AMC Engineering PLLC
18-36 42nd Street
Astoria, NY 11105
O: 718.545.0474

Date: March 17, 2025

Mr. Rafi Alam
Project Manager
New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway, Albany, New York 12233

Ref.: NYSDEC Site No. 241235
69-02 Queens Boulevard
Woodside, NY 11377
Slow-Release Oxygen Compound Work Plan

Dear Mr. Rafi,

AMC Engineering (AMC), on behalf of the property owner, is submitting the following Slow-Release Oxygen Compound Work Plan address the persistent presence of petroleum volatile organic compounds found in 20MW10, 20MW11R, and 19MW9 at the above referenced Site.

Previous Sampling Events
Based on the Sampling Report for the First, Second and Third Quarter of 2023, volatile organic compounds (VOCs) were detected above the New York State Ambient Water Quality Standards and Guidance Values in wells 20MW10, 20MW11R, and 19MW9.

Proposed Remedy to Monitoring Wells
The Work Plan to reduce the VOC concentrations in wells 20MW10, 20MW11R, and 19MW9 is proposed as follows:

1) Install 85" filter sock (Regenesis ORC Advanced® Filter Socks or equivalent) into 20MW10. Seven (7) 12" socks will be laced together to create a length of 85", which is approximately the column of water in 20MW10.
2) Install 72" filter sock (Regenesis ORC Advanced® Filter Socks or equivalent) into 20MW11R. Six (6) 12" socks will be laced together to create a length of 72", which is approximately the column of water in 20MW11R.
3) Install 72" filter sock (Regenesis ORC Advanced® Filter Socks or equivalent) into 19MW9. Six (6) 12" socks will be laced together to create a total length of 72", which is approximately the column of water in 19MW9.
4) Continue sampling 20MW10, 20MW11R, and 19MW9 on a quarterly basis to monitor VOC concentrations.
5) Based on sampling results, filter socks may be replaced as needed.

Regenesis ORC Advanced® Filter Socks are used to enhance bioremediation of petroleum hydrocarbons in groundwater. The filter sock contains ORC Advanced® and an inert carrier matrix. ORC Advanced® is an engineered, oxygen release compound designed specifically for enhanced, *in situ* aerobic bioremediation of petroleum hydrocarbons in groundwater and saturated soils. Upon contact with groundwater, this calcium peroxide-based material becomes hydrated

producing a controlled release of molecular oxygen (17% by weight) for periods of up to 12 months on a single application. The socks come in one-foot sections. They are laced together to vertically span the polluted saturated zone in monitoring wells. Once the socks are laced together and lowered into the wells, they become hydrated and begin releasing oxygen.

The ORC Advanced® design can be found in **Figure 2** as well as the **Specifications** attachment. ORC Advanced to be applied shall be 120-lbs per application point, which will be mixed with 129.4 gallons of water creating a 10% slurry. The total application volume will be 134.8 gallons. The treatment area will be 144 ft^2 per application point.

The start dates for the injection well installation and well connectivity survey are to be determined and will be scheduled following the approval of the Slow-Release Oxygen Compound Work Plan by the NYSDEC. Filter sock installation is anticipated 3-4 weeks after the approval, based on material availability and transportation. The start date for the injection program is to be determined and will be scheduled following the approval of the Work Plan by the NYSDEC. The wells will be sampled 1 month following the completion of the injections. Quarterly sampling will then resume 3- months following the completion of the injections.

Milestone	**Estimated Completion**
NYSDEC Comment Letter Received	October 22, 2024
Pre-Filter Sock Installation Sampling	**Conducted November 18, 2024**
Preparation & Resubmittal of Filter Sock Installation Plan	March 17, 2025
Begin Filter Sock Installation	3-4 weeks after plan approval
Post-Filter Sock Installation Check Well Sampling	1 month after Filter Sock installation
Quarterly Sampling	3 months after Filter Sock installation

The decision to replace the filter socks will be based on monitoring results and will be made in concurrence with the NYSDEC Project Manager.

Please contact me if you have any questions or require additional information regarding this Work Plan.

Sincerely,

Ariel Czemerinski, P.E.
AMC Engineering, PLLC

cc: Zachary Kadden, Madison Realty Capital
Shalom Silverman, Madison Realty Capital
Victoria Della Salla, Madison Realty Capital
Enclosures

Tables

Table 1: 2023-2024 Groundwater Sample Results

69-02 Queens Boulevard, Woodside, NY 11377

Compound	NYSDEC Groundwater Quality Standards	19MW9			20MW10			20MW11R		
		1Q24	2Q24	Pre-Injection	1Q24	2Q24	Pre-Injection	1Q24	2Q24	Pre-Injection
	µg/L	Results	Results	Results	Results	Results	Results	Results	Results	Results
1,1,1,2-Tetrachloroethane	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	5	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,1,2-Trichloroethane	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane	0.04	< 1.0	< 0.25	< 0.25	< 1.0	< 0.25	< 0.25	< 1.0	< 0.25	< 0.25
1,2,4-Trichlorobenzene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	2	**26**	**30**	**73**
1,2-Dibromo-3-chloropropane	0.04	< 1.0	< 0.50	< 0.50	< 1.0	< 0.50	< 0.50	< 1.0	< 0.50	< 0.50
1,2-Dibromoethane	0.0006	< 1.0	< 0.25	< 0.25	< 1.0	< 0.25	< 0.25	< 1.0	< 0.25	< 0.25
1,2-Dichlorobenzene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	0.6	< 0.60	< 0.60	< 0.60	< 0.60	< 0.60	< 0.60	< 0.60	< 0.60	< 0.60
1,2-Dichloropropane	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	3.8
1,3-Dichlorobenzene	3	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Hexanone	50	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
2-Isopropyltoluene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	2.1	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Methyl-2-pentanone		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Acetone	50	< 25	< 25	< 25	< 25	< 25	< 100	< 25	< 25	< 25
Acrolein	5	-	-	-	-	-	-	-	-	-
Acrylonitrile	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	1	< 0.70	< 0.70	< 0.70	< 0.70	< 0.70	**1.3**	< 0.70	< 0.70	< 0.70
Bromobenzene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromochloromethane	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bromoform	50	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Carbon Disulfide		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Carbon tetrachloride	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroform	7	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloromethane	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2-Dichloroethene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,3-Dichloropropene	0.4	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40
Dibromochloromethane	50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibromomethane	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dichlorodifluoromethane	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	**120**	**78**	**120**
Hexachlorobutadiene	0.5	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40
Isopropylbenzene	5	< 1.0	< 1.0	< 1.0	**5.1**	5	**15**	**5.1**	2.1	**5.3**
m&p-Xylene		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	16	16	98
Methyl ethyl ketone	50	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 100	< 5.0	< 5.0	< 5.0
Methyl t-butyl ether (MTBE)		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methylene chloride	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Naphthalene	10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	**20**	**19**	**30**
n-Butylbenzene	5	< 1.0	< 1.0	< 1.0	1.5	2.3	4.9	< 1.0	< 1.0	< 1.0
n-Propylbenzene	5	3.1	2	< 1.0	**20**	**23**	**71**	**11**	**13**	**11**
o-Xylene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1	< 1.0	4.6
p-Isopropyltoluene	5	< 1.0	< 1.0	< 1.0	< 1.0	1.2	2.9	< 1.0	< 1.0	< 1.0
sec-Butylbenzene	5	1.3	< 1.0	< 1.0	3.2	4.5	**9.9**	< 1.0	< 1.0	< 1.0
Styrene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
tert-Butylbenzene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrahydrofuran (THF)	50	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5
Toluene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Xylenes	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	**17**	**16**	**102.6**
trans-1,2-Dichloroethene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,3-Dichloropropene	0.4	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40
trans-1,4-dichloro-2-butene	5	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trichloroethene	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorotrifluoroethane	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl chloride	2	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
BTEX		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**1.30**	**137.00**	**94.00**	**222.60**
Total VOCs		**4.40**	**2.00**	**0.00**	**29.80**	**36.00**	**109.10**	**199.10**	**158.10**	**345.70**

