and delivered with a manifest. Under these conditions, this waste stream is acceptable for disposal at our landfill facility through the expiration date referenced above.

A copy of this letter must be presented to our scale operator with **EACH LOAD** of material entering our facility. We have enclosed a copy of the executed NYDEC 47-19-7 application for your records. In accordance, with 6 NYCRR 360-2.17(p)(1), you must contact our office to schedule disposal for each delivery of this waste stream. In the event significant changes in permit information occur, you shall immediately notify this department in writing.

Thank you for choosing our facility for your disposal needs. If you have any questions, please contact me.

Sincerely,

T. Jay Pierce

Tracy Pierce, "TJ"
Solid Waste Analyst

Enclosure

cc: NYSDEC (Ltr, App. Frm); CCLF: Scale (Ltr); Permit-Generator Files (entire permit)

Office Use Only

Bill to: 135 **Generator:** Reagan Development Corporation **Hauler:** Empire Building Diagnostics [135]

Material: ASBESTOS **Origin:** Chautauqua County, NY **Site:** 208-214 Washington Avenue, Dunkirk, NY 14048

I:\Landfill\Everyone\SHARE\1 EMPLOYEE FLDRS\TJP\WASTE PERMITS\2025PermitLttrs\Special\Asbestos\208-214WashingtonAveDunkirkNY\251230ACM7-208-214WashingtonAveDunkirkNY.docx

47-19-7 (sec-2001)

Print Form

Application for Treatment or Disposal of an Industrial Waste Stream

For State Use Only		
Site No.	Application Number	Date Received
07S12	2S1230ACM7	12/30/2025
☑ Approved	☐ Disapproved	Date
TVP		12/30/2025

1. Name of project/facility	2. County	3. Site number
Chautauqua County Landfill	Chautauqua County	07S12

4. Name of owner	5. Owner address (Street, City, State, Zip Code)	6. Owner telephone
Chautauqua County	3889 Towerville Rd, Jamestown, NY 14701	716-661-8422

7. Name of Operator	8. Operator address (Street, City, State, Zip Code)	9. Operator telephone
Chautauqua County	Same	716-661-8422

10. Method of treatment or disposal

Direct - Landfill

11. Company generating waste	12. Address of facility generating waste (Street, City, State, Zip Code)
REGAN DEVELOPMENT CORPORATION	208-214 WASHINGTON AVE, DUNKIRK, NY 14048

13. Representative of waste generator	14. Mailing address of representative:	15. Telephone No.
JASON BRYDGES	1055 SAW MILL RIVER RD, ARDSLEY, NY 10502	716-249-6880

16. Description of process producing waste:

ASBESTOS ABATEMENT

17. Expected annual waste production: 250 Tons/Year _____ Gallons/Year

18. Waste hauled in: ☐ Drums ☐ Bulk Tank ☒ Roll-off Container ☐ Other

19. Waste composition:
19a. Average percent solids: 100

19b. Physical state: ☐ Liquid ☐ Slurry ☐ Sludge ☒ Solid ☐ Contained Gas

19c. pH range: 2.5 to 12.5

19d. Components	Concentration (dry weight) Upper	Lower	Typical	Unit (check one) wt. %	ppm
1) FRIABLE DEBRIS	95	-100	98	☒	☐
2) PPE, POLY SHEETING	1	-2	2	☒	☐
3)				☐	☐
4)				☐	☐

20. Is an analysis of waste attached?	21. Was an EP toxicity test conducted on the waste?	22. Material is:
☐ Yes ☒ No	☐ Yes ☒ No if "yes" attach results	☐ Hazardous ☒ Not hazardous

23. Detail all hazard and nuisance problems associated with the wastes. List necessary safety, handling, treatment and disposal precautions.

DO NOT RENDER-FRIABLE ACM

24. Where was material disposed of previously?

N/A

25. Name of waste transporter	26. Address (Street, City, State, Zip Code)	27. NYSDEC Permit No.	28. Telephone No.
EMPIRE BUILDING DIAGNOSTICS, INC.	400 INGHAM AVE, LACKAWANNA, NY 14218	9A-329	716-685-4588

29. Certification:

I hearby affirm under penalty of perjury that information provided on this form and attached statements and exhibits is true to the best of my knowledge and belief. False statements made herein are punishable as a Class A misdemeanor pursuant to Section 210.45 of the Penal law.

b. Signature and title of representative of waste generator X Chris McMahan Date: 12/30/2025

b. Signature and title of representative of treatment or disposal facility X T. Hyperion/Solid Waste Analyst Date: 12/30/25

GENERATOR WASTE CHARACTERIZATION REPORT

GENERATOR INFORMATION:

Generator Name: REGAN DEVELOPMENT CORPORATION

Generating Facility Address: 208-214 WASHINGTON AVE, DUNKIRK, NY 14048

Technical Contact: CHRIS MCMAHAN Phone (716) 998-4838

INVOICING INFORMATION:

Contracting Firm: EMPIRE BUILDING DIAGNOSTICS, INC.

