

1407 Broadway, Suite 3301 New York, NY 10018

May 21, 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.

Subsequent to the IRM activities, ground-intrusive pile driving activities may be conducted on lot 28 in support of installation of a protective wall. This work is not a part of the remedial activities; however, CAMP will be implemented during all ground-intrusive activities that have the potential for off-site migration of dust. All soil and waste produced by the pile driving activities will be properly managed and disposed of in accordance with Section 5.0 below.



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 and Post-Excavation Sampling Program

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 minimum depth of 2 feet below ground surface (bgs) to the extent possible. Excavation to 10 feet bgs may be necessary for proper removal and closure of the UST. Support of excavation (SOE) will be installed to facilitate excavations deeper than 5 feet bgs. 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.
 - $\circ~$ One (1) sample will be collected beneath each removed floor drain.
 - \circ 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.

5.0 Site Restoration and Waste Disposal

After post-excavation sampling has been performed, the excavation will be backfilled as follows:

- 1. A geotextile liner will be installed against all exposed soil surfaces within the excavation to serve as a demarcation layer.
- 2. The excavation will be backfilled with virgin quarried #57 stone (i.e., ³/₄ 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, included as *Attachment D*.

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.

- 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.

Green and Sustainable Remediation Baseline Analysis

The Green and Sustainable Remediation Baseline Analysis was conducted utilizing the US Environmental Protection Agency (EPA) Greener Cleanup Metrics Workbook to estimate the environmental footprint of the IRM. The purpose of this analysis is to estimate a baseline footprint to be compared against after implementation of the IRM is complete. During the IRM, actual measurements or best estimates, as practical, of quantities of the footprint core elements (e.g., fuel usage, electricity, water volume, etc.) will be tracked and used to facilitate a comparison to this baseline analysis. The assessment generally follows the ITRC document titled "Green and Sustainable Remediation: State of the Science and Practice", May 2011. The assessment scoring worksheet has been arranged to group the footprint into 4 core elements: materials, waste, water consumption, and energy use. Additionally, there are no known sensitive ecosystems/habitats within the project area; therefore, the remedial work is not expected to impact ecosystems and habitats within the project area. A discussion of the expected environmental footprint of the IRM activities is provided below. The green and sustainable remediation baseline analysis is included as *Attachment E*.

<u>Energy</u>

Staff will be utilized from the TRC New York, NY office. Eurofins Edison will be the laboratory utilized throughout the duration of the IRM. Although subject to change, Bethlehem Landfill in Bethlehem, PA, is the disposal facility used to estimate the fuel usage for waste that will be transported. It is expected that approximately 4,850 gallons of diesel and 130 gallons of gasoline will be consumed in relation to IRM activities by engineers, contractors, and laboratories and equipment drop off/pickups. In addition, one diesel powered excavator will be utilized on-Site throughout the duration of remedial work.

Energy consumption also includes powering equipment necessary for completing the remedial work, including charging CAMP station equipment. Energy consumption related to equipment usage will be calculated based on equipment usage hours and required kilowatt-hours. It is expected that equipment will be operating 8 hours per day, for 20 days.

Water

It is expected that 10,000 gallons of non-potable public water will be utilized during remediation activities. Public water will be utilized mainly for dust suppression, cleaning of the UST and drainage systems, and cleaning and decontamination of equipment. Water usage will be measured based on waste generated and estimated based on the flow rate and numbers of hours of site wetting for dust suppression.

Materials and Waste

The forecasted materials and waste are based on the planned excavation for completion of the



IRM, and related required excavation on Lot 39.

Expected materials imported to the site include 6,000 tons of crushed stone, 360 pounds of geotextile liner, 24 55-gallon steel drums, and 20 feet of 2-inch PVC pipe for monitoring well repairs.

Expected waste transported off site for disposal includes 4,500 tons of non-hazardous soil, 1,320 gallons of non-hazardous liquid and sediment, and 5,000 pounds of UST shell/scrap metal.

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. Additionally, the report will include an analysis of the Green and Sustainable Remediation results compared to the baseline analysis included in this work plan, in accordance with DER-31. 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 in order to receive a Notice to Proceed (NTP) or a Notice of No Objection (NNO) in the Building Department's DOBNOW system. 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.



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Certification

I, Phillip Castellano, certify that I am currently a NYS registered professional engineer and that this Interim Remedial Measure Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10) and Green Remediation (DER-31).

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

Sincerely, **TRC Engineers, Inc.**

Jenna Raup Program Manager Jraup@trccompanies.com

Up GAT

Phillip Castellano, P.E. Senior Engineer <u>PCastellano@trccompanies.com</u>

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

Enclosures: Figure 1 – Site Location Map Figure 2 – Site Layout Map Figure 3 – Proposed Post-Excavation Sample Location Plan

> Attachment A – Quality Assurance Project Plan Attachment B – Community Air Monitoring Plan

- Attachment C Health and Safety Plan
- Attachment D NYSDEC Request to Import/Reuse Fill or Soil Form
- Attachment E Green and Sustainable Remediation Baseline Analysis



FIGURES





LEGEND (SYMBOLS NOT TO SCALE):

	SITE BOUNDARY
	LOT BOUNDARY
	BUILDING FOOTPRINT
	SUSPECT DRAINAGE SYSTEM PIPING
igodol	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.
- BASEMAP SOURCE FROM NYC DEPARTMENT OF 3. FINANCE TAX MAP.
- LOT 39 BUILDING IS CURRENTLY VACANT 4.
- UST UNDERGROUND STORAGE TANK 5.
- **OWS OIL WATER SEPARATOR** 6.



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 -0-SVOCS SOIL SAMPLE LOCATION - VOCS, SVOCS \otimes AND METALS MONITORING WELL TO BE PROTECTED NOTES: LOCATIONS AND DIMENSIONS OF PHYSICAL FEATURES 1.

- AND BOUNDARIES ARE APPROXIMATE.
- 2. BASEMAP SOURCE FROM NYC DEPARTMENT OF FINANCE TAX MAP.
- 3. SAMPLES MAY BE ADDED OR REMOVED AS NECESSARY TO COMPLY WITH DER-10 RECOMMENDATIONS.
- 4. SAMPLES TO BE COLLECTED FROM THE TERMINAL DEPTH OF EXCAVATION, BENEATH THE PIPING INVERTS, UST AND OWS, FOLLOWING COMPLETION OF EXCAVATION AND REMOVAL.
- 5. A GEOTEXTILE DEMARCATION LAYER WILL BE INSTALLED PRIOR TO BACKFILLING WITH VIRGIN QUARRIED #57 STONE, OR APPROVED EQUAL.
- 6. UST UNDERGROUND STORAGE TANK
- 7. OWS OIL WATER SEPARATOR



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.

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. 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. Resumes of key personnel, including the Project QA Officer, Project Manager, and Data Validator can be found at the end of the QAPP.

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 Eurofins-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., $\mu g/kg$ 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).

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 non-dedicated equipment being used. Since the scope of work includes soil sampling using disposable and sterile scoops, Equipment Blanks are not proposed.

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 analysis, 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 Interim Remedial Measure (IRM) 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.

