HCS Civil & Environmental Engineering, LLC
Professional Engineering Consultants

September 5, 2022

New York State Department of Environmental Conservation
Division of Environmental Remediation
Site Control Section
625 Broadway
Albany, NY 12233

Attn: Mr. Steven Wu

Subject: M4778 Broadway LLC
NYSDEC BCP Number: C231131
4778 Broadway, Bronx, New York
Remedial Action Work Plan (RAWP)
Groundwater Treatment Design Plan

HCS File: 20-0799

Dear Mr. Wu:

We are submitting herewith the proposed plan for treatment of groundwater at the referenced site. Our review of the proposed treatment plan appears to provide adequate application of chemical oxidants together with monitoring of natural attenuation of residual contamination. The plan provides flexibility for additional chemical injection should monitoring results suggest the need.

This submission is being made on behalf of 4778 Broadway, LLC in accordance with our professional engineering services agreement. Technical questions and comments may be directed to Anthony Cauterucci with AEI Consultants, Inc., and the undersigned.

Sincerely,
HCS CIVIL & ENVIRONMENTAL ENGINEERING, LLC

Philip G. Clark, P.E., LSP
President

Cc: G. Yaari, Joy Construction; K Savarese, MADD 4778 Broadway; A. Cauterucci, AEI Consultants, Inc.; D. Bausmith, AEI Consultants

AEI Consultants
20 Gibson Place, Suite 310
Freehold, NJ 07728
732.414.2720

August 29, 2022

Steven Wu
Project Manager
New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 2
47-40 21st Street
Long Island City, New York 11101

Subject: In-Situ Remediation Design and Monitoring Plan
4788 Broadway, Bronx, NY
NYSDEC BCP Number: C231131

Dear Mr. Wu,

AEI Consultants (AEI) has prepared this letter to present the plan for in-situ chemical oxidation (ISCO) of soil and groundwater contamination at in the Borough of Manhattan, County of New York, New York and is identified as Block 2233, Lot 10 on the New York City Tax Map (hereafter referred to as "Site"). As outlined in the April 2021 Remedial Action Work Plan (RAWP) prepared by AEI on behalf of on behalf of M4778 Broadway LLC and conditionally approved by the New York State Department of Environmental Conservation (NYSDEC), previous investigations have identified impacts to soil and groundwater at the Site related to petroleum underground storage tanks (USTs) located at the Site.

The RAWP outlines a plan for contaminant source removal (e.g., UST and soil excavation) and ISCO, followed by monitored natural attenuation of groundwater. The source removal component of the remedy was designed to occur concurrently with site development, which includes excavation to construct a 14-15-foot-deep basement/foundation for a future 12-story mixed-use building. Originally, the ISCO activities were to occur using direct-push drilling equipment prior to commencement of UST and soil removal activities. However, due to physical site constraints, dewatering requirements, and construction logistics, the design for applying chemical oxidants to the saturated soil and groundwater beneath the Site has been revised. Details regarding the ISCO remediation and monitoring plan is described below.

As described below, the installation of permanent monitoring wells and ISCO injection wells will occur after excavation of source materials and installation of the slab subgrade, sub-slab depressurization system (SSDS) piping, and initial 3-inch thick "rat slab" layer. Well installations will be installed using a drilling rig equipped with hollow-stem augurs, mobilized to the foundation interior after completion of the rat slab across the entire building footprint. At each of the monitoring well and injection well locations, a short section (approximately 1.5-feet long) of 8-inch or 10-inch diameter high-density polyethylene (HDPE) or polyvinyl chloride (PVC) casing will be installed to facilitate future drilling and prevent the surrounding SSDS stone material from entering the future borehole. A schematic of the protective casing is shown on **Figure 1**.

Permanent Monitoring Well and Injection Well Installations

As described in the RAWP, five (5) permanent monitoring wells were proposed to monitor groundwater conditions and natural attenuation of contaminants following completion of the source removal and ISCO activities. The wells were originally planned to be 2-inch diameter monitoring wells. However, to enhance the future monitoring network and provide a potential opportunity to recover residual product from groundwater, if needed, one (1) additional monitoring well will be installed and four (4) of the six (6) monitoring wells located in the groundwater contaminant source area will be constructed with 4-inch diameter PVC casing. Originally, per the April 2021 RAWP, a total of 42 *temporary* direct-push ISCO injection points were proposed across the 4,200-square foot groundwater contaminant source area. However, to provide a means for potential supplemental oxidant application after construction of the building foundation, and equivalent treatment of the groundwater contaminant source area, a total of 11 *permanent* ISCO injection wells will be installed. The 11 injection wells will be spaced approximately 20-feet on-center. This spacing, in conjunction with the ability for permanent wells to accommodate greater injection pressure than temporary, direct push points, is expected to facilitate appropriate distribution of injected chemical oxidant across the 4,200-square foot treatment area. The location of the proposed monitoring wells, injection wells, and SSDS riser pipes, which will penetrate the foundation slab, are illustrated on **Figure 2.**

The monitoring wells will be installed using Schedule 40 slotted PVC well screen installed from the top of the bedrock surface (approximately 20-feet beneath ground surface (bgs)] and the top of the excavated soil surface (approximately 14 feet bgs). For the injection wells, the length of the screen will be a maximum length of five (5) feet, and the slot size will be 0.020 to enhance oxidant distribution laterally. Solid-wall PVC casing for both the monitoring wells and injection wells will be used to extend the well to a minimum of one (1) foot above the final slab surface elevation. The finished slab elevation [14.2 feet above mean sea level (msl)] is projected to be approximately three (3) feet above the highest groundwater elevation measured at the Site (approximately 11 feet msl); therefore, raising the top of the well casings at least one (1) foot above the slab will provide a factor of safety against groundwater migration through the top of the casing if unexpectedly high groundwater conditions arise. The injection wells will also be equipped with a shut-off and bleed valve, and 2-inch diameter camlock fitting to facilitate safe delivery of oxidant solution. The annular space around the well screen will be backfilled with clean silica filter pack and the remaining annular space sealed with 6-inches of choker sand, and cement grout (bentonite-free) to the top of the rat slab surface elevation.