Billing Address: 400 INGHAM AVE, LACKAWANNA, NY 14218

Contact: CHRIS MCMAHAN

e-mail: CHRISM@EBDINC.COM Phone (716) 998-4838

Does contracting firm have an existing account with the CCLF? ☑ YES ☐ NO

TRANSPORTER INFORMATION:

Hauler Name: EMPIRE BUILDING DIAGNOSTICS, INC. NYSDEC Permit No. 9A-329

Contact Person: CHRIS MCMAHAN Phone (716) 998-4838

Is CCLF listed on hauler's Part 364 Permit? ☑ YES ☐ NO (if no, submit a Part 364 Permit modification)

WASTE INFORMATION:

1. *Does waste contain: a) less than 20% solids? ☐ Yes; ☑ No; b) any free liquid? ☐ Yes ☑ No
2. *Is Flash Point of waste less than 140° F? ☐ Yes ☑ No ☐ Not Applicable
3. *Corrosivity: Is pH of waste less than/equal to 2.0 or equal to/greater than 12.5 SU? ☐ Yes ☑ No ☐ Not Applicable
4. *Reactivity: Is waste Reactive? ☐ Yes ☑ No ☐ Not Applicable
5. *Is PCB concentration in waste equal to/greater than 30 mg/Kg? ☐ Yes ☑ No ☐ Not Applicable
6. *Is this a Listed Hazardous Waste as defined by USEPA Guidelines and 6NYCRR Part 371? ☐ Yes ☑ No

   ***If Any Of The Above Questions Is Answered Yes, Then The WASTE IS NOT ACCEPTABLE For Disposal At CCLF.**

7. Indicate the waste category: ☐ Industrial ☑ Special [i.e. Soil; ACM; Contaminated C&D; Other Contaminated Debris]
8. Indicate the type(s) of contaminant(s) that is (are) present in the waste referenced above (VP=Virgin Petroleum).

   ☐ VP (Type): _____ ☐ ACM ☐ Non-VP/Mixture _____

   ☑ Other (please specify): ASBESTOS
9. Aside from that listed in Item 8. above, is waste free of other known contaminants and/or residues: ☑ Yes ☐ No
10. What degree of odor does the waste exhibit? ☐ Strong ☐ Moderate ☐ Slight ☑ None

GENERATOR WASTE CHARACTERIZATION REPORT

11. Describe the incident or type of process and the location where this waste is/was generated [include contaminant(s)]:

ASBESTOS ABATEMENT

12. Describe the physical characteristics of the waste (texture; size uniformity)? _____

TCLP TESTING

METALS: Applicable // Not Applicable XXX

ANALYTE	NON-HAZARDOUS LIMIT (mg/L)	CONCENTRATION (mg/L)
Arsenic	5.0	
Barium	100.0	
Cadmium	1.0	
Chromium	5.0	
Lead	5.0	
Mercury	0.2	
Selenium	1.0	
Silver	5.0	

HERBICIDES/PESTICIDES: Applicable // Not Applicable XXX

COMPOUND	NON-HAZARDOUS LIMIT (mg/l)	CONCENTRATION (mg/L)
2,4-D	10.0	
2,4,5-TP (Silvex)	1.0	
Endrin	0.02	
Lindane	0.4	
Methoxychlor	10.0	
Toxaphene	0.5	
Chlordane	0.03	
Heptachlor	0.008	

ACID EXTRACTABLES: Applicable // Not Applicable XXX

COMPOUND	NON-HAZARDOUS LIMIT (mg/l)	CONCENTRATION (mg/L)
O-Creosol	200.0	
M-Creosol	200.0	
P-Creosol	200.0	
Pentachlorophenol	100.0	
2,4,5-Trichlorophenol	400.0	
2,4,6-Trichlorophenol	2.0	

BASE/NEUTRAL EXTRACTABLES: Applicable // Not Applicable XXX

COMPOUND	NON-HAZARDOUS LIMIT (mg/l)	CONCENTRATION (mg/L)
1,4-Dichlorbenzene	7.5	
2,4-Dinitrotoulene	0.13	
Hexachlorobenzene	0.13	
Hexachlorobutadiene	0.5	
Hexachloroetane	3	
Nitrobenzene	2	
Pyridine	5	