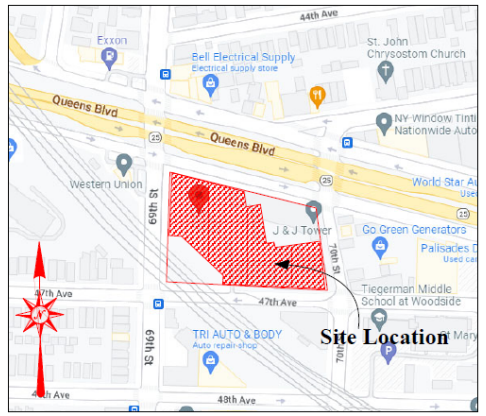
Results Detected

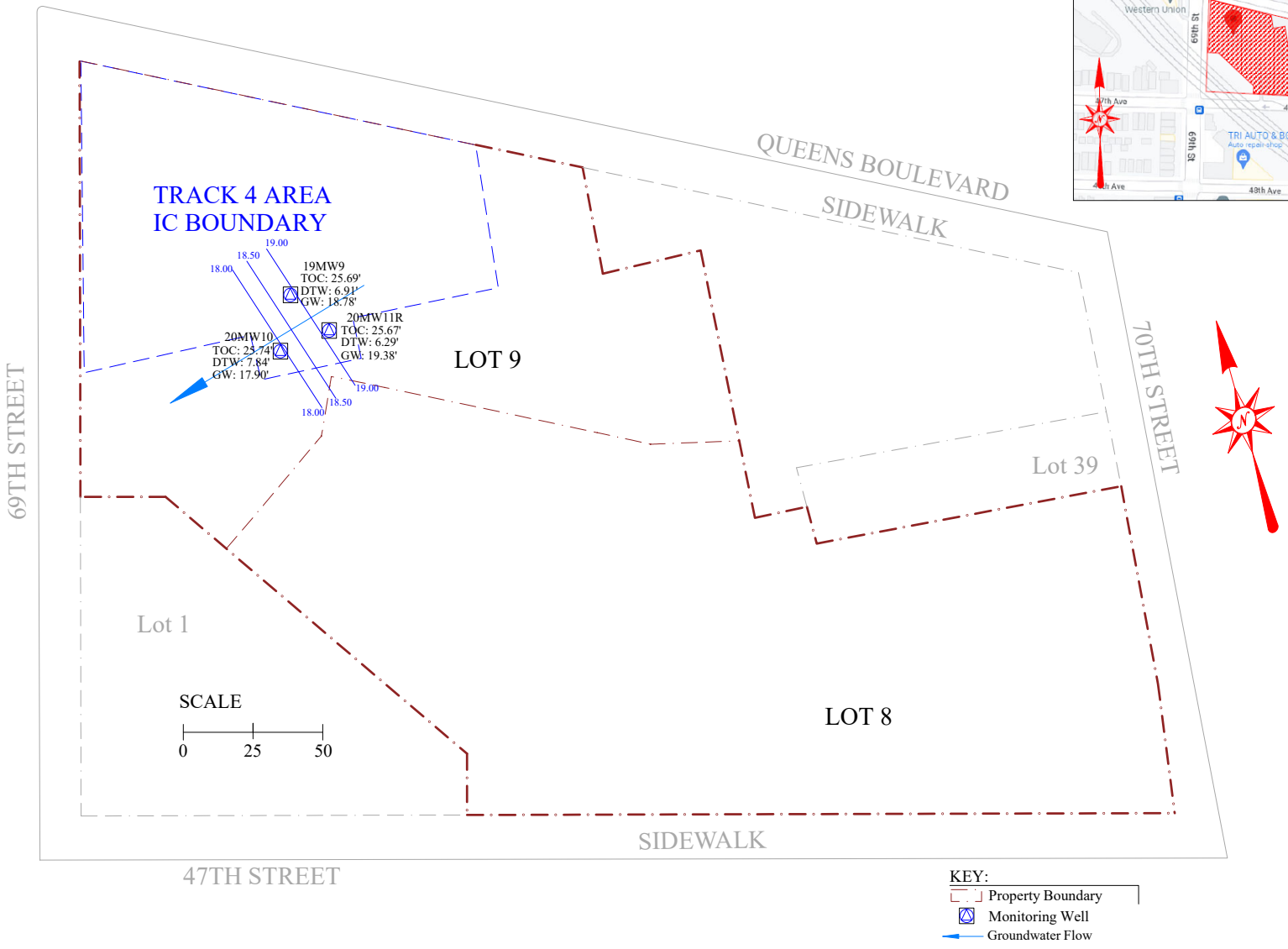
Results Exceeds Criteria

Table 2
Well Survey Data

Depth to Water Readings								
Well No.	Well Diameter (in)	Total Well Depth (ft)	Screened Interval (ft)	Survey Reading (ft)	DTW (ft) 07/24/2024	DTP	PT	GW ELV 07/24/2024
19MW9	2	13.7	4 to 14	27.41	6.05	-	-	21.36
20MW10	2	13	3 to 13	27.49	7.09	-	-	20.40
20MW11R	1	9	4 to 14	27.44	5.57	-	-	21.87