Pre-Injection Product Evaluation

Prior to conducting ISCO injections, AEI will gauge each of the injection and monitoring wells for the presence of measurable free product (i.e., >0.01-foot) using a decontaminated oil-water interface probe. If measurable free product is identified, drop tubes connected to portable pumping equipment will be utilized to remove the product, where present. Recovered product will be temporarily stored in appropriate on-site containers and transferred to a licensed waste hauler for off-site disposal. ISCO applications will not proceed at well locations where measurable free product is detected.

In-Situ Chemical Oxidation Approach

The application of chemical oxidants to treat petroleum contaminants at the Site was outlined in the RAWP. The specific approach discussed below involves the injection of oxidants that, upon contact with contaminants in the subsurface, break down the chemical bonds and transform the original contaminant to less harmful or innocuous end products such as CO_2 and H_2O. Some oxidants are chemically more compatible for destroying certain types of contaminants, while others effectively treat a wide range of contaminants. Activated persulfate is one particular type of oxidant that is extremely strong (relative to other oxidants), remains active for extended periods in the ground, and treats a broad range of contaminants including the petroleum-related volatile organic compounds (VOCs) and semi-VOCs (SVOCs) detected the Site. Activated persulfate also provides a secondary bioremediation benefit that does not exist with other oxidants such as Fenton's reagent. After dissolved oxygen has been depleted in the treatment area, sulfate (a by-product of the persulfate oxidation) may be used as an electron acceptor for anaerobic biodegradation by indigenous microbes.

A proprietary product manufactured by Regenesis® called PersulfOx® generates activated persulfate, which reacts directly with many organic materials, exchanging electrons in a process known as direct oxidation. Persulfate is considered a powerful direct oxidant as it has a theoretical standard oxidation potential (for the reaction $S_2O8^{2-} + 2e- \rightarrow 2SO_4^{2-}$) that is similar to other powerful oxidants like ozone and hydrogen peroxide. This strong oxidizing potential of persulfate makes oxidation of many organic contaminants thermodynamically favorable.

AEI and the manufacturer of PersulfOx® have developed a mix design based on dissolved-phase and soil-adsorbed phase petroleum contamination in the saturated target zone. The target treatment zone was anticipated to cover 4,200 square feet, over an average six (6) feet-thick saturated interval between the top of groundwater and the bedrock surface. Based on the levels of contamination documented in the Remedial Investigation Report (RIR), a total of 10,520 pounds of PersulfOx® (including activator) blended with 7,140 gallons of potable water are expected to be required for the treatment area. The PersulfOx® mix design is included as **Attachment A**.

Portable mixing and pumping equipment will be mobilized to the Site to blend and inject the PersulfOx® into the subsurface via the 11 permanent injection wells described above. The proposed injection plan is illustrated on **Figure 2**. To minimize the stress on the formation, enhance oxidant distribution, and minimize potential contaminant "rebound", the oxidant applications will occur over three (3) events conducted 1-2 weeks apart. During each application, approximately one-third of the design oxidant load (3,506 pounds) will be blended with potable water in portable mixing tanks (250-gallon polyethylene plastic totes, or equivalent). A total of approximately 319 pounds of oxidant/activator and 216 gallons of water will be blended and injected at each of the 11 points. The oxidant will be delivered to the injection wells using chemically compatible hoses and connections secured to the camlock on each well head, and chemically-compatible positive displacement pumps. Manifolds may be used to inject oxidant solutions to several well locations at one time. A pressure gauge and flow meter (or equivalent measurement of volume in the mix tank) will be used to monitor the flow rate and pressure during injection. Additionally, groundwater elevation and conductivity measurements will be performed in the groundwater monitoring wells, as appropriate, to monitor aquifer conditions during injection. A total of three (3) injection events are anticipated to complete delivery of the design oxidant load to the target treatment area at the Site. If site-specific conditions warrant a reduction in oxidant delivery rates, the injection schedule may be modified.

ISCO Performance Monitoring

Baseline and periodic post-injection monitoring of the groundwater in the vicinity of the ISCO injections will be performed. A new 4-inch diameter monitoring well will be installed near the central portion of the Site, as described earlier. This well will be used to augment the well network used to monitor the effectiveness of the ISCO process. AEI will sample existing monitoring wells for VOC and SVOC levels to establish baseline, or "pre-remediation" conditions.

Three (3) post-injection groundwater sampling events will be conducted to evaluate the effects of the ISCO events. Groundwater will be sampled approximately 2 weeks, 4 weeks, and 8 weeks after completing injections. Sampling will include all six (6) monitoring wells at the Site, including the newly installed monitoring well. Laboratory analysis will consist of Sulfate (indicator of PersulfOx® distribution), VOCs by Method 8260, and SVOCs by Method 8270.

Following groundwater monitoring, the results will be summarized in a letter report, along with recommendations for additional monitoring or remediation, if required.

Schedule

It is anticipated that the first round of ISCO injections will commence approximately three (3) to four (4) weeks after the foundation rat slab is complete, or one-week after completion of the permanent well installations. Depending on subsurface conditions and the achievable injection rates, delivery of the design oxidant load (10,520 pounds of PersulfOx®) is expected to require 6-8 weeks to complete, and post-injection monitoring is expected to require an additional 4-10 weeks (including analysis and reporting) to complete. The NYSDEC will be informed of the progress of the ISCO program.

If you have any questions or require additional information, please do not hesitate to contact Phil Clark, PE at (413) 281-2797 or the undersigned.