VOLATILE ORGANICS: Applicable // Not Applicable XXX

COMPOUND	NON-HAZARDOUS LIMIT (mg/l)	CONCENTRATION (mg/L)
1,1-Dichloroethylene	0.7	
Methyl ethyl ketone	200.0	
Tetrachloroethylene	0.7	
Vinyl chloride	0.2	
Benzene	0.5	
Carbon tetrachloride	0.5	
Chlorobenzene	100.0	
Chloroform	6.0	
Trichloroethylene	0.5	
1,2-Dichloroethane	0.5	

Other Analytical Testing:

GENERATOR WASTE CHARACTERIZATION REPORT

WASTE DISPOSAL TERMS AND CONDITIONS

1. The Generator warrants that the information provided herein, including all attachments, is complete, factual and an accurate representation of the known or suspected hazards detailed herein.

2. The Generator shall indemnify, defend and hold harmless CCLF against any and all liabilities arising from the Generator's breach of any warranty hereunder, negligence or willful misconduct in connection with this matter.

3. No waste will be accepted at CCLF without pre-approval to transport and dispose said waste at CCLF.

4. The Generator warrants that the permitted material being disposed of at CCLF is comprised of material exclusively from the incident/process and site attested to in said permit (or sub-permit). It is the Generator's responsibility to characterize its waste and demonstrate that it is classified as non-hazardous solid waste, as defined by Title 6 of the New York Codes, Rules and Regulations Part 371.

5. CCLF reserves the right to reject/delay the disposal of any material based on its physical/olfactory characteristics that are observed upon arrival at CCLF. If it is subsequently determined that said waste is NOT acceptable for disposal at CCLF, the Generator, at his expense, agrees to remove the waste from CCLF premises immediately and properly dispose of the waste at an appropriate facility.

GENERATOR ACKNOWLEDGEMENT AND CERTIFICATION

The Generator acknowledges that it has read, understood and agrees to the above referenced terms and conditions. The signatory below warrants that he/she is authorized to sign on behalf of the Generator.

PRINTED NAME: CHRIS MCMAHAN

SIGNATURE: Chris McMahan

TITLE: COMPLIANCE MNGR.

COMPANY: EMPIRE BUILDING DIAGNOSTICS, INC.

DATE: 12/30/2025

Mailing Address: Chautauqua County Landfill
3889 Towerville Road
Jamestown, NY 14701
Fax # (716) 985-4981
E-mail Address: piercet@chqgov.com

CITY OF DUNKIRK

Housing, Building and Zoning Officer
City Hall, Dunkirk, New York 14048
cityofdunkirk.com

KATE WDOWIASZ
MAYOR
(716) 366-9882
FAX (716) 366-2049

HOUSING, BUILDING AND ZONING OFFICE
(716) 366-9858
FAX (716) 363-6481

December 29, 2025

Washington Ave Revitalization
338 Central Ave
Dunkirk, NY 14048

RE: 25-000245
208-214 Washington AVE
79.57-1-81

Dear Property Owner,

Due to the condition of this property, this office had no choice but to issue an Order of Condemnation. The property is unsafe and poses an imminent danger to health and safety.

It is impossible to test for asbestos containing materials. You and your demolition contractor must contact the Department of Labor and begin the process required to demolish the building with asbestos containing materials in place.

If you have any questions, feel free to contact this office.

Submitted by,

Alan Gustafson

Alan Gustafson
Housing, Building and Zoning Officer

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF MATERIALS MANAGEMENT

PART 364
WASTE TRANSPORTER PERMIT NO. 9A-759

Pursuant to Article 27 ,Titles 3 and 15 of the Environmental Conservation Law and 6 NYCRR 364

PERMIT ISSUED TO:

IROQUOIS BAR CORPORATION
155 COMMERCE DR.
LACKAWANNA, NY 14218

PERMIT TYPE:

☐ NEW
☐ RENEWAL
■ MODIFICATION

CONTACT NAME:	ARNOLD COLLIER / AMANDA BOGDAN	EFFECTIVE DATE:	12/28/2025
COUNTY:	ERIE	EXPIRATION DATE:	**11/23/2026**
TELEPHONE NO:	(716)270-0433	US EPA ID NUMBER:	

AUTHORIZED WASTE TYPES BY DESTINATION FACILITY:
The Permittee is Authorized to Transport the Following Waste Type(s) to the Destination Facility listed :

