SESI
CONSULTING ENGINEERS

Zero Valent Iron Injection Workplan

For:

Centre Avenue Development – South
33 Centre Avenue
New Rochelle, Westchester County, New York
NYSDEC BCP Site # C360182

Prepared for:

Volunteer: RFMCH Huguenot Property Owner, LLC
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Project No. 12056

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CERTIFICATIONS

I, Fuad Dahan, certify that I am currently a NYS registered professional engineer as defined in 6 NYCRR Part 375 and that this Zero Valent Iron Injection Workplan was prepared in accordance with all applicable statutes and regulations.

090531	1/23/2023	
NYS Professional Engineer #	Date	Signature

It is a violation of Article 130 of New York State Education Law for any person to alter this document in any way without the express written verification of adoption by any New York State licensed engineer in accordance with Section 7209(2), Article 130, New York State Education Law.

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ATTACHMENTS

LIST OF ACRONYMS

Acronym	Definition
AWQS	Ambient Water Quality Standards
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
COC	Certificate of Completion
CVOCs	Chlorinated Volatile Organic Compounds
FSP	Field Sampling Plan
HASP	Health and Safety Plan
ISCO	In-Situ Chemical Oxidation
NYSDEC	New York State Department of Environmental
PFAS	Per- and poly-fluoroalkyl Substances
QAPP	Quality Assurance Project Plan
SESI	SESI Consulting Engineers, DPC
SMP	Site Management Plan
TCA	Trichloroethane
USEPA	United States Environmental Protection Agency
VOCs	Volatile Organic Compounds
ZVI	Zero Valent Iron

1.0 INTRODUCTION

The Zero Valent Iron (ZVI) Injection Workplan is an element of the remedial program for the Centre Avenue Development – South Site located at 33-35 Centre Avenue in New Rochelle, New York. The Site is currently in the New York State (NYS) Brownfield Cleanup Program (BCP), Site No. C360182 which is administered by the New York State Department of Environmental Conservation (NYSDEC).

Huguenot Partners, LLC entered into a Brownfield Cleanup Program (BCP) Agreement (BCA) with the NYSDEC on June 28, 2019. RFMCH Huguenot Property Owner, LLC, RFMCH Huguenot Development Partners LLC, Huguenot Centre Holdings LLC (collectively with Huguenot Partners LLC shall be hereinafter referred to as the "Volunteers") were added as additional volunteers to the BCA pursuant to a BCA Amendment executed on December 12, 2019. The Site received a certificate of completion (COC) in December 2021. The Site achieved a conditional Track 1 remedy with groundwater contamination. The proposed work in this document is governed by the approved Site Management Plan (SMP).

Prior to issuance of the COC, SESI Consulting Engineers (SESI) previously completed two (2) rounds of in-situ chemical oxidation (ISCO) treatments at the above-referenced BCP Site to reduce contaminant mass in the source area. SESI also installed an in-situ liquid activated carbon barrier (PlumeStop®) to prevent downgradient migration of the residual contaminants of concern including chlorinated volatile organic compounds (CVOCs), 1,4-dioxane, chromium, nickel and per- and polyfluoroalkyl substances (PFAS).

SESI has to date conducted seven (7) sampling rounds of all on-Site monitoring wells for volatile organic compounds (VOCs), PFAS, 1,4-dioxane, chromium and nickel. Four (4) sampling rounds were conducted prior to issuance of the COC in 2021, and three (3) sampling rounds have been conducted post-COC in 2022. The 4 sampling rounds in 2021 included one round before the first ISCO injection, one round post the first injection, one round post the second ISCO injection, and one round post-PlumeStop® injection. The groundwater sampling results are summarized in **Figure 1** of **Attachment A**, which exhibits all constituents that either formerly exceeded or currently exceed the NYSDEC Ambient Water Quality Standards (AWQS). The results indicate that 1,1,1-Trichloroethane (TCA) concentrations have decreased from a maximum concentration of 1,000,000 ppb in December 2019 to a maximum of 19,000 ppb in September 2022, which is a

98 percent reduction. Based on conversations with the NYSDEC in October 2022, quarterly sampling has ceased following the 3rd quarter of 2022 in anticipation of conducting additional treatment.