Figures

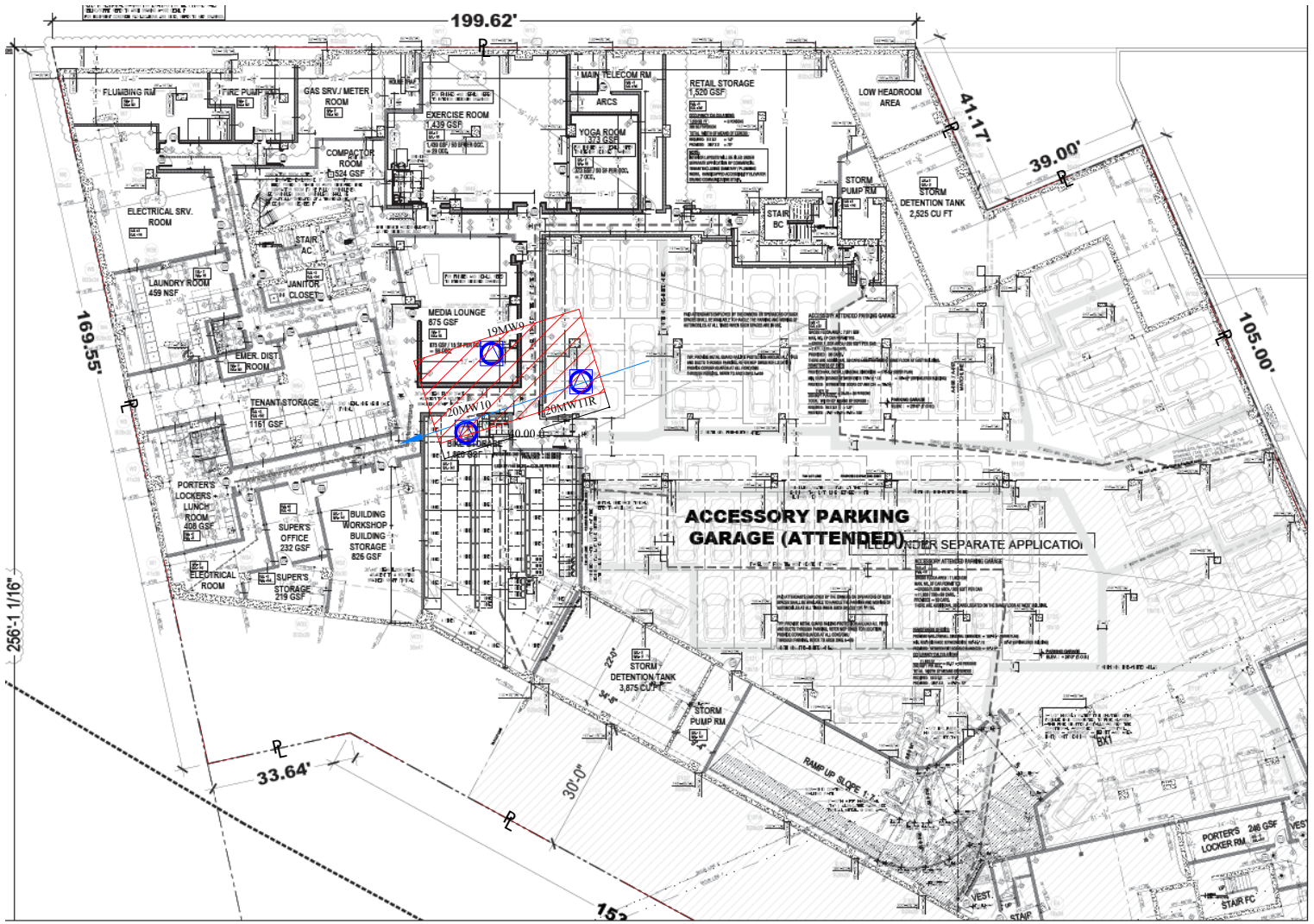


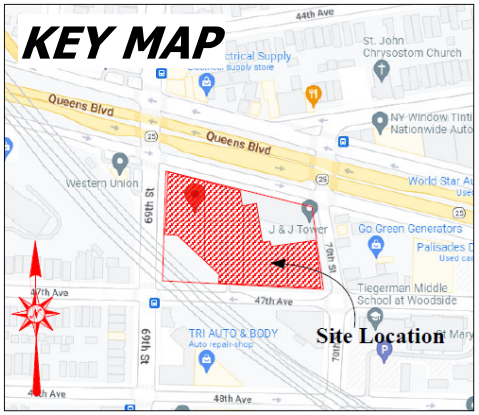


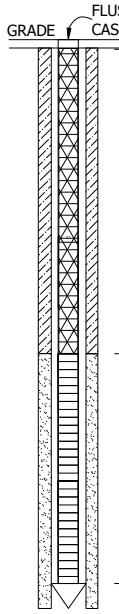
KEY:

- Property Boundary
- Monitoring Well
- Groundwater Flow

SEAL AND SIGNATURE	AMC ENGINEERING PLLC 18-36 42ND STREET ASTORIA, NY 11105 718-545-0474	PROJECT: 69-02 QUEENS BOULEVARD 49-06 60TH STREET/46-10 70TH STREET, WOODSIDE, NY
	DATE: 07/29/2024 DRAWING BY: JM	TITLE: FIGURE 1. GROUNDWATER CONTOUR



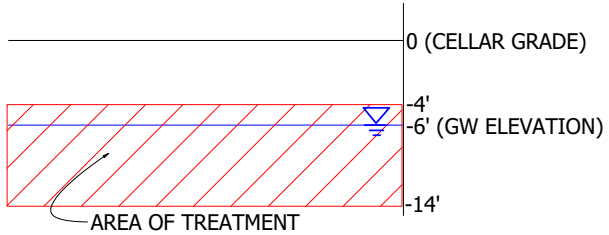




FILTER SOCK WELL DETAIL

LEGEND
- ORC-FILTER SOCK
- BENTONITE
- SANDPACK

LEGEND
- MONITORING WELL
- ORC-FILTER SOCK
- AREA OF TREATMENT
- GROUNDWATER FLOW DIRECTION



Treatment Elevation

SEAL AND SIGNATURE

AMC ENGINEERING PLLC
18-36 42ND STREET
ASTORIA, NY 11105
718-545-0474

PROJECT:
69-02 QUEENS BOULEVARD
49-06 60TH STREET/46-10 70TH STREET,
WOODSIDE, NY

DATE: 03/04/2025

DRAWING BY: AH

TITLE: Figure 2: Filter Sock Installation Plan

Specifications

REGENESIS

Project Info		
69-02 Queens Blvd		
Queens, NY		
20MW11R		
Prepared For:		
AMC Engineering		
Target Treatment Zone (TTZ) Info	**Unit**	**Value**
Treatment Area	ft^2	144
Top Treatment Depth	ft	4.0
Bottom Treatment Depth	ft	14.0
Vertical Treatment Interval	ft	10.0
Treatment Zone Volume	ft^3	1,440
Treatment Zone Volume	cy	53
Soil Type	---	silty sand
Porosity	cm^3/cm^3	0.40
Effective Porosity	cm^3/cm^3	0.20
Treatment Zone Pore Volume	gals	4,309
Treatment Zone Effective Pore Volume	gals	2,154
Soil Density	g/cm^3	1.6
Hydraulic Conductivity	ft/day	10.0
Hydraulic Gradient	ft/ft	0.005
GW Velocity	ft/yr	91

REGENESIS

Application Design Summary		
Application Method	-	**Direct Push**
Treatment Area	ft^2	144
Top Treatment Depth	ft. bgs	4.0
Bottom Treatment Depth	ft bgs	14.0
Spacing Within Rows	ft	10.0
Spacing Between Rows	ft	10.0
Application Points	-	**1**
ORC Advanced to be Applied	lbs	**120**
ORC Advanced per point	lbs	120.0
Percent Slurry	**%**	**10%**
Volume Water	gals	**129.4**
Volume ORC Advanced	gals	5.4
Total Application Volume	**gals**	**134.8**
Application Volume per Foot	gal/ft	13.48
Injection Volume per Point	gals	134.8

Application Dosing	Unit	Value
ORC Advanced to be Applied	**lbs**	**120**

Prepared By: Tyler Harris - Design Specialist

Date: 3/3/2025

ORC Advanced Technical Description

ORC Advanced® is an engineered, oxygen release compound designed specifically for enhanced, *in situ* aerobic bioremediation of petroleum hydrocarbons in ground-water and saturated soils. Upon contact with groundwater, this calcium peroxide based material becomes hydrated producing a controlled release of molecular oxygen (17% by weight) for periods of up to 12 months on a single application.