Destination Facility	Location	Waste Type(s)	Note
Allied Waste Niagara Falls Landfill	Niagara Falls , NY	Non-Hazardous Industrial/Commercial Asbestos Petroleum Contaminated Soil Waste Tires Grease Trap Waste	
Auburn Landfill No 2	Auburn , NY	Non-Hazardous Industrial/Commercial Asbestos Petroleum Contaminated Soil	
AUSTIN MASTER SERVICES	MARTINS FERRY , OH	Non-Hazardous Industrial/Commercial	
Biotreatment Facility	Tonawanda , NY	Non-Hazardous Industrial/Commercial	
CARBON LIMESTONE LANDFILL, LLC	LOWELVILLE , OH	Non-Hazardous Industrial/Commercial	
Chaffee Landfill	Chaffee , NY	Non-Hazardous Industrial/Commercial Asbestos Petroleum Contaminated Soil	
Chautauqua Landfill	Ellery , NY	Non-Hazardous Industrial/Commercial Asbestos Petroleum Contaminated Soil Waste Tires Grease Trap Waste	
Genesee Soil Recycling	Lancaster , NY	Non-Hazardous Industrial/Commercial	Restricted / LUF

*** AUTHORIZED WASTE TYPES BY DESTINATION FACILITY LISTING (continued on next page) ***

NOTE: By acceptance of this permit, the permittee agrees that the permit is contingent upon strict compliance with the Environmental Conservation Law, all applicable regulations, and the General Conditions printed on the back of this page.

ADDRESS:
New York State Department of Environmental Conservation
Division of Materials Management - Waste Transporter Program
625 Broadway, 9th Floor
Albany, NY 12233-7251

AUTHORIZED SIGNATURE: _____ Richard Clarkson 2025.12.26 12:08:01 -05'00' Date: ____/____/____

WASTE TRANSPORTER PERMIT

GENERAL CONDITIONS

The permittee must:

1. Carry a copy of this waste transporter permit in each vehicle used to transport waste. Failure to produce a copy of the permit upon request is a violation of the permit.

2. Display the full name of the transporter on both sides of each vehicle and display the waste transporter permit number on both sides and rear of each vehicle containing waste. The displayed name and permit number must be in characters at least three inches high and of a color that contrasts sharply with the background.

3. Transport waste only in authorized vehicles. An authorized vehicle is one that is listed on this permit.

4. Submit to the Department a modification application for additions/deletions to the authorized fleet of vehicles. The permittee must wait for a modified permit before operating the vehicles identified in the modification application.

5. Submit to the Department a modification application to add a new waste category or a new destination facility, or to change the current waste or destination facility category. The permittee must wait for a modified permit before transporting new waste types or transporting to new destination facilities.

6. Submit to the Department a modification application for any change to the permit.

7. Comply with requirements for placarding and packaging as set forth in New York State Transportation Law as well as any applicable federal rules and regulations.

8. Contain all wastes in the vehicle so there is no leaking, blowing, or other discharge of waste.

9. Use vehicles to transport only materials not intended for human or animal consumption unless the vehicle is properly cleaned.

10. Comply with requirements for manifesting hazardous waste, regulated medical waste, or low-level radioactive waste as set forth in the New York State Environmental Conservation Law and the implementing regulations. Transporters who provide a pre-printed manifest to a generator/shipper/offer or of regulated waste shall ensure that all information is correct and clearly legible on all copies of the manifest.

11. Deliver waste only to transfer, storage, treatment and disposal facilities authorized to accept such waste. Permittee must demonstrate that facilities are so authorized if requested to do so.

12. Maintain liability insurance as required by New York State Environmental Conservation Law.

13. Maintain records of the amount of each waste type transported to each destination facility on a calendar-year basis. The transporter is obligated to provide a report of this information to the Department by March 1 of each year.

14. Pay regulatory fees on an annual basis. Non-payment may be cause for revocation or suspension of permit.

15. **This permit is not transferable. A change of ownership will invalidate this permit.**

16. This permit does not relieve the permittee from the obligation to obtain any other approvals or permits, or from complying with any other applicable federal, state, or local requirement.

