TRC
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March 5, 2025

Ms. Jennifer Gonzalez
Division of Environmental Remediation
New York State Department of Environmental Conservation
47-40 21st Street
Long Island City, NY 11101

Re: Interim Remedial Measure Work Plan
Former Giuffre Auto Group Site (Proposed Public School 337K)
8802 5th Avenue and 429 89th Street, Brooklyn, New York 11209
NYSDEC BCP Site No. C224327
Service ID No. 81213; SCA Project ID No. 118924

Dear Ms. Gonzalez:

TRC Engineers, Inc. (TRC) has prepared this Interim Remedial Measure (IRM) Work Plan on behalf of the New York City School Construction Authority (NYCSCA) for the Former Giuffre Auto Group Brownfield Cleanup Program (BCP) Site No. C224327, located at 8802 5th Avenue and 429 89th Street, Brooklyn, New York 11209 (Block 6065, Lots 28 and 39) (the "Site").

The primary objective of the IRM is to remove the drainage system, suspected underground storage tank (UST), and oil-water separator (OWS) beneath the former auto repair/service station building located on the 429 89th Street portion of the Site (Lot 39). In addition, an objective of this IRM is to locate and remove shallow residual source area(s) of petroleum-related contaminant mass.

Site Description and Background

The Site encompasses approximately 31,659 square feet (sf) and is improved with a one-story commercial building with a basement and an asphalt-paved parking lot on Lot 28 (8802 5th Avenue), and a former commercial building with a partial basement on Lot 39 (429 89th Street). Lot 28 is approximately 21,659 sf and contains a one-story commercial building with a gross floor area of approximately 13,835 sf that is currently subdivided into two units that are currently vacant. Lot 39 is approximately 10,000 sf and is improved with a one-story former commercial building with a partial basement that is currently vacant and was most recently used by a construction company for storage of tiles and other assorted construction materials. The Site location is shown on *Figure 1*.

Between 2019 and 2020, TRC conducted environmental due diligence activities at the Site consisting of a Phase I Environmental Site Assessment (ESA) and a Phase II Environmental Site Investigation (ESI). The Site was entered into the BCP, and the Brownfield Cleanup Agreement (BCA) was executed on May 26, 2022. Between June 2022 and September 2024, TRC conducted a Remediation Investigation (RI) and a Supplemental Remedial Investigation (SRI) in accordance with the New York State Department of Environmental Conservation (NYSDEC)-

approved work plans dated March 17, 2022 and May 16, 2024. The RI Report was submitted to NYSDEC in December 2024. Comments to the RI Report have been received by NYSDEC and the RI Report is being finalized.

During prior investigations, petroleum impacted soils were identified beneath the 429 89th Street Building (Lot 39). Specifically, moderate to strong odors, staining and photoionization detector (PID) readings were identified in soil samples collected between 18.5 feet below ground surface (bgs) and 24.8 feet bgs, and two (2) volatile organic compounds (VOCs), 1,2,4-trimethylbenze and xylene, were detected in one (1) soil boring beneath Lot 39 at concentrations above the Restricted Residential Use Soil Cleanup Objective (RRSCO).

Additionally, during geophysical surveys performed as part of prior investigations, multiple suspected underground structures were identified. Specifically, identified structures resemble an underground drainage system, a UST, and an OWS. Since shallow source area impacts were not identified during prior extensive subsurface investigations, the intent of this IRM is to properly remove the suspected underground structures and investigate and remediate potential residual source area impacts in their vicinity. The information gained from this investigation, structure removal, and post-excavation sampling will provide additional clarity on the nature of the contamination previously identified onsite and may inform the proposed remedial efforts going forward. A Site Layout Map showing the locations of the suspected underground structures is included as *Figure 2*.

As part of the draft License Agreement with the neighboring property, the neighboring property's cars and parking lifts that are currently abutting the Site are required to be relocated during Lot 28 building demolition and construction of the barrier wall that is needed to mitigate potential future adjacent property vehicle emissions and car lift failures/collapses. As part of the draft License Agreement, it is anticipated that the neighboring property's relocated cars will be parked on Lot 39 during the demolition and construction activities on Lot 28. Due to the anticipated provisions of the License Agreement, it is beneficial to the progress of the project and the remedial approach to complete this IRM ahead of development of the Remedial Action Work Plan (RAWP) and the anticipated logistical and access constraints.

IRM Work Plan Scope of Work

The activities described in this Work Plan will be performed in accordance with applicable local, state, and Federal rules and regulations, and the Quality Assurance Project Plan (QAPP), Community Air Monitoring Plan (CAMP) and site-specific Health and Safety Plan (HASP), presented as *Attachments A through C,* respectively. The CAMP will be implemented during all ground-intrusive activities.

On-Site monitoring wells TRC-GW-22, TRC-GW-22-N, TRC-GW-22-E, and TRC-GW-22-SW will be protected during performance of the IRM using barriers to prevent damage. Refer to *Figures 2 and 3* for the locations of monitoring wells to be protected. In addition, the above grade portion of the building and the floor slab will be removed in advance of performance of the IRM.

1.0 Removal of the Suspect Drainage Piping and Floor Drain System

Within the Lot 39 Building, floor drains were identified that connect to suspected underground drainage piping. The floor drains and suspected piping will be excavated and removed from the Site as part of the IRM.

- The floor drains and suspected underground drainage piping will be emptied and cleaned. All waste generated during drainage system cleaning will be stored in 55-gallon drums, which will be labeled and remain stored onsite prior to disposal.
- Following cleaning, the floor drains and drainage system piping will be inspected for evidence of damage (e.g., corrosion) and penetrations. A description and photographic documentation of the floor drains and drainage system conditions, including any evidence of corrosion and leaks, will be documented.
- Soil in the vicinity of the piping will be inspected for evidence of contamination (e.g., odors, staining) and screened with a PID. If evidence of a release is identified, or evidence of damage to the floor drains/drainage system piping is identified, a sample of soil from the most impacted zone and/or area of observed damage will be collected and submitted to the Environmental Laboratory Approval Program (ELAP)-certified laboratory under standard chain-of-custody for analysis for Target Compound List (TCL)/Commissioner Policy 51 (CP-51) volatile organic compounds (VOCs) + Tentatively Identified Compounds (TICs), semivolatile organic compounds (SVOCs) + TICs, and Target Analyte List (TAL) metals. Analytical Services Protocol (ASP) Category B laboratory data packages will be provided.
- Any soil exhibiting evidence of contamination will be stockpiled on polyethylene sheeting for proper waste characterization, prior to being transported off-Site for disposal.
- Post-excavation soil sampling, which will be used to document the conditions of remaining on-Site material, will be performed as described in Section 4.0 below.

2.0 Removal of the Suspect Oil Water Separator

The suspect OWS is located beneath the south portion of the Lot 39 building, and is anticipated to be connected to the underground drainage system based on the geophysical survey performed during prior investigations. The removal of the suspect OWS will be performed as follows:

- Excavation in the area of the suspected OWS will be completed to confirm if a structure is present, and, if so, if the structure appears to be consistent with an OWS.
- If identified, the OWS will be emptied and scrubbed clean of residual material. All waste generated during cleaning will be stored in 55-gallon drums, which will be labeled and remain stored onsite prior to disposal.

- The OWS interior will be made inert.

- Following cleaning, the OWS interior will be inspected for indications of damage (e.g., corrosion, penetrations, etc.). A description and photographic documentation of the OWS conditions, including any evidence of corrosion and leaks, will be documented.

- Soil in the vicinity of the OWS will be inspected for evidence of petroleum contamination (e.g., odors, staining) and screened with a PID. If evidence of a release, and/or evidence of damage to the OWS is identified, a sample of soil from the most impacted zone and/or area of damage will be collected and submitted to the ELAP-certified laboratory under standard chain-of-custody for analysis for TCL/CP-51 VOCs + TICs, SVOCs + TICs, and TAL metals. ASP Category B laboratory data packages will be provided.

- Any soil exhibiting evidence of contamination will be stockpiled on polyethylene sheeting for proper waste characterization, prior to being transported off-Site for disposal.

- Post-excavation soil sampling, which will be used to document the conditions of remaining on-Site material, will be performed as described in Section 4.0 below.

3.0 Removal and Closure of the Suspect Underground Storage Tank

The dimensions of the suspect UST are assumed to be approximately 4.5 feet by 9 feet based on the limits of the anomaly detected during the prior geophysical survey work. If a UST is present, the tank and associated piping will be closed and removed in accordance with NYSDEC requirements and applicable local, state, and Federal rules and regulations.

Please note, there are no tanks currently registered in NYSDEC Petroleum Bulk Storage (PBS) program for Lot 39. If discovered, the UST will be registered and closed concurrently during the IRM, with consideration of the total petroleum storage, including the approximate 1,100-gallon above ground storage tank (AST) located on Lot 28. Closure of the tank (if encountered), including collection and analysis of post excavation end-point samples, will be conducted in accordance with NYSDEC Division of Environmental Remediation Technical Guidance for Site Investigation and Remediation (DER-10), as described in the following bullets and in Section 4.0:

- The tank will be emptied and scrubbed clean of any residual material. All waste generated during cleaning will be stored in 55-gallon drums, which will be labeled and remain stored onsite prior to being transported off-Site for disposal.

- The tank interior will be made inert.

- Following tank cleaning, the tank interior will be inspected for damage (e.g., corrosion, penetrations, etc.). A description and photographic documentation of the tank and piping conditions, including any evidence of corrosion and leaks, will be documented.

- Soil in the vicinity of the UST will be inspected for evidence of petroleum contamination (e.g., odors, staining) and screened with a PID. If evidence of a release is identified, and/or evidence of damage to the UST is identified, a sample of soil from the most impacted zone and/or area of damage will be collected and submitted to the ELAP-certified laboratory under standard chain-of-custody for analysis for TCL/CP-51 VOCs + TICs, SVOCs + TICs, and TAL metals. ASP Category B laboratory data packages will be provided.

- Any soil exhibiting evidence of contamination will be stockpiled on polyethylene sheeting for proper waste characterization, prior to being transported off-Site for disposal.

- Underground piping associated with the UST, if discovered, will be cleaned and removed.

4.0 Excavation, Post-Excavation Sampling Program, and Chemical Oxidant Application

Following closure and removal of the sub-slab drainage system, OWS, and UST, the Lot 39 portion of the Site will be excavated to a depth of 10 feet below ground surface (bgs) to the extent possible. Support of excavation (SOE) will be installed to facilitate excavation to a depth of 10 feet bgs, and it is anticipated that a buffer of approximately 5-10 feet will be required between SOE and adjacent structures. Soil will be direct loaded into trucks and transported off-site to a disposal facility permitted to accept such waste (i.e. non-hazardous excavated material and petroleum contaminated material).

Post-excavation samples will be collected from the terminal depth of the excavation. Refer to *Figure* 3 for the post-excavation sampling plan. Samples may be added or removed based on the actual extent of the piping discovered during excavation and removal work. Post-excavation sampling will remain compliant with DER-10 sampling frequency recommendations. Sampling will be conducted as follows:

- The following samples will be analyzed for TCL/CP-51 VOCs + TICs and TCL/CP-51 SVOCs + TICs:
    - One (1) sample will be collected every 20 linear feet of piping associated with the underground drainage system.
    - One (1) sample will be collected beneath each removed floor drain.
    - One (1) sample per five (5) feet of length of the OWS.
    - One (1) sample every five (5) feet of length of the UST (i.e., 2 soil samples).
        - If there is underground piping associated with the UST, one (1) sample every 20 linear feet of piping will be collected. If there is less than 20 feet of piping, one (1) sample will be collected.

- The following samples will be analyzed for TCL/CP-51 VOCs + TICs, TCL/CP-51 SVOCs + TICs, and TAL metals:

    - One (1) post-excavation sample will be collected approximately every 900 square feet. Post-excavation sample locations may be co-located with the drainage piping, OWS and UST sample locations, as applicable. Refer to *Figure 3*.

- If evidence of a release is identified at the terminal depth of the excavation, a sample of soil from the most impacted zone will be collected and submitted to the ELAP-certified laboratory under standard chain-of-custody for analysis for TCL/CP-51 VOCs + TICs, SVOCs + TICs, and TAL metals. ASP Category B laboratory data packages will be provided.

- Any previously unidentified drainage features will be thoroughly inspected and documented.

Samples will be submitted to an ELAP-certified laboratory under standard chain-of-custody for analysis. ASP Category B laboratory packages will be provided.

Following post-excavation soil sampling, approximately 5,000 pounds[1] of the Regenesis chemical oxidant, PersulfOx®, will be applied to the bottom of the excavation in the area of known contamination. Refer to *Figure 4* for the extents of proposed PersulfOx® application. The PersulfOx® will be mixed with the soil to 3 feet below the bottom of excavation, using an excavator, and hydrated to saturation. Application of the PersulfOx® will be conducted in accordance with manufacturers recommendations to maximize its benefit within the vadose zone and the zone of impact.

5.0 Site Restoration and Waste Disposal

After the Chemical Oxidant has been applied to the Site, the excavations will be backfilled as follows:

1. A geotextile liner will be installed against all exposed soil surfaces within the excavations to serve as a demarcation layer.

2. The excavations will be backfilled with virgin quarried #57 stone (i.e., ¾ inch bluestone) to grade, or an approved equal. NYSDEC's Request to Import/Reuse Fill or Soil form will be provided to NYSDEC prior to import.

All waste generated during IRM activities (soil, oil, wash waters, tank bottoms, drainage sediment, cleaning materials, etc.) will be properly characterized and transported offsite for disposal at a facility(ies) permitted to accept such waste.

[1] The quantity of PersulfOx® proposed for application at the bottom of the excavation is based on the manufacturer's recommendation considering the depth terminal depth of the excavation, depth and concentrations of petroleum-related VOCs in soil, and the depth to groundwater.

- Waste characterization sampling will be performed exclusively for the purposes of off-Site disposal in a manner suitable to comply with receiving facility(ies) permit(s).
- Loaded vehicles leaving the Site will be appropriately lined, tarped, securely covered, manifested, and placarded. Further, truck tires will inspected and cleaned, if necessary, to avoid tracking material into the street.
- All transport of materials will be performed by licensed haulers in accordance with 6 NYCRR Part 364 and other applicable local, state, and Federal rules and regulations.
- All soil/fill/liquid/solid waste excavated and removed from the Site will be disposed of in accordance with 6 NYCRR Part 360 and other applicable local, state, and Federal rules and regulations.

Report Preparation

After completion of off-site material disposal, site restoration, and receipt of validated laboratory results, an IRM Construction Completion Report (CCR) will be prepared. The IRM CCR will be prepared in accordance with DER-10, Section 5.8, and will contain a description of field activities, description of excavated areas, imported material sources and quantities, soil quantities removed, waste disposal documentation, tank closure documentation, and sampling results. The report will include an evaluation of the quality of the analytical data and the reliability of the data for its intended use. The report will contain NYSDEC ASP Category B data deliverables and a DUSR for non-waste characterization analyses. The IRM CCR will be signed and sealed by a licensed New York State Professional Engineer. The data deliverables package will be submitted to NYSDEC in approved electronic data deliverable (EDD) format.

Schedule

Prior to implementation of the IRM, the IRM Work Plan and NYSDEC approval letter will be filed with NYCOER. It is anticipated that the IRM field activities will occur during the upcoming demolition phase of the new building construction. It is anticipated that the IRM field activities will take place once the building demolition has sufficiently advanced to facilitate the intrusive work below the slab of the existing building. The IRM CCR will be submitted to NYSDEC within approximately 8 weeks of receipt of all documentation required for the report.

Certification

I, Phillip Castellano, certify that I am currently a registered Professional Engineer licensed by the State of New York and that this Interim Remedial Measure Work Plan was prepared in accordance with applicable statutes and regulations and in substantial conformance with DER-10.

Please contact me at (917) 359-1852 or pcastellano@trccompanies.com with any questions or comments.

Sincerely,
TRC Engineers, Inc.

Jenna Raup
Program Manager
Jraup@trccompanies.com

Phillip Castellano, P.E.
Senior Engineer
PCastellano@trccompanies.com

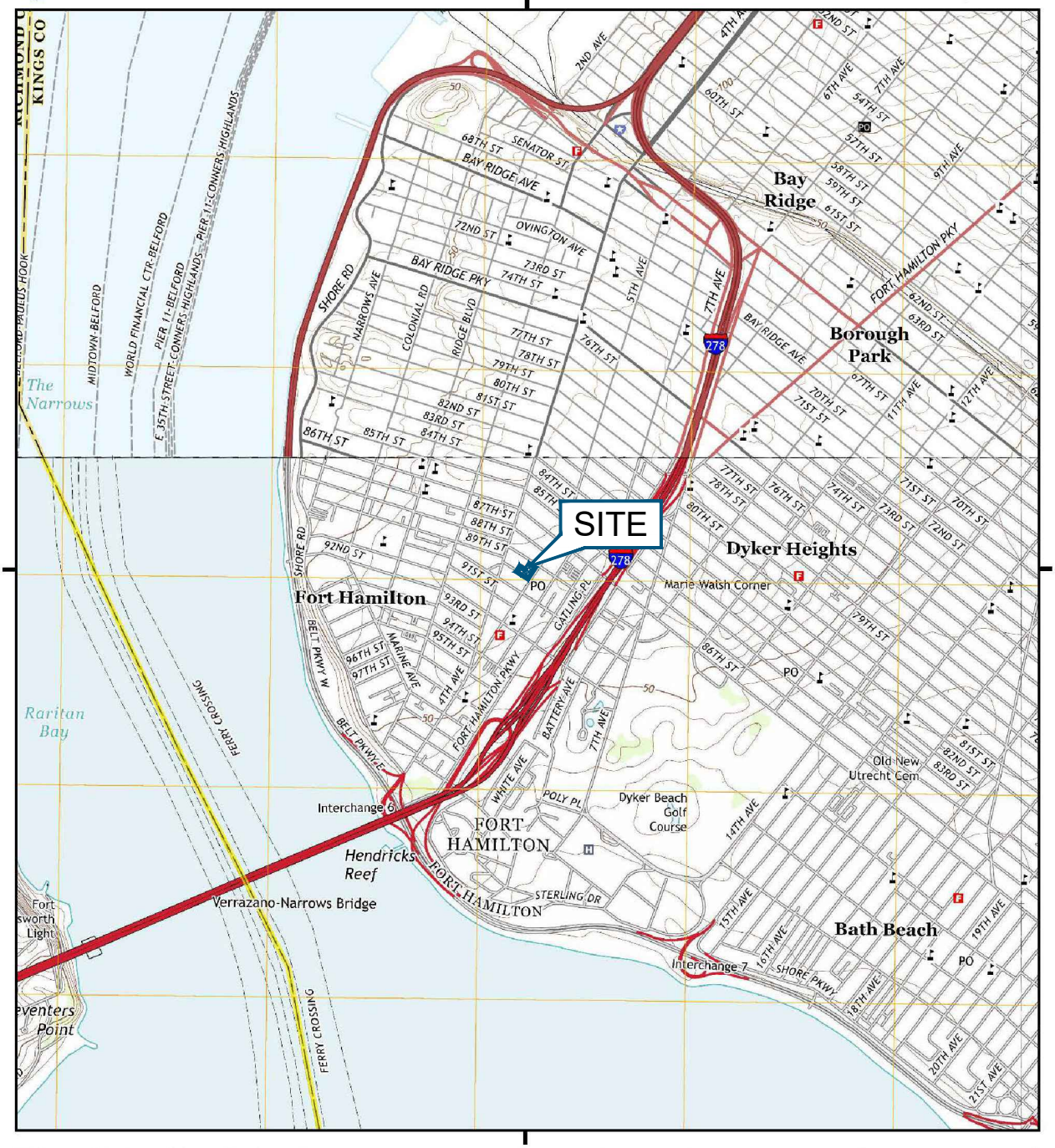
cc: J. O'Connell, A. Obligado, NYSDEC
M. Sherwood, B. Kanaparthi, NYCSCA
Z. Schwartz, TRC