INTERIM REMEDIAL MEASURE WORK PLAN – APPENDIX C PROPOSED PUBLIC SCHOOL FACILITY K337 8802 5TH AVENUE AND 429 89TH STREET (BLOCK 6065, LOT 28 AND 39), BROOKLYN, NEW YORK 11209 BROWNFIELD CLEANUP PROGRAM SITE NO. C224327

Table 1A								
Analytical Parameters, Methods, Preservation, Holding Time, and Container Requirements for Soil Samples								
				No. of				
Sample	Analytical	Sample	No. of	QA/QC	EPA Analytical	Sample		
Matrix	Parameter	Type ¹	Samples ²	Samples	Method	Preservation	Holding Time ³	Sample Container
Soil	TCL and CP-	Grab	26-30	Duplicate:	8260C	Sealed in	48 hours to extract: 2	3 x 5 gram EnCore®
	51 VOCs			1/20		EnCore® bag:	EnCore [®] samplers	samplers
	51 + 0 05					Cool to 4° C	extruded in 5 mL DI	I I I
							water and freeze vials to	
							$< 7^{0}C: 1 EnCore$	
							somplar avtruded in 5 ml	
							mathemal and Casi to 40	
							C 14 la sta sul si	
~		~ .				~	C; 14 days to analysis	
Soil	TCL and CP-	Grab	26-30	Duplicate:	8270D	Cool to 4 ^o C	14 days to extract	8 oz glass jar
	51 SVOCs			1/20				
Soil	TAL Metals	Grab	16-20	Duplicate:	6010C	Cool to 4° C	180 days to analysis	8 oz glass jar
				1/20				
Soil	Mercury	Grab	16-20	Duplicate:	7471B	Cool to 4° C	28 days to analysis	8 oz glass jar
				1/20			5 5	
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 2A Laboratory Data Quality Objectives: Precision and Accuracy: Soil Samples							
					Accuracy Frequency	Precision (RPD)	Precision Frequency
Parameter	Method	Matrix	Accuracy Control Limits		Requirements	Control Limits	Requirements
TCL and CP-	8260C	Soil	Surrogates	<u>%</u>	Surrogates: All samples,	Field Duplicates	Field Duplicates:
51 VOCs			Rec.		standards, QC samples	RPD ≤50	One per 20 soil
			1,2-Dichloroethane-d4	78-135			samples
			4-Bromofluorobenzene	67-126			
			Toluene-d8	73-121			
			Dibromfluoromethane	61-			
			149				

INTERIM REMEDIAL MEASURE WORK PLAN – APPENDIX C PROPOSED PUBLIC SCHOOL FACILITY K337 8802 5TH AVENUE AND 429 89TH STREET (BLOCK 6065, LOT 28 AND 39), BROOKLYN, NEW YORK 11209 BROWNFIELD CLEANUP PROGRAM SITE NO. C224327

Table 2A								
Laboratory Data Quality Objectives: Precision and Accuracy: Soil Samples								
					Accuracy Frequency	Precision (RPD)	Precision Frequency	
Parameter	Method	Matrix	Accuracy Control Limits		Requirements	Control Limits	Requirements	
TCL and CP-	8270D	Soil	<u>Surrogates</u>	<u>%</u>	Surrogates: All samples,	Field Duplicates	Field Duplicates:	
51 SVOCs			Rec.		standards, QC samples	RPD ≤50	One per 20 soil	
			2-Fluorophenol	38-95			samples	
			Phenol-d5	32-91				
			2,4,6-Tribromophenol	10-103				
			Nitrobenzene-d5	37-94				
			2-Fluorobiphenyl	38-95				
			Terphenyl-d14	24-109				
TAL Metals	6010C	Soil	Matrix Spikes:		Matrix Spikes: One per 20	Field Duplicates	Field Duplicates:	
			75-125% recovery		soil samples per laboratory	RPD ≤20	One per 20 soil	
			Laboratory Control Samples:		analytical batch		samples	
			80-120% recovery					
					Laboratory Control Samples:			
					One per 20 samples per			
					laboratory analytical batch			

Project Goals

The principal objectives of the IRM Work Plan sampling program are to document the soil conditions following excavation activities.

Sampling Plan

Environmental sampling will include soil. Soil samples will be collected using disposable sampling equipment.

Soil Sampling

Soil samples will be collected in 2-ounce disposable, sterile scoops and placed in the sample bottles. Samples will be collected from the terminal depth of the excavation at locations described in the IRM. 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.

QC Sample Collection

QC samples will include field duplicates soil samples. Refer to Table 1A 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 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.

INTERIM REMEDIAL MEASURE WORK PLAN – APPENDIX C PROPOSED PUBLIC SCHOOL FACILITY K337 8802 5TH AVENUE AND 429 89TH STREET (BLOCK 6065, LOT 28 AND 39), BROOKLYN, NEW YORK 11209 BROWNFIELD CLEANUP PROGRAM SITE NO. C224327

- 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.



JENNA RAUP

YEARS OF ENVIRONMENTAL CONSULTING EXPERIENCE: 15

EDUCATION

B.A., Chemistry; Minor, Environmental Science; University at Buffalo, SUNY, 2010

PUBLICATIONS

Raup, J., Eberle, M., Denly, E., Glass, D.S., Stefansky, J., Dyber, J., Scharf, B., Saucier, S., 2024. "A Conceptual Site Model for Per- and Polyfluoroalkyl Substance Water Supply Impacts in a Residential Community." Remediation Journal, 2024; 35:e70001 2024. <u>https://doi.org/10.1002/rem.70001</u>.

AREAS OF EXPERTISE

Ms. Jenna Raup has program management and technical experience in the following general areas:

- Quality Assurance and Quality Control
- Contract and Project Management
- Environmental Assessments and Investigations
- Underground Storage Tank Management
- Soil, Groundwater, and Soil Vapor Investigations and Remediation
- Vapor Intrusion Investigations and Remediation
- Potable Water Sampling and System Evaluation
- Data Management
- Regulatory Compliance
- Report Preparation
- Analytical Chemistry

Ms. Jenna Raup is an environmental consultant specializing in due diligence, site investigation, and remediation services. She is proficient at overseeing environmental site assessments and investigations, as well as project scoping, budgeting, and closeout. Ms. Raup also serves as a TRC Corporate Quality Leader. As a Quality Leader, Ms. Raup is responsible for ensuring the proper implementation of the requirements under the United State Environmental Protection Agency (USEPA)-approved Quality Management Plan (QMP), developing internal tools and guidance, conducting quality control audits and surveys, documenting Lessons Learned and conducting root cause analyses, and serving as a resource to develop project and team-specific quality procedures.

REPRESENTATIVE EXPERIENCE

NYCSCA Hazardous Materials Consulting Services, NYC - Program Manager

For nearly 13 years, Ms. Raup has provided environmental consulting services to the NYCSCA's IEH Division. In that time, she has managed an array of assignments including: due diligence (Phase I ESAs/Phase II ESIs/IAQs); design of remediation and mitigation systems to address environmental contaminants; petroleum storage tank investigations and closure designs; emergency responses related to blue water, water intrusion, and odors; product evaluations; preparation of cost estimates for remedial actions, remedial programs, and design implementation; construction-phase support; potable water supply system investigations and city-wide sampling; and, New York State Department of Environmental Conservation and NYC Mayor's Office of Environmental Remediation (OER) remedial sites. Ms. Raup is well-versed in federal, state, and local regulations pertaining to the assignments on this contract, and supports NYCSCA in navigating regulatory changes, as necessary. Since April 2018, she has served as the Program Manager, responsible for performance on the former and current 3-year on-call services contracts, contributing greatly by methodically and diligently training new staff on the requirements of the contract, and implementing quality control procedures to ensure responsive, high-quality service.