17. Renewal applications must be submitted no less than 30 days prior to the expiration date of the permit to:

New York State Department of Environmental Conservation
Division of Materials Management, Waste Transporter Program
625 Broadway, 9th Floor
Albany, NY 12233-7251

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF MATERIALS MANAGEMENT

PART 364
WASTE TRANSPORTER PERMIT NO. 9A-759

Pursuant to Article 27 ,Titles 3 and 15 of the Environmental Conservation Law and 6 NYCRR 364

PERMIT ISSUED TO:

IROQUOIS BAR CORPORATION
155 COMMERCE DR.
LACKAWANNA, NY 14218

PERMIT TYPE:

☐ NEW
☐ RENEWAL
■ MODIFICATION

CONTACT NAME:	ARNOLD COLLIER / AMANDA BOGDAN	EFFECTIVE DATE:	12/28/2025
COUNTY:	ERIE	EXPIRATION DATE:	**11/23/2026**
TELEPHONE NO:	(716)270-0433	US EPA ID NUMBER:	

AUTHORIZED WASTE TYPES BY DESTINATION FACILITY: (Continued)
The Permittee is Authorized to Transport the Following Waste Type(s) to the Destination Facility listed :

Destination Facility	Location	Waste Type(s)	Note
High Acres Western Expansion Landfill	Fairport , NY	Non-Hazardous Industrial/Commercial Asbestos Petroleum Contaminated Soil	
Hyland Landfill	Angelica , NY	Non-Hazardous Industrial/Commercial	
MAHONING LANDFILL	NEW SPRINGFIELD , OH	Non-Hazardous Industrial/Commercial	
Mill Seat SLF	Riga , NY	Non-Hazardous Industrial/Commercial Asbestos Petroleum Contaminated Soil	
Modern Landfill, Inc.	Model City , NY	Non-Hazardous Industrial/Commercial Asbestos Petroleum Contaminated Soil Waste Tires	
Ontario County Sanitary Landfill	Stanley , NY	Non-Hazardous Industrial/Commercial Asbestos Petroleum Contaminated Soil Sludge from Sewage or Water Supply Treatment Plant	
Seneca Meadows LF	Waterloo , NY	Petroleum Contaminated Soil	
Tonawanda Bioremediation Facility	Tonawanda , NY	Non-Hazardous Industrial/Commercial Petroleum Contaminated Soil	
Triad Recycling and Energy Corp	Tonawanda , NY	Petroleum Contaminated Soil	

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF MATERIALS MANAGEMENT

PART 364
WASTE TRANSPORTER PERMIT NO. 9A-759

Pursuant to Article 27 ,Titles 3 and 15 of the Environmental Conservation Law and 6 NYCRR 364

PERMIT ISSUED TO:

IROQUOIS BAR CORPORATION
155 COMMERCE DR.
LACKAWANNA, NY 14218

PERMIT TYPE:

☐ NEW
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CONTACT NAME:	ARNOLD COLLIER / AMANDA BOGDAN	EFFECTIVE DATE:	12/28/2025
COUNTY:	ERIE	EXPIRATION DATE:	**11/23/2026**
TELEPHONE NO:	(716)270-0433	US EPA ID NUMBER:	

AUTHORIZED VEHICLES:
The Permittee is Authorized to Operate the Following Vehicles to Transport Waste:

(Vehicles enclosed in <>'s are authorized to haul Residential Raw Sewage and/or Septage only)

32 (Thirty Two) Permitted Vehicle(s)

NY 13317NG Truck 035
NY 21777MN Truck 040
NY 26839NA Truck 039
NY 30627NC Truck 056
NY 30628NC Truck 058
NY 30630NC Truck 050
NY 30631NC Truck 051
NY 30634NC Truck 055
NY 30635NC Truck 049 - Sold (Remove Next Renewal)
NY 30638NC Truck 054
NY 30639NC Truck 053
NY 30640NC Truck 052
NY 30998NC Truck 043
NY 31714NF Truck 060 - Roll Off
NY 32292NC Truck 044
NY 32442NB Truck 042
NY 35705MG Truck 030
NY 43015MM Truck 016
NY 43213NE Truck 039
NY 43473NE Truck 059
NY 43661MM Truck 035
NY 57295NG Truck 038
NY 58278NA Truck 041
NY 60957NF Truck 062
NY 60971NF Truck 063
NY 60972NF Truck 061
NY 60973NF Truck 064
NY 74243NF Truck 031
NY 74405NF Truck 065
NY 74407NF Truck 066
NY 74418NF Truck 034
NY 74419NF Truck 030
End of List

CITY OF DUNKIRK

Housing, Building and Zoning Officer
City Hall, Dunkirk, New York 14048
cityofdunkirk.com

KATE WDOWIASZ
MAYOR
(716) 366-9882
FAX (716) 366-2049

HOUSING, BUILDING AND ZONING OFFICE
(716) 366-9858
FAX (716) 363-6481

PERMIT NUMBER: D26-000005 **DATE: 03/19/2026**

This notice, which must be prominently displayed on the property or premises to which it pertains to, indicates that a

DEMOLITION PERMIT

Has been issued to Chris McMahon
Permitting: Controlled Demolition 220 Washington x Shed
At: 220 Washington AVE Dunkirk, NY 14048 (SBL: 79.57-1-79)

Zoned:

All work shall be executed in strict compliance with the permit application, approved plans, the Codes of New York State, City of Dunkirk Codes, and all other laws, rules, and regulation which apply. The building permit does not constitute authority to build in violation of any federal, state, or local law or other rules and regulations.