Sincerely,

David Bausmith, PE (NY #106011)
Principal Engineer/Regional Operations Manager
AEI Consultants
20 Gibson Place, Suite 310
Freehold, New Jersey 07728
Phone: (732) 307-8375
Email: dbausmith@aeiconsultants.com

Anthony Cauterucci, CHMM
Senior Scientist
AEI Consultants
20 Gibson Place, Suite 310
Freehold, New Jersey 07728
Phone: (732) 275-4719
Email: acauterucci@aeiconsultants.com

ATTACHMENT A

PersolfOx® Mix Design and Product Data

6/27/2022

Proposal for Site Remedy

To: AEI Consultants
jfarber@aeiconsultants.com

June 27, 2022

From: Glenn Nicholas Iosue, P.E., BCEE Jake Price - Design Specialist
jprice@regenesis.com 610-655-5259

Subject: ***Preliminary Design and Cost Estimate Proposal for use of PersulfOx™***

Site: *4778 Broadway*
Manhattan, New York, New York

Treatment Unit Saturated Soil

Applicable Product	**Link(s) to view Product Information**
PersulfOx™	PersulfOx

Technical and Cost Summary

The following is a preliminary remedial design and cost estimate for the use of PersulfOx™ (PersulfOx) in situ chemical oxidation (ISCO) technology to treat petroleum hydrocarbons in groundwater and saturated soil at the above-referenced site. The treatment area(s) are shown on the attached treatment map with text boxes summarizing relevant information for the remedial design. Design assumptions and technical specifications regarding the proposed design are contained on the attached tables behind the map. The following table provides a summary of pertinent information pertaining to the treatment areas, basic design elements and product cost.

Treatment Unit	Treatment Surface Area (sq ft)	Treatment Thickness (ft)	Cubic Yards (cy)	Technology	# of inject points*	# of applications	Product Quantity (lbs)	Injection Volume (gals)	Product Cost**
Saturated Soil	4,200	6	933	**PersulfOx**	47	1	10,524	7,673	$27,047
							Estimated Tax and Freight	15%	$4,399
							Project Totals	***7,750***	***$33,723***

***Per application. **Tax and freight charges are estimated. Please contact Customer Service Department at 949-366-8000 for a shipping quote.**

Product Description and Use Rationale

PersulfOx is a catalyzed formulation of sodium persulfate ($Na_2S_2O_8$) engineered to oxidize organic contaminants in groundwater and soil while using a patented silica and silicate-based catalyst to optimize oxidative destruction of petroleum hydrocabons (PHCs) without the need for separate activiation chemistry. ORC Advanced supplies a controlled release of oxygen for 9-12 months in the target treatment zone to create and support the geochemical environment necessary for aerobic biodegradation of contaminants. Further technical specifications for these technologies are attached. The combined use of these technologies provides an ISCO to bio (i.e., aerobic biodegradation) sequential treatment resulting in relatively quick destruction of high mass PHCs and a sustained, controlled supply of oxygen to allow for further contaminant reductions.

Assumptions

In generating this design proposal Regenesis relied upon professional judgment and site specific information provided by others. Using this information as input, we performed calculations based upon known chemical and geologic relationships to generate an estimate of the mass of product and subsurface placement required to affect remediation of the site. The attached design summary tables specify the assumptions used in preparation of this technical design. We request that these modeling input assumptions be verified by your firm prior to application of PersulfOx.

REGENESIS developed this Scope of Work in reliance upon the data and professional judgments provided by those whom completed the earlier environmental site assessment(s). The fees and charges associated with the Scope of Work were generated through REGENESIS' proprietary formulas and thus may not conform to billing guidelines, constraints or other limits on fees. REGENESIS does not seek reimbursement directly from any government agency or any governmental reimbursement fund (the "Government"). In any circumstance where REGENESIS may serve as a supplier or subcontractor to an entity which seeks reimbursement from the Government for all or part of the services performed or products provided by REGENESIS, it is the sole responsibility of the entity seeking reimbursement to ensure the Scope of Work and associated charges are in compliance with and acceptable to the Government prior to submission. When serving as a supplier or subcontractor to an entity which seeks reimbursement from the Government, REGENESIS does not knowingly present or cause to be presented any claim for payment to the Government.

6/27/2022

Application Guidance

Almost all ISCO projects regardless of reagent require multiple injection events to deplete contaminant mass in high-concentration source areas. Multiple applications of chemical oxidants are typically required for two reasons: 1) high-concentration source areas typically contain too much contaminant mass to overcome with a single application of any oxidant, and 2) aquifers will "accept" a limited volume of fluid during a single injection event. This fluid volume limit (equivalent to 2-10% total porosity per event at most sites) is typically lower than the oxidant volume required to achieve adequate distribution and deliver a sufficient mass of oxidant to overcome contaminant demand. Testing of the fluid acceptance rates within the treatment zone, using clear water, may be necessary to confirm the per-point fluid injection rates proposed here.

PersulfOx is shipped as a dry powder to be mixed into water on site and applied in situ. It is an *all-in-one* product with a mildly alkaline pH and is safe and easy to use in comparison to alternative sodium persulfate ISCO products/approaches. We recommend this product be applied in situ, using a direct push technology (DPT) injection method. It is important that the materials be applied per the design, including material loading rates and injection point spacing specified, to the extent site conditions allow. In the table below are links to the PersulfOx MSDS and application instructions for details of safe handling and application. Regenesis can assist with further site-specific application design information as needed or, upon notification that our proposed remedy is chosen for implementation.