Enclosures: Figure 1 – Site Location Map
Figure 2 – Site Layout Map
Figure 3 – Proposed Post-Excavation Sample Location Plan
Figure 4 – Chemical Oxidant Application Location Plan
Attachment A – Quality Assurance Project Plan
Attachment B – Community Air Monitoring Plan
Attachment C – Health and Safety Plan

FIGURES

Historical Topo Map

2013, 2014



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

NW N NE
W E
SW S SE

TP, The Narrows, 2013, 7.5-minute
N, Jersey City, 2014, 7.5-minute
NE, Brooklyn, 2013, 7.5-minute
SE, Coney Island, 2013, 7.5-minute

0 Miles 0.25 0.5 1 1.5

SITE NAME: 8802 5th Avenue
ADDRESS: 8802 5th Avenue
Brooklyn, NY 11209

N

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PROJECT: **NEW YORK CITY SCHOOL CONSTRUCTION AUTHORITY**
INTERIM REMEDIAL MEASURE WORK PLAN - BCP SITE NO. C224327
8802 5TH AVENUE AND 429 89TH STREET
BLOCK: 6065, LOTS: 28 & 39
BROOKLYN, NEW YORK 11209

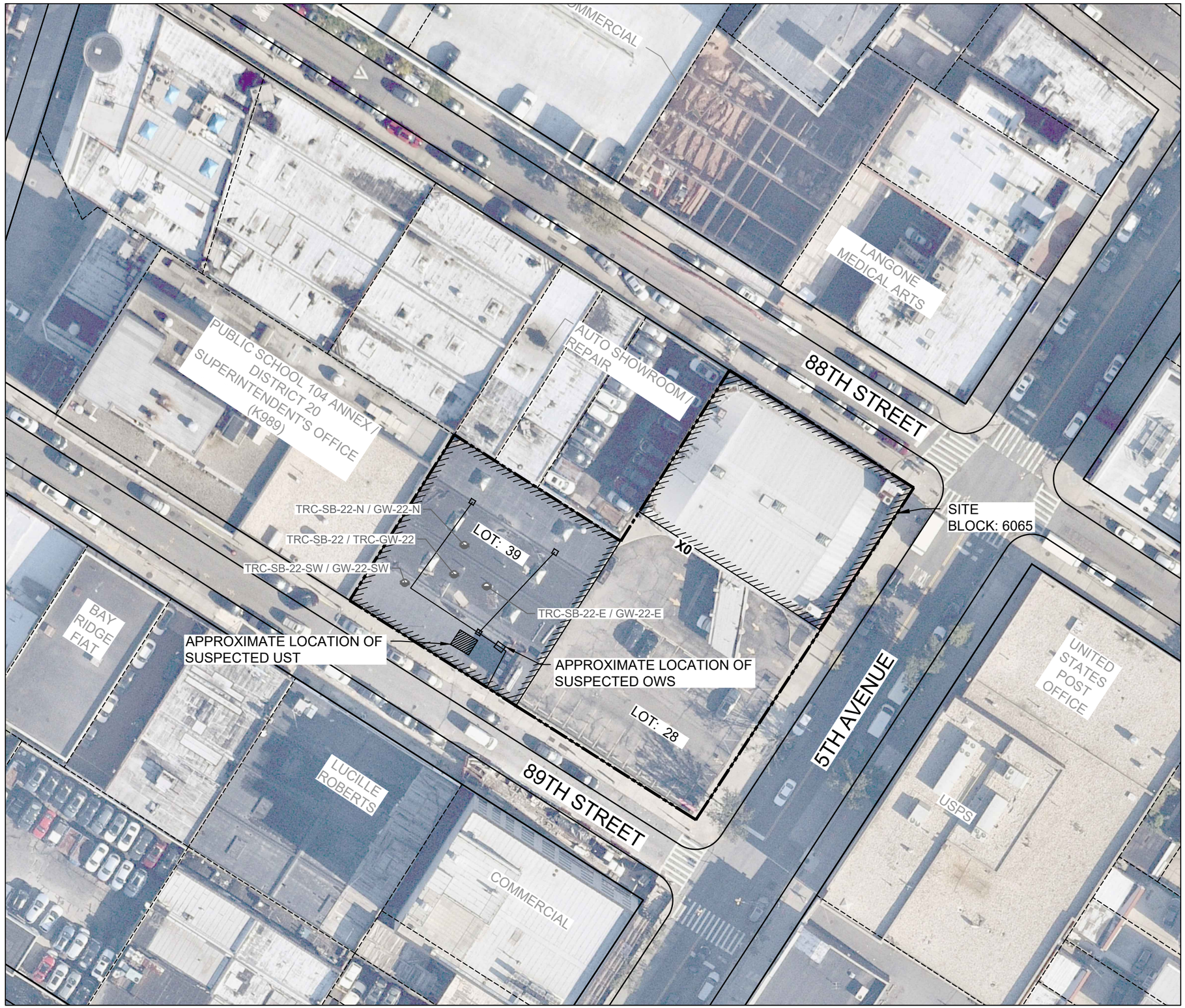
TITLE:

SITE LOCATION MAP

DRAWN BY:	H. DELGADO
CHECKED BY:	Z. SCHWARTZ
APPROVED BY:	J. RAUP
DATE:	FEBRUARY 2025
PROJ. NO.:	565027.0000.0000
FILE:	Fig 1 - Site Location Map (K20F).dwg

FIGURE 1

8.5x11 -- ATTACHED XREFS: -- ATTACHED IMAGES: 2013-2014 Hist Topo:
DRAWING NAME: \\nyc-fp1\Projects\NYCSCA Contract C000015348\435632 - K20F 8802 5th Ave Brooklyn\IRM\TRC Working Drawings\ Fig 1 - Site Location Map (K20F).dwg -- PLOT DATE: February 21, 2025 - 2:47PM -- LAYOUT: 8.5x11P



LEGEND (SYMBOLS NOT TO SCALE):

- SITE BOUNDARY
- LOT BOUNDARY
- BUILDING FOOTPRINT
- SUSPECT DRAINAGE SYSTEM PIPING
- MONITORING WELL TO BE PROTECTED
- FLOOR DRAIN
- X0 — FILL PORT / VENT PIPE

NOTES:

1. LOCATIONS AND DIMENSIONS OF PHYSICAL FEATURES AND BOUNDARIES ARE APPROXIMATE.
2. AERIAL IMAGE BACKGROUND SOURCED FROM NEARMAP DATED OCTOBER 01, 2020.
3. BASEMAP SOURCE FROM NYC DEPARTMENT OF FINANCE TAX MAP.
4. LOT 39 BUILDING IS CURRENTLY VACANT
5. UST - UNDERGROUND STORAGE TANK
6. OWS - OIL WATER SEPARATOR

N

TRUE NORTH NY83-LIF

0 50' 100'

SCALE: 1" = 50'
SHEET SIZE: 11" BY 17"

PROJECT: **NEW YORK CITY SCHOOL CONSTRUCTION AUTHORITY**
INTERIM REMEDIAL MEASURE WORK PLAN - BCP SITE NO. C224327
8802 5TH AVENUE AND 429 89TH STREET
BLOCK: 6065, LOTS: 28 & 39
BROOKLYN, NEW YORK 11209

TITLE: **SITE PLAN**

DRAWN BY:	H. DELGADO	PROJ NO.:	565027.0000.0000
CHECKED BY:	Z. SCHWARTZ		**FIGURE 2**
APPROVED BY:	J. RAUP		
DATE:	FEBRUARY 2025		

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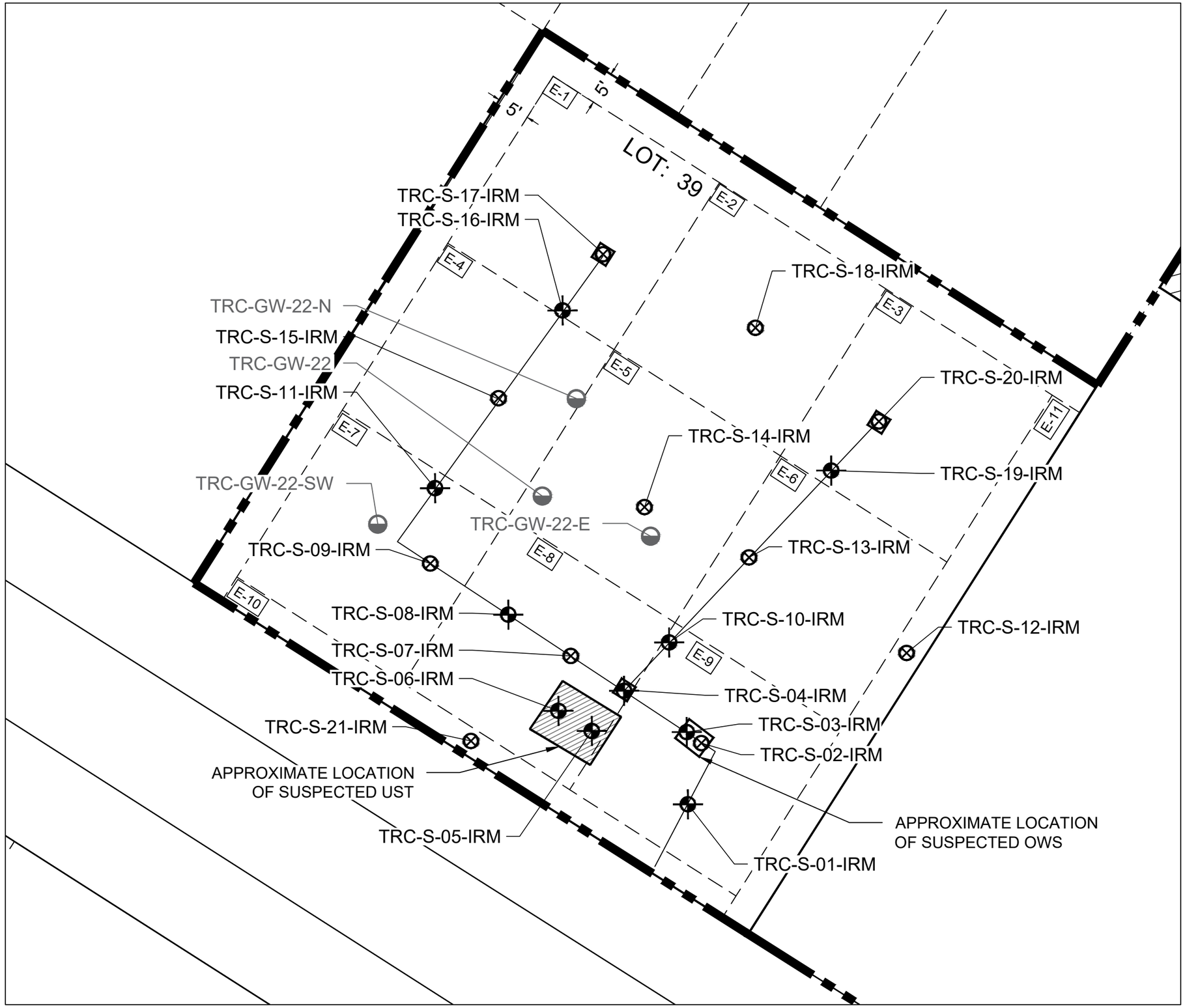
FILE NO.: Fig 2 - Site Plan (K20F).dwg



LEGEND (SYMBOLS NOT TO SCALE):

- SITE BOUNDARY
- LOT BOUNDARY
- EXCAVATION AREA REPRESENTING APPROXIMATELY 900 SQUARE FEET
- SUSPECT DRAINAGE SYSTEM PIPING
- FLOOR DRAIN
- SOIL SAMPLE LOCATION - VOCS AND SVOCS
- SOIL SAMPLE LOCATION - VOCS, SVOCS AND METALS
- MONITORING WELL TO BE PROTECTED

NOTES:

1. LOCATIONS AND DIMENSIONS OF PHYSICAL FEATURES AND BOUNDARIES ARE APPROXIMATE.
2. AERIAL IMAGE BACKGROUND SOURCED FROM NEARMAP DATED OCTOBER 01, 2020.
3. BASEMAP SOURCE FROM NYC DEPARTMENT OF FINANCE TAX MAP.
4. SAMPLES MAY BE ADDED OR REMOVED AS NECESSARY TO COMPLY WITH DER-10 RECOMMENDATIONS.
5. SAMPLES TO BE COLLECTED FROM THE TERMINAL DEPTH OF EXCAVATION, BENEATH THE PIPING INVERTS, UST AND OWS, FOLLOWING COMPLETION OF EXCAVATION AND REMOVAL.
6. A CHEMICAL OXIDANT WILL BE APPLIED PRIOR TO BACKFILLING. REFER TO FIGURE 4.
7. A GEOTEXTILE DEMARCATION LAYER SHALL BE INSTALLED PRIOR TO BACKFILLING WITH VIRGIN QUARRIED #57 STONE, OR APPROVED EQUAL.
8. UST - UNDERGROUND STORAGE TANK
9. OWS - OIL WATER SEPARATOR

N

TRUE NORTH NY83-LIF

0 15' 30'

SCALE: 1" = 15'
SHEET SIZE: 11" BY 17"

PROJECT: **NEW YORK CITY SCHOOL CONSTRUCTION AUTHORITY**
INTERIM REMEDIAL MEASURE WORK PLAN - BCP SITE NO. C224327
8802 5TH AVENUE AND 429 89TH STREET
BLOCK: 6065, LOTS: 28 & 39
BROOKLYN, NEW YORK 11209

TITLE:

PROPOSED POST-EXCAVATION SAMPLE LOCATION PLAN

DRAWN BY:	H. DELGADO	PROJ NO.:	565027.0000.0000
CHECKED BY:	Z. SCHWARTZ		
APPROVED BY:	J. RAUP		**FIGURE 3**
DATE:	FEBRUARY 2025		

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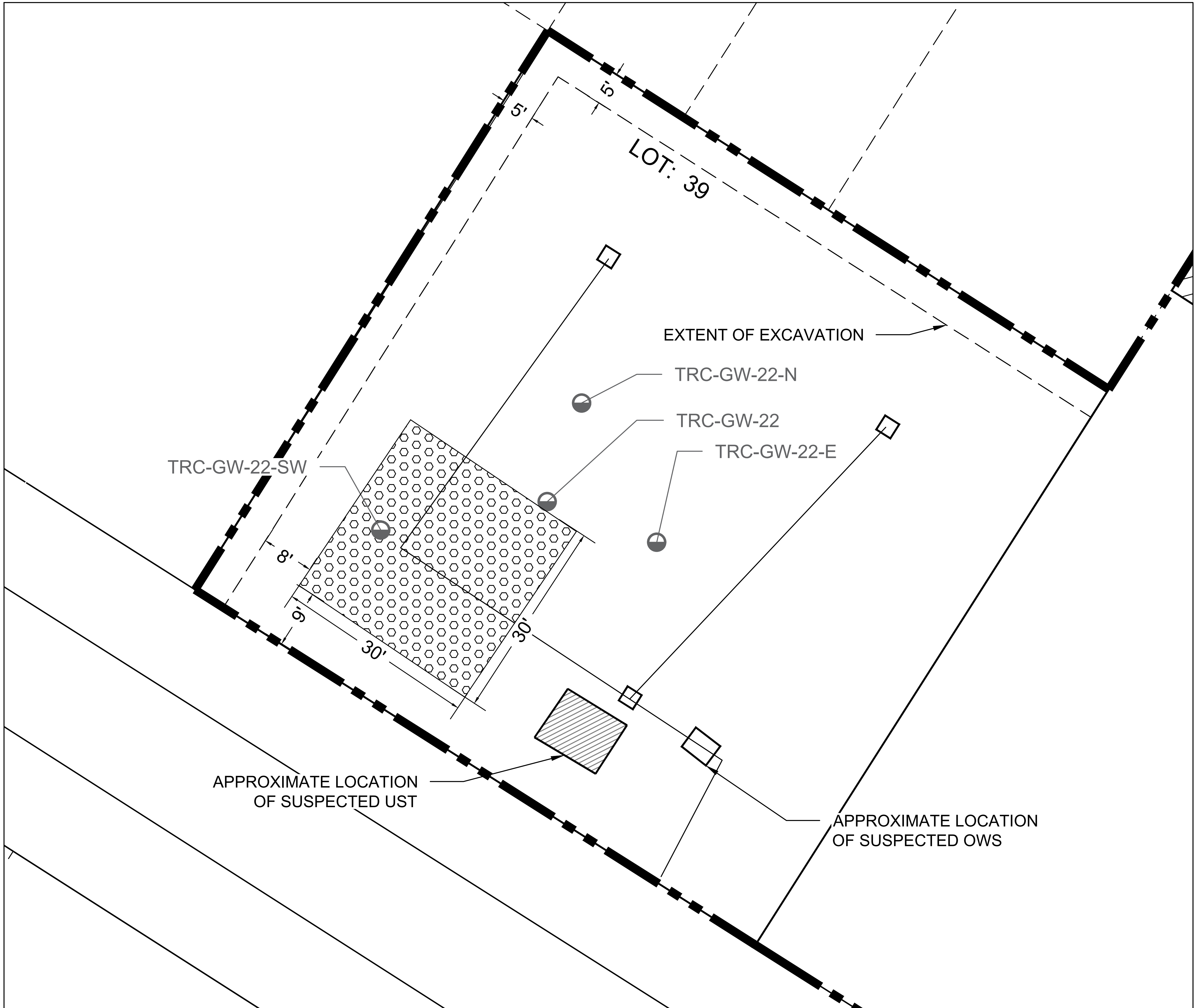
FILE NO.: Fig 3 - Sample Location Plan (K20F).dwg



LEGEND (SYMBOLS NOT TO SCALE):

- SITE BOUNDARY
- LOT BOUNDARY
- EXTENT OF CHEMICAL OXIDANT APPLICATION
- SUSPECT DRAINAGE SYSTEM PIPING
- FLOOR DRAIN
- MONITORING WELL TO BE PROTECTED

NOTES:

1. LOCATIONS AND DIMENSIONS OF PHYSICAL FEATURES AND BOUNDARIES ARE APPROXIMATE.
2. AERIAL IMAGE BACKGROUND SOURCED FROM NEARMAP DATED OCTOBER 01, 2020.
3. BASEMAP SOURCE FROM NYC DEPARTMENT OF FINANCE TAX MAP.
4. THE EXTENT OF THE CHEMICAL OXIDANT APPLICATION MAY CHANGE PENDING FIELD CONDITIONS.
5. A GEOTEXTILE DEMARCATION LAYER SHALL BE INSTALLED PRIOR TO BACKFILLING WITH 3/4-INCH BLUESTONE, OR APPROVED EQUAL.
6. UST - UNDERGROUND STORAGE TANK
7. OWS - OIL WATER SEPARATOR

SCALE: 1" = 15'
SHEET SIZE: 11" BY 17"

PROJECT: NEW YORK CITY SCHOOL CONSTRUCTION AUTHORITY
INTERIM REMEDIAL MEASURE WORK PLAN - BCP SITE NO. C224327
8802 5TH AVENUE AND 429 89TH STREET
BLOCK: 6065, LOTS: 28 & 39
BROOKLYN, NEW YORK 11209

TITLE:
CHEMICAL OXIDANT APPLICATION LOCATION PLAN

DRAWN BY:	H. DELGADO	PROJ NO.:	565027.0000.0000
CHECKED BY:	Z. SCHWARTZ		FIGURE 4
APPROVED BY:	J. RAUP		
DATE:	FEBRUARY 2025		

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FILE NO.: Fig. 4 - Chemical Oxidant Location Plan.dwg

DRAWING NAME: \\nyc-fp1\Projects\NYCSCA Contract C000015348\435632 - K20F 8802 5th Ave Brooklyn\IRM\TRC Working Drawings\Fig. 4 - Chemical Oxidant Location Plan.dwg --- PLOT DATE: March 04, 2025 - 2:43PM --- LAYOUT: 11x17L
11x17 --- ATTACHED XREFS: --- ATTACHED IMAGES: EPSG2263;

ATTACHMENT A

QUALITY ASSURANCE PROJECT PLAN

QUALITY ASSURANCE PROJECT PLAN

This Quality Assurance Project Plan (QAPP) presents the organization, objectives, planned activities, and specific quality assurance/quality control (QA/QC) procedures associated with the field activities described in the scope of work. The QAPP also describes specific protocols for field sampling, sample handling and storage, and laboratory analysis. The data generated from the analysis of samples will be used to document post-excavation soil conditions and post-remediation groundwater conditions.