Example of ORC Advanced

ORC Advanced decreases time to site closure and accelerates degradation rates up to 100 times faster than natural degradation rates. A single ORC Advanced application can support aerobic biodegradation for up to 12 months with minimal site disturbance, no permanent or emplaced above ground equipment, piping, tanks, power sources, etc are needed. There is no operation or maintenance required. ORC Advanced provides lower costs, greater efficiency and reliability compared to engineered mechanical systems, oxygen emitters and bubblers.

ORC Advanced provides remediation practitioners with a significantly faster and highly effective means of treating petroleum contaminated sites. Petroleum hydrocarbon contamination is often associated with retail petroleum service stations resulting from leaking underground storage tanks, piping and dispensers. As a result, ORC Advanced technology and applications have been tailored around the remediation needs of the retail petroleum industry and include: tank pit excavations, amending and mixing with backfill, direct-injection, bore-hole backfill, ORC Advanced Pellets for waterless and dustless application, combined ISCO and bioremediation applications, etc. For a list of treatable contaminants with the use of ORC Advanced, view the Range of Treatable Contaminants Guide

Chemical Composition

- Calcium peroxide
- Calcium hydroxide
- Dipotassium phosphate
- Monopotassium phosphate

Properties

Physical State	Solid
Form	Powder
Color	White to pale yellow
Odor	Odorless
pH	12.5 (3% suspension/water)

Storage and Handling Guidelines

Storage

- Store in a cool, dry place out of direct sunlight
- Store in original tightly closed container
- Store in a well-ventilated place
- Do not store near combustible materials
- Store away from incompatible materials
- Provide appropriate exhaust ventilation in places where dust is formed

Handling

- Minimize dust generation and accumulation
- Keep away from heat
- Routine housekeeping should be instituted to ensure that dust does not accumulate on surfaces
- Observe good industrial hygiene practices
- Take precaution to avoid mixing with combustibles
- Keep away from clothing and other combustible materials
- Avoid contact with water and moisture
- Avoid contact with eyes, skin, and clothing
- Avoid prolonged exposure
- Wear appropriate personal protective equipment

Applications

- Slurry mixture direct-push injection through hollow rods or direct-placement into boreholes
- *In Situ* or *ex situ* slurry mixture into contaminated backfill or contaminated soils in general
- Slurry mixture injections in conjunction with chemical oxidants like RegenOx® or PersulfOx®
- Filter sock applications in groundwater for highly localized treatment
- *Ex Situ* biopiles

Health and Safety

Wash thoroughly after handling. Wear protective gloves, eye protection, and face protection. Please review the ORC Advanced Safety Data Sheet for additional storage, usage, and handling requirements.

REGENESIS

Oxygen Release Compound (ORC®) Installation Instructions

(Replaceable Filter-Sock Application)

ORC Filter Socks are used to enhance bioremediation of petroleum hydrocarbons in groundwater. The filter sock contains ORC and an inert carrier matrix. The socks come in one foot sections. They are laced together to span the vertical polluted saturated zone in monitoring type wells. Once the socks are laced together and lowered into the wells, they become hydrated and begin releasing oxygen. The following instructions are vital to proper installation and subsequent removal of the socks.

SAFETY PRECAUTIONS:

- ORC is completely non-toxic, but is composed of ultra-fine particles.
- Wear dust masks and goggles to prevent soft tissue irritation
- Reference the Material Safety Data Sheet for specific technical and physical information.

CONDITION OF SOURCE WELL:

- Test for well deviation and smoothness before ORC installation.
- For the test, use a 5 foot section of pipe with an outside diameter 1/2 inch smaller than the source well's inside diameter.

KEY REQUIREMENTS FOR INSTALLATION:

- **SOCKS MUST BE INSTALLED WITH BLACK GROMMETS ON TOP**
- Wrap Socks as independent units (see page 3, figure 5)
- A maximum of **20** ea. 2-inch socks per section.
- A maximum of **8** ea. 4-inch socks per section.
- A maximum of **6** ea. 6-inch socks per section.
- Make sure each sock is properly shaped (cylindrical and without bends) to facilitate ease of installation and removal.

HELPFUL HINTS:

- ORC matrix hardens into a cement once hydrated
- Minimize slack between each sock, by periodically pulling up slack while lacing
- Tie off ORC retrieval lines to the well cap. Regenesis recommends the use of a 3/8" diameter x 6" long eyebolt.

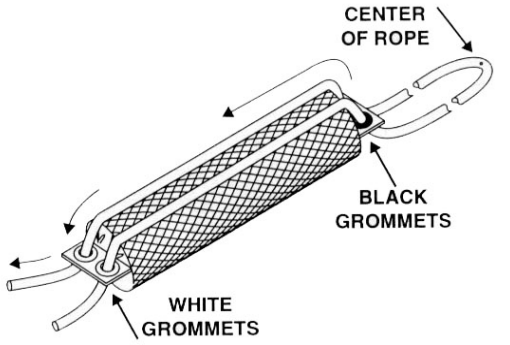
- The ORC Socks should be wetted to prevent excessive dusting prior to installation
- Make sure your work area is clean to avoid oil and dirt deposits on the socks.

FILTER-SOCK REMOVAL:

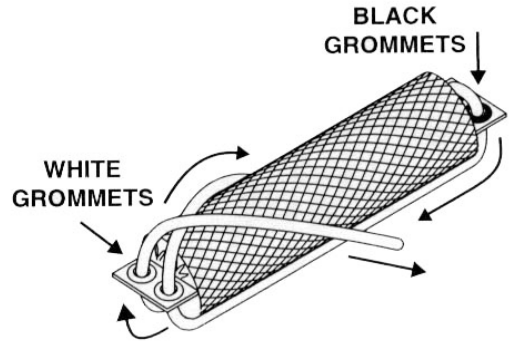
- ORC Socks will be approximately 20% heavier after water saturation
- Static friction from screened casing may cause difficulty in removal
- A winch and stanchion (or comparable equipment) may be necessary to help remove the socks due to increased weight, friction, etc.