CONTRACTOR: Empire Building Diagnostics, Inc

Do not proceed beyond these points until countersigned by the inspector:

__ Backfill, __ Demolition, __ Final

Permission is hereby granted to proceed with work as set forth in the specifications, plans or statements now on file in this Department. Any amendments made to the original plans and specifications must be first submitted for approval.

Alan Gustafson

Alan Gustafson, Housing, Building and Zoning Officer

SPECIAL CONDITIONS (if not below, see reverse or next page):

CITY OF DUNKIRK

Housing, Building and Zoning Officer
City Hall, Dunkirk, New York 14048
cityofdunkirk.com

KATE WDOWIASZ
MAYOR
(716) 366-9882
FAX (716) 366-2049

HOUSING, BUILDING AND ZONING OFFICE
(716) 366-9858
FAX (716) 363-6481

DEMOLITION PERMIT

Address: 208-214 Washington AVE, **Tax Map #** 79.57-1-81

Permit #: D26-000001 **- Type:** Commercial Principal Structure **- Issue Date:** 02/18/2026 **- Expiration Date:** 02/18/2027

Owner: Washington Ave Revitalization, 338 Central Ave Dunkirk NY 14048 **Applicant: Empire Building Diagnostics, Inc, 400 Ingham Ave Lackawanna NY 14218**

Cost of Construction: $0.00

Permit Fee: Permit Fee Demo Com/In 001-0001-2555 - $650.00

PERMISSION is hereby granted for permission to:
Controlled Demo- 208 Washington Ave

You are to notify this department of the commencement of work under this permit and forty-eight (48) hours prior to the start of the following construction stages in order to schedule the required inspections. It is also required that timely notice be given to the Code Enforcement Officer of the readiness of construction for all tests which the Uniform Code requires for inspection and approval. Copies of all tests and their certification of approval are required to be submitted to the Code Enforcement Department prior to final inspection.

Required inspections:

Backfill, Demolition, Final, Fill,

This permit is subject to the condition that all construction is to be in conformance with **accepted plans and specifications.**
Submitted,

Alan Gustafson

Alan Gustafson, Housing, Building and Zoning Officer

SPECIAL CONDITIONS (if not below, see reverse or next page):

Office of the City Clerk

Amy Dobek
342 Central Ave
Dunkirk, New York 14048
(716) 366-0452

Date: 2/18/2026
Time: 4:37:13 PM **Invoice:** 225041

S#	T	R/C	S	Yr	Reference	Description	Quan	Price	Charge	Payment
1	O	661	N		D26-000001	DEMOLITION PERMIT FOR 208-214 WASHINGTON AVE BUILDING PERMIT	1	650.00	650.00	0.00
2	P	PCK	N		7120	CHECK PAYMENT	1	0.00	0.00	650.00

Total Charges: $650.00
Total Payment: $650.00
Change Due: $0.00

Deposit: 2026-01002 **Clerk ID:** COD

City of Dunkirk
342 Central Ave
Dunkirk, NY 14048

Receipt #: 86

Date Paid: 02/18/2026

Payer: Empire Building Diagnostics, Inc
Payer Address: 400 Ingham Ave Lackawanna NY 14218

Notes:

Fee Type	**Amount**
Permit Fee Demo Com/In 001-0001-2555	$650.00

Permit #	**Address**	**Payment Type**	**Amount**	**Ref #**
D26-000001	208-214 Washington AVE	Check	650.00	7120

Amount Paid: 650.00

CITY OF DUNKIRK

Housing, Building and Zoning Officer
City Hall, Dunkirk, New York 14048
www.dunkirktoday.com

KATE WDOWIASZ
MAYOR
(716) 366-9882
FAX (716) 366-2049

HOUSING, BUILDING & ZONING OFFICE
(716)366-9858
FAX (716)363-6481

APPLICATION FOR DEMOLITION PERMIT

Call before you dig! www.digsafelynewyork.com - 811 or 1-800-962-7962

Project Information

Address: 208-214 Washington Ave
Tax Map Number: 79.57-1-81
UFPO Number: Pre-Demo 12155-000-648 Demo 12155-000-652
Projected Start Date: 02/02/2026