Project Organization and Responsibility

A qualified person will coordinate and manage the sampling and analysis program, data reduction, QA/QC, data validation, analysis, and reporting. TRC will direct the sampling activities and coordinate laboratory and remedial investigation activities. The TRC Project Quality Assurance (QA) Officer will be Elizabeth Denly and will report directly to the Project Manager, Jenna Raup.

A qualified person will ensure that the QAPP is implemented and will oversee data validation. A qualified person will provide oversight and technical support for the sampling and analytical procedures followed in this project. This individual has the broad authority to approve or disapprove project plans, specific analyses, and final reports. The Project QA Officer is independent from the data generation activities. In general, the QA officer will be responsible for reviewing and advising on all QA/QC aspects of this program.

Data validation will be performed for the post-excavation documentation/confirmatory soil sample analytical data and groundwater sample analytical data. The results of the data validation will be summarized in Data Usability Summary Reports (DUSRs). Nancy Weaver of Environmental Data Services, Inc. is the proposed data validator for this project.

Laboratories used will be New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP)-certified laboratories. The proposed laboratory for this project is TestAmerica Laboratory in Edison, New Jersey (ELAP Certification No. 11452). The laboratory will communicate directly with the Project Manager regarding the analytical results and reporting and will be responsible for providing all labels, sample containers, temperature blanks, shipping coolers, and laboratory documentation.

QA Objectives for Data Management

New York State Analytical Services Protocol (ASP) Category B laboratory packages will be provided by the laboratory.

All analytical measurements will be made so that the results are representative of the media sampled and the conditions measured. Data will be reported in consistent dry weight units for solid samples (i.e., µg/kg and/or mg/kg). Table 1A presents the proposed samples, sampling and analytical parameters, analytical methods, sample preservation requirements, containers, and QA/QC samples.

Quantitation Limits (QLs) are laboratory-specific and reflect those values achievable by the laboratory performing the analyses.

Data Quality Levels (DQLs) are those reporting limits required to meet the objectives of the program (i.e., program action levels, cleanup standards, etc.).

Data Quality Objectives (DQOs) define the quality of data and documentation required to support decisions made in the various phases of the data collection activities. The DQOs are dependent on the end uses of the data to be collected and are also expressed in terms of objectives for precision, accuracy, representativeness, completeness, and comparability.

The analytical methods to be used at this site provide the highest level of data quality and can be used for purposes of risk assessment, evaluation of remedial alternatives and verification that cleanup standards have been met. However, in order to ensure that the analytical methodologies are capable of achieving the DQOs, measurement performance criteria have been set for the analytical measurements in terms of accuracy and precision.

The overall QA objective is to develop and implement procedures for field sampling, chain-of-custody, laboratory analysis, and reporting which will provide results that are scientifically valid, and the levels of which are sufficient to meet DQOs.

For quantitation limits for parameters associated with soil samples, the laboratory will be required to attempt to meet or surpass the parameter-specific limits listed in 6 NYCRR Part 375 Unrestricted Use Criteria and Commissioner Policy 51 Tables 2 and 3 (CP-51).

For quantitation limits for parameters associated with groundwater samples, the laboratory will be required to attempt to meet or surpass the parameter-specific limits for groundwater from the NYSDEC Division of Water Technical and Operational Guidance Series (1.1.1) Ambient Water Quality Standards and Guidance Values.

The QA objectives are defined as follows:

- ***Accuracy*** is the closeness of agreement between an observed value and an accepted reference value. The difference between the observed value and the reference value includes components of both systematic error (bias) and random error.

  Accuracy in the field is assessed through the adherence to all field instrument calibration procedures, sample handling, preservation, and holding time requirements, and through the collection of equipment blanks prior to the collection of samples for each type of equipment being.

  The laboratory will assess the overall accuracy of their instruments and analytical methods (independent of sample or matrix effects) through the measurement of "standards," materials of accepted reference value. Accuracy will vary from analysis to analysis because of individual sample and matrix effects. In an individual analysis, accuracy will be measured in terms of blank results, the percent recovery (%R) of surrogate compounds in organic analyses and/or laboratory control samples (LCSs). This gives an indication of expected recovery for analytes tending to behave chemically like the spiked or surrogate compounds. Table 2A summarizes the laboratory accuracy requirements.

- ***Precision*** is the agreement among a set of replicate measurements without consideration of the "true" or accurate value: i.e., variability between measurements of the same material for the same analyte. Precision is measured in a variety of ways including statistically, such as calculating variance or standard deviation.

  Precision in the field is assessed through the collection and measurement of field duplicates (one extra sample in addition to the original field sample). Field duplicates will be collected at a

frequency of one per twenty investigative samples per matrix per analytical parameter. Precision will be measured through the calculation of relative percent differences (RPDs). The resulting information will be used to assess sampling and analytical variability. These criteria apply only if the sample and/or duplicate results are >5x the quantitation limit; if both results are < 5x the quantitation limit, the criterion will be doubled.

Precision in the laboratory is assessed through the calculation of RPD for duplicate samples. For organic soil and groundwater analyses, laboratory precision will be assessed through the analysis of field duplicates.

- ***Completeness*** is a measure of the amount of valid data obtained from a measurement system compared to the amount that was expected to be obtained under normal conditions. "Normal conditions" are defined as the conditions expected if the sampling plan was implemented as planned.

  Field completeness is a measure of the amount of (1) valid measurements obtained from all the measurements taken in the project and (2) valid samples collected. The field completeness objective is greater than 90 percent.

  Laboratory completeness is a measure of the amount of valid measurements obtained from all valid samples submitted to the laboratory. The laboratory completeness objective is greater than 95 percent.

- ***Representativeness*** is a qualitative parameter that expresses the degree to which data accurately and precisely represents either a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition within a defined spatial and/or temporal boundary. To ensure representativeness, the sampling locations have been selected to provide coverage over a wide area and to highlight potential trends in the data. In addition, field duplicate samples will provide an additional measure of representativeness at a given location.

  Representativeness is dependent upon the proper design of the sampling program and will be satisfied by ensuring that the Remedial Action Work Plan is followed and that proper sampling, sample handling, and sample preservation techniques are used.

  Representativeness in the laboratory is ensured by using the proper analytical procedures, appropriate methods, and meeting sample holding times.

- ***Comparability*** expresses the confidence with which one data set can be compared to another. Comparability is dependent upon the proper design of the sampling program and will be satisfied by ensuring that the Work Plan are followed and that proper sampling techniques are used. Maximization of comparability with previous data sets is expected because the sampling design and field protocols are consistent with those previously used.

  Comparability is dependent on the use of recognized United Stated Environmental Protection Agency (USEPA) or equivalent analytical methods and the reporting of data in standardized units. Laboratory procedures are consistent with those used for previous sampling efforts.

Table 1A
Analytical Parameters, Methods, Preservation, Holding Time, and Container Requirements for Soil Samples

Sample Matrix	Analytical Parameter	Sample Type[1]	No. of Samples[2]	No. of QA/QC Samples	EPA Analytical Method	Sample Preservation	Holding Time[3]	Sample Container
Soil	TCL and CP-51 VOCs	Grab	26-30	Duplicate: 1/20	8260C	Sealed in EnCore® bag; Cool to 4° C	48 hours to extract: 2 EnCore® samplers extruded in 5 mL DI water and freeze vials to <-7^{0}C; 1 EnCore® sampler extruded in 5 mL methanol and Cool to 40 C; 14 days to analysis	3 x 5 gram EnCore® samplers
Soil	TCL and CP-51 SVOCs	Grab	26-30	Duplicate: 1/20	8270D	Cool to 4° C	14 days to extract	8 oz glass jar
Soil	Copper and Total Chromium	Grab	10-12	Duplicate: 1/20	6010C	Cool to 4° C	180 days to analysis	8 oz glass jar
Soil	TAL Metals	Grab	16-20	Duplicate: 1/20	6010C	Cool to 4° C	180 days to analysis	8 oz glass jar
Soil	Mercury	Grab	16-20	Duplicate: 1/20	7471B	Cool to 4° C	28 days to analysis	8 oz glass jar
Soil	Total Cyanide	Grab	16-20	Duplicate: 1/20	SW 846 9012B	Cool to 4° C	14 days to extract	8 oz glass jar
Soil	TCL Pesticides	Grab	16-20	Duplicate: 1/20	8081B	Cool to 4° C	14 days to extract	8 oz glass jar
Soil	TCL Herbicides	Grab	16-20	Duplicate: 1/20	8151A	Cool to 4° C	14 days to extract	8 oz glass jar
Soil	PCBs	Grab	16-20	Duplicate: 1/20	8082A	Cool to 4° C	14 days to extract	8 oz glass jar

[1] A six-inch sampling interval is the targeted sample size; however, sample volume recovery, analytical method requirements, and field conditions can affect the actual sample interval size. For these reasons, the actual sampling interval may change in order to obtain adequate volume.
[2] Actual number of samples may vary depending on field conditions, sample material availability, and field observations.
[3] From date and time of sample collection

Table 1 B
Analytical Parameters, Methods, Preservation, Holding Time, and Container Requirements for Groundwater Samples

Sample Matrix	Analytical Parameter	Sample Type	No. of Samples[1]	No. of QA/QC Samples	EPA Analytical Method	Sample Preservation	Holding Time[2]	Sample Container
Groundwater	Select CVOCs	Grab	4	Trip Blank[3]: as necessary (one per day, per cooler containing CVOC groundwater samples) Duplicate: 1/20 Equipment Blank: 1/20	8260C	pH<2 with HCl; cool to 4°C; no headspace	14 days to analysis	3 40-mL glass vials

[1] Actual number of samples may vary depending on field conditions, sample material availability, and field observations.
[2] From date and time of sample collection
[3] Trip blank bottleware – 3 40-mL HCl-preserved glass vials.
[4] Select list of CVOCs for analysis include trichloroethene (TCE), cis-1,2-dichloroethene (cis-1,2-DCE), 1,1-dichloroethene (1,1-DCE), carbon tetrachloride, tetrachloroethene (PCE), 1,1,1-trichloroethane (1,1,1-TCA), methylene chloride, vinyl chloride, chloromethane, 1,1-dichloroethane, and trans-1,2-dichloroethene

Table 2A
Laboratory Data Quality Objectives: Precision and Accuracy: Soil Samples

Parameter	Method	Matrix	Accuracy Control Limits	Accuracy Frequency Requirements	Precision (RPD) Control Limits	Precision Frequency Requirements
TCL and CP-51 VOCs	8260C	Soil	Surrogates % Rec. 1,2-Dichloroethane-d4 78-135 4-Bromofluorobenzene 67-126 Toluene-d8 73-121 Dibromfluoromethane 61-149	Surrogates: All samples, standards, QC samples	Field Duplicates RPD ≤50	Field Duplicates: One per 20 soil samples
TCL and CP-51 SVOCs	8270D	Soil	Surrogates % Rec. 2-Fluorophenol 38-95 Phenol-d5 32-91 2,4,6-Tribromophenol 10-103 Nitrobenzene-d5 37-94 2-Fluorobiphenyl 38-95 Terphenyl-d14 24-109	Surrogates: All samples, standards, QC samples	Field Duplicates RPD ≤50	Field Duplicates: One per 20 soil samples
TAL Metals	6010C	Soil	Matrix Spikes: 75-125% recovery Laboratory Control Samples: 80-120% recovery	Matrix Spikes: One per 20 soil samples per laboratory analytical batch Laboratory Control Samples: One per 20 samples per laboratory analytical batch	Field Duplicates RPD ≤20	Field Duplicates: One per 20 soil samples
Mercury	7471B	Soil	Matrix Spikes: 75-125% recovery Laboratory Control Samples: 80-120% recovery	Matrix Spikes: One per 20 soil samples per laboratory analytical batch Laboratory Control Samples: One per 20 samples per laboratory analytical batch	Field Duplicates RPD ≤20	Field Duplicates: One per 20 soil samples
Total Cyanide	SW 846-9012B	Soil	Matrix Spikes: 75-125% recovery Laboratory Control Samples: 80-120% recovery	Matrix Spikes: One per 20 soil samples per laboratory analytical batch	Field Duplicates RPD ≤20	Field Duplicates: One per 20 soil samples

Table 2A
Laboratory Data Quality Objectives: Precision and Accuracy: Soil Samples

Parameter	Method	Matrix	Accuracy Control Limits	Accuracy Frequency Requirements	Precision (RPD) Control Limits	Precision Frequency Requirements
				Laboratory Control Samples: One per 20 samples per laboratory analytical batch		
TCL Pesticides	8081B	Soil	Matrix Spikes: 75-125% recovery Laboratory Control Samples: 80-120% recovery	Matrix Spikes: One per 20 soil samples per laboratory analytical batch Laboratory Control Samples: One per 20 samples per laboratory analytical batch	Field Duplicates RPD ≤20	Field Duplicates: One per 20 soil samples
TCL Herbicides	8151A	Soil	Matrix Spikes: 75-125% recovery Laboratory Control Samples: 80-120% recovery	Matrix Spikes: One per 20 soil samples per laboratory analytical batch Laboratory Control Samples: One per 20 samples per laboratory analytical batch	Field Duplicates RPD ≤20	Field Duplicates: One per 20 soil samples
PCBs	8082A	Soil	Matrix Spikes: 75-125% recovery Laboratory Control Samples: 80-120% recovery	Matrix Spikes: One per 20 soil samples per laboratory analytical batch Laboratory Control Samples: One per 20 samples per laboratory analytical batch	Field Duplicates RPD ≤20	Field Duplicates: One per 20 soil samples

Table 2B
Laboratory Data Quality Objectives: Precision and Accuracy: Groundwater Samples

Parameter	Method	Matrix	Accuracy Control Limits		Accuracy Frequency Requirements	Precision (RPD) Control Limits	Precision Frequency Requirements
Select CVOCs	8260C	Groundwater	Surrogates	% Rec.	Surrogates: All samples, standards, QC samples	Field Duplicates RPD ≤30	Field Duplicates: One per 20 groundwater samples
			1,2-Dichloroethane-d4	74-132			
			4-Bromofluorobenzene	77-124			
			Toluene-d8	80-120			

Project Goals

The principal objectives of the Interim Remedial Measure Work Plan (IRM) sampling program are to document the soil conditions following excavation activities.

Sampling Plan

Environmental sampling will include soil and groundwater. Soil samples will be collected using disposable sampling equipment. Groundwater samples will be collected from permanent monitoring wells using peristaltic pumps and new dedicated high density polyethylene (HDPE) tubing.

Soil Sampling

Soil samples will be collected in 2-ounce sterile scoops and placed in the sample bottles. EnCore® samplers will be used to collect soil samples for VOC analysis. Samplers will wear phthalate-free gloves such as nitrile (no latex will be used). Only clean instruments will be allowed to touch the sample.

Groundwater Sampling

Groundwater samples will be collected from four-inch diameter permanent wells installed on the Site. Groundwater from each well will be purged via a peristaltic pump equipped with Teflon-lined or HDPE tubing until parameters have stabilized in accordance with USEPA Low-Stress (Low-Flow) sampling procedures. A turbidity level of 50 Nephelometric Turbidity Units (NTUs) or less is the well purging goal, but not an absolute value before sampling. Other field parameters including temperature, conductivity, pH, and dissolved oxygen (DO) will also be monitored. As practical, all field measurements will be taken from the flow-through cell and will be recorded during and after purging, and before sampling. Field parameters should generally be within ±10 percent for three consecutive readings prior to sampling.

A minimum of three well volumes will be purged prior to sample collection. Ideally, pumping rates will be maintained between 100 and 500 milliliters per minute (ml/min) so that no drawdown of the groundwater level occurs (i.e., pumping rate is less than recharge rate). During purging, the sampler will actively monitor and track the volume of water purged and the field parameter readings. Data will be recorded in the field logbook. For example, the sampler will record the running total volume purged from each well and note the readings for the corresponding field parameters.

Once groundwater conditions have stabilized and groundwater levels have recovered, samples will be collected. Sampling will be performed with the pump intake at the same location used for purging. Pumping rates for withdrawing the samples will be similar to those followed for well purging.

The samples will be collected in sample bottles (pre-preserved, if appropriate), placed in chilled coolers, and removed from light immediately after collection. All bottles will be filled to avoid cascading and aeration of the samples, the goal being to minimize any precipitation of colloidal matter.

QC Sample Collection

QC samples will include trip blanks for groundwater and field duplicates and equipment blanks for soil and groundwater samples. Refer to Table 1A-1B for a summary of QC sample preservation and container requirements.

Field duplicates are an additional aliquot of the same sample submitted for the same parameters as the original sample. Field duplicates will be used to assess the sampling and analytical reproducibility. Field duplicates will be collected by alternately filling sample bottles from the source being sampled. Field duplicates will be submitted at a frequency of one per 20 samples for all matrices and all parameters. Refer to Table 1A-1B for a summary of QC sample preservation and container requirements.

Equipment blanks will consist of distilled water and will be used to check for potential contamination of the equipment (i.e., sterile scoops), which may cause sample contamination. Equipment blanks will be collected by routing the distilled water through the sampling equipment prior to sample collection. Equipment blanks will be submitted to the laboratory at a frequency of one per 20 samples. Refer to Table 1A-1B for a summary of QC sample preservation and container requirements.

Sample Preservation and Containerization

The analytical laboratory will supply the containers for analytical samples. These containers will be cleaned by the manufacturer to meet or exceed all analyte specifications established in the latest USEPA's Specifications and Guidance for Contaminant-Free Sample Containers. Certificates of analysis are provided with each bottle lot and maintained on file to document conformance to USEPA specifications. Soil samples will be placed in chilled coolers immediately after collection.

Equipment Decontamination

Since disposable sampling equipment will be utilized, equipment decontamination procedures are not included in this QAPP.

Field Custody Procedures

Sample chain-of-custody and packaging procedures are summarized below. These procedures are intended to ensure that the samples will arrive at the laboratory with the chain-of-custody intact.

- The field sampler is personally responsible for the care and custody of the samples until they are transferred or dispatched properly. Field procedures have been designed such that as few people as possible will handle the samples.