LACING DIAGRAMS FOR SOCK INSTALLATION:

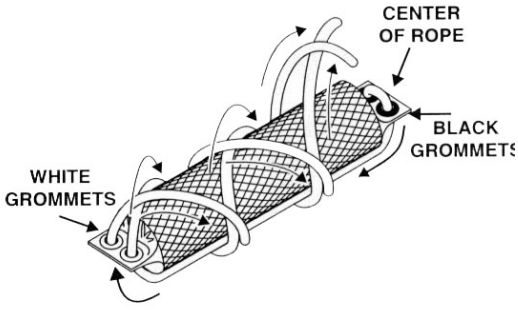
4 INCH AND 6 INCH SOCK LACING DIAGRAM:



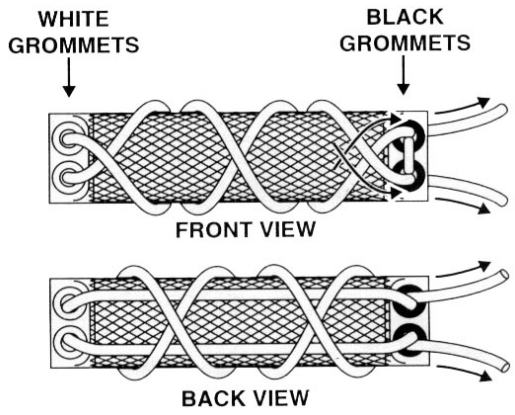
1. Find the center of the rope. Begin lacing the ORC Socks by threading the two ends of the installation rope through the black grommets and then through the white grommets at the bottom of the same side of the bottom sock



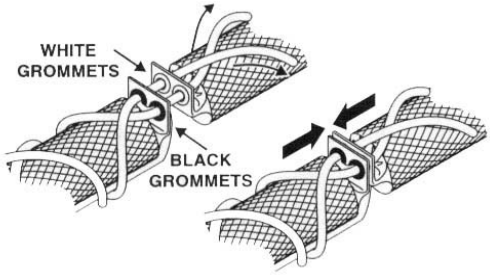
2. Pull the rope through the bottom sock, making sure the center of the rope is between the black grommets. Cross the ropes over each other.



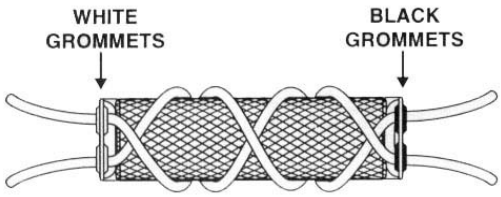
3. Loop the ends of the rope around the back of the sock and cross them. Repeat this step once again, so the rope is wrapped around the sock with two full turns.



4. Bring the ends of the rope around from the back, cross them, and thread them into the black grommets. The rope ends should be inserted into the black grommets diagonally from the white ones they started from. Threading the black grommets will be tight only on the bottom sock due to the unique lacing pattern.



5. To avoid the ORC Sock slipping past each other, the socks must be laced with the grommet flaps of the bottom sock and second sock butting against each other (as shown)

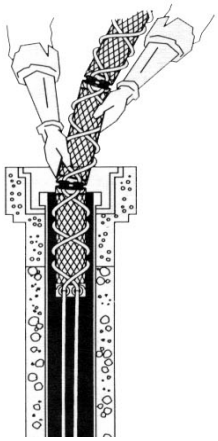


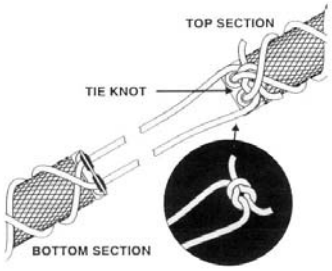
6. The remaining socks on the rope section are laced up according to Figure 6. Make sure that the rope is turned around the sock two full turns, with the grommets of each sock butting up against the next sock as shown in Figure 5.

7. Lace each subsequent ORC Sock exactly the same as in Figure 5 and 6.

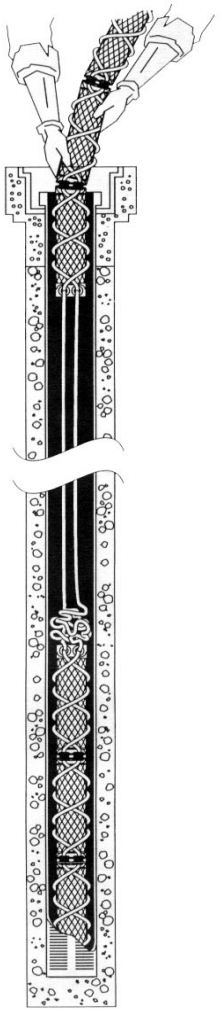
IMPORTANT: *Do not exceed the maximum number of socks per section (see "Key Requirements D & E" on page 1).*

Minimize the slack between the socks



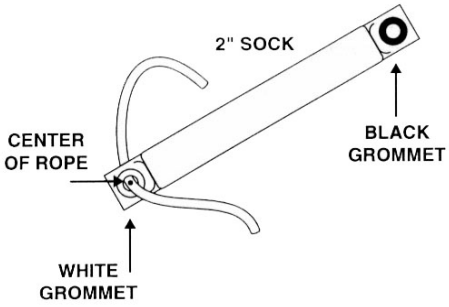


8. If you need to install more ORC Socks than the maximum allowed per well size (see "Key Requirements D & E on page 1), then multiple sections must be installed. Each section is laced exactly the same, but they should be tied off to each other. Tie the end of the rope from the lower section to the bottom sock of the upper section; this allows each section to be installed and removed independently (see well diagram)

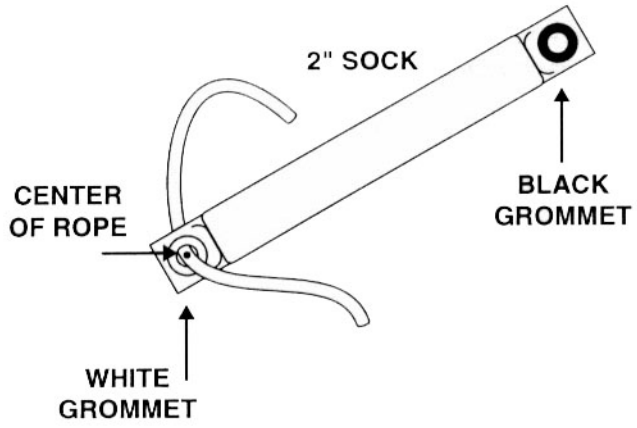


Well Diagram

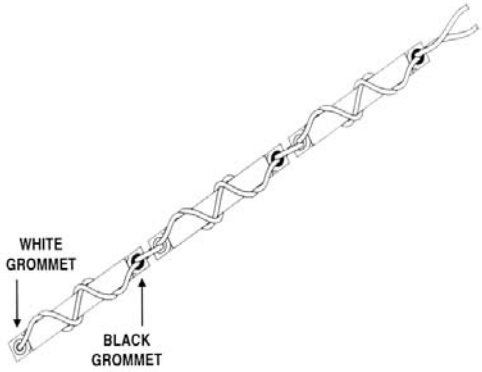
2 INCH SOCK LACING DIAGRAM:



9. Find the center of the rope. Begin lacing the ORC Socks by threading one end of the installation rope through the white grommet. Make sure that the center of the rope is pulled through to the center of the white grommet on the bottom sock.