Owner Information

Owner's Name: Washington Ave Revitalization
Full Address: 338 Central Ave Dunkirk NY 14048
Phone Number: _____ Mobile: _____
Email: _____

Project Description

Description of structure to be demolished
Commercial Principal Structure

Applicant's proposal and description of materials to fill in sub-surface areas to grade level:
Clean Dirt Fill

Applicant's proposal for disconnecting/capping utility service:
Electric Termed by Grid, Gas termed by N Fuel, Water termed by Dunkirk Water, Sewer to be capped by Spaeder Plumbing during demo

Contractor Information

Name: Empire Building Diagnostics, Inc
Full Address: 400 Ingham Ave Lackawanna NY 14218
Phone Number: 7169984838 Mobile: _____
Email: chrism@ebdinc.com

Utility Disconnection Documentation

City Water Date: 12/16/2025
City Sewer Date:

Demolition Permit Application (cont'd)

Conditions

1. ALL DEMOLITION SITES SHALL BE BARRICADED IN SUCH A MANNER AS TO PROVIDE PROPER WARNING AND PROTECTION TO THE PUBLIC. DUST CONTROL AND WATER RUNOFF PROTECTION IS REQUIRED. BURNING AND/OR BURYING MATERIALS ON-SITE IS ADIRECT VIOLATION OF LOCAL AND STATE LAWS.

   ☑ **Applicant Approval**

2. ALL DEMOLITION DEBRIS SHALL BE PROMPTLY AND LEGALLY DISPOSED OF AT ANAUTHORIZED SITE.

   Chautauqua Co Landfill, 3889 Towerville Rd, Jamestown, NY 14701 ☑

   Site Name — Site Location

   Applicant Approval

3. ALL PROJECTS TO BE COMPLETED WITHIN 30 DAYS OF COMMENCEMENT.

   ☑ **Applicant Approval**

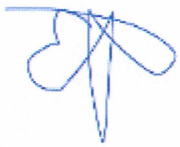
4. PERMIT SHALL EXPIRE 90 DAYS FROM DATE OF ISSUANCE.

   ☑ **Applicant Approval**

5. PROJECT IS SUBJECT TO THE NEW YORK STATE FIRE PREVENTION AND BUILDING CODE.

   ☑ **Applicant Approval**

I swear that to the best of knowledge and belief the statements contained in this application are a true and complete statement of all proposed work to be done on the described premises and that all provisions of the Building Codes and Zoning Codes and all other laws pertaining to the proposed work shall be complied with, whether specified or not, and that such work is authorized by the owner. I acknowledge that Zoning Code information relating to property's district has been reviewed.



Applicant Signature

01/23/2026

Date

Ellen Papke

From: Nick Celotto
Sent: Tuesday, December 16, 2025 1:34 PM
To: Stefanie Wilkes; Ellen Papke
Cc: Jason Brydges
Subject: Re: Water service Dunkirk Washington Ave

Follow Up Flag: Follow up
Flag Status: Completed

Thank you

Thanks,

Nick Celotto

Senior Project Manager / CC&R Division Manager

716.984.7347

EBD 35 YEARS
TRUSTED on the TOUGHEST Jobs

400 Ingham Ave Lackawanna, NY 14218

GO BILLS!

From: Stefanie Wilkes <stefaniew@ebdinc.com>
Sent: Tuesday, December 16, 2025 1:33 PM
To: Nick Celotto <nickc@ebdinc.com>
Subject: Water service Dunkirk Washington Ave

Got a call, they wanted to let you know the water service at 208 and 220 Washington Ave in Dunkirk were cut.

716-366-3255 if you need it.

Thank You,

Stefanie Wilkes
AP Specialist

EBD
TRUSTED on the TOUGHEST Jobs™ 35 YEARS
Selective Demolition | Abatement | Wrecking
Remediation | Hydro-Excavation
Shoring & Dismantlement | Concrete Cutting

400 Ingham Avenue | Lackawanna, NY | 14218
716.685.4588 [T] | 716.685.6055 [F]
www.ebdinc.com

National Fuel

Date: 12/9/25

RE: **Service Line Disconnected**

This letter responds to your request to receive information from National Fuel Gas concerning the service line at 208 Washington Ave., Dunkirk, NY.

National Fuel Gas confirms that, based on its records and as of the date of this letter, National Fuel's service line to the structure located at 208 Washington Ave., Dunkirk, NY was disconnected on 7/22/97.