Accomplished under Ms. Raup's supervision during this timeframe include over 70 site inspections for potential lease spaces in Queens to support the 3-K and ACS lease properties programs, more than 100



Phase I ESAs, 50 IAQs, 20 Phase II ESIs, potable water system disinfection oversight and sampling at over 70 sites, inspections and closure reports for about ten tank systems, and ongoing construction-phase services for more than 20 capacity sites.

In addition, Ms. Raup worked with the IEH Division to modify due diligence templates to ensure that the documents facilitate adherence to current standards and NYCSCA protocols, and to improve efficiency and functionality. Although she is responsible for management of the contract, her role on this contract spans all technical and administrative needs. Ms. Raup performs technical reviews of all work products, and is responsible for the exceptional technical performance, which is a result of her programmatic vision and day-to-day hands-on involvement. Her long-standing relationships with NYCSCA staff form her understanding and approach to solving NYCSCA's problems as if they were TRC's, and her technical guidance to junior level staff ensure that the service provided by TRC is delivered consistently and at the highest quality.

NYSDEC Mahopac Business District Wells – Senior Project Manager

In response to New York State's emerging contaminant sampling initiative, monitoring wells at a State Superfund site in Mahopac, NY were sampled for emerging contaminants, revealing that the per- and polyfluoroalkyl substances (PFAS) perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) are present in groundwater at the site. A survey of the surrounding area revealed that residential and commercial properties rely on private water supply wells for drinking water, and further, sampling of these wells identified PFOA and PFOS above the screening criteria. Ms. Raup led the PFAS Source Investigation in connection with the widespread PFAS contamination present in the 1/2 -mile area surrounding the Superfund Site. Since a precedent was not yet established for area-wide PFAS Source Investigations, Ms. Raup worked closely with the client, New York State Department of Health (NYSDOH), and TRC subject matter experts to develop a methodical investigative approach that would most efficiently identify potential PFAS sources and confirm links to area-wide contamination in support of a conceptual site model. Information review began as a desktop study of the historical uses of the area, public and private water supply and waste disposal infrastructure, use and/or storage of aqueous film forming foam (AFFF) in the area, and a review of the signature trends of PFAS compounds.

As a data management solution, Ms. Raup worked with TRC's GIS team to create a digital, accessible, and georeferenced database repository to facilitate real-time mapped updates for the client and NYSDOH throughout the project in the form of a project-specific and secure GIS Viewer. Informational layers in the viewer included the following information: private well sampling and mitigation records; sewer maps; public water supply maps and connections; and potential PFAS sources and proposed sampling locations. The Viewer afforded the project team the ability to download datasets, generate formatted and customized figures on demand, and visualize the sampling progress throughout the area.

Ms. Raup also designed and implemented subsurface investigations at twelve sites identified as potential PFAS sources. Investigations consisted primarily of targeted overburden soil and groundwater sampling, as well as surface water and sediment sampling at State Pollutant Discharge Elimination System (SPDES) outfalls and throughout the nearby surface water body (Lake Mahopac). Sampling of Lake Mahopac also included collection of fish via electroshocking methods. The results of the PFAS Source Investigation are being compiled in a final report that will be available to the public and will inform the next steps of NYSDEC and NYSDOH on the area-wide issue. Ms. Raup also managed the public outreach effort throughout the project by collaborating with the NYSDEC and NYSDOH on regularly circulated community update bulletins, brochures on alternative water supplies, educational pieces on the efficacy of activated carbon, website content development, communication with community members through a dedicated email, and management and execution of a public availability session.

Confidential Client, Buchanan, NY - Senior Project Manager

In support of decommissioning of the nuclear power generation facility, to satisfy requirements of the Order on Consent and Administrative Settlement between Holtec Decommissioning International LLC and NYSDEC, Ms. Raup prepared and received NYSDEC's approval of a Remedial Investigation (RI) Scoping Work Plan (SWP). The SWP was prepared by touring the facility, interviewing knowledgeable site representatives, reviewing environmental databases and historical maps/aerial photographs, and



reviewing nearly 50 years of environmental documentation for the nearly 300-acre site, and summarizing the potential and known remaining contamination for purposes of informing non-radiological remedial investigation that will be required to be performed as part of facility decommissioning and prior to reuse of the land. The SWP was prepared in a short timeframe, demanding thorough review, keen attention to detail, and quick uptake of a large volume of information. Subsequently, Ms. Raup scoped and received NYSDEC approval of a RI Work Plan for an area of concern. Implementation of the work plan has not yet started. Ms. Raup has also managed and supported other site-related activities including air permit modifications to allow for temporary boiler use, tank closure plans, Citizen Participation Plan development, and Spill Prevention, Control, and Countermeasure (SPCC) plan updates.

NYCHA PACT Round 9 Due Diligence – Project Manager and Senior Environmental Scientist

Scoped and managed preparation of two Phase I ESAs in connection with two NYCHA development land transactions in Manhattan and Bronx, NY that will unlock federal funding to allow private developers to take on property upgrades and management responsibilities. Ms. Raup reviewed sites that spanned several hundred acres to determine the most efficient way to perform Site reconnaissance and review regulatory agency and historical records. She prepared a streamlined Phase I ESA template that effectively presented findings and captured NYCHA-specific out-of-scope services. Reports were prepared and reviewed by Jenna within a short timeframe to meet NYCHA's project schedule. NYCHA's review of the Phase I ESAs yielded no comments, and reports were finalized for distribution.

PANYNJ Newark Liberty International Airport Terminal One Redevelopment Design-Build – Senior Environmental Scientist

Providing environmental services for the \$1.4 billion design-build of the new Terminal One at Newark Liberty International Airport in Newark, NJ. The Port Authority of New York and New Jersey (PANYNJ) project encompasses phased demolition of the existing Terminal A building and associated infrastructure and construction of a new 1 million-sf, 33-gate common-use terminal; a new pedestrian bridge; new terminal parking garage and toll plaza facility; and airside and landside redevelopment. The scope of services includes asbestos abatement prior to demolition activities; soil sampling to assess how to best dispose of certain materials; and other testing to secure permits for flood hazards, soil erosion, hazmat removal, and stormwater/dewatering/discharge.

NYCT On-Call Environmental Consulting Services – Senior Environmental Scientist

Preparing due diligence reports (Phase I and Phase II ESAs) and performing technical reviews of environmental due diligence assessments for various New York City Transit (NYCT) projects. Projects that Ms. Raup has been involved with include the planned construction of a new electrical substation at 28th Street and 8th Avenue; ADA Station upgrades at 11 sites in Manhattan, Bronx, and Staten Island; and, a new temporary bus parking lot in Queens. She is also responsible for preparing subcontractor agreements, as needed.

SPECIALIZED TRAINING

- OSHA 40-Hour HAZWOPER
- Brownfield Industry Professional, Gold Level; OER (2016)
- Analytical Chemist (2010-2012)



ELIZABETH A. DENLY

EDUCATION

B.A., Chemistry, University of New Hampshire, 1987

PROFESSIONAL REGISTRATIONS / CERTIFICATIONS

Licensed Site Professional Association, Massachusetts, Associate Member American Chemical Society (ACS) American Society for Quality (ASQ)

AREAS OF EXPERTISE

Ms. Denly has over 30 years of experience in:

- Emerging Contaminants
- Technical Advisor for QA/Chemistry
- PFAS Forensics
- Data Evaluation/Data Validation
- QA Project Plans
- QA Management
- Analytical Laboratory and Field Sampling Audits

Quality Assurance/Quality Control

As a QA chemist at TRC, Ms. Denly is responsible for providing QA/QC oversight in support of a variety of environmental investigations including contaminant ambient air monitoring, human health and ecological risk assessments, riskbased soil cleanups, remediation programs, and delineation. Ms. Denly has provided this oversight under different regulatory programs, including MassDEP, NYSDEC, NJDEP, and USEPA Region I, Region II, Region III, and Region V. In this role, she has been responsible for the preparation of the project-specific QAPP, coordination with the laboratory, selection of the appropriate analytical methodologies to achieve the desired state or regulatory standards, oversight and performance of the data validation process, and determination of the usability of the data in comparison to the overall project objectives.