10. Wrap each end of the installation rope around the sock twice and then cross them through the black grommet.



11. Lace each subsequent sock using the same method ad describe in Figure 2 above.

IMPORTANT:

Do not exceed the maximum number of socks per section (see "Key requirements B" on Page 1) Minimize the slack between socks

For direct assistance or answers to any questions you may have regarding these instructions, contact Regenesis Technical Services at 949-366-8000.

REGENESIS, 2002
www.regenesis.com

REGENESIS®

Range of Treatable Contaminants

REGENESIS®

Range of Treatable Contaminants

REGENESIS® Products have been used to effectively treat a broad range of contaminants from petroleum hydrocarbons, to chlorinated solvents, pesticides, and metals. Contact us to discuss the treatability of your contaminant of concern and site details so that we can recommend the most effective REGENESIS solution.

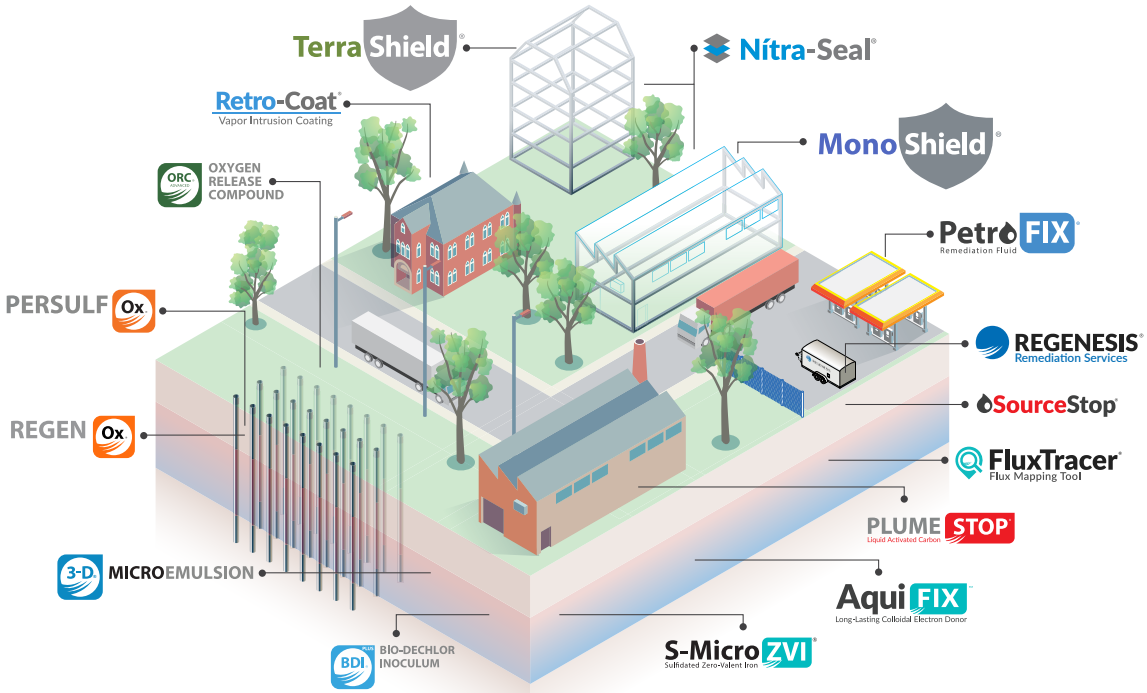
● = Contaminant treatable with REGENESIS Products

	Sorption			ISCO		Aerobic Bio	Anaerobic Bio			ISCR
Range of Treatable Contaminants	PlumeStop	SourceStop	PetroFix	RegenOx	PersulfOx	ORC Advanced	3DME	AquiFix	BDI Plus	S-MicroZVI
PFAS										
Perfluoroalkyl carboxylates (PFCAs)	●	●								
Perfluoroalkane sulfonates (PFSAs)	●	●								
Chlorinated Solvents										
Tetrachloroethylene (PCE)	●			●	●		●	●	●	●
Trichloroethene (TCE)	●			●	●		●	●	●	●
Dichloroethene (DCE)	●			●	●		●	●	●	●
Vinyl chloride (VC)	●			●	●	●	●	●	●	
Bis(2-chlorethoxy)methane	●			●	●		●	●		●
Bis(2-chloroethyl)ether	●			●	●		●	●		●
Carbon tetrachloride	●			●	●		●	●		●
Chloroethane	●			●	●	●	●	●		
Chloroform	●			●	●		●	●		●
Chloromethane	●			●	●		●	●		
Dichloroethane (DCA)	●			●	●	●	●	●	●	●*
Dichloropropane	●			●	●		●	●		
Dichloropropene	●			●	●		●	●		
Hexachlorobutadiene	●			●	●		●	●		●
Methylene chloride	●			●	●		●	●		
Tetrachloroethane	●			●	●		●	●	●	●
Trichloroethane (TCA)	●			●	●		●	●	●	●
Trichloropropane	●			●	●		●	●		
Petroleum Hydrocarbons										
Benzene	●		●	●	●	●				
Toluene	●		●	●	●	●				
Ethylbenzene	●		●	●	●	●				
Xylene	●		●	●	●	●				
Creosote (coal tar)	●		●	●	●	●				
Diesel range organics (DRO)	●		●	●	●	●				
Gasoline range organics (GRO)	●		●	●	●	●				
Oil range organics (ORO)	●		●	●	●	●				
Oxygenates										
Methyl tert butyl ether (MTBE)	●		●	●	●	●				
Tert-butyl alcohol (TBA)				●	●	●				

For additional questions or for a site review please call (949) 366-8000

	Sorption			ISCO		Aerobic Bio	Anaerobic Bio			ISCR
Range of Treatable Contaminants	PlumeStop	SourceStop	PetroFix	RegenOx	PersulfOx	ORC Advanced	3DME	AquiFix	BDI Plus	S-MicroZVI
Aromatics										
2-chlorophenol	●			●	●	●				
2,4-dichlorophenol	●			●	●	●				
2,4-dinitrophenol	●			●	●	●				
4-chloro-3-methyl phenol	●			●	●	●				
4-iso-propyltoluene	●			●	●	●				
4-nitrophenol	●			●	●	●				
Chlorobenzene	●			●	●	●				
Chlorotoluene	●			●	●	●	●	●		●
Dichlorobenzene	●			●	●	●				
N-butylbenzene	●			●	●	●				
Nitrobenzene	●			●	●	●				
Polycyclic aromatic hydrocarbons (PAHs)	●		●	●	●	●				
Pentachlorophenol	●				●	●	●	●		●
Phenol	●			●	●	●				
Propylbenzene	●			●	●	●				
Styrene	●			●	●	●				
Trichlorobenzene	●			●	●	●				
Trimethylbenzene	●			●	●	●				
Haloalkanes										
Dichlorodifluoromethane (Freon 12)	●						●	●		●
Trichlorofluoromethane (Freon 11)	●						●	●		●
Trichlorotrifluoroethane (Freon 113)	●						●	●		●
Pesticides and Herbicides										
2,4-D	●						●	●		●
2,4,5-T	●						●	●		●
Chlorodane	●						●	●		●
DDT, DDD, DDE	●						●	●		●
Dieldrin	●						●	●		●
Endrin	●						●	●		●
Heptachlor epoxide	●						●	●		●
Lindane (hexachlorocyclohexane)	●						●	●		●
Toxaphene	●						●	●		●
Energetics										
DNT	●			●			●	●		●
HMX	●			●			●	●		●
Nitroglycerine	●			●			●	●		●
RDX	●			●			●	●		●
TNT	●			●			●	●		●
Miscellaneous										
1,4-Dioxane					●					
4-methyl-2-pentanone	●			●	●	●				
Acetone	●			●	●	●				
Bis(2-ethylhexyl)phthalate	●			●	●	●				
Carbon disulfide (CS_2)				●	●		●	●		
Nitrates							●	●		●
Perchlorate							●	●		
Polychlorinated biphenyls (PCBs)	●						●	●		
Heavy Metals										
Chromium (VI)							●	●		●