- All bottles will be identified by the use of sample labels with sample numbers, sampling locations, date/time of sample collection, and type of analysis.

- Sample labels will be completed for each sample using waterproof ink unless prohibited by weather conditions. For example, a logbook notation would explain that a pencil was used to fill out the sample label because the pen would not function in wet weather.

- Samples will be accompanied by a properly completed chain-of-custody form. The sample numbers and locations will be listed on the chain-of-custody form. When transferring the possession of samples, the individuals relinquishing and receiving will sign, date, and note the time on the record. This record documents the transfer of custody of samples from the sampler to another person, to a mobile laboratory, to the permanent laboratory, or to/from a secure storage location.

- All shipments will be accompanied by the chain-of-custody record identifying the contents. The original record will accompany the shipment, and copies will be retained by the sampler and placed in the project files.

- Samples will be properly packaged for shipment and dispatched to the appropriate laboratory for analysis, with a separate signed custody record enclosed in and secured to the inside top of each sample box or cooler. Shipping containers will be secured with strapping tape and custody seals for shipment to the laboratory. The custody seals will be attached to the front right and back left of the cooler and covered with clear plastic tape after being signed by field personnel. The cooler will be strapped shut with strapping tape in at least two locations.

- If the samples are sent by common carrier, the air bill will be used. Air bills will be retained as part of the permanent documentation. Commercial carriers are not required to sign off on the custody forms since the custody forms will be sealed inside the sample cooler and the custody seals will remain intact.

- Samples remain in the custody of the sampler until transfer of custody is completed. This consists of delivery of samples to the laboratory sample custodian, and signature of the laboratory sample custodian on chain-of-custody document as receiving the samples and signature of sampler as relinquishing samples.

Data Management and Reporting

ASP Category B Laboratory Packages will undergo data validation. A NYSDEC Data Usability Summary Report (DUSR) will be prepared for each laboratory package. Note that waste characterization samples, if collected for laboratory analysis, will not undergo data validation.

ATTACHMENT B
COMMUNITY AIR MONITORING PLAN

COMMUNITY AIR MONITORING PLAN

In accordance with the Interim Remedial Measure Work Plan (IRM), this Community Air Monitoring Plan (CAMP) was developed to describe the procedures for real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area at the Site during ground intrusive work activities at 8802 5th Avenue and 429 89th Street, Brooklyn, New York (referred to as the "Site"). 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 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 do not spread contamination off-site through the air.

Community Air Monitoring Plan

Real-time air monitoring for VOCs and observations of particulate levels at the perimeter of the work areas will be completed during intrusive activities. Continuous monitoring and observations will be required during soil excavation activities. The downwind location will be just inside the fence line at the edge of the property.

VOC Monitoring, Response Levels, and Actions

VOCs will be monitored at the downwind perimeter of each designated work area on a continuous basis. Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work will be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment will be calibrated daily. The equipment will 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 exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities will be temporarily halted and monitoring will continue. 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 persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring will continue. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the work area 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 will be recorded and will be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes will also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations will be monitored continuously at the upwind and downwind locations of the borings at temporary particulate monitoring stations. The particulate monitoring will 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 will be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration will be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter ($\mu g/m^3$) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 $\mu g/m^3$ 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 $\mu g/m^3$ above the upwind level, work will be stopped and a re-evaluation of activities will be initiated. Work will be able to be resumed provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 $\mu g/m^3$ of the upwind level and in preventing visible dust migration.

3. All readings will be recorded and be available for State (NYSDEC and NYSDOH) personnel to review.

ODOR MONITORING AND MITIGATION PLAN

The purpose of this Odor Monitoring and Mitigation Plan is to detail the monitoring and, if necessary, mitigation of odor potentially generated during implementation of the IRM. However, work activities will be performed to minimize the potential for generation of odor.

Odor Monitoring

Odor will be monitored within the work area and at the perimeter CAMP stations. If nuisance odors are identified at the Site boundary, or if odor complaints are received, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of any other complaints about the project. Odor or dust complaints from any owner or occupant of an adjacent or nearby property will be immediately addressed and managed by the Environmental Monitor in a manner equivalent to an exceedance of an air monitoring action level.

Odor Mitigation

All necessary means will be employed to prevent on- and off-Site nuisances. These measures may include: containerizing drill cuttings immediately and using tarps to cover exposed odorous soil (if encountered). Stockpiles will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by NYSDEC.

Stockpiles will be kept covered at all times with appropriately anchored tarps, except when materials are being removed or added, and during stockpile sampling. Stockpiles will be routinely inspected and damaged tarp covers will be promptly replaced.

Soil stockpiles will be continuously encircled with silt fences. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: use of chemical odorants in spray or misting systems; and, use of staff to monitor odors in surrounding neighborhoods. It is anticipated that any nuisance odors developed during intrusive work can be corrected, without the use of a temporary containment structure equipped with appropriate air venting/filtering systems.

ATTACHMENT C

HEALTH AND SAFETY PLAN

SITE-SPECIFIC HEALTH AND SAFETY PLAN FOR

REMEDIATION ACTIVITIES

AT

Proposed Public School K337

Brownfield Cleanup Program Site No. C224327
8802 5th Avenue and 429 89th Street
Brooklyn, New York 11209

Prepared by:

TRC Engineers, Inc.
1407 Broadway, Suite 3301
New York, New York 10018

TRC Project Number: 630067

November 2024

DISCLAIMER

STRICT ADHERENCE TO THE HEALTH AND SAFETY GUIDELINES SET FORTH HEREIN WILL REDUCE, BUT NOT ELIMINATE, THE POTENTIAL FOR INJURY AT THESE SITES. THE HEALTH AND SAFETY GUIDELINES IN THIS HEALTH AND SAFETY PLAN WERE PREPARED SPECIFICALLY FOR THIS PROJECT AND SHOULD NOT BE USED ON ANY OTHER SITE OR PROJECT WITHOUT PRIOR RESEARCH AND EVALUATION BY TRAINED HEALTH AND SAFETY SPECIALISTS.

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ATTACHMENTS

1.0 SITE INFORMATION

1.1 Introduction

The following is the Health and Safety Plan (HASP) for remediation activities at the proposed Public School K337 located at 8802 5th Avenue and 89th Street, Brooklyn, New York 11209 (the "Site"). A detailed scope of work is described in the Interim Remedial Measure Work Plan (IRM).

The site-specific HASP was developed from Site visits and investigations, as well as appropriate project documents. Revisions and/or alterations to this HASP may become necessary as more information becomes available. Any proposed changes to this HASP will be approved by the Health & Safety Coordinator prior to implementation. All on-site personnel are required to read, review, and strictly comply with the HASP as well as sign the Health and Safety Plan Acceptance in **Attachment A**. It is the responsibility of the Project Manager or designee to ensure that the HASP is implemented and enforced.

1.2 Purpose

The Site remediation tasks and objectives are the mitigation of human contact with soil vapor, groundwater, and soil impacted by volatile organic compounds (VOCs) and metals. Remedial measures described herein will be performed in accordance with this HASP and applicable federal, state, and local regulations.

1.3 Site Description and History

The Site encompasses approximately 31,659 square feet (sf) and is improved with a one-story commercial building with a basement and an asphalt-paved parking lot on Lot 28 (8802 5th Avenue), and a commercial building with a partial basement on Lot 39 (429 89th Street). Lot 28 is approximately 21,659 sf and contains a one-story commercial building with a gross floor area of approximately 13,835 sf that is currently subdivided into two units that are currently vacant. Lot 39 is approximately 10,000 sf and is improved with a one-story commercial building with a partial basement that is currently vacant and was most recently used by a construction company for storage of assorted construction materials. Historically, Lot 28 was occupied by several low-rise structures prior to construction of the current one-story commercial building with a basement in 1956. The building was most recently used by a bank and as real estate offices. Lot 39 has been improved with the current one-story building with a partial basement since 1923, which was occupied by a garage with gasoline tank and auto repair/service station between 1926 and circa 1977.

Previous investigations conducted at the Site include a Phase I Environmental Site Assessment (ESA) Report prepared by TRC in May 2011, a Phase II Environmental Site Investigation (ESI) Report prepared by TRC in May 2013, and a Remedial Investigation Report completed in October 2024.

Based on the results of previously investigation, the primary contaminants of concern in soil include metals (mercury) and SVOCs; in groundwater the primary contaminants of concern are VOCs (TCE, 1,2-DCE, benzene, m-xylene & p-xylene, total xylenes and chloroform); and in soil vapor the primary contaminants of concern are chlorinated VOCs (TCE and PCE).

2.0 SCOPE OF WORK

Remedial activities to be implemented as part of the IRM include:

- Remove the suspected underground storage tank (UST), suspected oil water separator (OWS), and underground drainage and floor drain system.
- Remove and dispose off-Site soil in excavated to remove the UST, OWS and drainage system
- Post-excavation documentation/confirmatory soil sampling in the area that of the UST, OWS and drainage system.

3.0 EMERGENCY AND TRC CONTACT NUMBERS

Ambulance: **911** Fire Department: **911**

Police Department: **911 (68th Precinct (718) 439-4211)**

Hospital: **New York-Presbyterian Brooklyn Methodist Hospital**

Emergency Center No.: **(718) 283-2190**

Hospital Address: **699 92nd Street, Brooklyn, NY 11228**

HOSPITAL DIRECTIONS

NOTE: FOR ANY TYPE OF SERIOUS MEDICAL EMERGENCY, CALL 911 AND REQUEST AN AMBULANCE. NEW YORK CITY STREETS ARE OFTEN CONGESTED DUE TO HEAVY TRAFFIC, CONSTRUCTION AND DOUBLE-PARKED VEHICLES AND IT MAY BE DIFFICULT TO DRIVE TO THE EMERGENCY ROOM.

Refer to **Attachment B** for Hospital Route Direction with maps.

TRC Contacts

1. Project Manager

   Name: Jenna Raup

   Office/Division: New York, NY

   Office Phone: 212 221 7822

   Cell Phone: 929-502-6469

2. Certified Industrial Hygienist

   Name: Ed Gerdts, CIH

   Office/Division: New York, NY

   Office Phone: 212-221-7822

3. National Safety Director

   Name: Mike Glenn

   Office/Division: Irvine, CA

   Office Phone: 949-727-7347

   Cell Phone: 949-697-7418

4. Office Safety Coordinator (OSC)

   Name: Emily Kessler

   Office/Division: New York, NY

   Cell Phone: (908) 451-0203

5. Work Care can provide assistance in providing first aid advice and directing an injured worker to non-emergency medical care. WorkCare is a service that provides 24/7 access to an Occupational Healthcare physician or clinician.

   Work Care Incident Intervention: 888-449-7787 (refer to **Attachment C)**

6. Human Resource Manager

   Name: Suzanne Micallef

   Office/Division: Administrative

   Office Telephone: 978-656-3628

Refer to **Attachment D** for emergency contact information.

4.0 HAZARD ASSESSMENT

4.1 Contaminants of Concern

Based on our understanding of the history of the Site and the results of previous environmental investigations performed at the Site, the following chemical hazards have been identified:

- The primary contaminants of concern in soil include metals (mercury) and SVOCs in shallow soil.
- Groundwater contaminants of concern include VOCs (TCE, 1,2-DCE, benzene, m-xylene & p-xylene, total xylenes and chloroform).
- Soil vapor contaminants of concern include chlorinated VOCs (TCE and PCE).

Safety Data Sheets (SDS) for compounds of concern are provided in **Attachment E**.

4.2 Level of Protection

The Project Manager will continually evaluate levels of protection to be utilized by on-site personnel, with assistance from the Health & Safety Coordinator and the Industrial Hygienist. The levels of protection may be downgraded or upgraded, as necessary, with approval by the Project Manager.

5.0 ON-SITE OPERATION

5.1 First Aid Procedures for Chemical Exposures

EYE: If any chemicals come in contact with eyes, immediately wash the eyes with large amounts of water, occasionally lifting lower and upper lids. Get medical attention immediately.

BREATH: If person breathes large amounts of any chemicals, remove person to fresh air. If breathing has stopped, perform artificial respiration. Keep affected person warm and rested. Get medical attention as soon as possible.

SKIN: If any chemicals except those listed below come in contact with the skin, immediately wash skin with soap and water. Get medical attention promptly. If chemical penetrates clothing, immediately remove clothing and wash with soap and water.

SWALLOW: If any chemicals are swallowed get medical attention immediately

5.2 Chemical Hazards

Based on previous investigations completed at the Site, the presence of the following contaminants is expected in soil:

- Metals, specifically mercury.
- SVOCs

5.3 Biological Hazards

During the course of the project, there is a potential for workers to come into contact with biological hazards, such as animals and their scat.

During Site operations, wild animals such as birds, rats, stray dogs or cats, raccoons, and other rodents and their scat may be encountered. Workers will use discretion and avoid all contact with wild animals and their scat. Avoid areas and habitats inside and outside work areas that are contaminated with scat. If unsafe conditions are noted (e.g., gross accumulations of scat or vermin infestations), work in these areas will be halted and reevaluated.

5.4 Physical Hazards

The physical hazards are anticipated to be low and are outlined in Table A-1 below.

TABLE A-1

PHYSICAL HAZARDS

HAZARD TYPE	KNOWN	POTENTIAL
Heat Stress/Cold Stress		**X**
Severe Weather (lightning, snow, sleet)		**X**
Excessive Noise	**X**	
Facility Operations (machinery, structures)		**X**
Unstable ground (wet areas)		**X**
Site Operations (drilling, hand and power tool use)	**X**	
Heavy lifting/moving		**X**
Hazardous materials use & storage		**X**
Fire		**X**
Slips, trips, and falls	**X**	
Cuts, punctures		**X**

TRC personnel can avoid most of the hazards listed above including hand tools, hazardous materials use, slips, trips and falls, and punctures and cuts by remaining alert and performing safe work practices during all site activities. Other proper work practices are outlined below.

1. To avoid falling objects:
    - Do not walk or stand under suspended/overhead loads (including scaffolding).
    - Be aware of falling objects in the work area.
    - Secure overhead objects.
2. When using hand tools:
    - Hand tools will meet the manufacturer's safety standards.
    - Hand tools will not be altered in any way.
    - Makeshift tools will not be used.
    - At a minimum, eye protection will be used when working with hand tools.

- Wrenches, including adjustable, pipe, end and socket wrenches, will not be used when jaws are sprung to the point that slippage occurs.
- Impact tools such as drift pins, wedges and chisels, will be kept free of mushroom heads.
- Wooden handles will be free of splinters or cracks and secured tightly to the tool.

3. Overhead Wires and Underground Utilities:

   If contact is possible (i.e., ladder, equipment, crane lift, etc.) one or more of the following will be done:

   - Power sources will be disconnected by the utility;
   - Power sources will be shielded by the utility; and
   - Object will get no closure than 12' to prevent arcing.

4. Slips, Trips and Falls:

   - Proper lighting will be maintained at all times.
   - Walkways will remain clear and unobstructed at all times.
   - When possible, cords, hose lines, etc., will be raised to reduce or eliminate trip hazards.

5.5 Cold Stress

The single most important aspect of hypothermia (cold stress) is the fall in the deep core temperature of the body. Workers should be protected from exposure to cold so that the deep core temperature does not fall below 36ºC (96.8ºF). Lower body temperatures will very likely result in reduced mental alertness, reduction in rational decision-making, or loss of consciousness.

Pain in the extremities may be the first early warning of danger to cold stress. During exposure to cold, maximum severe shivering develops when the body temperature has fallen to 35ºC (95ºF). This must be taken as a sign of danger to the workers and exposure to cold should be immediately terminated for all workers when severe shivering becomes evident. Useful physical, or mental work is limited when severe shivering occurs.

Since prolonged exposure to cold air at temperatures well above freezing can lead to dangerous hypothermia, whole body protection must be provided. Adequate insulating clothing to maintain core temperatures above 36ºC must be provided to workers if work is performed in air temperatures below 4ºC (40ºF). In addition, it should be kept in mind that, the higher the wind speed and the

lower the temperature in the work area, the greater the insulation value of the protective clothing required.

To prevent cold stress, Contractor personnel will be encouraged to maintain an optimal level of physical fitness, and to maintain body fluids at normal levels. Workers will be encouraged to drink water before beginning work and frequently during the day. TRC personnel and subcontractors will be instructed to recognize symptoms of and measures to prevent cold stress prior to the commencement of field activities.

5.6 Noise

Approved hearing protection will be required in work areas involving heavy equipment, impact tools, drilling, etc. In general, hearing protection should be worn if an individual cannot be heard in a normal speaking voice at a distance of two feet.

5.7 Electrical Utility Hazards

TRC will implement the following subsurface utility clearance procedure:

- TRC will review available site plans for work involving activities at or near utilities.
- TRC's utility mark-out subcontractor will conduct a geophysical survey around all proposed intrusive locations to identify subsurface electric utilities and mark the centerline of underground lines.
- The drilling or excavation contractor will notify the NYC One Call Center at (800) 272-4480, in accordance with Code 753, a minimum of 5 working days prior to any drilling or excavation on streets and sidewalks.

5.8 Mechanical Hazards

The mechanical hazards are anticipated to be associated with excavation activities and loading of trucks using a backhoe/excavator. The following precautions will be taken around construction equipment and excavations:

- Ensure the equipment operator is aware of the location of on-site personnel at all times to avoid potential injuries (e.g., maintain eye contact with the equipment operator). A spotter should be used to direct the movement of heavy equipment. A swing zone should be established with cones behind any excavators to prevent injury during movement of equipment.

- Exercise caution and wear protective equipment around the equipment to guard against crushing and pinching hazards. On-site personnel will maintain a distance (approximately 10 feet) from mechanical hazards associated with heavy equipment.
- Perimeter protection in the form of barricades is necessary for the protection of employees and subcontractor personnel and the public. Such protection will meet requirements set forth in 29 CFR 1926, as well as in the New York City Building Code, Article 19.
- All field team members working near/with equipment with emergency shut-off switches should be aware of the locations and situations when these switches should be used.

5.9 Air Monitoring Requirements

Real-time air monitoring for VOCs and observations of particulate levels at the perimeter of the work areas will be completed during intrusive activities. Continuous monitoring and observations will be required for all intrusive work activity. A detailed description of the Community Air Monitoring Plan (CAMP) is provided as Attachment B to the IRM.

OSHA Permissible Exposure Limit (PEL)

The OSHA PEL, for benzene, which will be used to determine the appropriate respiratory protection, is 1 part per million (ppm) over an 8-hour time-weighted average or 5 ppm over 15 minutes. This value is based upon the OSHA PEL for benzene, which, of the VOC constituents of petroleum compounds, has the lowest PEL.

Respiratory Protection

It is unlikely that respiratory protection will be required during implementation of the work plan. TRC's health and safety goal is to avoid using respiratory protection unless it is absolutely necessary or required. Administrative controls or engineering controls should always be considered as a means to reduce potential exposures before PPE is required. If air monitoring measurements indicate that levels of organic vapors have reached 5 ppm, workers will cease work in the area until levels of organic vapors have decreased. If necessary, modifications to work practices will be implemented to reduce or avoid generating elevated levels of organic vapors.

Respiratory protection for TRC’s subcontractor may be required during tank cleaning activities. Any upgrade in respiratory protection will be coordinated with the Health & Safety Coordinator and the Industrial Hygienist. For operations that may require the use of a respirator, the TRC Project Manager (and Contractor equivalent) must verify that Field Personnel are medically

approved to use respiratory equipment, fit tested, and trained in the proper use of respirators. Only respirators that are NIOSH/MSHA1 approved are to be used.