In addition, Ms. Denly serves as TRC's Remediation and Building Science Practices Quality Assurance & Chemistry Systems Manager, responsible for the creation and implementation of the Sector's Quality Management Plan and Standard Operating Procedures (SOPs) for field sampling and documentation protocols. Ms. Denly also leads Quality Coordinator networks in the Remediation and Building Science Practices which are responsible for the development and communication of quality initiatives within the organization. Among the quality initiatives that have been implemented or created under Ms. Denly's leadership include the following:

- Procedures for Peer Review of Deliverables
- Tracking of Peer Review Documentation via monthly random audits
- Project Planning Checklist tool
- Analytical Data Review Checklist and Training
- Practice Self-Assessments with follow-up Corrective Actions
- Biweekly Quality Messaging
- Technical Editing Guidelines
- Publication of Quality Lessons Learned reports



Data Validation

Ms. Denly provides oversight and senior review on data validation performed for a variety of analytical parameters. She performs data validation for organic parameters including VOCs, SVOCs, Pesticides, PCB Aroclors, PCB homologues/congeners, Dioxins, specialty analyses including GC/MS/SIM and various air analyses. Validation and reporting guidelines utilized include USEPA National Functional Guidelines, USEPA Regions I through V, and NYSDEC DUSRs. Ms. Denly developed internal protocols for the validation of the MassDEP EPH/VPH methodologies.

REPRESENTATIVE EXPERIENCE (Descriptions marked with an asterisk (*) undertaken within past three years) New York City School Construction Authority*

Ms. Denly has provided quality assurance management for a variety of SCA programs, including PCB air monitoring, site investigations, and sub-slab soil vapor and indoor air investigations. In this role, Ms. Denly is responsible for reviewing field team documentation, providing oversight of the analytical laboratory, data validation, and preparation of DUSRs. She is responsible for frequent communication with the laboratories to ensure proper receipt of samples, proper utilization of project-specific analytical protocols in order to achieve necessary project action levels, and to monitor the overall performance of the laboratories.

Brownfields Programs – Various Locations*

Ms. Denly serves as the Project Quality Assurance Manager on TRC's Brownfields programs within USEPA Regions 1 and 3. In this role, she is responsible for maintaining and updating the USEPA-approved generic Brownfields QAPPs. She provides final review of site-specific QAPP addenda prepared for the individual Brownfields sites and assists in the determination of required analytical methodologies necessary to achieve specific project objectives. Ms. Denly is the point of contact for the field team and the laboratory during the investigations for issues related to the ultimate usability of the analytical data. She reviews the chains-of-custody as samples are received by the laboratory to ensure the requirements for sample collection in the site specific QAPP addenda are followed and samples are properly logged into the laboratory. Final review of the analytical data is performed by Ms. Denly and a data usability assessment is generated for each investigation.

Vieques Island, Environmental Cleanup Oversight, Vieques, Puerto Rico* Ms. Denly provides technical and regulatory compliance oversight to the Commonwealth of Puerto Rico and the Puerto Rico Environmental Quality Board (EQB) regarding the investigation, assessment, and remediation of contamination on Vieques Island by the U.S. Navy in support of the property's transfer to the Commonwealth of Puerto Rico. Ms. Denly conducts technical and regulatory reviews pertaining to analytical methods and QA/QC issues of the documents prepared by Navy subcontractors including draft and final submissions of work plans, field sampling plans, investigation results, technical memoranda, feasibility studies, and remedial designs.

Massachusetts Department of Environmental Protection – MA*

Ms. Denly is currently providing assistance to MassDEP to determine whether the regulated community is correctly implementing analytical methodologies at MassDEP sites; this includes providing training for all MassDEP auditors. Ms. Denly is also assisting MassDEP in the development of a protocol for the analysis of volatile petroleum hydrocarbons (VPH) by GC/MS. Previously, Ms. Denly has assisted MassDEP in the review/evaluation of data packages for EPH/VPH analyses from laboratories selected by MassDEP as part of a Data Audit project to ensure compliance with the methods and CAM. She provided consultation to MassDEP for revisions to the MassDEP's innovative EPH/VPH analytical methods used to measure petroleum hydrocarbon concentrations in soil and groundwater. Ms. Denly served as a member of the Data



Quality Enhancement Work Group led by MassDEP and assisted in the development of a policy for achieving consistency of data reported under the MCP. Ms. Denly was responsible for generating the framework for QC parameters on organic analyses typically utilized under the MCP, method-specific performance standards for these QC parameters, minimum reporting requirements for the laboratories for each method, and a list of what laboratories need to keep on file for potential audits by the MassDEP.

Mattiace Petrochemical Superfund Site – Glen Cove, NY*

Ms. Denly prepared the QAPP for the Long Term Remedial Action under TRC's Exit Strategy® program using USEPA Region II guidance. She provides QA oversight to the field team. Ms. Denly also performs data validation of data generated for demonstration of achievement of cleanup objectives. Ms. Denly is responsible for performing assessment of data to determine overall usability.

USEPA Region I Superfund RAC*

Ms. Denly serves as lead chemist for a variety of Superfund programs under the USEPA Region I Remedial Action Contract (RAC). Her responsibilities have included ongoing development of analytical specifications for laboratories to achieve specific project objectives and development of QAPPs following the requirements of USEPA Region I QAPP guidelines. She performs data validation and/or senior review of data validation for a variety of analytical methodologies utilizing USEPA Region I validation guidelines. Ms. Denly generates data usability assessments and/or split sample comparison reports in accordance with USEPA Region I guidance, when required. She interacts with USEPA Region I chemists in the selection of analytical methodologies and project objectives. Ms. Denly provides QA oversight of PRPs' validation reports, sampling and analysis plans, and QAPPs. She is also responsible for providing QA oversight to field teams, performing daily reviews of COCs and traffic reports, and acting as the main liaison between the field team and USEPA.

FAA, Region II – Atlantic City, NJ

Ms. Denly assisted in the preparation of QA protocols for the Supplemental RI and Ecological Risk Assessment Work Plan. She was also responsible for providing QA support to the field team. Ms. Denly interfaced with laboratories to ensure achievement of risk-based standards and performed data validation and/or oversight for all data generated. Ms. Denly provided oversight for all validation performed on the Remedial Investigation data.

Queens West Development – Stage 2 Site – Long Island City, NY

Ms. Denly prepared the QAPP for the NYSDEC Voluntary Cleanup Program under TRC's Exit Strategy® program. She provided QA oversight to the field team. Ms. Denly performed data validation for the program. She was responsible for performing assessment of data to determine overall usability. Ms. Denly provided daily support to the project team on chemistry, laboratory, and QA issues. She was responsible for ensuring project objectives were achieved by the laboratory and for oversight of laboratory QA issues.

Consolidated Edison First Avenue Properties - New York, NY

Ms. Denly prepared a QAPP for Supplemental Soil Investigation and Voluntary Cleanup of four sites under TRC's Exit Strategy® program. The First Avenue Properties Site is the site of a former Consolidated Edison Power Plant located in midtown Manhattan between East 38th Street and East 40th Street. Ms. Delny provided QA oversight to field team during site remediation. Ms. Denly performed data validation of select data points used for decision-making and was responsible for performing assessment of data to determine overall usability for various Remedial Work Plans.