Results will depend on specific site conditions, please discuss your site with a REGENESIS technical manager to determine which technology is most optimal for your site. The information provided is for guidance only. It is recommended that a pilot test or treatability study be performed to verify applicability to your specific contaminant and site conditions. REGENESIS makes no warranty or representation, expressed or inferred, and nothing herein should be construed as to guaranteeing actual results in field use, or permission or recommendation to infringe any patent.



PlumeStop® Liquid Activated Carbon™ is composed of very fine (1-2 micron-size) activated particles suspended in water through a unique, organic polymeric dispersion chemistry that resists clumping and allows permeation through aquifer materials. PlumeStop sorbs to the aquifer matrix soon after injection, rapidly removing contaminants from the groundwater to eliminate risk. It can be co-applied with electron donors, electron acceptors, or used as a stand-alone amendment to treat most organic groundwater contaminants.

SourceStop® prevents leaching of PFAS from soils and halts further migration in groundwater to eliminate the risk to downgradient receptors. Available in Liquid and Solid formulations, SourceStop's colloidal activated carbon (CAC) technology provides unsurpassed distribution, penetrating adn permanently coating impacted soils. Engineered for easy application, rapid results and long-term treatment, SourceStop is an adaptable and affordable solution for PFAS sites.

PetroFix® is a colloidal activated carbon technology used to remediate total petroleum hydrocarbons (TPHs) from contaminated environments. Petrofix uses a proprietary formula of activated carbon to adsorb total petroleum hydrocarbons. It then adds electron acceptors to stimulate hydrocarbon biodegradation.

RegenOx® is an *in situ* chemical oxidation (ISCO) reagent used to directly oxidize contaminants. Its unique catalytic component generates a range of highly oxidizing free radicals that rapidly and effectively destroy a range of target contaminants including both petroleum hydrocarbons and chlorinated compounds. RegenOx is an injectable, two-part ISCO reagent combining a solid sodium percarbonate based alkaline oxidant (Part A), with a liquid mixture of sodium silicates, silica gel and ferrous sulfate (Part B), resulting in a powerful contaminant destroying technology.

PersulfOx® is an advanced *in situ* chemical oxidation (ISCO) reagent that destroys organic contaminants found in groundwater and soil through abiotic chemical oxidation reactions. It is an all-in-one product with a built-in catalyst which activates the sodium persulfate component and generates contaminant-destroying free radicals without the costly and potentially hazardous addition of a separate activator.

ORC Advanced® is an engineered, oxygen-release compound developed for enhanced, *in situ* aerobic bioremediation of petroleum hydrocarbon contaminants in groundwater and saturated soils. Containing 17% by weight molecular oxygen, ORC Advanced provides a controlled release of molecular oxygen-an electron acceptor that optimizes microbial utilization in a treatment zone for up to 12 months post-application.

3-D Microemulsion® is an easy-to-apply remedial amendment for the *in situ* treatment of chlorinated solvent-contaminated aquifers. The patented technology, applied as a micellar suspension, provides a controlled, self-distributing hydrogen source to facilitate biologically mediated enhanced reductive dechlorination. 3-D Microemulsion's unique chemistry enables its distribution by naturally flowing groundwater while persisting for years after injection, resulting in much greater treatment coverage and faster degradation rates than other electron donor amendments.

AquiFix™ is a solid, colloidal remediation amendment for the *in situ* treatment of chlorinated solvent-contaminated aquifers, designed for direct mixing and co-application with PlumeStop. The novel formulation, patent-pending, includes a nutrient-enriched, solid-phase, fatty acid source that quickly establishes and sustains enhanced reductive dechlorination over long timeframes (e.g., ten years post-injection). AquiFix's optimized hydrogen release profile significantly improves remediation efficacy and reduces life-cycle costs to treat these contaminants.

BDI PLUS® (Bio-Dechlor INOCULUM Plus) is an enriched natural consortium containing *Dehalococcoides sp.* and other dechlorinating microbes for biologically augmenting enhanced reductive dechlorination remedies. Co-applied with electron donor amendments such as 3-D Microemulsion and AquiFix, BDI PLUS has proven to improve chlorinated solvent remediation efficiency.

S-MicroZVI® is a colloidal suspension of sulfidated zero-valent iron that promotes the destruction of a wide range of organic pollutants including chlorinated solvents, pesticides, haloalkanes and energetics. S-MicroZVI is engineered to promote rapid contamination degradation through multiple pathways which leads to faster cleanup while minimizing daughter product formation. Compared to larger particle size ZVI products, S-MicroZVI's 2-3 micron-sized particles, suspended in a proprietary polymer, make it easy to handle and simple to inject, leading to significantly better reagent distribution.

REGENESIS®
www.REGENESIS.com

Disposal Issues

Upon the completion of a ORC Filter Sock application (usually about six months), disposal of the product will need to be addressed. Under most conditions, it will be possible to simply dispose of the ORC Filter Socks in conventional dumpsters designated for a Class III landfill.

By the time it is removed from its wells, the product will have formed a weakly-cemented magnesium hydroxide and sand matrix. This is essentially a solid block of Milk of Magnesia and sand in a 50:50 ratio. The MSDS on magnesium hydroxide, as prepared by Morton Thiokol (a major chemical company), is clear that magnesium hydroxide is non-toxic and in fact is classified GRAS (Generally Recognized as Safe) for consumption. This is of course substantiated by its use as an anti-acid.

MSDS disposal requirements simply state that it be disposed of in a container and does not further clarify those requirements; presumably this could be a plastic trash bag. As is indicative of any MSDS you are always instructed to contact local, state or federal EPA offices for a final decreed disposal method. Recent discussions with state and local agencies in several states have resulted in concurrence that non-hazardous disposal is acceptable.

Alternately, one may consider a hardened ORC and sand matrix to be a form of concrete - which it is, just as calcium hydroxide and sand has been from the time of the Romans. The dumping of concrete generally does not have to meet MSDS requirements for the individual components, such as calcium oxide and calcium silicate.

With regard to landfill requirements, TCLP measurements on the product show extractable pHs ranging from 8.2 to 10.8, averaging 9.5. Even considering the highest value of 10.8, this pH is significantly below a value of 12.5 which would classify it as a corrosive material in accordance with the Code of Federal Regulations. ORC meets the criteria, beyond the corrosivity standard, for being a non-hazardous waste in that it is non-ignitable, non-reactive, and non-toxic.