Application Method	Description	MSDS and Instructions	
Direct Push Injection	Direct push drilling rods are advanced to target depth. Reagent is injected through rods, evenly throughout the treatment zone.	MSDS	PersulfOx App Inst

Given the complexities associated with applications, it is recommended that a contractor with proven experience mixing and injecting the remediation products proposed for this project. As part of the selection process, it is suggested to question the application contractor on the following:

- Specific experience injecting the reagent proposed
- of the appropriate injection pump (type, pressure rating, flow rate, etc.)
- Use of in-line flow meters and pressure gauges
- In-line safety values for bleeding high pressure from injection lines
- Injection tooling for bottom up or top down application
- Other project specific tooling (i.e. air compressor)
- Distribution monitoring during injection

The contractor should provide a detailed log of field activities for the application process. This information is critical to the post-injection assessment of remediation performance across the site.

Performance Monitoring

Analyze for contaminants of concern prior to and after application of PersulfOx. In addition, for dissolved-phase plume treatment, we recommend sampling for the following field parameters both during application and post-application monitoring: pH, dissolved oxygen, oxidation-reduction potential and specific conductance. Note that obtaining field parameter measurements during application is useful for providing insight as to the distribution achieved at specific monitoring points.

Closing

Please feel free to contact me if you need additional information or have any questions regarding our evaluation and/or this correspondence (contact info provided above). I will be following up with you in the near future regarding this proposal. We appreciate the opportunity and thank you for considering Regenesis as your remedial solution provider for this project.

Project Information

4778 Broadway
New York, Manhattan, NY
Saturated Soil
Prepared For:
AEI Consultants

Target Treatment Zone (TTZ) Info	Unit	Value
Treatment Area	ft^2	4,200
Top Treat Depth	ft	14.0
Bot Treat Depth	ft	20.0
Vertical Treatment Interval	ft	6.0
Treatment Zone Volume	ft^3	25,200
Treatment Zone Volume	cy	933
Soil Type	---	silty sand
Porosity	cm^3/cm^3	0.40
Effective Porosity	cm^3/cm^3	0.20
Treatment Zone Pore Volume	gals	75,404
Treatment Zone Effective Pore Volume	gals	37,702
Fraction Organic Carbon (foc)	g/g	0.003
Soil Density	g/cm^3	1.6
Soil Density	lb/ft^3	100
Soil Weight	lbs	2.5E+06
Hydraulic Conductivity	ft/day	10.0
Hydraulic Conductivity	cm/sec	3.53E-03
Hydraulic Gradient	ft/ft	0.005
GW Velocity	ft/day	0.25
GW Velocity	ft/yr	91

Application Dosing

PersulfOx Required	**lbs**	**10,524**

PersulfOx® Application Design Summary

Saturated Soil	
Application Method	**Direct Push**
Spacing Within Rows (ft)	10
Spacing Between Rows (ft)	10
Injection Points (per app.)	**47**
Number of Applications	**1**
Areal Extent (square ft)	4,200
Top Application Depth (ft bgs)	14
Bottom Application Depth (ft bgs)	20
PersulfOx to be Applied (lbs)	**10,524**
PersulfOx Solution %	15%
Volume Water (gals)	**7,146**
Total Volume (gals)	**7,673**

Field App. Instructions

Field Mixing Ratios

Water per Pt per app (gals)	152
PersulfOx per Pt per app (lbs)	224
Total Volume per Pt per app (gals)	163

Per Application Totals

PersulfOx per app. (lbs)	*10,524*	*Volume per vertical ft (gals)*
Volume Water per app. (gals)	*7,146*	*27*
Total Volume per app. (gals)	*7,673*	

Technical Notes/Discussion

Assumptions/Qualifications

In generating this preliminary estimate, Regenesis relied upon professional judgment and site specific information provided by others. Using this information as input, we performed calculations based upon known chemical and geologic relationships to generate an estimate of the mass of product and subsurface placement required to affect remediation of the site.

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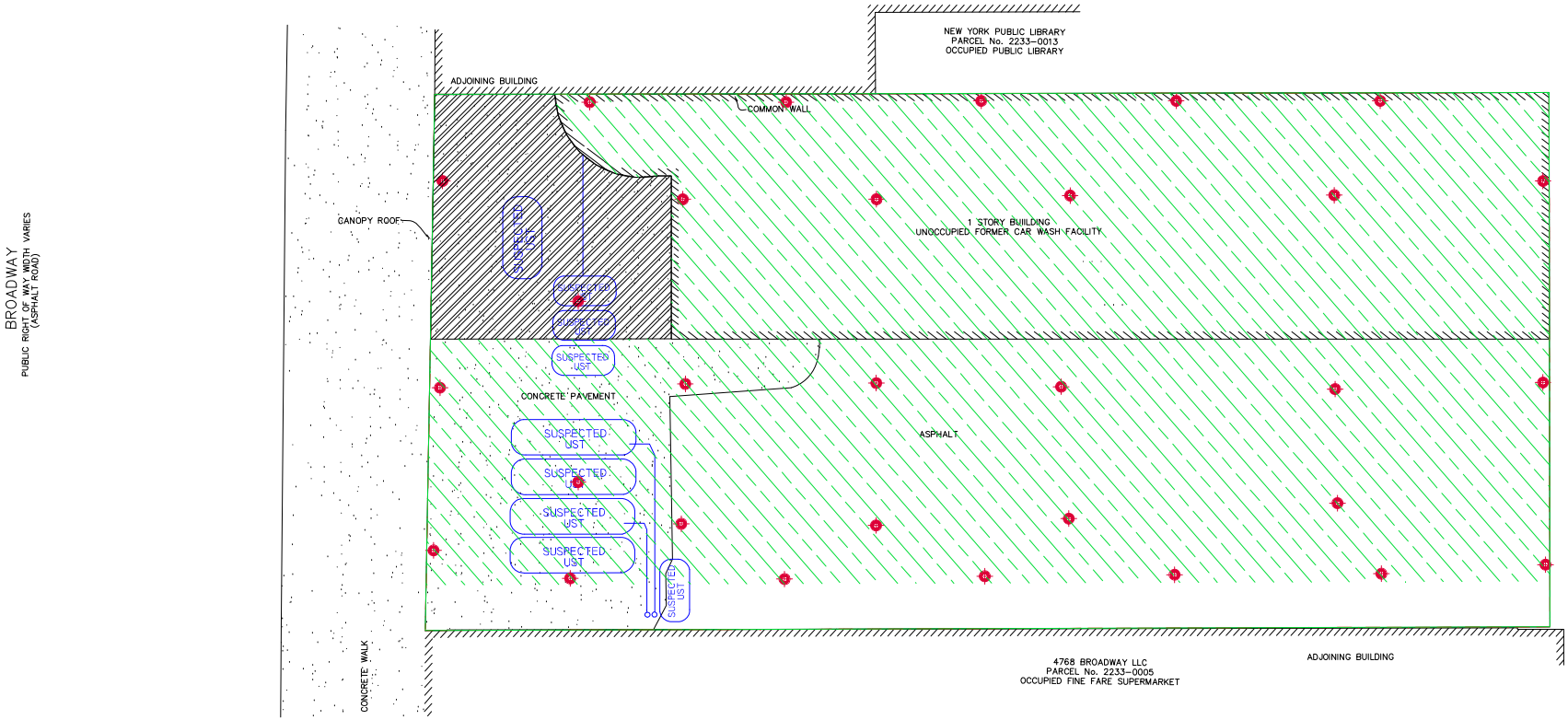
Prepared By: Jake Price - Design Specialist
Date: 6/27/2022