130 Liberty Street – New York, NY

Ms. Denly developed the QAPP for the extensive ambient air monitoring program and waste management program under USEPA Region II oversight. Ms. Denly provided oversight of six analytical laboratories and was responsible for coordination and performance of data validation for asbestos, metals, dioxins/furans, PAHs, PCBs, and silica ambient air data as well as TCLP and metals waste characterization data. Ms. Denly communicated frequently with the laboratories to ensure proper receipt of samples, proper utilization of projectspecific analytical protocols and to monitor the overall performance of the laboratories. Responsible for the oversight and performance of field and laboratory audits. Reviewed all data prior to web-site posting and submission to USEPA.

PUBLICATIONS AND PRESENTATIONS

Raup J, Eberle M, Denly E, Glass D, Stefansky J, Dyber J, Scharf B, Saucier S. A Conceptual Site Model for Per-and Polyfluoroalkyl Substance Water Supply Impacts in a Residential Community. Remediation. 2024; 35:e70001. <u>https://doi.org/10.1002/rem.70001.</u>

Denly, E., & Morin, K. (2022). A review of draft Environmental Protection Agency Method 1633: A data user's perspective. Remediation Journal, 1–5. <u>https://doi.org/10.1002/rem.21713</u>

Denly E, Occhialini J, Bassignani P, Eberle M, Rabah N. *Per- and polyfluoroalkyl substances in environmental sampling products: Fact or fiction?* Remediation Journal. 2019; 29:65–76.

Eberle M, Edelman M, Denly E, Rabah N. *Evaluation of the effects of PFAS soil adsorption and transformation in the presence of divalent cations under ambient conditions*. Remediation. 2019; 30:15–25.

Fiorenza, S, Denly, E, Vitale, R J, Nigro, N, Leahy, M C, Neslund, C, Blye, D R, & Farmer, N (2022). *PFAS Experts Symposium 2: An update on advances in the chemical analysis of PFAS*. Remediation Journal, 1–9. <u>https://doi.org/10.1002/rem.21707</u>

Simon JA, Abrams S, Bradburne T, et al. *PFAS Experts Symposium: Statements on regulatory policy, chemistry and analytics, toxicology, transport/fate, and remediation for per- and polyfluoroalkyl substances (PFAS) contamination issues.* Remediation Journal. 2019; 29:31–48.



Nancy Weaver

Education

B.S., Chemistry, University of Colorado, Denver, Colorado

Certifications and Training

State of New York Department of Environmental Conservation certified Asbestos Inspector

40-Hour OSHA Hazardous Waste Training

8-Hour Health and Safety Supervisor Training for Hazardous Waste Operations

Experience Overview

Relevant Experience

- More than 20 years combined laboratory, data validation and project management experience
- Experienced in writing Quality Assurance Project Plans (QAPPs), managing subcontracted analytical laboratories, performing laboratory audits, and analyzing samples in a laboratory.

Ms. Weaver has over twenty years combined laboratory, data validation and project management experience. She is the President and co-founder of EDS and is responsible for the technical data review and validation of laboratory data. Ms. Weaver has performed data validation on thousands of data validation projects. She has extensive knowledge in applying the various regional and project specific data validation guidelines and QAPPs. Her experience also includes writing Quality Assurance Project Plans (QAPPs), managing subcontracted analytical laboratories, performing laboratory audits, participating in field sampling activities and analyzing samples in a laboratory.

Relevant Project Experience

Principal/Senior Chemist, Environmental Data Services, Inc., Williamsburg, Virginia, August 1994 - Present. As the Principal Chemist at Environmental Data Services, Inc., Ms. Weaver has provided Level IV data review on more than 6000 Sample Delivery Groups (SDGs) generated through site investigations and/or remediations. These SDGs have included every analytical fraction possible including VOC, SVOC, pesticides, PCBs, herbicides, DRO, GRO, dioxin/furans, PCB congeners, metals, wet chemistry and radiological parameters. Sample matrices include water, soil, sediment, wipe, concrete and air. The SDGs have included CLP data packages produced under the CLP SOWs and CLP-like data packages with samples analyzed under SW-864 methodologies. Sample quantities validated may reach upwards of 120,000 per fraction over the past 20 years. Ms. Weaver has been using the USEPA National Functional Data Validation Guidelines since 1993 and has provided Level IV (full) and Level III (cursory) validation. Specifically validated PCB congeners by EPA Method 1668 and dioxin/furans by EPA Method 1613 using the USEPA National Functional Guidelines, USEPA Region I and USEPA Region III data validation guidelines. Validated radiological parameters analyzed by alpha and gamma spectrometry using the USACE Kansas City and St. Louis District Radionuclide Data Quality Evaluation Guidance.

<u>Chemist-Analyst Specialist, City & County of Denver, Denver, Colorado, June 1992 - August 1994.</u> As a Chemist-Analyst Specialist for the City and County of Denver, Ms. Weaver supervised performance and compliance sampling for O & M requirements at groundwater treatment facility. She provided assessment of analytical data for quarterly reports to local regulatory agencies. She also acted as liaison between the technical group and laboratory to coordinate sampling events and resolve problems with analyses. While in this capacity, she performed data validation for organic, inorganic and radiological analyses. Ms. Weaver reviewed over 2000 VOC, SVOC, pesticide, PCB, TPH, metals and wet chemistry samples. Ms. Weaver managed the database for groundwater and treatment plant sampling events and performed environmental site assessments for commercial and residential properties. She provided technical review and recommendations of Phase I and Phase II site investigations performed by outside consultants. She also analyzed policy and interpreted city, state and federal environmental regulations.

Data Validation Specialist, C.C. Johnson & Malhotra, Lakewood, Colorado, January 1990 to June 1992. While a Data Validation Specialist at C.C. Johnson & Malhorta, Ms. Weaver performed data validation and interpretation of organic analytical data generated from the EPA Contract Laboratory Program (CLP). Data analysis included VOC,



SVOC, pesticides, PCBs, metals and wet chemistry. Ms. Weaver reviewed more than 600 SDGs and 9000 samples. She interpreted gas chromatograms, gas chromatography/mass spectral data and verified mathematical calculations.

Environmental Chemist, The Anschutz Corporation - SP Environmental Systems, Inc., Denver, Colorado, July 1990 to January 1992. As an Environmental Chemist for The Anschutz Corporation - SP Environmental Systems, Inc., Ms. Weaver assisted in the management of site investigations and remediation for Southern Pacific Transportation Company properties. In this capacity, she performed environmental audits and site assessments and conducted site investigations at potential Superfund sites with state and federal agencies. She researched and prepared responses to regulatory agencies for non-compliant sites and defined the needs for hazardous waste disposal including the analysis required and disposal. Ms. Weaver also supervised the removal of underground storage tanks and remediation. She prepared closure reports for UST removals, as well as annual waste summary forms for TSD facilities throughout the state of Texas. She also constructed, developed, and sampled groundwater monitoring wells.

Environmental Specialist, Martin Marietta Astronautics Group, Denver, Colorado, January 1988 to January 1990. While with Martin Marietta Astronautics Group as an Environmental Specialist, Ms. Weaver performed organic analysis and sampling of wastewater, groundwater, and drinking water in support of NPDES permit. She operated and maintained laboratory instrumentation including GC and GC/MS for volatile, semi-volatile, and pesticide/PCB analysis. Ms. Weaver also coordinated sample collection and preparation activities, developed and authored standard operating procedures for laboratory analysis, and followed EPA protocol for QA/QC requirements for analysis. She calculated and interpreted data and reported results.