TCLP also resulted in measured magnesium concentrations from 180-1,500 mg/L in an active extraction test. In a non-advective situation, the magnesium levels are essentially unchanged since the ORC is virtually insoluble and elevated concentrations can only exist in the vicinity of the well. Actual field data from the University of Waterloo indicates the concentration of magnesium in the vicinity of the well only elevate to a few ppm above background concentrations.

The only remaining issue, relative to a Class III disposal, is whether or not the ORC Filter Socks have absorbed minor amounts of the target hydrocarbons during exposure to contaminated groundwater. This, however, is highly unlikely

since the surface of the sock would be in a very highly oxygenated zone where remediation is maximal. Even if a sock was dissipated of oxygen, unless the socks are placed in wells with free product, it is highly it would have hydrocarbon concentrations higher than those of groundwater in the well from which they are removed. These levels would generally be insignificant once the sock is intended for solid waste disposal where the actionable standards are much higher. Furthermore, it is clear that if the spent material was exposed to the air it would soon dissipate or be further remediated since it would retain moisture for a period. Spent product set on a tarp and exposed to air would most likely allow ND to be reached in a short period assuming hazardous compounds were present to start.

Should the disposal requirements become more rigorous than Class III, it is probably easiest to simply dispose of the spent filter socks in drums, in a similar manner as PPE used at the site, at a cost of approximately $100 per 55 gallon drum. For each of the REGENESIS ORC Filter Sock products there are the following approximate unit disposal charges.

Filter Sock Size	Number / 55 Gallon Drum	Unit Disposal Cost
6-Inch Diameter	15 to 20	$3.75 to $5.00
4-Inch Diameter	45 to 60	$1.25 to $1.66
2-Inch Diameter	110 to 150	$0.50 to $0.66

In a typical scenario, 150 socks would be used in a barrier, and would be changed out twice a year. A total of 300 socks would therefore cost between $150 and $1500 per year for disposal depending on size, not including drum cost and labor for retrieval and handling.

DEC Correspondence

Outlook

RE: 69-02 Queens Blvd | C241235 | In-Situ Chemical Oxidation Injection Work Plan - Approval Letter

From Alam, Rafi S (DEC) <Rafi.Alam@dec.ny.gov>
Date Thu 2/27/2025 6:12 PM
To Ariel Czemerinski <ariel@amc-engineering.com>
Cc Anjeza Harrington <AnjezaH@amc-engineering.com>; Gorton, Lisa A (DEC) <Lisa.Gorton@dec.ny.gov>; Shalom Silverman <ssilverman@madisonrealtycapital.com>; Victoria Della Salla <vdellasalla@madisonrealtycapital.com>; Zachary Kadden <zkadden@madisonrealtycapital.com>; Minzloff, Ryan (HEALTH) <Ryan.Minzloff@health.ny.gov>

Hi Ariel,

The Department has reviewed the below request and, based on the current site conditions, approves the proposed use of slow-release chemical oxidant socks in the monitoring wells as an initial remedial measure. This method is expected to enhance contaminant oxidation within the groundwater system, supporting the site's remediation efforts.

However, if post groundwater monitoring data following the application of chemical oxidant socks indicates VOC exceedances and fails to meet the groundwater remedial action objectives, a more advanced remediation strategy, such as in-situ chemical oxidation (ISCO), will be necessary. In that case, the approved ISCO injection work plan, dated December 2024, must be implemented at the site.

Please provide a timeline for the application of the chemical oxidant socks in the monitoring wells. We look forward to reviewing the groundwater monitoring data in the upcoming Periodic Review Report (PRR).

RAFI ALAM *(he/him/his)*
Project Manager, Division of Environmental Remediation

New York State Department of Environmental Conservation
Division of Environmental Remediation | Bureau B, Section D
625 Broadway, Albany, NY 12233-4500
w: (518) 402-8606 | c: (518) 461-4085 | rafi.alam@dec.ny.gov
dec.ny.gov | @NYSDEC on Social Media | Podcast

From: Ariel Czemerinski <ariel@amc-engineering.com>
Sent: Tuesday, February 11, 2025 11:44 AM

To: Alam, Rafi S (DEC) <Rafi.Alam@dec.ny.gov>
Cc: Anjeza Harrington <AnjezaH@amc-engineering.com>; O'Connell, Jane H (DEC) <jane.oconnell@dec.ny.gov>; Shalom Silverman <ssilverman@madisonrealtycapital.com>; Victoria Della Salla <vdellasalla@madisonrealtycapital.com>; Zachary Kadden <zkadden@madisonrealtycapital.com>
Subject: Re: 69-02 Queens Blvd | C241235 | In-Situ Chemical Oxidation Injection Work Plan - Approval Letter

Hi Rafi,
Thanks for sending.

We have a similar project in which after a few years of monitoring GW, VOC levels, while low, persist. In that scenario, short of conducting ISCO, and in an effort to be more sustainable and at the suggestion of the Department, we are addressing the lingering contamination with the placement of slow release chemical oxidant socks in the monitoring wells.

The other site (3035 White Plans Rd) had an accessibility issue, since the well in question is on a sidewalk, between to a combined sewer and the building, and there is an elevated NYCT line on WPR which requires permits from NYCT to drill.

In our case, drilling for the new injection points results in hardship because of the thickness of the slabs (3ft and 4ft), and the damage to the Preprufe vapor barrier which will require professional repair (we will have to remove a section of the slab to repair the vapor barrier).

My apologies for not coming up with this approach before your review, but this approach was only recently suggested to us by the Department.

Please, let me know if it is something we can discuss.

thanks,
Ariel

Ariel Czemerinski, PE
AMC Engineering, PLLC
18-36 42 Street
Astoria, NY 11105
of 718 545-0474

From: Alam, Rafi S (DEC) <Rafi.Alam@dec.ny.gov>
Sent: Monday, February 3, 2025 5:29 PM
To: zkadden@madisonrealtycapital.com <zkadden@madisonrealtycapital.com>
Cc: Gorton, Lisa A (DEC) <Lisa.Gorton@dec.ny.gov>; Anjeza Harrington <AnjezaH@amc-engineering.com>; Ariel Czemerinski <ariel@amc-engineering.com>; McLaughlin, Scarlett E (HEALTH) <scarlett.mclaughlin@health.ny.gov>; Minzloff, Ryan (HEALTH) <Ryan.Minzloff@health.ny.gov>
Subject: 69-02 Queens Blvd | C241235 | In-Situ Chemical Oxidation Injection Work Plan - Approval Letter

Greetings,

Please find attached the approval Letter of the In-Situ Chemical Oxidation Injection Work Plan for the above referenced site.

Should you have any questions, please feel free to contact me.

RAFI ALAM *(he/him/his)*

Project Manager, Division of Environmental Remediation

New York State Department of Environmental Conservation

Division of Environmental Remediation | Bureau B, Section D

625 Broadway, Albany, NY 12233-4500

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