Exposure Limits: The following tables summarizes anticipated concentrations and accepted exposure limits of chemicals potentially present at the Site.

Known or Suspected Chemicals/Contaminants	
Chemical/Contaminant of Concern	**OSHA Permissible Exposure Limit (PEL)**
Heavy metals – Mercury	0.1 mg/m^3 (OSHA PEL for Mercury)

1 NIOSH – National Institute for Occupational Safety and Health; MSHA – Mine Safety and Health Administration

6.0 GENERAL SAFETY REQUIREMENTS

The general safety rules listed below apply to all TRC personnel present at the site.

- A tailgate health and safety meeting will be held with all field team members and subcontractors each day prior to the start of work.
- Adhere to all requirements of this health and safety plan (HASP).
- Wear protective clothing appropriate for the designated level of protection and decontaminate before entering clean areas when applicable.
- Use safety equipment in accordance with OSHA guidance and labeling instructions.
- Maintain safety equipment in good condition and proper working order and make sure that the equipment is calibrated prior to use.
- Immediately report unsafe acts or conditions to the Project Manager and OSC.
- Eating, drinking, and smoking are prohibited on site, except in designated areas.
- Maintaining a position upwind from intrusive activities is encouraged.
- The emergency shutoff switch should be demonstrated to be working prior to initiating excavation activities.
- An adequately stocked first-aid kit will be maintained at the work site.

Communication

TRC team members shall be equipped with cellular telephones. If an emergency occurs, and the team members are not in close proximity to each other, communication will occur via telephone.

7.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

It is anticipated that Level D PPE will be required. Level D protection is applicable when no respiratory protection and minimal skin protection is required. Level D can be used in the following circumstances:

- The atmosphere contains no known hazard
- Work functions preclude splashes, immersion, or the potential for unexpected inhalation of or contact with hazardous levels of any chemicals

The Level D recommended for this Site includes:

Level D Personal Protective Equipment	
Item	**Rationale/Notes**
Hardhat	Appropriately rated hard hats will be worn by personnel for protection against overhead hazards, including electrical.
Hearing protection	Hearing protection will be worn by all personnel exposed to more than 85 dB of sound during the workday.
Safety boots	Safety boots will be worn by all personnel during project work described in this HASP and at all times on site.
Eye protection (safety glasses)	Eye protection will be worn when personnel are exposed to flying debris, chemical vapors or particulates. Chemical splash goggles will be worn for protection against chemical gases, vapors or particulates. Safety glasses will be worn for protection against flying objects.
Safety vest	Utilize in areas in or near vehicular traffic of any kind on or off property.
Gloves	Gloves to be changed between samples to avoid cross-contamination. Nitrile chemically resistant gloves will be worn when handling sample bottles.
Kevlar work gloves	As indicated herein, use Cut and Abrasion Resistance Level 4 or Level 5 gloves when necessary for hand protection during field tasks.

If excessive ionizable organic vapors containing of VOCs are detected at or above the action levels (See Section 6.3), workers will cease work in the area until organic vapor levels decrease for Level D PPE. Odor suppression techniques (i.e., water misting and foam) will be used during excavation activities as necessary.

A basic first aid kit will be provided by the contractor and readily available on-Site in the event of an emergency.

A fire extinguisher should be present with the excavator. All personnel working on or around the excavator should know the location of and how to operate the fire extinguisher. TRC will confirm the location of the first aid kid and fire extinguisher during daily tailgate safety meetings.

8.0 DECONTAMINATION PROCEDURES

8.1 Minimization of Contact with Contaminants

During the completion of all Site activities, personnel should attempt to minimize the degree of contact with contaminated materials. This involves a conscientious effort to keep "clean" during Site activities. All personnel should minimize kneeling, splash generation, and other physical contact with contamination. This may ultimately minimize the degree of decontamination required and the generation of waste materials from Site operations.

8.2 Personnel Decontamination Procedures

The following describes procedures to be employed for personnel decontamination.

PERSONNEL DECONTAMINATION PROCEDURES FOR LEVEL D PROTECTION	
1.	Decontaminate equipment used on-Site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) with moist towel.
2.	Use boot brush to remove soil from treads of shoes.
2.	Remove PPE and wipe down with moist towel.
3.	Remove gloves and deposit in waste container.
4.	If inner clothing has become contaminated, remove it and place it into a poly bag.
5.	Wash hands and face.

8.3 Decontamination Procedures

All liquids used in the decontamination procedure will be collected, stored, and disposed in accordance with federal, state, and local regulations. Personnel performing this task will wear the proper PPE as prescribed in the table in Section 7.

8.4 Emergency Decontamination

If circumstances dictate that contaminated clothing cannot be readily removed, then remove gross contamination; wrap injured personnel with clean garments/blankets to avoid contaminating other personnel or transporting equipment.

If the person cannot be moved because of the extent of the injury (a back or neck injury) provisions will be made to ensure that emergency response personnel are able to respond to victim without being exposed to potentially hazardous atmospheric conditions. If the potential for inhalation hazards exist, such as with open excavation, this area will be covered with poly to eliminate any potential inhalation hazards. All emergency personnel are to be immediately informed of the injured person's condition, potential contaminants, and provided with all pertinent chemical data.

8.5 Hand Held Equipment Decontamination

Hand held equipment includes all monitoring instruments, samples, hand tools, and field logbooks. To aid in decontamination, monitoring instruments can be sealed in plastic bags or wrapped in polyethylene. This will also protect the instruments against contaminants. The instruments will be wiped clean using wipes or paper towels if contamination is visually evident.

Decontamination procedures for sampling equipment, hand tools, etc. will include a moist towel wipe, as appropriate for the Site conditions.

9.0 REQUIRED PERSONNEL TRAINING

TRC field personnel will have the training outlined below before on-Site work activities:

Project Training Requirements

(* required for all sites; but minimum recommended)

Check "A" if training required for everyone, and check "T" if training required for specific task or per notations.

A	T	SUBJECT	REFERENCE	
			29 CFR 1910	29 CFR 1926 or Other
☒	☐	HAZWOPER 40 hour	1910.120	1926.65
☐	☐	3-Day HAZWOPER Supervised On-site	1910.120	1926.65
☒	☐	8-Hour HAZWOPER Refresher	1910.120	1926.65
☐	☒	8-Hour Supervisor HAZWOPER*	1910.120	1926.65
☐	☒	First Aid, CPR[1]	1910.151	1926.23,.50
☒	☐	Hazard Communication (HAZCOM)	1910.1200	1926.59
☐	☐	DOT / IATA Shipping Training	1910.1201	49 CFR 172.704
☒	☐	TRC Hand Protection Policy	1910.138	TRC Policy[2]
☒	☐	Defensive Driving	N/A	White Paper[3] TRC Manual[4]
Client-specific training: ☐ Not Applicable ☐ Specify				
Client-specific training: ☐ Not Applicable ☐ Specify				
Client-specific training: ☐ Not Applicable ☐ Specify				

Note:
***** The OHSO shall have OSHA 8-hour supervisor training, in addition to 40-hour HAZWOPER.
1 Per the TRC Health and Safety Policy and Procedure Manual, each TRC project will have at least one certified CPR/first aid trained person on- Site at all times. All Project Managers, and anyone acting as the on-site Health and Safety Officer, must be current in First Aid/CPR.
2 TRC RMD Hand Protection Policy, August 2012
3 Guidelines for Employers to Reduce Motor Vehicle Crashes (joint white paper by NETS, NHTSA and OSHA)
4 TRC Driver and Vehicle Management Policy and Procedure Manual, Rev 1 (April 2012)

Project training requirements beyond those provided in the above table will require a HASP revision/upgrade or concurrence of the TRC Safety Director or Practice Safety Manager.

10.0 MEDICAL MONITORING

Medical monitoring will apply routinely to all employees who are or may be exposed to hazardous substances or health hazards at or above the established permissible exposure limit, above the published exposure levels for these substances, without regard to the use of respirators, for 30 days or more a year (40 CFR 1910.120[f][2][i]). Said TRC field personnel will have the medical surveillance outlined in the table below prior to commencing on-site work activities.

Medical Surveillance Required			
*Baseline is minimum recommended.			
	29 CFR 1910	**29 CFR 1926 or Other**	**Notes**
☒ HAZWOPER Physical - Baseline	1910.120	1926.65	
☒ HAZWOPER Physical – Annual	1910.120	1926.65	
☐ HAZWOPER Physical - Biennial	1910.120	1926.65	
Client-specific drug testing[1]	☒ Not Applicable ☐ Specify		
Client-specific medical monitoring[1]	☒ Not Applicable ☐ Specify		
Site-specific medical monitoring:	☒ Not Applicable ☐ Specify		

Note:
[1] Client required drug testing or medical monitoring should be coordinated through the Project Manager.

TRC has a Drug and Alcohol-Free Workplace Policy. TRC may require employees or subcontractors to be tested upon reasonable suspicion, following accidents or incidents during work activities, or during travel to or from a project Site. Client policies may be stricter in regard to procedures following an accident. Project Managers must be aware of these and inform employees and subcontractors of any additional requirements.

11.0 TAILGATE SAFETY MEETINGS

A tailgate safety meeting will be conducted daily prior to commencement of the work day (see Daily Pre-Job Safety Briefing Form provided in **Attachment F**) or if site conditions change.

Topics covered by the tailgate safety meeting will include, but not be limited to:

- Scope of work and who will conduct each task
- Potential hazards for the scope of work
- weather forecast
- PPE
- Emergency procedures and the route to the medical facility
- Site conditions and features
- Communication guidelines related to stakeholder engagement and visitors

Safety meetings will be held to address modifications to this HASP and any addenda prepared to supplement the HASP. Subcontractors and personnel present at the tailgate safety meeting shall be required to sign an acknowledgement form after each meeting.

12.0 OBSERVATIONS

Note that the Project Manager and/or OSC may notify field staff that their site activities may be the subject of Safety Observation, an integral part of the continuous improvement safety culture promoted at TRC. If subject to an observation, please note the following:

- The Observation will tend to focus on the highest risk activity (as a general example, drilling in a public right-of-way).
- Follow-up observations may be required, depending on prior data collected.
- The observer's preparation before visiting the site will be a review of the HASP, client-specific requirements, etc., and a review of the work scope with the Project Manager to ensure the context of the work is well understood in advance.
- Review items may include PPE, body use and positioning, work environment, operating procedures, and tools and equipment (see **Attachment H**).
- The observation should last between 30 and 60 minutes.

Observations will be documented on the form found in **Attachment H**. Both positive and negative observations are candidates for documentation and later discussion. The overarching goals are to identify and correct questionable practices, and to identify and promote good, safe and efficient practices. It is a data gathering process that will allow TRC safety specialists to identify root causes for safety issues in both categories to better inform policy decisions.

In addition, TRC may record a Safe Catch which is identification and mitigation of a condition that may have created a hazard if it were not identified. The Safe Catch documentation is provided in **Attachment I**.

13.0 INCIDENT REPORTING

In case of an incident, TRC personnel must report the incident immediately to their project manager/supervisor and/or OHSC, and client's representative, and follow the TRC Incident Response and Reporting Process (see **Attachment G**). Required forms must be completed within 24 hours following the incident. If the forms are unavailable, the incident shall be reported to the TRC Safety Director (Mike Glenn). Accident/injury/exposure information must be recorded per TRC policy (see **Attachment G**) and will be the basis of any accident/incident investigations.

14.0 ACKNOWLEDGEMENT

All TRC personnel operating under this HASP must read the HASP and sign the acknowledgment page in **Attachment A**.

15.0 SUBCONTRACTORS AND HEALTH AND SAFETY PLANNING

TRC personnel must provide the complete HASP to all subcontractors for their reference in advance of the work. Subcontractors must prepare their own site-specific HASP and provide evidence of HASP preparation before the start of site work to ensure that the subcontractor has an understanding of the safety hazards associated with the work that they are performing. Subcontractor HASPs are not required to be included unless contractually/client required, of is so desired by the Project Manager or OSC.

Attachment A
Health and Safety Plan Acceptance

SITE: 8802 5th Avenue and 429 89th Street, Brooklyn, N.Y. 11209

I have received a copy of the Health and Safety Plan for this site and have read, understand and will abide by the procedures set forth in this Health and Safety Plan and any amendments to this plan.

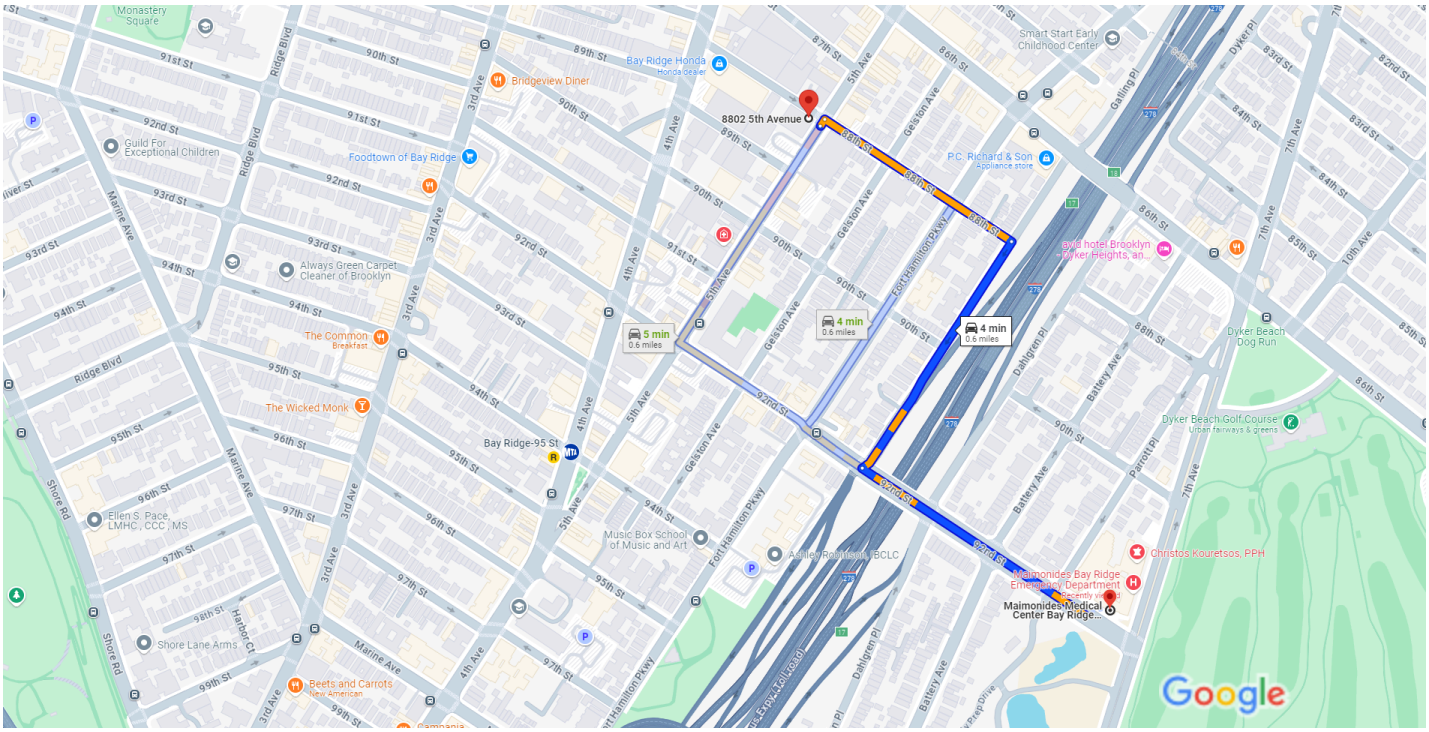
Printed Name	**Signature**	**Date**

Attachment B
Hospital Route

Google Maps

8802 5th Ave, Brooklyn, NY 11209 to Maimonides Medical Center Bay Ridge Emergency Department, 699 92nd St, Brooklyn, NY 11228

Drive 0.6 mile, 4 min



Map data ©2024 Google 200 ft

8802 5th Ave
Brooklyn, NY 11209

1. Head northeast on 5th Ave toward 88th St

30 ft

2. Turn right at the 1st cross street onto 88th St

0.2 mi

3. Turn right onto Gatling Pl

0.2 mi

4. Use the middle lane to turn left onto 92nd St

0.2 mi

Maimonides Medical Center Bay Ridge Emergency Department
699 92nd St, Brooklyn, NY 11228

Attachment C
Work Care Information

EARLY INCIDENT INTERVENTION®

Immediate Access to Medical Advice for Work Related Incidents

(888) 449-7787

INTRODUCTION

WorkCare, Inc. (WorkCare) and TRC have partnered together to promote Incident Intervention®, a resource designed to support company safety goals/targets—while reducing runaway-costs associated with workplace injuries and illnesses.

PURPOSE

Early Incident Intervention provides TRC employees with **IMMEDIATE** telephonic access to WorkCare clinicians at the time of a presumed, non-emergency workplace injury or illness. Clinicians provide expert guidance on the evaluation of symptoms, appropriate first aid, and the need for additional medical evaluation or treatment.

When utilizing this service within the first hour of an incident, known as the "Golden Hour," licensed medical staff can guide the case so that medical evaluation and treatment are rendered appropriately.

> ***"…helps the worker traverse the unpredictable terrain of work-related injuries and illness."***

PRINCIPLES OF EARLY INCIDENT INTERVENTION

- Utilizes principles of the "Golden Hour."
- Provides workers immediate clinician support at the time of an incident.
- Focuses on providing the right care, at the right time in the proper setting.

BENEFITS FOR EMPLOYEES

- Instant access to a medically qualified professional for evaluation of symptoms and possible outcomes.
- Professional guidance on appropriate first aid measures and medications.
- Professional advice regarding the need for additional medical evaluation or treatment.

BENEFITS FOR TRC

- Point of contact for emergency and non-emergency medical clinicians.
- Triages the incident to determine risk and urgency, delivering interventions that are consistent with medical guidelines for the specified injury and illness.
- Maintains communication with clinicians to ensure accurate and timely reporting.

Attachment D
Emergency Contact Information

ATTACHMENT D

EMERGENCY CONTACT INFORMATION

Name	Role	Phone Number
Lee Guterman, NYCSCA	NYCSCA, IEH Division	(718)-472-8502
Bob Kanaparthi, NYCSCA	NYCSCA, IEH Division	(718) 472-8620
Michael Sherwood, NYCSCA	NYCSCA, IEH Division	(718) 752-5211 Cell: (914) 400-5205
Charles Guder, TRC	TRC Vice President	(212) 221-7822
Lindsay O'Hara, TRC	TRC Office Practice Leader	(203) 278-5305 Cell: (914) 420-9649
Jenna Raup, TRC	TRC Project Manager	Cell: (929) 502-6469
Emily Ebert, TRC	TRC Office Safety Coordinator	(212) 221-7822 Cell: (908) 451-0203
Zachary Schwartz, TRC	TRC Project Engineer	Cell: (332) 323-9840
Jannell Franklin, Test America	Laboratory Services	(732) 593-2551

Attachment E
Safety Data Sheets for Potential Contaminants of Concern

Per- and Polyfluoroalkyl Substances (PFAS)
Frequently Asked Questions

What are PFAS?

PFAS are a large group of man-made chemicals that have been used since the 1950s. Use of some of these chemicals has decreased in the United States over the last 10 years. People can still be exposed to PFAS because they are still present in the environment. PFAS do not break down easily in the environment. They also build up in the bodies of exposed humans and animals. Over the last decade, interest in PFAS has grown.