LEGEND

Proposed Post-Excavation Soil Sample

Area of Excavation

Site Boundary



GRAPHIC SCALE

0 16 32

(1 INCH = 16 FEET)

AEI Consultants	DRAWN BY: AC	REVIEWED BY: PC	Site Excavation and Post-Excavation Sample Location Map 4778 Broadway, New York, New York 10034	AEI Project #384736 BCP #C231131	FIGURE 11
	APPROVED BY: PC	Date: 12/11/2020			

PersulfOx® Technical Description

PersulfOx is an *In Situ* Chemical Oxidation (ISCO) reagent that destroys organic contaminants found in groundwater and soil through powerful, yet controlled, chemical reactions. A sodium persulfate-based technology (figure 1), PersulfOx employs a patented catalyst to enhance the oxidative destruction of both hydrocarbons and chlorinated contaminants in the subsurface.

Typically, sodium persulfate is activated with the addition of heat, chelated metals, hydrogen peroxide, or base in order to generate sulfate radicals. These activation processes are inherently complex, costly and can pose additional health and safety risks. In comparison, PersulfOx is a relatively safe and easy-to-use ISCO agent with a built-in catalyst which activates the persulfate component, generating contaminant-destroying free radicals without the need for the addition of a separate activator. The equation below shows the net complete oxidation of toluene, a constituent of gasoline, by PersulfOx:

Example of PersulfOx

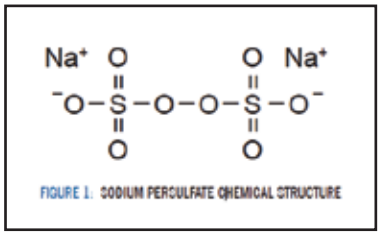


FIGURE 1: SODIUM PERSULFATE CHEMICAL STRUCTURE

For a list of treatable contaminants with the use of PersulfOx, view the Range of Treatable Contaminants Guide

Chemical Composition

- Sodium Persulfate - CAS #7775-27-1
- Sodium Silicate - CAS #1344-09-8

Properties

- pH - 7 to 11.5 at 25°C
- Appearance – White, free-flowing powder, clear to cloudy when mixed with water
- Odor – Not detectable
- Vapor Pressure – None
- Chemical Hazard Classification - Class 5.1 Oxidizer

Storage and Handling Guidelines

Storage
Store locked up
Keep away from heat
Store in a cool, dry place out of direct sunlight

Handling
Minimize dust generation and accumulation
Routine housekeeping should be instituted to ensure that dust does not accumulate on surfaces

PersulfOx® Technical Description

Storage (continued)
Store in original tightly closed container
Store in a well-ventilated place
Do not store near combustible materials
Store away from incompatible materials
Recommended to store at less than 40°C
Provide appropriate exhaust ventilation in places where dust is formed

Handling (continued)
Avoid mixing with combustibles
Avoid contamination
Keep away from clothing and other combustible materials
Wear appropriate personal protective equipment
Avoid breathing dust
Avoid contact with eyes, skin, and clothing
Avoid prolonged exposure
Do not taste or swallow
When using, do not eat, drink or smoke
Wear appropriate personal protective equipment
Wash hands thoroughly after handling
Observe good industrial hygiene practices

Applications

- PersulfOx is mixed with water at a rate of 5% to 20% prior to application.
- For most applications, REGENESIS suggests a 10-15% solution. The resulting mixture has viscosity similar to water.
- Injects into formation through direct push injection points, injection wells or other injection delivery systems.

Application instructions for this product are contained here PersulfOx Application Instructions.

Health and Safety

Material is relatively safe to handle; however, avoid contact with eyes, skin and clothing. OSHA Level D personal protection equipment including: vinyl or rubber gloves, eye protection, and dust mask are recommended when handling this product. Please review the Material Safety Data Sheet for additional storage, usage, and handling requirements here: PersulfOx SDS.

REGENESIS
1011 Calle Sombra
San Clemente, CA 92673-6244
Tel: 949.366.8000 • Fax: 949.366.8090

Terms and Conditions
Products and Services

1. PAYMENT TERMS. Net 30 Days. Accounts outstanding after 30 days will be assessed 1.5% monthly interest. Volume discount pricing will be rescinded on all accounts outstanding over 90 days. An early payment discount of 1.5% Net 10 is available for cash or check payments only. We accept Master Card, Visa and American Express.