Environmental Chemist, Camp, Dresser, & McKee, Boston, Massachusetts, April 1986 to October 1987. As an Environmental Chemist with Camp, Dresser, & McKee, Ms. Weaver analyzed water/wastewater for organic compounds. She operated and maintained laboratory instrumentation including GC and infrared spectrophotometer for volatile, pesticide/PCB, and petroleum hydrocarbon analysis. She also calculated and interpreted data and reported results. Ms. Weaver analyzed more than 2000 samples.

Employment History

Environmental Data Services, Inc.	Principal/Senior Chemist	1994–Present
City & County of Denver	Chemist-Analyst Specialist	1992–1994
C.C. Johnson & Malhorta	Contractor/Data Validation Specialist	1990–1992
The Anschutz Corporation - SP	Environmental Chemist	1990–1992
Environmental Systems, Inc.		
Martin Marietta Astronautics Group	Environmental Specialist	1988–1990
Camp, Dresser, & McKee	Environmental Chemist	1986–1987

ATTACHMENT B COMMUNITY AIR MONITORING PLAN

INTERIM REMEDIAL MEASURE WORK PLAN – ATTACHMENT B PROPOSED PUBLIC SCHOOL FACILITY K337 8802 5TH AVENUE AND 429 89TH STREET (BLOCK 6065, LOT 28 AND 39), BROOKLYN, NEW YORK 11209 BROWNFIELD CLEANUP PROGRAM SITE NO. C224327

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 μ g/m³ 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 μ g/m³ 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

- Attachment A Health and Safety Plan Acceptance
- Attachment B Hospital Route
- Attachment C Work Care Information
- Attachment D Emergency Contact Information
- Attachment E Safety Data Sheets for Potential Contaminants of Concern
- Attachment F Daily Pre-Job Safety Briefing Form
- Attachment G Incident Reporting Forms
- Attachment H Observation Documentation Form
- Attachment I Safe Catch Report

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:911Fire 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:	<u>New York, NY</u>	
Office Phone:	<u>212 221 7822</u>	
Cell Phone:	<u>929-502-6469</u>	

2. Certified Industrial Hygienist

Name:	Ed Gerdts, CIH
Office/Division:	<u>New York, NY</u>
Office Phone:	212-221-7822

3. National Safety Director

Name:	Mike Glenn
Office/Division:	Irvine, CA
Office Phone:	<u>949-727-7347</u>
Cell Phone:	<u>949-697-7418</u>

4. Office Safety Coordinator (OSC)

Name:	Emily Kessler
Office/Division:	<u>New York, NY</u>
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:	<u>978-656-3628</u>

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	x	
use)	21	
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 36°C (96.8°F). 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 35°C (95°F). 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 36°C must be provided to workers if work is performed in air temperatures below 4°C (40°F). 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.

REQUIRED PERSONNEL TRAINING 9.0

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

Project Training Requirements				
(* re	quired	for all sites; but minimum recommended)		
Chec	Check "A" if training required for everyone, and check "T" if training required for specific task or per notations.			
	т	SURIECT	REFERENCE	
А	I	SUBJECT	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
\boxtimes		Hazard Communication (HAZCOM)	1910.1200	1926.59
		DOT / IATA Shipping Training	1910.1201	49 CFR 172.704
\boxtimes		TRC Hand Protection Policy	1910.138	TRC Policy ²
\boxtimes		Defensive Driving	N/A	White Paper ³
				TRC Manual ⁴
Clie	Client-specific training:			
Client-specific training:				
Client-specific training:				
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, clientspecific 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
		<u> </u>
	<u> </u>	

Attachment B Hospital Route

Google Maps

8802 5th Ave, Brooklyn, NY 11209 toDrive 0.6 mile, 4 minMaimonides Medical Center Bay Ridge Emergency Department, 69992nd St, Brooklyn, NY 11228



Map data ©2024 Google 200 ft L

8802 5th Ave

Brooklyn, NY 11209



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 nonemergency 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


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

¹Use 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 Uses advised against Laboratory chemicals. Not for food, drug, pesticide or biocidal product use

Details of the supplier of the safety data sheet

<u>Company</u>

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

Category 2 Category 4 Category 4 Category 2 Category 2 Category 3

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/sprav 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 Eves 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-E	Dichloroethylene	156-59-2	97
	4.	First-aid measures	
Eye Contact	Rinse immed medical atter	iately with plenty of water, also under th	ne eyelids, for at least 15 minutes. Get
Skin Contact	Wash off imn	nediately with plenty of water for at leas	t 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 Notes to Physician	Breathing difficulties. Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting 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 Lower Sensitivity to Mechanical Impact Sensitivity to Static Discharge	12.80% 9.70% No information available 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 (CO₂)

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 2	Flammability 3	Instability 0	Physical hazards N/A
	6. Accidental re	elease measures	
Personal Precautions	Ensure adequate ventilat ignition. Take precaution eyes and clothing.	ion. Use personal protective equip ary measures against static discha	ment. Remove all sources of arges. Avoid contact with skin,
Environmental Precautions	See Section 12 for addition sanitary sewer system.	onal ecological information. Do no	t flush into surface water or
Methods for Containment and Clear Up	n Soak up with inert absort sawdust). Keep in suitab Use spark-proof tools an	pent material (e.g. sand, silica gel, le, closed containers for disposal. d explosion-proof equipment.	acid binder, universal binder, Remove all sources of ignition.

	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			

<u>Legend</u>

ACGIH - American Conference of Governmental Industrial Hygienists

Engineering Measures	Ensure adequate ventilation, especially in confined areas. Use explosion-proof
5 5	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 (CO2)
Hazardous Polymerization	Hazardous polymerization does not occur.
Hazardous Reactions	None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information Component Information Toxicologically Synergistic	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-Dichloroethylen e	156-59-2	Not listed	Not listed	Not listed	Not listed	Not listed			
Mutagenic Effects		No information ava	ailable						
Reproductive Effect	S	No information ava	ailable.						
Developmental Effect	cts	No information ava	ailable.						
Teratogenicity		No information available.							
STOT - single exposure STOT - repeated exposure		Respiratory system 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 ava	ailable						
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 FC50 = 905 mg/L 30 min	Not listed				
Persistence and Degradability		Persistence i	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. Di	sposal consider	ations					
Waste Disposal Methods		Chemical wa hazardous w national haza	ste generators must deterr aste. Chemical waste gen ardous waste regulations to	nine whether a discarded of erators must also consult le ensure complete and acc	chemical is classified as a ocal, regional, and urate 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	Х	-	Х	205-859-7	-		-	Х	Х	Х	Х

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

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

U.S. Department of Transportation

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

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
Creation Date	22-Sep-2009
Revision Date	23-Jan-2018
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	: 1-866-734-3438

operation)

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 Other means of

identification

: Mixture

: Not available.

CAS number/other identifiers

CAS number	1	Not applicable.
Product code	4	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 ŝ, 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. : As this product is a gas, refer to the inhalation section. Ingestion

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.	