How can I be exposed to PFAS?

ATSDR and our state health partners are studying exposure to PFAS at a number of sites. PFAS are found near areas where they are manufactured or used. Listed below are places where they can be found.

- Public water systems and drinking water wells, soil, and outdoor air near industrial areas with frequent PFAS use
- Indoor air in spaces that contain carpets, textiles, and other consumer products treated with PFAS to resist stains
- Surface water (lakes, ponds, etc.) and run-off from areas where aqueous (water-based) film-forming fire fighting foam (AFFF) was often used (like military or civilian airfields)
- Locally caught fish from contaminated bodies of water
- Food items sold in the marketplace

Consumer products can be source of exposures to PFAS. These products include

- Some grease-resistant paper, fast food wrappers, microwave popcorn bags, pizza boxes, and candy wrappers
- Nonstick cookware such as Teflon®[1] coated pots and pans
- Stain resistant coatings such as Scotchguard®[1] used on carpets, upholstery, and other fabrics
- Water resistant clothing such as Gore-Tex®[1]
- Cleaning products
- Personal care products (shampoo, dental floss) and cosmetics (nail polish, eye makeup)
- Paints, varnishes, and sealants

Recent efforts to stop using some PFAS in consumer products appear to have lowered exposure in the U.S. population. CDC surveys have shown that blood levels of PFAS have dropped over time. People who work with PFAS are more likely to be exposed than the general population. Workers may be exposed to PFAS by inhaling them, getting them on their skin, and swallowing them, but inhaling them is the most likely route for exposure.

How can I reduce my exposure to PFAS?

PFAS are found in people and animals all over the world. They are found in some food products and in the environment (air, water, soil, etc.). Completely stopping exposure to PFAS is unlikely. But, if you live near sources of PFAS contamination you can take steps to reduce your risk of exposure to PFAS:

- Some states have warnings about eating fish from bodies of water with high PFAS levels. Check with your state public health and environmental quality departments to learn the types and local sources of fish that are safe to eat.
- If your water contains PFAS, you can reduce exposure by using an alternative or treated water source for drinking, food preparation, cooking, brushing teeth, and any activity that might result in ingestion of water.
- It is safe to shower and bathe in PFAS-contaminated water. Neither routine showering or bathing are a significant source of exposure. Studies have shown very limited absorption of PFAS through the skin.

Agency for Toxic Substances and Disease Registry
Division of Community Health Investigations

17-CS265744B_Updated March 9, 2017

How can PFAS affect people's health?

Scientists are not sure about the health effects of human exposure to PFAS. Some studies in humans have shown that certain PFAS may affect the developing fetus and child, including possible changes in growth, learning, and behavior. In addition, they may decrease fertility and interfere with the body's natural hormones, increase cholesterol, affect the immune system, and even increase cancer risk.

- PFAS build up and stay in the human body and the amount goes down very slowly over time. So scientists and doctors are concerned about their effects on human health.
- Some studies show that animals given PFAS have changes in the liver, thyroid, pancreas, and hormone levels. Scientists are not sure what animal data means about human health. PFAS act differently in humans than they do in animals and may be harmful in different ways.

How can I learn more?

Contact 1-800-CDC-INFO for updated information on this topic.

Contact the Consumer Product Safety Commission at (800) 638-2772 if you have questions about the products you use in your home.

Visit the following websites for more information:

ATSDR Websites

http://www.atsdr.cdc.gov/pfc/index.html

Environmental Protection Agency

http://www2.epa.gov/chemical-research/perfluorinated-chemical-pfc-research

List of Common PFAS and Their Abbreviations

Compound	Abbreviation
Perfluorobutane sulfonate	PFBS
Perfluorohexane sulfonate	PFHxS
Perfluorooctane sulfonate	PFOS
Perfluoroheptanoic acid	PFHpA
Perfluorooctanoic acid	PFOA
Perfluorononanoic acid	PFNA
Perfluorodecanoic acid	PFDA
Perfluoroundecanoic acid	PFUnA
Perfluorododecanoic acid	PFDoA
Perfluorooctane sulfonamide	PFOSA
2-(N-Methyl-perfluorooctane sulfonamido) acetate	Me-PFOSA-AcOH
2-(N-Ethyl-perfluorooctane sulfonamido) acetate	Et-PFOSA-AcOH

Notes

[1]Use of trade names is for identification only and does not imply endorsement by the Centers for Disease Control and Prevention/Agency for Toxic Substances and Disease Registry, the Public Health Service, or the U.S. Department of Health and Human Services

SAFETY DATA SHEET

Creation Date 22-Sep-2009 **Revision Date** 23-Jan-2018 **Revision Number** 3

1. Identification

Product Name **cis-1,2-Dichloroethylene**

Cat No. : **AC113380000; AC113380025; AC113380100; AC113380500**

Synonyms cis-Acetylene dichloride.

Recommended Use Laboratory chemicals.
Uses advised against Not for food, drug, pesticide or biocidal product use

Details of the supplier of the safety data sheet

Company
Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Acros Organics
One Reagent Lane
Fair Lawn, NJ 07410

Emergency Telephone Number
For information **US** call: 001-800-ACROS-01 / **Europe** call: +32 14 57 52 11
Emergency Number **US:**001-201-796-7100 / **Europe:** +32 14 57 52 99
CHEMTREC Tel. No.**US:**001-800-424-9300 / **Europe:**001-703-527-3887

2. Hazard(s) identification

Classification
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Flammable liquids	Category 2
Acute oral toxicity	Category 4
Acute Inhalation Toxicity - Vapors	Category 4
Skin Corrosion/irritation	Category 2
Serious Eye Damage/Eye Irritation	Category 2
Specific target organ toxicity (single exposure)	Category 3
Target Organs - Respiratory system.	

Label Elements

Signal Word
Danger

Hazard Statements
Highly flammable liquid and vapor
Harmful if swallowed
Harmful if inhaled
Causes serious eye irritation
Causes skin irritation
May cause respiratory irritation

Precautionary Statements
Prevention
Wear protective gloves/protective clothing/eye protection/face protection
Use only outdoors or in a well-ventilated area
Avoid breathing dust/fume/gas/mist/vapors/spray
Keep away from heat/sparks/open flames/hot surfaces. - No smoking
Keep container tightly closed
Ground/bond container and receiving equipment
Take precautionary measures against static discharge
Do not eat, drink or smoke when using this product
Response
Call a POISON CENTER or doctor/physician if you feel unwell
Inhalation
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Call a POISON CENTER or doctor/physician if you feel unwell
Skin
IF ON SKIN: Wash with plenty of soap and water
Take off contaminated clothing and wash before reuse
If skin irritation occurs: Get medical advice/attention
Eyes
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
If eye irritation persists: Get medical advice/attention
Ingestion
Rinse mouth
IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell
Fire
Explosion risk in case of fire
Fight fire with normal precautions from a reasonable distance
Evacuate area
Storage
Store in a well-ventilated place. Keep cool
Store in a closed container
Store locked up
Disposal
Dispose of contents/container to an approved waste disposal plant
Hazards not otherwise classified (HNOC)
None identified

3. Composition/Information on Ingredients

Component	CAS-No	Weight %
cis-1,2-Dichloroethylene	156-59-2	97

4. First-aid measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. Obtain medical attention.

Inhalation Move to fresh air. Obtain medical attention. If not breathing, give artificial respiration.

Ingestion Do not induce vomiting. Obtain medical attention.

Most important symptoms and effects Breathing difficulties. Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting

Notes to Physician Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media Water spray. Carbon dioxide (CO_2). Dry chemical. Use water spray to cool unopened containers. Chemical foam. Cool closed containers exposed to fire with water spray.

Unsuitable Extinguishing Media No information available

Flash Point 6 °C / 42.8 °F

Method - No information available

Autoignition Temperature 440 °C / 824 °F

Explosion Limits

Upper 12.80%

Lower 9.70%

Sensitivity to Mechanical Impact No information available

Sensitivity to Static Discharge No information available

Specific Hazards Arising from the Chemical

Flammable. Vapors may travel to source of ignition and flash back. Containers may explode when heated. Vapors may form explosive mixtures with air.

Hazardous Combustion Products

Hydrogen chloride gas Carbon monoxide (CO) Carbon dioxide (CO_2)

Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

Health	Flammability	Instability	Physical hazards
2	3	0	N/A

6. Accidental release measures

Personal Precautions Ensure adequate ventilation. Use personal protective equipment. Remove all sources of ignition. Take precautionary measures against static discharges. Avoid contact with skin, eyes and clothing.

Environmental Precautions See Section 12 for additional ecological information. Do not flush into surface water or sanitary sewer system.

Methods for Containment and Clean Up Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment.

7. Handling and storage

Handling Ensure adequate ventilation. Wear personal protective equipment. Use explosion-proof equipment. Use only non-sparking tools. Avoid contact with skin, eyes and clothing. Avoid breathing dust/fume/gas/mist/vapors/spray. Avoid ingestion and inhalation. Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharges. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded.

Storage Keep in a dry, cool and well-ventilated place. Keep container tightly closed. Keep away from heat and sources of ignition. Flammables area. Keep container tightly closed in a dry and well-ventilated place.

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH	Mexico OEL (TWA)
cis-1,2-Dichloroethylene	TWA: 200 ppm			

Legend

ACGIH - American Conference of Governmental Industrial Hygienists

Engineering Measures Ensure adequate ventilation, especially in confined areas. Use explosion-proof electrical/ventilating/lighting/equipment. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal Protective Equipment

Eye/face Protection Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin and body protection Wear appropriate protective gloves and clothing to prevent skin exposure.

Respiratory Protection No protective equipment is needed under normal use conditions.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical State	Liquid
Appearance	Colorless
Odor	aromatic
Odor Threshold	No information available
pH	No information available
Melting Point/Range	-80 °C / -112 °F
Boiling Point/Range	60 °C / 140 °F @ 760 mmHg
Flash Point	6 °C / 42.8 °F
Evaporation Rate	No information available
Flammability (solid,gas)	Not applicable
Flammability or explosive limits	
Upper	12.80%
Lower	9.70%
Vapor Pressure	201 mmHg @ 25 °C
Vapor Density	3.34 (Air = 1.0)
Specific Gravity	1.280
Solubility	No information available
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	440 °C / 824 °F
Decomposition Temperature	No information available
Viscosity	No information available
Molecular Formula	C2 H2 Cl2
Molecular Weight	96.94

10. Stability and reactivity

Reactive Hazard None known, based on information available

Stability Stable under normal conditions.

Conditions to Avoid Keep away from open flames, hot surfaces and sources of ignition. Exposure to air. Exposure to light. Incompatible products. Exposure to moist air or water.

Incompatible Materials Bases

Hazardous Decomposition Products Hydrogen chloride gas, Carbon monoxide (CO), Carbon dioxide (CO_2)

Hazardous Polymerization Hazardous polymerization does not occur.

Hazardous Reactions None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information
Component Information
Toxicologically Synergistic Products No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation Irritating to eyes, respiratory system and skin

Sensitization No information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
cis-1,2-Dichloroethylene	156-59-2	Not listed	Not listed	Not listed	Not listed	Not listed

Mutagenic Effects No information available

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure Respiratory system
STOT - repeated exposure None known

Aspiration hazard No information available

Symptoms / effects,both acute and delayed Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting

Endocrine Disruptor Information No information available

Other Adverse Effects The toxicological properties have not been fully investigated.

12. Ecological information

Ecotoxicity

Do not empty into drains. Do not flush into surface water or sanitary sewer system. Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment. The product contains following substances which are hazardous for the environment.

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea

cis-1,2-Dichloroethylene	Not listed	Not listed	EC50 = 721 mg/L 5 min EC50 = 905 mg/L 30 min	Not listed

Persistence and Degradability Persistence is unlikely based on information available.

Bioaccumulation/ Accumulation No information available.

Mobility Will likely be mobile in the environment due to its volatility.

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

14. Transport information

DOT

UN-No	UN1150
Proper Shipping Name	1,2-DICHLOROETHYLENE
Hazard Class	3
Packing Group	II

TDG

UN-No	UN1150
Proper Shipping Name	1,2-DICHLOROETHYLENE
Hazard Class	3
Packing Group	II

IATA

UN-No	1150
Proper Shipping Name	1,2-DICHLOROETHYLENE
Hazard Class	3
Packing Group	II

IMDG/IMO

UN-No	1150
Proper Shipping Name	1,2-DICHLOROETHYLENE
Hazard Class	3
Packing Group	II

15. Regulatory information

International Inventories

Component	TSCA	DSL	NDSL	EINECS	ELINCS	NLP	PICCS	ENCS	AICS	IECSC	KECL
cis-1,2-Dichloroethylene	X	-	X	205-859-7	-		-	X	X	X	X

Legend:
X - Listed
E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.
F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.
N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.
P - Indicates a commenced PMN substance
R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.
S - Indicates a substance that is identified in a proposed or final Significant New Use Rule
T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.
XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B).
Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.
Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

U.S. Federal Regulations

TSCA 12(b) Not applicable

SARA 313 Not applicable

SARA 311/312 Hazard Categories See section 2 for more information

CWA (Clean Water Act) Not applicable

Clean Air Act Not applicable

OSHA Occupational Safety and Health Administration
Not applicable

CERCLA

California Proposition 65 This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
cis-1,2-Dichloroethylene	X	-	X	-	-

U.S. Department of Transportation

Reportable Quantity (RQ): N
DOT Marine Pollutant N
DOT Severe Marine Pollutant N

U.S. Department of Homeland Security
This product does not contain any DHS chemicals.

Other International Regulations

Mexico - Grade No information available

16. Other information

Prepared By Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

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Print Date 23-Jan-2018
Revision Summary This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

Disclaimer
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of SDS

SAFETY DATA SHEET

Nonflammable Gas Mixture: Isobutylene / Nitrogen / Oxygen

Section 1. Identification

GHS product identifier : Nonflammable Gas Mixture: Isobutylene / Nitrogen / Oxygen

Other means of identification : Not available.

Product use : Synthetic/Analytical chemistry.

SDS # : 002103

Supplier's details : Airgas USA, LLC and its affiliates
259 North Radnor-Chester Road
Suite 100
Radnor, PA 19087-5283
1-610-687-5253

Emergency telephone number (with hours of operation) : 1-866-734-3438

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture : GASES UNDER PRESSURE - Compressed gas

GHS label elements

Hazard pictograms :

Signal word : Warning

Hazard statements : Contains gas under pressure; may explode if heated.

Precautionary statements

General : Read and follow all Safety Data Sheets (SDS'S) before use. Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand. Close valve after each use and when empty. Use equipment rated for cylinder pressure. Do not open valve until connected to equipment prepared for use. Use a back flow preventative device in the piping. Use only equipment of compatible materials of construction.

Prevention : Use and store only outdoors or in a well ventilated place.

Response : Not applicable.

Storage : Protect from sunlight. Protect from sunlight when ambient temperature exceeds 52°C/125°F. Store in a well-ventilated place.

Disposal : Not applicable.

Hazards not otherwise classified : None known.

Section 3. Composition/information on ingredients

Substance/mixture : Mixture

Other means of identification : Not available.

CAS number/other identifiers

CAS number : Not applicable.

Product code : 002103

Ingredient name	%	CAS number
Nitrogen	75 - 80.5	7727-37-9
oxygen	19.5 - 23.5	7782-44-7
2-methylpropene	0.0001 - 1.13	115-11-7

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention if irritation occurs.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Skin contact : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : As this product is a gas, refer to the inhalation section.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : Contact with rapidly expanding gas may cause burns or frostbite.

Inhalation : Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

Skin contact : Contact with rapidly expanding gas may cause burns or frostbite.

Frostbite : Try to warm up the frozen tissues and seek medical attention.

Ingestion : As this product is a gas, refer to the inhalation section.

Over-exposure signs/symptoms

Eye contact : No specific data.

Inhalation : No specific data.

Skin contact : No specific data.

Ingestion : No specific data.

Section 4. First aid measures

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : Contains gas under pressure. In a fire or if heated, a pressure increase will occur and the container may burst or explode.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
nitrogen oxides

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Avoid breathing gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill : Immediately contact emergency personnel. Stop leak if without risk.

Large spill : Immediately contact emergency personnel. Stop leak if without risk. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Avoid contact with eyes, skin and clothing. Avoid breathing gas. Empty containers retain product residue and can be hazardous. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in a segregated and approved area. Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Keep container tightly closed and sealed until ready for use. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F).

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

None.

Appropriate engineering controls : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Section 8. Exposure controls/personal protection

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state : Gas.

Color : Not available.

Melting/freezing point : -140.7°C (-221.3°F) This is based on data for the following ingredient: 2-methylpropene. Weighted average: -211.14°C (-348.1°F)

Critical temperature : Lowest known value: -146.95°C (-232.5°F) (nitrogen).

Odor : Not available.

Odor threshold : Not available.

pH : Not available.

Flash point : Not available.

Burning time : Not applicable.

Burning rate : Not applicable.

Evaporation rate : Not available.

Flammability (solid, gas) : Not available.

Lower and upper explosive (flammable) limits : Not available.

Vapor pressure : Not available.

Vapor density : Highest known value: 1.94 (Air = 1) (2-methylpropene). Weighted average: 1.01 (Air = 1)

Gas Density (lb/ft ^{3}) : Weighted average: 0.07

Relative density : Not applicable.

Solubility : Not available.

Solubility in water : Not available.

Partition coefficient: n-octanol/water : Not available.

Auto-ignition temperature : Not available.

Decomposition temperature : Not available.

SADT : Not available.

Viscosity : Not applicable.

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : No specific data.

Incompatibility with various substances : Extremely reactive or incompatible with the following materials: reducing materials and combustible materials.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Not available.

Irritation/Corrosion

Not available.

Sensitization

Not available.

Mutagenicity

Not available.

Carcinogenicity

Not available.

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

Section 11. Toxicological information

Potential acute health effects

Eye contact : Contact with rapidly expanding gas may cause burns or frostbite.

Inhalation : Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

Skin contact : Contact with rapidly expanding gas may cause burns or frostbite.

Ingestion : As this product is a gas, refer to the inhalation section.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : No specific data.

Inhalation : No specific data.

Skin contact : No specific data.

Ingestion : No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Not available.

General : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

Section 12. Ecological information

Toxicity

Not available.

Persistence and degradability

Not available.

Bioaccumulative potential

Section 12. Ecological information

Not available.

Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Empty Airgas-owned pressure vessels should be returned to Airgas. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Do not puncture or incinerate container.

Section 14. Transport information

	DOT	TDG	Mexico	IMDG	IATA
UN number	UN1956	UN1956	UN1956	UN1956	UN1956
UN proper shipping name	COMPRESSED GAS, N.O.S. (nitrogen, oxygen)	COMPRESSED GAS, N.O.S. (nitrogen, oxygen)	COMPRESSED GAS, N.O.S. (nitrogen, oxygen)	COMPRESSED GAS, N.O.S. (nitrogen, oxygen)	COMPRESSED GAS, N.O.S. (nitrogen, oxygen)
Transport hazard class(es)	2.2 	2.2 	2.2 	2.2 	2.2 
Packing group	-	-	-	-	-
Environment	No.	No.	No.	No.	No.
Additional information	-	**Explosive Limit and Limited Quantity Index** 0.125 **Passenger Carrying Road or Rail Index** 75	-	-	-

"Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product."

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code : Not available.

Section 15. Regulatory information

U.S. Federal regulations : **TSCA 8(a) CDR Exempt/Partial exemption**: Not determined

United States inventory (TSCA 8b): All components are listed or exempted.