2. **RETURN POLICY.** A 15% re-stocking fee will be charged for all returned goods. All requests to return product must be pre-approved by seller. Returned product must be in original condition and no product will be accepted for return after a period of 90 days.

3 FORCE MAJEURE. Seller shall not be liable for delays in delivery or services or failure to manufacture or deliver due to causes beyond its reasonable control, including but not limited to acts of God, acts of buyer, acts of military or civil authorities, fires, strikes, flood, epidemic, war, riot, delays in transportation or car shortages, or inability to obtain necessary labor, materials, components or services through seller's usual and regular sources at usual and regular prices. In any such event Seller may, without notice to buyer, at any time and from time to time, postpone the delivery or service dates under this contract or make partial delivery or performance or cancel all or any portion of this and any other contract with buyer without further liability to buyer. Cancellation of any part of this order shall not affect Seller's right to payment for any product delivered or service performed hereunder.

4. LIMITED WARRANTY. Seller warrants the product(s) sold and services provided as specified on face of invoice, solely to buyer. Seller makes no other warranty of any kind respecting the product and services, and expressly DISCLAIMS ALL OTHER WARRANTIES OF WHATEVER KIND RESPECTING THE PRODUCT AND SERVICES, INCLUDING ALL WARRANTIES OF MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSE AND NON-INFRINGEMENT.

5. DISCLAIMER. Where warranties to a person other than buyer may not be disclaimed under law, seller extends to such a person the same warranty seller makes to buyer as set forth herein, subject to all disclaimers, exclusions and limitations of warranties, all limitations of liability and all other provisions set forth in the Terms and Conditions herein. Buyer agrees to transmit a copy of the Terms and Conditions set forth herein to any and all persons to whom buyer sells, or otherwise furnishes the products and/or services provided buyer by seller and buyer agrees to indemnify seller for any liability, loss, costs and attorneys' fees which seller may incur by reason, in whole or in part, of failure by buyer to transmit the Terms and Conditions as provided herein.

6. LIMITATION OF SELLER'S LIABILITY AND LIMITATION OF BUYER'S REMEDY. Seller's liability on any claim of any kind, including negligence, for any loss or damage arising out of, connected with, or resulting from the manufacture, sale, delivery, resale, repair or use of any goods or performance of any services covered by or furnished hereunder, shall in no case exceed the lesser of (1) the cost of repairing or replacing goods and repeating the services failing to conform to the forgoing warranty or the price of the goods and/or services or part thereof which gives rise to the claim. IN NO EVENT SHALL SELLER BE LIABLE FOR SPECIAL INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING LOST PROFITS, OR FOR DAMAGES IN THE NATURE OF PENALTIES.

7. INDEMNIFICATION. Buyer agrees to defend and indemnify seller of and from any and all claims or liabilities asserted against seller in connection with the manufacture, sale, delivery, resale or repair or use of any goods, and performance of any services, covered by or furnished hereunder arising in whole or in part out of or by reason of the failure of buyer, its agents, servants, employees or customers to follow instructions, warnings or recommendations furnished by seller in connection with such goods and services, by reason of the failure of buyer, its agents, servants, employees or customers to comply with all federal, state and local laws applicable to such goods and services, or the use thereof, including the Occupational Safety and Health Act of 1970, or by reason of the negligence or misconduct of buyer, its agents, servants, employees or customers.

8. EXPENSES OF ENFORCEMENT. In the event seller undertakes any action to collect amounts due from buyer, or otherwise enforce its rights hereunder, Buyer agrees to pay and reimburse Seller for all such expenses, including, without limitation, all attorneys and collection fees.

9. TAXES. Liability for all taxes and import or export duties, imposed by any city, state, federal or other governmental authority, shall be assumed and paid by buyer. Buyer further agrees to defend and indemnify seller against any and all liabilities for such taxes or duties and legal fees or costs incurred by seller in connection therewith.

10. ASSISTANCE AND ADVICE. Upon request, seller in its discretion will furnish as an accommodation to buyer such technical advice or assistance as is available in reference to the goods and services. Seller assumes no obligation or liability for the advice or assistance given or results obtained, all such advice or assistance being given and accepted at buyer's risk.

11. SITE SAFETY. Buyer shall provide a safe working environment at the site of services and shall comply with all applicable provisions of federal, state, provincial and municipal safety laws, building codes, and safety regulations to prevent accidents or injuries to persons on, about or adjacent to the site.

12. INDEPENDENT CONTRACTOR. Seller and Buyer are independent contractors and nothing shall be construed to place them in the relationship of partners, principal and agent, employer/employee or joint ventures. Neither party will have the power or right to bind or obligate the other party except as may be expressly agreed and delegated by other party, nor will it hold itself out as having such authority.

13. REIMBURSEMENT. Seller shall provide the products and services in reliance upon the data and professional judgments provided by or on behalf of buyer. The fees and charges associated with the products and services thus may not conform to billing guidelines, constraints or other limits on fees. Seller does not seek reimbursement directly from any government agency or any governmental reimbursement fund (the "Government"). In any circumstance where seller may serve as a supplier or subcontractor to an entity which seeks reimbursement from the Government for all or part of the services performed or products provided by seller, it is the sole responsibility of the buyer or other entity seeking reimbursement to ensure the products and services and associated charges are in compliance with and acceptable to the Government prior to submission. When serving as a supplier or subcontractor to an entity which seeks reimbursement from the Government, seller does not knowingly present or cause to be presented any claim for payment to the Government.

14. APPLICABLE LAW/JURISDICTION AND VENUE. The rights and duties of the parties shall be governed by, construed, and enforced in accordance with the laws of the State of California (excluding its conflict of laws rules which would refer to and apply the substantive laws of another jurisdiction). Any suit or proceeding hereunder shall be brought exclusively in state or federal courts located in Orange County, California. Each party consents to the personal jurisdiction of said state and federal courts and waives any objection that such courts are an inconvenient forum.