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Date of issue/Date of revision
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Section 4. First aid measures

Indication of immediate med	<u>dica</u>	l 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 : Use an extinguishing agent suitable for the surrounding fire. media Unsuitable extinguishing : None known. media Specific hazards arising : Contains gas under pressure. In a fire or if heated, a pressure increase will occur and the container may burst or explode. from the chemical **Hazardous thermal** : Decomposition products may include the following materials: carbon dioxide decomposition products carbon monoxide nitrogen oxides **Special protective actions** : Promptly isolate the scene by removing all persons from the vicinity of the incident if for fire-fighters 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** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. equipment for fire-fighters

Section 6. Accidental release measures

Personal precautions, protec	e 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 co	ainment 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.
Date of issue/Date of revision	: 1/23/2015. Date of previous issue : No previous validation. Version : 0.01 3/1

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

<u>Control parameters</u> <u>Occupational exposure lin</u>	<u>nits</u>
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 meas	<u>ures</u>
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.
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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.
рН	:	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	1	Not available.
Vapor pressure	:	Not available.
Vapor density	1	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 : Not available.

routes of exposure

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: 1/23/2015. Date o

Date of previous issue

Section 11. Toxicological information

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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 phy	sical, 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 effec	ts and also chronic effects from short and long term exposure
<u>Short term exposure</u>	
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 effe	ects
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

: 1/23/2015.

Date of previous issue

: No previous validation. Version : 0.01

Section 12. Ecological information

Not available.

Mobility in soil

Soil/water partition	
coefficient (Koc)	

: Not available.

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

Section 13. Disposal considerations

: The generation of waste should be avoided or minimized wherever possible. Disposal **Disposal methods** 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	ΙΑΤΑ
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 : Not available. to Annex II of MARPOL 73/78 and the IBC Code

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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.
<u>SARA 311/312</u>	
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 : Not listed Convention List Schedule III Chemicals

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.)



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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

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Section 16. Other information

Koy to abbroviations	• ATE - Acute Toxicity Estimate
Rey to abbreviations	PCE - Disconcentration Easter
	CLICE – Dioconcentration 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
	I C – 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
	WENIS Condian Workplace Hazardous Material Information System
References	: Not available.

V 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	Ε

Material Safety Data Sheet Naphthalene MSDS

Section 1: Chemical Product and Company Identification

Product Name: NaphthaleneConCatalog Codes: SLN1789, SLN2401CAS#: 91-20-3RTECS: QJ0525000TSCA: TSCA 8(b) inventory: NaphthaleneCl#: Not available.Synonym:1-8Chemical 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.

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

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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:C2HCI3 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/m3/30M; 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:

Risk Phrases:

Т

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	ect Name: Proposed Public School K337 Interim Remedial Measure			
Work Location: 8802 5 th Avenue and 429 89 th S	Date:			
Tasks Performed:	Time: AM PM			
Client Name: New York City School Construct				
Health and Safety Plan Available Onsite: Yes	□ No □ Health and Saf	ety Plan	Location:	
Emergency Facility(s): Maimonides Medical Cen	ter Bay Ridge Emergency Departmen	t N	umber(s):	718-283-2190
Physical Address: 699 92 nd Street, Brooklyn	NY 11228			
First Aid/CPR Persons:				
For Emergencies D	ial 911/For Non-Emergen	cies Dia	al Work(Care (888) 449-7787
Personal Protective Equipment Required	Procedures/Programs Required	Yes	No	Additional Considerations
Yes No Type	Hot Work			Work Procedures: Isolation of equipment
Fall Protection	LOTO/Energy Control			Check for potential Adequate grounding
body harness, lifelines, barricades, other (specify)	Trenching/Excavation			Vehicle grounds Working clearances
Eye/Face	Signs/Barricades			Dig Safe/CBYD E-911 Protocol
goggles, face shield, hood, other (specify)	Confined Space			People: Worker fatigue Other work groups
Respirator 🗆 🗆	Cranes/Critical Lifts 🛛 🖓 🖓 Public safety 🖓 Pedestrian contro			Public safety Pedestrian control Experience
SCBA, supplied air, HEPA, dust, other (specify)	Line Breaking/Hot Tap			\Box Traffic control \Box Other utilities \Box Spec. Training
Foot Protection	Scaffolds/Aerial Lifts			Tools/Equipment: Adequate cover-up
safety toe, EH rated, rubber boots, other (specify)	System Testing/ Grounding			Live line tools Portable Grounds
Hand Protection	_ Employee Certification/Training F	Required		\square Inspection of tools/equipment
leather, cut resistant, chemical, EH, other (specify)	Crane Operator			\Box Specialized tools/equipment
Head Protection	Forklift Operator			\Box Correct tool/equipment for the job
hard hat, helmet, electrical hazard, other (specify)	Mobile Equipment Operator			Special Precautions: Adjacent structures
Clothing	Competent Person			\Box Condition of structures \Box Weather conditions
coveralls, welding, sleeves, rain, FR, reflective vest,	OSHA 10/30			□ Lighting conditions □ Terrain □ Water bodies
chemical, other (specify)	HAZWOPER			\Box Spills and leaks \Box Environmental \Box Cultural
Hearing Protection	Clearance/Tagging Authority			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)							
<u>G</u> ravity	<u>E</u> lectrical		<u>M</u> echanical			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	g/Shifting loads	□ Confined space
□ Climbing obstructions	Flash potential		Loaded springs		🗌 Rotatin	g machinery	Excavations
Dangerous trees	🗆 Step/Touch potenti	al	☐ Moving parts		□ Vehicle	stability	Heat/Cold
\Box Aerial device operation	Static charge		□ Crane/Rigging		🗌 Heavy	equip. operation	Pressurized fluids/gases
List all hazards associated with	this task	S	ignature of Crew Members	Present			
						Doct Tack	Safaty Analysis
						FUST TASK	Salety Allalysis
						Did any injuries or ir explain.	ncidents occur today? If yes,
						□ Yes	□ No
Barriers to eliminate/control ab	oove hazards?					Was the injury or indepartment?	cident reported the safety
						□ Yes	🗆 No 🛛 N/A
						What problems did assignment?	you have with today's work
						What can we do ton	norrow 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: F	Was Vehicle Drivable?
INCIDENT INFORMATION:	
Date of Incident: Time of Incident:	A.M. P.M. Photos I Yes I 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?	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: F	Was Vehicle Drivable?	🗌 Yes 🗌 No
Insurance Company Name:	Policy Number:	
Insurance Company Phone: ()	Number of Passeng Vehicle:	ers in
List Persons Injured:		
Were Any Other Vehicles Involved in Incident?	Yes No If yes, provide de	tails 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).