Clean Air Act (CAA) 112 regulated flammable substances: 2-methylpropene

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Not listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304

Composition/information on ingredients

No products were found.

SARA 304 RQ : Not applicable.

SARA 311/312

Classification : Sudden release of pressure

Composition/information on ingredients

No products were found.

State regulations

Massachusetts : The following components are listed: NITROGEN; OXYGEN (LIQUID); 2-METHYLPROPENE

New York : None of the components are listed.

New Jersey : The following components are listed: NITROGEN; OXYGEN; ISOBUTYLENE; 1-PROPENE, 2-METHYL-

Pennsylvania : The following components are listed: NITROGEN; OXYGEN; 1-PROPENE, 2-METHYL-

Canada inventory : All components are listed or exempted.

International regulations

International lists : **Australia inventory (AICS)**: All components are listed or exempted.
China inventory (IECSC): All components are listed or exempted.
Japan inventory: Not determined.
Korea inventory: All components are listed or exempted.
Malaysia Inventory (EHS Register): Not determined.
New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.
Philippines inventory (PICCS): All components are listed or exempted.
Taiwan inventory (CSNN): Not determined.

Chemical Weapons Convention List Schedule I Chemicals : Not listed

Chemical Weapons Convention List Schedule II Chemicals : Not listed

Section 15. Regulatory information

Chemical Weapons Convention List Schedule III Chemicals : Not listed

Canada

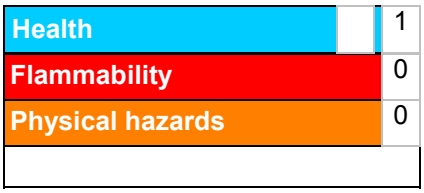
WHMIS (Canada) : Class A: Compressed gas.

CEPA Toxic substances: None of the components are listed.
Canadian ARET: None of the components are listed.
Canadian NPRI: The following components are listed: Butene (all isomers)
Alberta Designated Substances: None of the components are listed.
Ontario Designated Substances: None of the components are listed.
Quebec Designated Substances: None of the components are listed.

Section 16. Other information

Canada Label requirements : Class A: Compressed gas.

Hazardous Material Information System (U.S.A.)



Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on SDSs under 29 CFR 1910. 1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)

Reprinted with permission from NFPA 704-2001, Identification of the Hazards of Materials for Emergency Response Copyright ©1997, National Fire Protection Association, Quincy, MA 02269. This reprinted material is not the complete and official position of the National Fire Protection Association, on the referenced subject which is represented only by the standard in its entirety.

Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

History

Date of printing : 1/23/2015.

Date of issue/Date of revision : 1/23/2015.

Date of previous issue : No previous validation.

Version : 0.01

Section 16. Other information

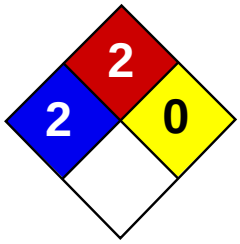
Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United NationsACGIH – American Conference of Governmental Industrial Hygienists
AIHA – American Industrial Hygiene Association
CAS – Chemical Abstract Services
CEPA – Canadian Environmental Protection Act
CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act (EPA)
CFR – United States Code of Federal Regulations
CPR – Controlled Products Regulations
DSL – Domestic Substances List
GWP – Global Warming Potential
IARC – International Agency for Research on Cancer
ICAO – International Civil Aviation Organisation
Inh – Inhalation
LC – Lethal concentration
LD – Lethal dosage
NDSL – Non-Domestic Substances List
NIOSH – National Institute for Occupational Safety and Health
TDG – Canadian Transportation of Dangerous Goods Act and Regulations
TLV – Threshold Limit Value
TSCA – Toxic Substances Control Act
WEEL – Workplace Environmental Exposure Level
WHMIS – Canadian Workplace Hazardous Material Information System

References : Not available.

Indicates information that has changed from previously issued version.

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.



Health	2
Fire	2
Reactivity	0
Personal Protection	E

Material Safety Data Sheet
Naphthalene MSDS

Section 1: Chemical Product and Company Identification

Product Name: Naphthalene

Catalog Codes: SLN1789, SLN2401

CAS#: 91-20-3

RTECS: QJ0525000

TSCA: TSCA 8(b) inventory: Naphthalene

CI#: Not available.

Synonym:

Chemical Name: Not available.

Chemical Formula: C10H8

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Naphthalene	91-20-3	100

Toxicological Data on Ingredients: Naphthalene: ORAL (LD50): Acute: 490 mg/kg [Rat]. 533 mg/kg [Mouse]. 1200 mg/kg [Guinea pig]. DERMAL (LD50): Acute: 20001 mg/kg [Rabbit]. VAPOR (LC50): Acute: 170 ppm 4 hour(s) [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of ingestion. Hazardous in case of eye contact (irritant), of inhalation. Slightly hazardous in case of skin contact (irritant, permeator). Severe over-exposure can result in death.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Classified Development toxin [POSSIBLE]. The substance is toxic to blood, kidneys, the nervous system, the reproductive system, liver, mucous membranes, gastrointestinal tract, upper respiratory tract, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Do not use an eye ointment. Seek medical attention.

Skin Contact:
After contact with skin, wash immediately with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cover the irritated skin with an emollient. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

Serious Skin Contact: Not available.

Inhalation: Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:
Do not induce vomiting. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 567°C (1052.6°F)

Flash Points: CLOSED CUP: 88°C (190.4°F). OPEN CUP: 79°C (174.2°F).

Flammable Limits: LOWER: 0.9% UPPER: 5.9%

Products of Combustion: These products are carbon oxides (CO, CO2).

Fire Hazards in Presence of Various Substances: Not available.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
Flammable solid. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container.

Large Spill:
Flammable solid. Stop leak if without risk. Do not touch spilled material. Use water spray curtain to divert vapor drift. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe dust. Avoid contact with eyes Wear suitable protective clothing In case of insufficient ventilation, wear suitable respiratory equipment If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents.

Storage:
Flammable materials should be stored in a separate safety storage cabinet or room. Keep away from heat. Keep away from sources of ignition. Keep container tightly closed. Keep in a cool, well-ventilated place. Ground all equipment containing material. Keep container dry. Keep in a cool place.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection:
Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
Israel: TWA: 10 (ppm) TWA: 10 STEL: 15 (ppm) from ACGIH (TLV) [1995] TWA: 52 STEL: 79 (mg/m3) from ACGIH [1995] Australia: STEL: 15 (ppm) Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Crystalline solid.)

Odor: Aromatic.

Taste: Not available.

Molecular Weight: 128.19 g/mole

Color: White.

pH (1% soln/water): Not available.

Boiling Point: 218°C (424.4°F)

Melting Point: 80.2°C (176.4°F)

Critical Temperature: Not available.

Specific Gravity: 1.162 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: 4.4 (Air = 1)

Volatility: Not available.

Odor Threshold: 0.038 ppm

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties:
Partially dispersed in hot water, methanol, n-octanol. Very slightly dispersed in cold water. See solubility in methanol, n-octanol.

Solubility:
Partially soluble in methanol, n-octanol. Very slightly soluble in cold water, hot water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Highly reactive with oxidizing agents.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: May attack some forms of rubber and plastic

Polymerization: No.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 490 mg/kg [Rat]. Acute dermal toxicity (LD50): 20001 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 170 ppm 4 hour(s) [Rat].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH. DEVELOPMENTAL TOXICITY: Classified Development toxin [POSSIBLE]. The substance is toxic to blood, kidneys, the nervous system, the reproductive system, liver, mucous membranes, gastrointestinal tract, upper respiratory tract, central nervous system (CNS).

Other Toxic Effects on Humans:
Very hazardous in case of ingestion. Hazardous in case of inhalation. Slightly hazardous in case of skin contact (irritant, permeator).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans: Not available.

Section 12: Ecological Information

Ecotoxicity: Ecotoxicity in water (LC50): 305.2 ppm 96 hour(s) [Trout].

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are more toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: CLASS 4.1: Flammable solid.

Identification: : Naphthalene, refined : UN1334 PG: III

Special Provisions for Transport: Marine Pollutant

Section 15: Other Regulatory Information

Federal and State Regulations:
Rhode Island RTK hazardous substances: Naphthalene Pennsylvania RTK: Naphthalene Florida: Naphthalene Minnesota: Naphthalene Massachusetts RTK: Naphthalene TSCA 8(b) inventory: Naphthalene TSCA 8(a) PAIR: Naphthalene TSCA 8(d) H and S data reporting: Naphthalene: 06/01/87 SARA 313 toxic chemical notification and release reporting: Naphthalene: 1% CERCLA: Hazardous substances.: Naphthalene: 100 lbs. (45.36 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS B-4: Flammable solid. CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC). CLASS D-2B: Material causing other toxic effects (TOXIC).

DSCL (EEC):
R36- Irritating to eyes. R40- Possible risks of irreversible effects. R48/22- Harmful: danger of serious damage to health by prolonged exposure if swallowed. R48/23- Toxic: danger of serious damage to health by prolonged exposure through inhalation. R63- Possible risk of harm to the unborn child.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 2

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 2

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/11/2005 01:30 PM

Last Updated: 05/21/2013 12:00 PM

Material Safety Data Sheet
Trichloroethylene

ACC# 23850

Section 1 - Chemical Product and Company Identification

MSDS Name: Trichloroethylene
Catalog Numbers: AC158310000, AC158310025, AC421520000, AC421520040, AC421520200, AC421525000, 15831-0010, S80327ACS-1, S80327ACS-2, T340-4, T341-20, T341-4, T341-500, T341J4, T403-4
Synonyms: Ethylene trichloride; 1,1,2-Trichloroethylene; TCE.
Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100
Emergency Number: 201-796-7100
For CHEMTREC assistance, call: 800-424-9300
For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
79-01-6	Trichloroethylene	99+	201-167-4

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: APHA: 15 max liquid.
Warning! Harmful to aquatic organisms; may cause long-term adverse effects in the aquatic environment. Breathing vapors may cause drowsiness and dizziness. Possible risks of irreversible effects. Cancer hazard. Causes eye and skin irritation. May cause respiratory tract irritation. May cause liver and kidney damage. May cause central nervous system effects.
Target Organs: Kidneys, central nervous system, liver, spleen, respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes eye irritation. Contact with trichloroethylene causes pain but no permanent injury to the eyes. (Doc of TLV)
Skin: Causes skin irritation. May be harmful if absorbed through the skin.
Ingestion: May cause irritation of the digestive tract. May be harmful if swallowed. May cause central nervous system effects.
Inhalation: May cause respiratory tract irritation. May cause liver and kidney damage. May be harmful if inhaled. May cause central nervous system effects. The chief symptoms of TCE exposure were found to be abnormal fatigue, irritability, headache, gastric disturbances, and intolerance to alcohol. (Doc to TLV)
Chronic: Prolonged or repeated skin contact may cause defatting and dermatitis. May cause liver and kidney damage. May cause cancer in humans. Repeated exposure may cause damage to the spleen. Adverse reproductive effects have been reported in animals. Laboratory experiments have resulted in mutagenic effects. Possible risk of irreversible effects.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.
Skin: Get medical aid. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.
Ingestion: Do not induce vomiting. Get medical aid.
Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.
Notes to Physician: Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.
Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.
Flash Point: Not applicable.
Autoignition Temperature: 410 deg C (770.00 deg F)
Explosion Limits, Lower:7.9 Vol %
Upper: 90 Vol %
NFPA Rating: (estimated) Health: 2; Flammability: 1; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Wear a self contained breathing apparatus and appropriate personal protection. (See Exposure Controls, Personal Protection section). Remove all sources of ignition. Use a spark-proof tool. Do not let this chemical enter the environment.

Section 7 - Handling and Storage

Handling: Do not get in eyes, on skin, or on clothing. Keep away from heat, sparks and flame. Do not ingest or inhale. Use only in a chemical fume hood.
Storage: Keep away from sources of ignition. Store in a cool, dry place. Store in a tightly closed container. Store protected from light.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use only under a chemical fume hood.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Trichloroethylene	10 ppm TWA; 25 ppm STEL	1000 ppm IDLH	100 ppm TWA; 200 ppm Ceiling

OSHA Vacated PELs: Trichloroethylene: 50 ppm TWA; 270 mg/m3 TWA
Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
Skin: Wear appropriate protective gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Liquid
Appearance: clear, colorless - APHA: 15 max
Odor: chloroform-like
pH: Not available.
Vapor Pressure: 77.3 mbar @ 20 deg C
Vapor Density: 4.5 (air=1)
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 87 deg C @ 760 mmHg
Freezing/Melting Point:-86 deg C
Decomposition Temperature: Not available.
Solubility: Insoluble.
Specific Gravity/Density:1.460
Molecular Formula:C2HCl3
Molecular Weight:131.39

Section 10 - Stability and Reactivity

Chemical Stability: Moisture sensitive. Light sensitive.
Conditions to Avoid: Incompatible materials, light, ignition sources, excess heat, exposure to moist air or water.
Incompatibilities with Other Materials: Strong oxidizing agents, strong reducing agents, bases, active metals, metals and metal compounds (toxic, e.g. beryllium, lead acetate, nickel carbonyl, tetraethyl lead).
Hazardous Decomposition Products: Hydrogen chloride, carbon monoxide, carbon dioxide.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 79-01-6: KX4550000
LD50/LC50:
CAS# 79-01-6:
Draize test, rabbit, eye: 20 mg/24H Moderate;
Draize test, rabbit, skin: 2 mg/24H Severe;
Inhalation, mouse: LC50 = 8450 ppm/4H;
Inhalation, mouse: LC50 = 220000 mg/m3/20M;
Inhalation, mouse: LC50 = 262000 mg/m3/30M;
Inhalation, mouse: LC50 = 40000 mg/m3/4H;
Inhalation, rat: LC50 = 140700 mg/m3/1H;
Oral, mouse: LD50 = 2402 mg/kg;
Oral, mouse: LD50 = 2400 mg/kg;
Oral, rat: LD50 = 4920 mg/kg;
Skin, rabbit: LD50 = >20 gm/kg;

Skin, rabbit: LD50 = 20 mL/kg;

.

Carcinogenicity:
CAS# 79-01-6:

- **ACGIH:** A2 - Suspected Human Carcinogen
- **California:** carcinogen, initial date 4/1/88
- **NTP:** Suspect carcinogen
- **IARC:** Group 2A carcinogen

Epidemiology: Tumorigenic effects have been reported in experimental animals.
Teratogenicity: Teratogenic effects have occurred in experimental animals.
Reproductive Effects: Adverse reproductive effects have occurred in experimental animals.
Mutagenicity: Mutagenic effects have occurred in humans.
Neurotoxicity: No information available.
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Fathead Minnow: 41-67 mg/L; 96 hrs.; LC50Daphnia: Daphnia: 2.2-100 mg/L; 48 hrs.; LC50Mollusk Shrimp: 2 mg/L; 96 hrs.; LC50 Bluegill sunfish, LD50= 44,700 ug/L/96Hr. Fathead minnow, LC50=40.7 mg/L/96Hr.
Environmental: In air, substance is photooxidized and is reported to form phosgene, dichloroacetyl chloride, and formyl chloride. In water, it evaporates rapidly. Potential for mobility in soil is high.
Physical: No information available.
Other: Bioconcentration potential is low (BCF less than 100).

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series:
CAS# 79-01-6: waste number U228.

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	TRICHLOROETHYLENE	TRICHLOROETHYLENE
Hazard Class:	6.1	6.1
UN Number:	UN1710	UN1710
Packing Group:	III	III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 79-01-6 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

CAS# 79-01-6: 100 lb final RQ; 45.4 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 79-01-6: immediate, delayed, reactive.

Section 313

This material contains Trichloroethylene (CAS# 79-01-6, 99+%),which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR

Clean Air Act:

CAS# 79-01-6 is listed as a hazardous air pollutant (HAP).
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

CAS# 79-01-6 is listed as a Hazardous Substance under the CWA. CAS# 79-01-6 is listed as a Priority Pollutant under the Clean Water Act. CAS# 79-01-6 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 79-01-6 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California Prop 65

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

WARNING: This product contains Trichloroethylene, a chemical known to the state of California to cause cancer.

California No Significant Risk Level: CAS# 79-01-6: 50 æg/day NSRL (oral); 80 æg/day NSRL (inhalation)

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T

Risk Phrases:

R 36/38 Irritating to eyes and skin.
R 45 May cause cancer.
R 52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R 67 Vapours may cause drowsiness and dizziness.
R 68 Possible risk of irreversible effects.

Safety Phrases:

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S 53 Avoid exposure - obtain special instructions before use.
S 61 Avoid release to the environment. Refer to special instructions /safety data sheets.

WGK (Water Danger/Protection)

CAS# 79-01-6: 3

Canada - DSL/NDSL

CAS# 79-01-6 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of D1B, D2B.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List

CAS# 79-01-6 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 2/01/1999
Revision #9 Date: 6/03/2008

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

Attachment F
Daily Pre-Job Safety Briefing Form

Daily Pre-Job Safety Briefing

Project Name: Proposed Public School K337 | Interim Remedial Measure Project Number: _____

Work Location: 8802 5th Avenue and 429 89th Street, Brooklyn, NY 11209 Date: _____

Tasks Performed: _____ Time: _____ AM PM

Client Name: New York City School Construction Authority Submitted By: _____

Health and Safety Plan Available Onsite: Yes ☐ No ☐ Health and Safety Plan Location: _____

Emergency Facility(s): Maimonides Medical Center Bay Ridge Emergency Department Number(s): 718-283-2190

Physical Address: 699 92nd Street, Brooklyn, NY 11228

First Aid/CPR Persons: _____

For Emergencies Dial 911/For Non-Emergencies Dial WorkCare (888) 449-7787

Personal Protective Equipment Required	Yes	No	Type
Fall Protection	☐	☐	_____
body harness, lifelines, barricades, other (specify)			
Eye/Face	☐	☐	_____
goggles, face shield, hood, other (specify)			
Respirator	☐	☐	_____
SCBA, supplied air, HEPA, dust, other (specify)			
Foot Protection	☐	☐	_____
safety toe, EH rated, rubber boots, other (specify)			
Hand Protection	☐	☐	_____
leather, cut resistant, chemical, EH, other (specify)			
Head Protection	☐	☐	_____
hard hat, helmet, electrical hazard, other (specify)			
Clothing	☐	☐	_____
coveralls, welding, sleeves, rain, FR, reflective vest, chemical, other (specify)			
Hearing Protection	☐	☐	_____

Procedures/Programs Required	Yes	No
Hot Work	☐	☐
LOTO/Energy Control	☐	☐
Trenching/Excavation	☐	☐
Signs/Barricades	☐	☐
Confined Space	☐	☐
Cranes/Critical Lifts	☐	☐
Line Breaking/Hot Tap	☐	☐
Scaffolds/Aerial Lifts	☐	☐
System Testing/ Grounding	☐	☐
Employee Certification/Training Required		
Crane Operator	☐	☐
Forklift Operator	☐	☐
Mobile Equipment Operator	☐	☐
Competent Person	☐	☐
OSHA 10/30	☐	☐
HAZWOPER	☐	☐
Clearance/Tagging Authority	☐	☐

Additional Considerations

Work Procedures: ☐ Isolation of equipment
☐ Check for potential ☐ Adequate grounding
☐ Vehicle grounds ☐ Working clearances
☐ Dig Safe/CBYD ☐ E-911 Protocol
People: ☐ Worker fatigue ☐ Other work groups
☐ Public safety ☐ Pedestrian control ☐ Experience
☐ Traffic control ☐ Other utilities ☐ Spec. Training
Tools/Equipment: ☐ Adequate cover-up
☐ Live line tools ☐ Portable Grounds
☐ Inspection of tools/equipment
☐ Specialized tools/equipment
☐ Correct tool/equipment for the job
Special Precautions: ☐ Adjacent structures
☐ Condition of structures ☐ Weather conditions
☐ Lighting conditions ☐ Terrain ☐ Water bodies
☐ Spills and leaks ☐ Environmental ☐ Cultural
Other: _____

If Conditions CHANGE…Stop Work, Review and Revise the Plan!!