15. ENTIRE AGREEMENT. This agreement constitutes the entire contract between buyer and seller relating to the goods or services identified herein. No modifications hereof shall be binding upon the seller unless in writing and signed by seller's duly authorized representative, and no modification shall be effected by seller's acknowledgment or acceptance of buyer's purchase order forms containing different provisions. Trade usage shall neither be applicable nor relevant to this agreement, nor be used in any manner whatsoever to explain, qualify or supplement any of the provisions hereof. No waiver by either party of default shall be deemed a waiver of any subsequent default.

Remedial Design Assumptions and Qualifications

Cost Estimate Disclaimer: The cost listed assumes conditions set forth within the proposed scope of work and assumptions and qualifications. Changes to either could impact the final cost of the project. This may include final shipping arrangements, sales tax or application related tasks such as product storage and handling, access to water, etc. If items listed need to be modified, please contact Regenesis for further evaluation.

Shipping Estimates: Shipping estimates are valid for 30 days. All shipping charges are estimates and actual freight charges are calculated at the time of invoice. Additional freight charges may be assessed for any accessorial requested at the time of delivery. The estimate included within assumes standard shipping.

Standard delivery is between 8am -5pm Monday –Friday. *accessorial – can include, but not limited to lift gate and pallet jack at delivery, inside delivery, time definite deliveries, and delivery appointments.

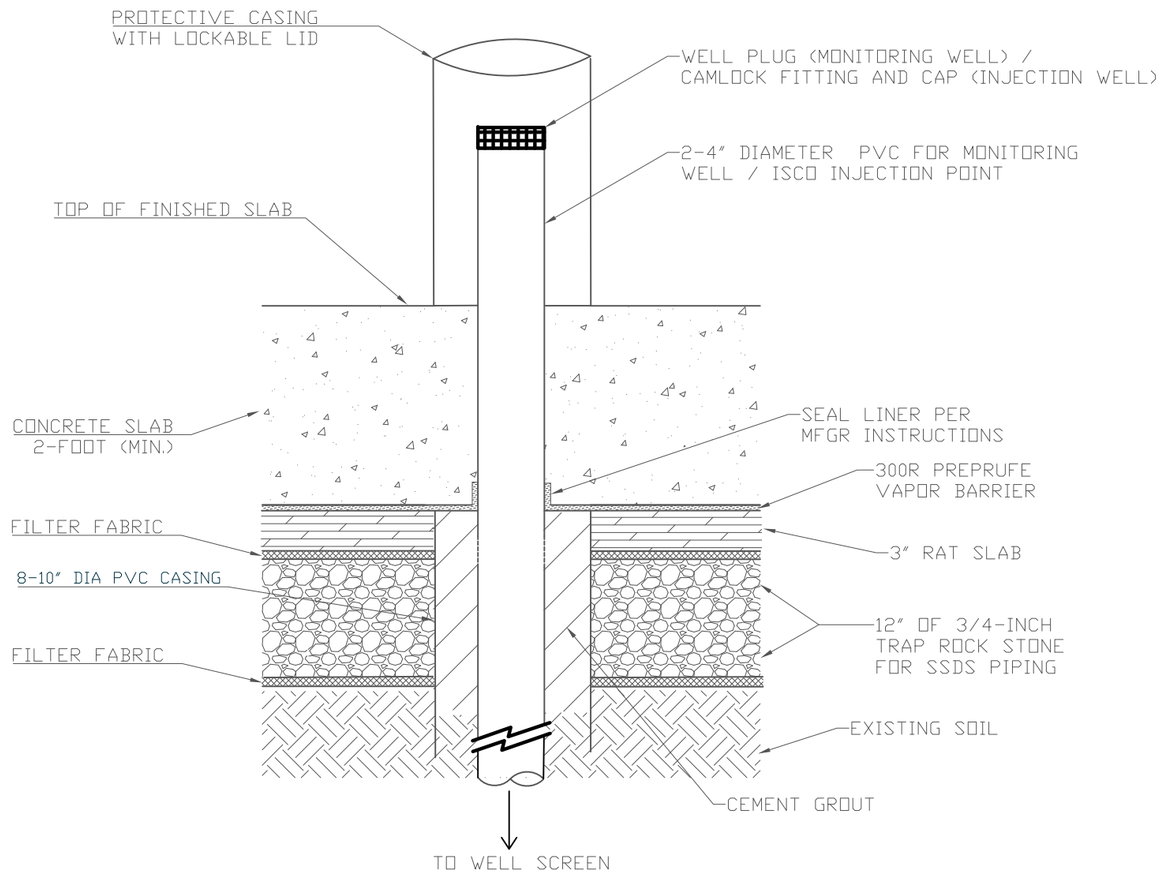
Please communicate any requirements for delivery with the customer service department at the time the order is placed.

Return Policy: To initiate a return please contact your local sales manager for an RMA. A 15% re-stocking fee will be charged for all returned goods. Return freight must be prepaid. All requests to return product must be in original condition and no product will be accepted for return after 90 days from date of delivery.

Professional Judgement: In generating this estimate, REGENESIS relied upon professional judgment and site specific information provided by others. Using this information as input, we performed calculations based upon known chemical and geologic relationships to generate an estimate of the mass of product and subsurface placement required to affect remediation of the site.

REGENESIS developed this Scope of Work in reliance upon the data and professional judgments provided by those whom completed the earlier environmental site assessment(s), and in reliance upon REGENESIS' prior experience on similar project sites. The fees and charges associated with the Scope of Work were generated through REGENESIS' proprietary formulas and thus may not conform to billing guidelines, constraints or other limits on fees. REGENESIS does not seek reimbursement directly from any government agency or any governmental reimbursement fund (the "Government"). In any circumstance where REGENESIS may serve as a supplier or subcontractor to an entity which seeks reimbursement from the Government for all or part of the services performed or products provided by REGENESIS, *it is the sole responsibility of the entity seeking reimbursement to ensure the Scope of Work and associated charges are in compliance with and acceptable to the Government prior to submission*. When serving as a supplier or subcontractor to an entity which seeks reimbursement from Government, REGENESIS does not knowingly present or cause to be presented any claim for payment to the government.