Sincerely,

National Fuel Gas
Dunkirk Service Center

Ellen Papke

From: James Bialaszewski <James.Bialaszewski@nationalgrid.com>
Sent: Monday, December 15, 2025 8:28 AM
To: Ellen Papke
Subject: 208 / 220 Washington Ave, Dunkirk

Follow Up Flag: Follow up
Flag Status: Flagged

Caution: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good Morning Ellen – Here's what we have for the electric services for 208 / 220 Washington Ave, Dunkirk:

208 Washington – The last customer of record here was James Payne, who had the service disconnected in December of 2009. At that time the electric meter as well as the overhead service wire were removed.

220 Washington – There is an active electric service at this address for Paradis Fence & Flag. On the rear of the building is the active electric meter, as well as the overhead service wire coming off National Grid pole # 5-1 to the point of attachment. Once a request is on file to have this service disconnected, National Grid will remove the meter, service wire & pole (access will be needed as currently this area is fenced off).

If you have any other questions or concerns, please let me know.

Thanks,

Jim Bialaszewski
Distribution Design
National Grid
401 Water St
Fredonia, NY 14063
(716)673-7270
James.Bialaszewski@nationalgrid.com

Advance notice of vacation:
I will be out of the office Fri 12/19

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NEW YORK STATE | Department of Labor

DIVISION OF SAFETY & HEALTH LICENSE AND CERTIFICATE UNIT, STATE OFFICE CAMPUS, BLDG. 12, ALBANY, NY 12226

ASBESTOS HANDLING LICENSE

Empire Building Diagnostics, Inc.
400 Ingham Ave., Lackawanna, NY, 14218

License Number: 29326
License Class: FULL
Date of Issue: 09/24/2025
Expiration Date: 10/31/2026
Duly Authorized Representative: Mark Young

This license has been issued in accordance with applicable provisions of Article 30 of the Labor Law of New York State and of the New York State Codes, Rules and Regulations (12 NYCRR Part 56). It is subject to suspension or revocation for a (1) serious violation of state, federal or local laws with regard to the conduct of an asbestos project, or (2) demonstrated lack of responsibility in the conduct of any job involving asbestos or asbestos material.

This license is valid only for the contractor named above and this license or a photocopy must be prominently displayed at the asbestos project worksite. This license verifies that all persons employed by the licensee on an asbestos project in New York State have been issued an Asbestos Certificate, appropriate for the type of work they perform, by the New York State Department of Labor.

Amy Phillips, Director
For the Commissioner of Labor

EXCELSIOR

SH 432 (12/21)

CITY OF DUNKIRK

Housing, Building and Zoning Officer
City Hall, Dunkirk, New York 14048
cityofdunkirk.com

KATE WDOWIASZ
MAYOR
(716) 366-9882
FAX (716) 366-2049

HOUSING, BUILDING AND ZONING OFFICE
(716) 366-9858
FAX (716) 363-6481

PERMIT NUMBER: B25-000181 **DATE: 03/18/2026**

This notice, which must be prominently displayed on the property or premises to which it pertains to, indicates that a

BUILDING PERMIT

Has been issued to: Dunkirk Landing LLC
Permitting: 3 Story, Wood Framed, New Construction - 48 Apartment Units
At: 208-214 Washington AVE Dunkirk, NY 14048 (SBL: 79.57-1-81)

Zoned:C-2

All work shall be executed in strict compliance with the permit application, approved plans, the Codes of New York State, City of Dunkirk Codes, and all other laws, rules, and regulation which apply. The building permit does not constitute authority to build in violation of any federal, state, or local law or other rules and regulations.

CONTRACTOR: Kulbacks, Inc.

Do not proceed beyond these points until countersigned by the inspector:

__ Footer, __ Foundation, __ Foundation/Slab Insulation and Vapor Barrier, __ Framing, __ Electrical (Third Party), __ Gas Lines, __ Sprinklers, __ Doors /Windows, HVAC, __ Insulation, __ Drywall,__ Fire Alarm/Detectors, __ Mid-Roofing, __ Plumbing - Rough-In, __ Plumbing - Final, __ Siding,__ Special Inspection, __ Trusses, Framing, and Certification, __ Final

Permission is hereby granted to proceed with work as set forth in the specifications, plans or statements now on file in this Department. Any amendments made to the original plans and specifications must be first submitted for approval.

Alan Gustafson

Alan Gustafson, Housing, Building and Zoning Officer

SPECIAL CONDITIONS (if not below, see reverse or next page):