The ISCO has resulted in complete destruction of previously detected Toluene, and sharp reductions of 1,4 Dioxane in many wells. Post ISCO results show that some Chlorinated VOCs and metals (chromium, nickel) are remaining in the Site groundwater at levels that require further treatment. The ISCO treatment is no longer active since the persulfate oxidant injected has been spent through high-pH activation. Because the bulk of the remaining contamination in the source area consists of chlorinated VOCs and the metals nickel and chromium, an alternative technology can be implemented. SESI will use in-situ chemical reduction (ISCR), a long-lasting in-situ treatment method that involves the transfer of electrons from a reductant such as ZVI to a contaminant such as the main chlorinated VOC at this Site (1,1,1-TCA), whereby the molecule is converted to harmless compounds. ZVI has also been shown to treat certain metals. The oxidation of ZVI leads to the formation of various iron oxide species on the surface of the material, which can adsorb contaminants such as the cations of nickel and chromium metals present at this Site. Note that ISCR is a contingency remedy to be considered when the Site groundwater contaminants include only CVOCs per the approved Site remedial action work plan (RAWP) and the Site Decision Document. However, since ISCR can also be utilized to treat metal contamination including chromium and nickel cations, it will be used as the contingency remedy for long-term in-situ treatment of CVOCs and metals at this Site.

This ZVI Injection Workplan discusses the rationale, design, and post-injection groundwater sampling approach.

2.0 INJECTION RATIONALE

To further decrease CVOC and metal concentrations in the groundwater at the Site, SESI proposes to inject zero valent iron (ZVI). This ISCR treatment method involves the transfer of electrons from a reductant such as ZVI to a contaminant such as 1,1,1-TCA, whereby the molecule is converted to harmless compounds. SESI proposes to inject Höganäs/Cascade CleanER-iZVI, a highly engineered, directly injectable form of ZVI that is optimized for direct injection via DPT, injection wells, and other methods. CleanER-iZVI is optimized for placement in bedrock injection wells and formulated to promote broad dispersion in the subsurface at low injection pressures. The CleanER-ZVI family of products includes formulations for remediation of CVOCs, as well as removal of heavy metal contaminants such as metal cations chromium and nickel.

CleanER-iZVI delivers superior injectability and distribution through the combination of advanced metallurgy, advanced surfactant/dispersant chemistry, and advanced blending technologies, and is offered as a precisely blended liquid-suspension concentrate. Delivered as a neat product that is diluted on-site without clumping and other ZVI blending issues, CleanER-iZVI accelerates treatment and delivers multiple advantages for this Site including direct injection into the existing bedrock injection wells at sub-fracture pressures and rapid dispersion in the subsurface via the advanced surfactant/dispersant chemistry. This technology can be integrated as a combined remedy with other remediation chemistries and amendments to support anaerobic bioremediation or activated carbon sequestration, as is the case at this Site. CleanER-iZVI also fosters all the known benefits of ZVI biotic/abiotic reactions to rapidly accelerate treatment results such as up to two (2) years of persistence in the subsurface to overcome back diffusion issues.

□

3.0 INJECTION DESIGN

The design of the CleanER-iZVI injection plan was conducted in close cooperation with Cascade. Cascade's injection proposal is presented in **Attachment B**. A total of 3,083 lbs of CleanER-iZVI will be injected in 23 existing injection wells at a 0.9% by weight concentration. A total of 16,442 gallons of CleanER-iZVI solution is proposed to be injected. The injectant will be gravity-fed into the wells without using pressure. The injection well locations are depicted in **Figure 2** of **Attachment A**. Injection details are presented in a table in **Attachment C**.

4.0 POST-INJECTION GROUNDWATER SAMPLING

Following an appropriate time interval of no less than four (4) weeks post-injection, all existing monitoring wells will be sampled utilizing low-flow purging/sampling in accordance with United States Environmental Protection Agency (USEPA) low flow sampling procedures or 3-volume purging/sampling. Care will be taken to ensure that samples are collected with as low a turbidity as possible, which may entail additional well purging. The sampling results will be compared to the NYSDEC Ambient Water Quality Standards (AWQS) and provided to NYSDEC to discuss the next steps of the remedial program.

Following post-injection sampling, quarterly sampling will continue during 2023 per the monitoring plan detailed in the SMP.

5.0 GOVERNING DOCUMENTS

All field work will be conducted in accordance with the approved Site Management Plan (SMP) on file for the Site, which includes an appended Health and Safety Plan (HASP), Field Sampling Plan (FSP), and Quality Assurance Project Plan (QAPP).

Attachment A:

Figures

	MW-209S	MW-209S	MW-209S	MW-209S	MW-209S	MW-209S	MW-209S
	9/12/2020	8/3/2021	10/25/2021	11/29/2021	3/23/2022	6/6/2022	9/27/2022
ANALYTE	Conc	Conc	Conc	Conc	Conc	Conc	Conc
1,1-DCA	14J	ND	1.2	1.08	2	1.5	1.1
1,1,1-TCA	440	142	45	10.4	36.6	32	16
1,1-DCE	96	ND	0.84	ND	4.6	ND	ND
TCE	2,300	308	150	13.9	41.6	16	21
1,4-D	296	13.3	10	30.4	3.8	20.1	6.64
Ni	~	~	~	~	261	140.8	117.9
Cr	5.2	89.6	188.2	107	325	189.6	117.2
PFOA (ng/L)	47.4	28.7	26.4	10	19.3	10.7	9.6
PFOS (ng/L)	383	399	221	ND	214	46.3	133