FIGURES



SCALE: N.T.S.

REMEDIATION ENGINEER:
HCS Civil & Environmental Engineering, LLC
169 UPPER VALLEY ROAD
WASHINGTON, MA 01223

STATE OF NEW YORK · PHILIP GERALD CLARK · 16 088422 · LICENSED PROFESSIONAL ENGINEER

DRAWN BY:
AC

APPROVED BY:
PG CLARK
8/16/2022

STANDARD DETAIL FOR MONITORING WELL/ ISCO INJECTION WELL SLAB PENETRATION

4778 Broadway,
New York, New York 10034

AEI Project #384736
BCP #C231131

FIGURE
1

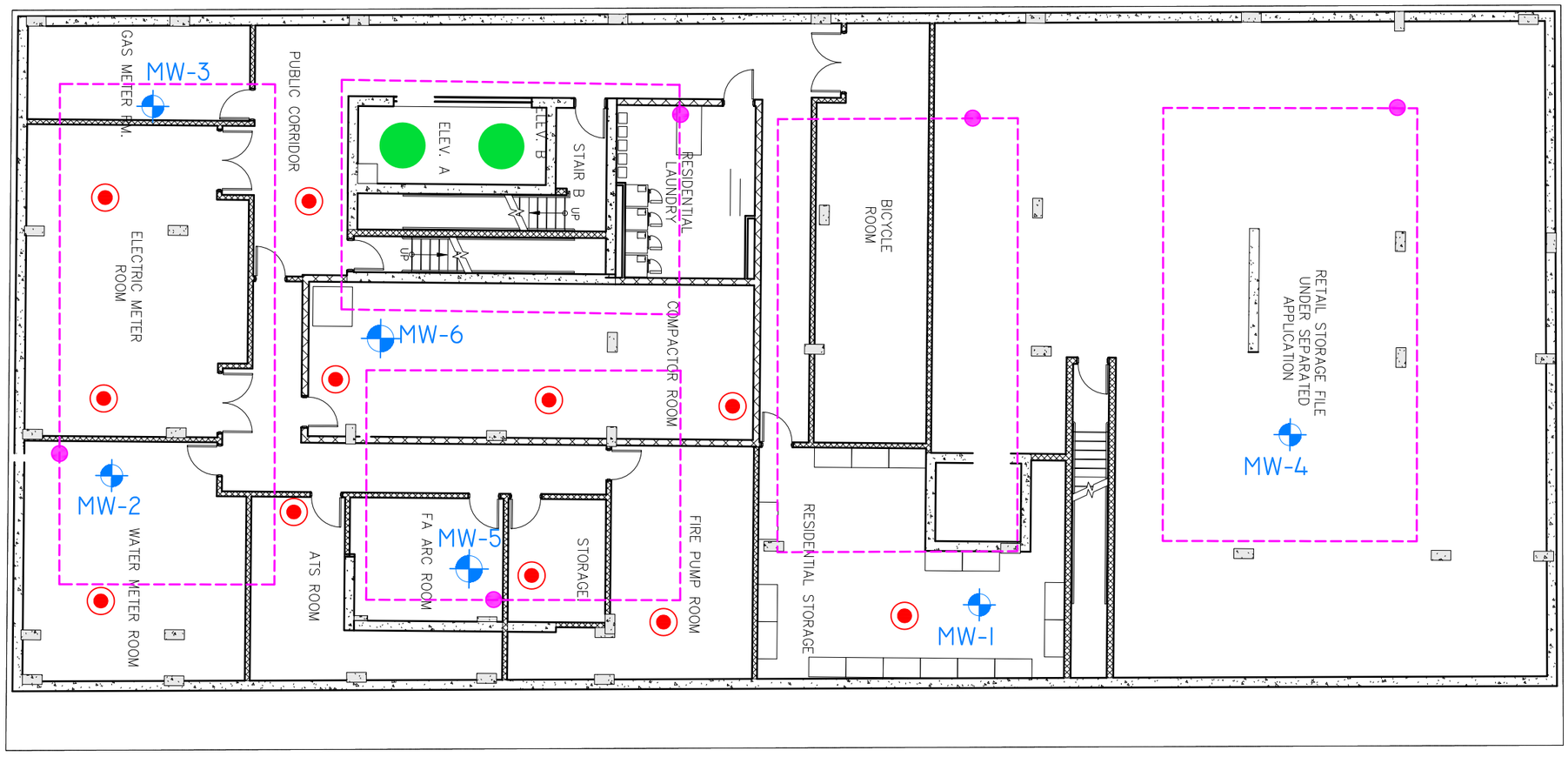
LEGEND

MW-3 PERMANENT MONITORING WELL

PROPOSED INJECTION WELL

PROPOSED TEMPORARY DEWATERING/RECOVERY SUMP

4" DIA PERFORATED SSDS VAPOR COLLECTION PIPE AND RISER



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WASHINGTON, MA 01223

STATE OF NEW YORK * PHILIP GERALD CLARK * LICENSED PROFESSIONAL ENGINEER 16 088422

GRAPHIC SCALE

0 16 32

(1 INCH = 16 FEET)

DRAWN BY: AC

APPROVED BY: PC 8/30/2022

REMEDIAL ACTION SITE PLAN (Rev. 3 August 29, 2022)

4778 Broadway,
New York, New York 10034

AEI Project #384736
NYSDEC Spill #1700751

FIGURE 2