Daily Pre-Job Safety Briefing

Hazards Associated with the Job (focus on the GEMS)				
Gravity	**Electrical**	**Mechanical**	**Kinetic**	**Other/Environmental**
☐ Falling from a height	☐ Electrical contact	☐ Equipment failure	☐ Traffic	☐ Asbestos/Lead
☐ Falling objects	☐ Induced voltage	☐ Conductor tension	☐ Driving conditions	☐ Animals/Insects
☐ Falling structures	☐ Back-feed	☐ Cable tension	☐ Moving/Shifting loads	☐ Confined space
☐ Climbing obstructions	☐ Flash potential	☐ Loaded springs	☐ Rotating machinery	☐ Excavations
☐ Dangerous trees	☐ Step/Touch potential	☐ Moving parts	☐ Vehicle stability	☐ Heat/Cold
☐ Aerial device operation	☐ Static charge	☐ Crane/Rigging	☐ Heavy equip. operation	☐ Pressurized fluids/gases

List all hazards associated with this task	**Signature of Crew Members Present**	**Post Task Safety Analysis**
		Did any injuries or incidents occur today? If yes, explain.
		☐ Yes ☐ No
Barriers to eliminate/control above hazards?		Was the injury or incident reported the safety department?
		☐ Yes ☐ No ☐ N/A
		What problems did you have with today's work assignment?
		What can we do tomorrow to improve performance?
Supervisor Signature		

Attachment G
Incident Reporting Forms

AUTO INCIDENT REPORT

TRC DRIVER INFORMATION:

Driver's Name: _____ Driver's Phone: ( ) _____

Company Name: _____ Company Location: _____

Supervisor's Name: _____ Supervisors Phone: ( ) _____

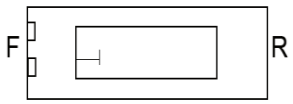
Project Name: _____ Client Name: _____

Driver's Date of Birth (MM/DD/YY): _____ Driver's License #: _____ State: _____

TRC VEHICLE INFORMATION (V-1):

Year/Make/Model of Vehicle: _____

License Plate #: _____ Vehicle ID # (VIN): _____

Circle Point of Contact: 

Was Vehicle Drivable? ☐ Yes ☐ No

Personal: ☐ Yes Rental: ☐ Yes Fleet: ☐ Yes

Rental Company

INCIDENT INFORMATION:

Date of Incident: _____ Time of Incident: _____ A.M. _____ P.M. Photos Taken: ☐ Yes ☐ No

Location of Incident: _____ City: _____

Were The Authorities Contacted? Police: ☐ Yes ☐ No Ambulance: ☐ Yes ☐ No Fire: ☐ Yes ☐ No

Name of Police Dept: _____ Case #: _____ Officer Name: _____

Were Citations Issued? ☐ Yes ☐ No If Yes, To Whom? _____

Citation Number: _____

Were There Any Witnesses? ☐ Yes ☐ No If Yes, Please Provide Name, Address and Phone Below:

Witness Name: _____ Witness Phone: ( ) _____

Witness Address: _____

Traffic Conditions (i.e., heavy, light): _____ Weather Conditions (i.e., dry, wet, ice, fog): _____

Was the TRC Driver Injured? ☐ Yes ☐ No Was Medical Treatment Received? ☐ Yes ☐ No

Describe Injuries:

Describe Damage to Property Other Than Motor Vehicles (i.e., guardrails, mailboxes, etc.):

AUTO INCIDENT REPORT

OTHER DRIVER & VEHICLE INFORMATION (V-2):

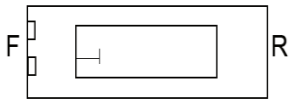
Driver's Name: _____ Driver's Phone: ( ) _____

Driver's Address: _____

Owner's Name (If different than driver): _____ Owner's Phone: ( ) _____

Owner's Address: _____

Year/Make/Model of Vehicle: _____ License Plate #: _____ State: _____

Circle Point of Contact: 

Was Vehicle Drivable? ☐ Yes ☐ No

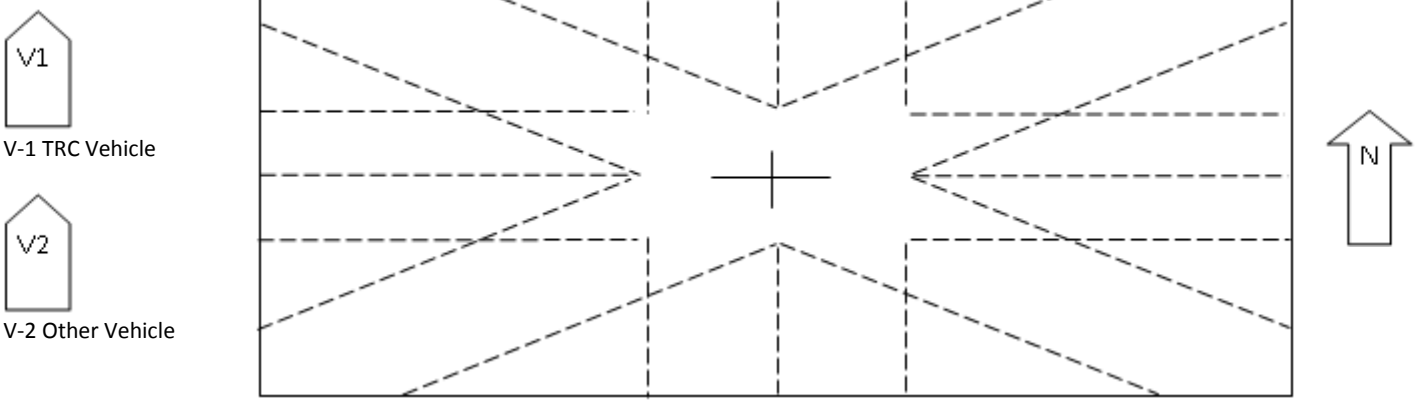
Insurance Company Name: _____ Policy Number: _____

Insurance Company Phone: ( ) _____ Number of Passengers in Vehicle: _____

List Persons Injured: _____

Were Any Other Vehicles Involved in Incident? ☐ Yes ☐ No If yes, provide details below:

PLEASE DESCRIBE THE INCIDENT AND COMPLETE THE DIAGRAM BELOW. Be sure to indicate as many details as possible (i.e., How many lanes in each direction; Were there any turn lanes; What kind of traffic controls were there – light, stop sign, yield sign, Positions of vehicles on impact).



Completed By: _____ Signature: _____

TRC Incident Report Form

(To be completed immediately after an Injury, Illness, Incident, Accident or Significant Near Miss by Employee's Supervisor and Employee involved)

Incident Category						
☐ Employee Injury/Illness	☐ Near Miss/Loss	☐ Property Damage	☐ Vehicle Accident	☐ Fire	☐ Other: Specify	
1	Incident Location:					
2	Site Identification/Project No.:					
3	Site Address:					
4	Date Incident Occurred:					
5	Time Incident Occurred:					
6	Date Incident Reported to Supervisor:					
7	Date Report Completed:					
8	Was WorkCare Contacted? ☐ Yes ☐ No					
9	Client:					

TRC Employee Information					
10	Name:				
11	Address:				
12	Employee Phone:				
13	Title or Occupation:				
14	Sector/Practice:				
15	Supervisor Name/Phone:				
TRC Employee Information (to be completed by Worker's Compensation Claims Administrator)					
16	Employee Date of Birth:				
17	Employee Social Security Number:				
18	Employee Marital Status:	☐ Married	☐ Single		
19	Number of Dependant under the age of 18:				
20	Date of Hire:				
21	Rate of Pay:		Hours per week:		

Type of Employee Injury or Illness (To be determined by Safety Director)			
22	☐ First Aid Only	20	☐ Extended Time Away From Work (3 days or more)
23	☐ Medical Treatment Only	21	☐ Fatality
24	☐ Restricted Work-case	22	☐ Other (specify):
25	☐ Lost Workday		
26	Estimated Number of Days on Restricted Work:		
27	Estimated Number of Days Away from Work:		

Employee Injury or Illness Description	
28	Describe the Injury or Illness:
29	First Aid/Medical Treatment Administered:
30	Name of Doctor's Office, Clinic, or Hospital: Concentra
31	Address and Phone Number:

Incident Description	
32	Equipment Involved:
33	Site Description:
34	What task was being performed at time of incident?
35	Describe Incident in Detail :
36	Conditions at time of Incident: (weather, lighting, etc.):
37	Motor Vehicle Accident:
38	TRC Vehicle ID:

39	Year/Make/Model:	
☐ DOT Regulated Vehicle ☐ Towed From Scene ☐ Airbag Deployed ☐ Seatbelt in Use ☐ TRC Fleet ☐ Rental ☐ Personal Vehicle		
40	Other Vehicle License Plate	
41	Other Vehicle Year/Make/Model	
42	Other Vehicle Driver Name	
43	Other Vehicle Year/Make/Model	
44	Other Injured Parties ☐ Yes ☐ No	
43	Description of other injuries:	

Subcontractor Involvement / Description of Incident	
44	Subcontractor Involved: ☐ Yes ☐ No
45	Name of Company:
46	Address:
47	Contact Name and Phone Number:
48	Subcontractor Description of Incident:

Witness Involvement / Description of Incident	
49	Witnesses to Incident: ☐ Yes ☐ No
50	Name(s) and Address(s):
51	Phone Number(s):
52	Witness Description of Incident:

Personal Protective Equipment (PPE)	
53	List PPE required to complete the task: (glasses, gloves, shoes, hard hat, respirator, hearing protection, etc.)
54	Was the employee using the proper PPE at the time of the Incident?

Immediate Corrective Actions			
55	Describe the immediate corrective actions taken:		
56	Immediate Supervisor:	Signature:	Date:
57	Employee:	Signature:	Date:

Supervisor's Post-Incident Review and Recommendations

	Safety Violation	☐ Yes	☐ No
58	State the company safety rule, OSHA regulation, or specific training that was violated:		
59	Describe the training the employee received to prevent this violation:		

#	Root Cause Factors (RCF)
1	Lack of skill or knowledge
2	In the past, did not follow procedures or acceptable practices and no incident occurred (injury, product quality incident, equipment damage, regulatory assessment or production delay)
3	Doing the job according to procedures or acceptable practices takes more time/effort
4	Short-cutting procedures or acceptable practices are positively reinforced or tolerated
5	Lack of or inadequate operational procedures
6	Inadequate communication of expectations regarding procedures or acceptable practices
7	Inadequate tools or equipment (available, operable and safely maintained, proper task and workplace design)
8	External factors

60	Root Cause(s)	Identified Root Cause(s):							
		#1	#2	#3	#4	#5	#6	#7	#8
A		☐	☐	☐	☐	☐	☐	☐	☐
B		☐	☐	☐	☐	☐	☐	☐	☐
C		☐	☐	☐	☐	☐	☐	☐	☐
D		☐	☐	☐	☐	☐	☐	☐	☐
E		☐	☐	☐	☐	☐	☐	☐	☐
F		☐	☐	☐	☐	☐	☐	☐	☐
G		☐	☐	☐	☐	☐	☐	☐	☐
H		☐	☐	☐	☐	☐	☐	☐	☐

61 **Conclusion: Why did the Incident Occur?**

62

Item No.	RCF No.	Recommended Corrective Action(s) How to Prevent Incident from Reoccurring	Responsible Person	Due Date	Completed (date)	Verified/ Validated (date)

Supervisor: _____ Signature: _____ Date: _____

TRC Safety Director: _____ Signature: _____ Date:_____

TRC Incident Reporting Guidelines

Incident Response:

1. For life threatening injuries and medical emergencies call 911 or go to the closest emergency room.
2. An injured worker must report an injury to their supervisor immediately.
3. Supervisor is required to complete The TRC Incident Report Form within 24 hours of the reported accident and forward to Bill Russell at Sargent & Associates with a copy to Mike Glenn.

   Bill Russell – Sargent &Associates
   Office: (978) 256-7459; Fax: (978) 256-4941
   bill@sargentandassociates.com

   Mike Glenn, National Safety Director
   Office: (949) 727-7347; Mobile: (949) 697-7418
   mglenn@trcsolutions.com

4. WorkCare can provide assistance in providing first aid advice and directing an injured worker to non-emergency medical care. WorkCare is a service that provides 24/7 access to an Occupational Healthcare physician or clinician.

   WorkCare Incident Intervention
   (888) 449-7787

Return to Work:

1. The injured worker is responsible for providing the Supervisor with a copy of the doctor's note detailing the injury and "return to work" status within 24 hours of the doctor's visit. The supervisor must email or fax the completed TRC Incident Report and Doctor's notes to Sargent & Associates.
2. Sargent & Associates will contact the injured worker and the Supervisor to confirm the facts surrounding the injury.
3. Sargent & Associates will report the injury to the workers' compensation insurance carrier, Zurich.

4. Zurich may contact the injured worker and supervisor to conduct an accident investigation.
5. Sargent & Associates will maintain communication with all parties in order to monitor the medical treatment, and the injured worker's return to work status. They will act as liaison between the injured worker, TRC, and Zurich.
6. Sargent & Associates will work with TRC's Health & Safety, Human Resources, and/or Supervisors to determine if modified duty work is an option, until the injured worker is able to return to full duty work activities.

Incident Investigation:

1. All incidents that result in injuries that require reporting for OSHA recordkeeping purposes and all high potential first aid and near miss events require an incident investigation.
2. The Supervisor with assistance from the National Safety Director and/or Safety Coordinator, must complete the incident investigation report/contributing cause analysis within 7 days of the incident and must develop a corrective action plan within 14 days of the incident.

Attachment H
Observation Documentation Form

TRC SAFETY OBSERVATION FORM

Revised January 2014

Location/Project Name: _____ **Date:** _____

Observer Name: _____

Observee Name: _____ **Time:** _____

Task Observed

Description of Task Observed and Background Information

Positive Comments

Conclusions / Why the Questionable Items Occurred?

Feedback Session Conducted By: _____ **Date:** _____

Name of Observee's Supervisor: _____ **Time:** _____

At-Risk Observations/Root Cause Analysis

Personal Factor:
(1) Lack of skill or knowledge
(2) Correct way takes more time/requires more effort
(3) Shortcutting standard procedures is rewarded or appreciated
(4) In past, did not follow procedures or acceptable practices and no incident occurred

Job Factor:
(5) Lack of or inadequate operational procedures or work standards
(6) Inadequate communication of expectations or work standards
(7) Inadequate tools or equipment

At-Risk Observation #	Root Cause Analysis #	Solution(s) To Prevent Potential Incident from Occurring	Person Responsible	Agreed Due Date	Date Completed

Results of Verification (were solutions done?) and Validation (were solutions effective?)

Reviewed by (PM/Supervisor): _____ **Date:** _____

Approved by (Practice Safety Leader): _____ **Date:** _____

TRC SAFETY OBSERVATION FORM

Revised January 2014

PERSONAL PROTECTIVE EQUIPMENT	Safe	At-Risk	Comments
1. Hearing Protection (e.g., Ear Plugs)			
2. Head Protection (e.g., Hard Hat)			
3. ANSI Rated Eye Protection (e.g., Safety Glasses)			
4. Hand Protection (e.g., Kevlar Gloves)			
5. Foot Protection (e.g., Safety Shoes)			
6. Respiratory Protection			
7. Fall Protection Inspected (e.g., Harness)			
8. ANSI Rated Reflective Vest/High Visibility Clothing			
9. Other (Specify)			
BODY USE AND POSITIONING	**Safe**	**At-Risk**	**Comments**
10. Correct Body Use and Positioning When Lifting/Pushing/Pulling			
11. Pinch Points/Moving Equipment - Hands/Body Clear			
12. Mounts/Dismounts Using 3-Points of Contact			
13. Other (Specify)			
WORK ENVIRONMENT	**Safe**	**At-Risk**	**Comments**
14. Work/Walk Surface Free of Obstructions (e.g., Tripping Hazards)			
15. Housekeeping/Storage			
16. Defined and Secured (e.g., warning devices, barricades, cones, flags)			
17. Suspended Load, Swing Radius & Lift Area is Barricaded			
18. Safety Shutdown Devices			
19. Proper Storage & Labeling /Disposal of Sample & Waste Materials			
20. Cylinders Stored Upright, Secured, & Caps in Place			
21. Manhole/vault Inspected for Hazards			
22. Other (Specify)			
OPERATING PROCEDURES	**Safe**	**At-Risk**	**Comments**
23. Job Planning (HASP reviewed, JSAs, etc.)			
24. Fire Extinguishers Accessible and Inspections Current			
25. Work Permit/Authorization to Work (Hot, Cold, LOTO, Confined Space)			
26. JSA Reviewed & Followed			
27. Hazard Assessment - Hazard Hunt			
28. Interfaces with Other Functions (awareness with other personnel on site)			
29. Operators Looking Behind Prior to Backing Up			
30. Operators Wearing Seat Belts While Operating Equipment			
31. Subsurface Structures Identified			
32. Proper Trench Protective Equipment in Place			
33. Adequate Egress Is Available for Excavation & Trench (within 25 ft. if depth is <4 ft.)			
34. All Materials Set Back at Least 2 Feet From Edge of Trench/Excavation			
35. Other (Specify)			
TOOLS/EQUIPMENT	**Safe**	**At-Risk**	**Comments**
36. Hand Tools (Proper Equipment Selection, Condition, and Use)			
37. Power Tools (Proper Equipment Selection, Condition, and Use)			
38. Equipment, Including Heavy (Proper Equipment Selection, Condition, and Use)			
39. Hoses Inspected			
40. Required Monitoring Equipment Calibrated & Used			
41. Ladders Set up Correctly & Inspected			
42. Right Tools for the Job are Available and in Good Condition - No Fixed Open Blade Knives (FOBKs)			
43. Other (Specify)			
Total #	0	0	

Attachment I
Safe Catch Report

"Safe Catch" Report

A "Safe Catch" is a potential hazard or incident that has not resulted in any personal injury. Unsafe working conditions, unsafe employee behaviors, improper use of equipment or use of malfunctioning equipment have the potential to cause work related injuries. It is everyone's responsibility to report and/or correct these potential incidents immediately. Please complete this form as a means to report these "Good Catch" situations and submit to your local OSC Representative and Mike Glenn, National Safety Director.

Employee Name:		Date:	
Incident Location:		Office:	
Project:		Practice:	

Conditions

Please check all appropriate conditions:

☐ Unsafe Act	☐ Unsafe Condition	☐ Unsafe Equipment	☐ Unsafe Use of Equipment

Description of Incident or Potential Hazard:

Task Performed at Time of Incident:

Causes (Primary and Contributing):

Corrective Action(s) Taken (remove the hazard, replace, repair, or retrain):

Employee Signature:		Date Completed:	

Our Mission: To reduce the frequency of incidents by applying local lessons learned globally.

If you have any questions about this report or would like additional information, please reference Compliance Program CP019—TRC Incident Response and Lessons Learned Program, located on TRCNET or contact Mike Glenn, National Safety Director at mglenn@trcsolutions.com.