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	7 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:

39	Year/Make/Model:					
[] [DOT Regulated Vehicle	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 Ves No					
43	Description of other injuries:	•				

	Subcontractor Involvement / Description of Incident		
44	Subcontractor Involved: Ves 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	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
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):								
00	Root Cause(s)	#1	#2	#3	#4	#5	#6	#7	#8	
А										
В										
С										
D										
Е										
F										
G										
н										

61	Conclusion: W	hy did t	the Incident Occur?				
62	ltem 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:

- 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/Proj	ect Name:			Date:							
Obse	erver Name:										
Obser	vee Name:	Time:									
Task Observed											
Description of Ta	ask Observed a	nd Background Information									
Positive Comme	nts										
Conclusions / W	hy the Oyestian	achia Kama Qaauwad?									
	ny the Question										
Feedbac	k Session Cond	ucted By:		Date:							
Name o	of Observee's Su	upervisor:		Time:							
At-Risk Observa	tions/Root Caus	se Analysis									
		,									
(1) Lack of skill or	knowledge	<u>J</u>	ob Facto	<u>r:</u> f or inadequate operational procedur	os or						
(2) Correct way ta(3) Shortcutting st	kes more time/re	equires more effort (*	work s	tandards	65 01						
appreciated		(6	 Inadec work s 	quate communication of expectations tandards	or						
(4) In past, did no practices and r	no incident occur	red (7	7) Inadeo	quate tools or equipment							
At-Risk	Root Cause	Solution(s) To Prevent Potential In	icident	Person	Agreed Due	Date					
Observation #	Analysis #			Кезронзіме	Date	Completed					
Results of Verific	cation (were sol	utions done?) and Validation (were s	solutions	effective?)							
Reviewed	by										
(PM/Superv	isor):			Date:							
Approved by	/ (Practice Safe	ty Leader):		Date:							
		- ,									

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PERSONAL PROTECTIVE EQUIPMENT	Sate	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)			
	Eafa	At Bick	Comments
	Sale	AL-RISK	comments
14. work/ waik surface Free of Obstructions			
(e.g., Tripping nazarus)			
15. nousekeeping/storage			
16. Defined and Secured (e.g., warning devices,			
parricades, cones, flags)			
17. Suspended Load, Swing Radius & Lift Area			
is Barricaded			ļ
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 20. Operators Wearing Seat Belts While			
Operating Equipment			
31. Subsurface Structures Identified	1		
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	1		
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 Demoined Marite in Factories			
40. Kequired Monitoring Equipment			
41. Ladders Set up Correctly & Inspected			
42 Right Tools for the Joh are Available and in			
Good Condition - No Fixed Open Blade Knives			
Good Condition - No Fixed Open Blade Knives (FOBKs)			
Good Condition - No Fixed Open Blade Knives (FOBKs) 43. Other (Specify)			
Good Condition - No Fixed Open Blade Knives (FOBKs) 43. Other (Specify) Total #	0	0	

Attachment I 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			Tructice.		
Please check all appro	nriate conditions:				
Flease check an applo					
🔲 Unsafe Act	Unsafe Condition	🗌 Unsafe	Equipment	_ υ	nsafe Use of Equipment
Description of Inci	dent or Potential Hazar	d:			
Task Performed at	Time of Incident:				
Causes (Primary a	nd Contributing):				
Corrective Action(s) Taken (remove the h	azard renla	ce renair	or retr	ain).
	of raken (remove the m	azara, repia	ee, repuit,	orrett	
Employee Signature			Date Compl	eted	
employee signature.			Date compl	cieu.	

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 <u>CP019—TRC Incident Response and Lessons Learned Program</u>, located on TRCNET or contact Mike Glenn, National Safety Director at <u>mglenn@trcsolutions.com</u>.

ATTACHMENT D

NYSDEC REQUEST TO IMPORT/REUSE FILL OR SOIL FORM



<u>NEW YORK STATE</u> DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Request to Import/Reuse Fill or Soil



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

SECTION 1 – SITE BACKGROUND

Site Name:

Site Number:

The allowable site use is:

Have Ecological Resources been identified?

Is this soil originating from the site?

How many cubic yards of soil will be imported/reused? If greater than 1000 cubic yards will be imported, enter volume to be imported:

SECTION 2 – MATERIAL OTHER THAN SOIL

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

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

Is this virgin material from a permitted mine or quarry?

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

SECTION 3 - SAMPLING

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

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

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

SECTION 3 CONT'D - SAMPLING

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

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

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

SECTION 4 – SOURCE OF FILL

Name of person providing fill and relationship to the source:

Name and address of fill source:

Location where fill was obtained:

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

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

Provide a list of supporting documentation included with this request:

The information provided on this form is accurate and complete.

Signature

Date

Print Name

Firm

ATTACHMENT E

GREEN AND SUSTAINABLE REMEDIATION BASELINE ANALYSIS

	Greener Cleanup Metrics - Summary Table								
Site Name:	Former Giuffre Auto Group Site (Proposed Public School 337K)			City or Locale State		Cleanun	Dreemen NVCDEC Prownfields Cleanup Program		Prownfields Cleanup Brogram
Unit Name:	Remove underground structures and	nvestigate potential residual source area impact	Site Location:	Brooklyn	NY	Cleanup	Program:	NISDECT	Stownlields Cleanup Program
			Description of	Site and Cleanup Activities					
	Description of Site:	The Site consists of a one-story commercial building with a basement and an asphalt-paved parking lot (Lot 28), and a former commercial building with a partial basement (Lot 39).	Cleanup Activities:	The primary objective of the IRM is to remove the drainage system, suspected underground storage tank (UST), and oil-wate separator (OWS) beneath the former auto repair/service station building located on the 429 89th Street portion of the Site (Lot In addition, an objective of this IRM is to locate and remove shallow residual source area(s) of petroleum-related contaminar					orage tank (UST), and oil-water Street portion of the Site (Lot 39). petroleum-related contaminants.
		Description of Units and Cleanup Phase for these Metrics							
	Description of Unit:	Remove the suspected underground structures and investigate and remediate potential residual source area impacts in their vicinity.	Phase of Cleanup:	e of nup: Interim Remedial Measure Source of Input Data Interim Remedial Measure Work Pl				al Measure Work Plan	
		• •	-	-					
			Notes	on Data Collection					
				Site Contact Person				EPA Cor	ntact Person
			Name:	NYCSCA - Mike Sherwood			Nam	ne:	
	Data Collection:	NA	Contact Information:	718-752-5211, msherwood@nycsca.org			Contact Info	ormation:	

						SUMMARY FOR TOTALS
	Timeframe for Data>					
Core Element	Metric	Resources Used		Resources Used Resources Conserved		Comments About Results
Matorials	Refined materials	0.76	Tons	0.00	Tons	
Waterials	Unrefined materials	6,000.00	Tons	0.00	Tons	
Wasto	Hazardous waste generation	0.00	Tons	0.00	Tons	
waste	Non-hazardous waste generation	4,502.50	Tons	2.50	Tons	
	Public water	0.01	MG	0.00	MG	
Water	Groundwater	0.00	MG	0.00	MG	
vvaler	Wastewater generation	0.00	MG	0.00	MG	
	Other water	0.00	MG	0.00	MG	
	Grid electricity	0.60	MWh	0.00	MWh	
	Diesel for equipment	1,200	Gallons	0	Gallons	
Freezer	Diesel for transportation	3,655	Gallons	0	Gallons	
chergy	Gasoline for equipment	0	Gallons	0	Gallons	
	Gasoline for transportation	124	Gallons	0	Gallons	
	Other energy	0	(variable)	0	(variable)	

	Notes on Inputs for Resources Used	Notes on Inputs for Resources Conserved
Refined Materials:	Geotextile liner, 2-inch PVC pipe, 55-gallon drums.	N/A
Unrefined Materials:	Imported crushed stone	N/A
Hazardous Waste:	N/A	N/A
Non-Hazardous Waste:	Non-hazardous soil hauled off site via dump trucks to Bethlehem Landfill.	Scrap Metal hauled off site via dump truck to TNT Scrap instead of landfill for disposal.
Water:	Non-hazardous wastewater hauler off site to Clean Water of NY.	N/A
Grid Electricity:	Grid electricity used for charging of PID and CAMP stations.	N/A
Fuel Used Onsite:	Large excavator.	N/A
Fuel Used for Transportation:	Fuel used for transportation of excavator, materials, waste, and personnel travel.	N/A
Other Notes:	Assumptions were used for transportation vehicle size and equipment HPs. All quantities are estimated based on the scope of work outlined in the IRM Work Plan.	