	MW-209 D	MW-209 D	MW-209 D	MW-209 D	MW-209 D	MW-209 D	MW-209 D
	9/12/2020	8/3/2021	10/25/2021	11/29/2021	3/24/2022	6/6/2022	9/27/2022
ANALYTE	Conc	Conc	Conc	Conc	Conc	Conc	Conc
1,1-DCA	8.8	3.8	3.4	ND	ND	ND	ND
1,1,1-TCA	28	85.6	21	ND	3.1	12	1.5
1,1-DCE	53	8	0.99	ND	ND	ND	ND
TCE	700	81.5	38	ND	ND	0.29	0.22
1,1-DCE	53	8	0.99	ND	ND	ND	ND
Cr	~	~	~	~	ND	119.2	ND
Ni	8.4	94.1	699.1	222	23.7	102.1	14.7
1,4-Di	~	~	~	~	0.133	12	0.562
PFOA (ng/L)	29.4	24.5	20.8		1.7	9.63	ND
PFOS (ng/L)	193	98.9	80.5		34.6	9.17	ND

	MW-207DD	MW-207DD	MW-207DD	MW-207DD	MW-207DD	MW-207DD	MW-207DD
	2/12/2021	8/2/2021	10/27/2021	11/29/2021	3/23/2022	6/6/2022	9/26/2022
ANALYTE	Conc	Conc	Conc	Conc	Conc	Conc	Conc
1,1-DCA	120	250	180	72	54.4	8.2	ND
PCE	7	ND	44	2.99	2.5	1.8	ND
1,2-DCA	3.1	6.2	ND	3.83	1.5	ND	ND
1,1,1-TCA	3600	3910	5900	2630	772	890	1600
Toluene	16	14.5	ND	ND	ND	ND	ND
VC	2.5	ND	ND	ND	ND	ND	ND
1,1-DCE	240	212	16	ND	68.5	ND	ND
TCE	220	102	49	11.6	53.8	ND	2
1,4-D	29.5	4.76	2.77	2.67	5.05	0.259	0.238
PFOA (ng/L)	29.7	17.6	19.1	15	17.8	21.8	16.9
PFOS (ng/L)	168	96.3	74.7	105	110	148	135
Cr	~	~	~	~	~	58.27	55.8
Ni	~	~	~	~	~	786.9	987.6

	MW-206	MW-206	MW-206	MW-206	MW-206	MW-206	MW-206
	9/11/2020	8/3/2021	10/25/2021	11/29/2021	3/23/2022	6/6/2022	9/27/2022
ANALYTE	Conc	Conc	Conc	Conc	Conc	Conc	Conc
1,1,1-TCA	500	313	120	13.7	5.8	7.7	4
1,1-DCE	8.4	ND	2.4	ND	1.1	0.26	0.52
TCE	9.2	8.3	2	1.7	ND	0.42	0.57
1,4-D	1.25	0.1	0.135	ND	0.0559	0.343	0.206
Cr	~	~	~	~	125	17.04	1.74
Ni	63	347	107.6	130	103	163.5	133.8
PFOA (ng/L)	20.4	16.4	15.7	10	2.9	4.15	1.85
PFOS (ng/L)	88.1	50.4	38.9	ND	8.1	10.2	6

	MW-204	MW-204	MW-204	MW-204	MW-204	MW-204	MW-204
	9/15/2020	8/11/2021	10/26/2021	11/29/2021	3/23/2022	6/6/2022	9/27/2022
ANALYTE	Conc	Conc	Conc	Conc	Conc	Conc	Conc
1,1-DCA	12	4.5	1.5	57	1	0.91	ND
PCE		1.3	12	201	2.8	5.5	1.6
1,1,1 TCA	5.2	0.83	ND	ND	0.79	2.5	ND
1,1-DCE	7.5	ND	0.41	21	ND	0.25	0.77
Ni	1,179	12,500	876	1,690	869	563.1	554.5
PFOA (ng/L)	42.2	23.4	26.1	29.4	20.6	24	18.5
PFOS (ng/L)	166	55.3	56.9	60.8	52.3	62.6	45
1,4-Di	~	~	~	~	0.423	1.26	1.03

	MW-202	MW-202	MW-202	MW-202	MW-202	MW-202	MW-202
	9/9/2020	8/4/2021	10/27/2021	11/29/2021	3/25/2022	6/6/2022	9/26/2022
ANALYTE	Conc	Conc	Conc	Conc	Conc	Conc	Conc
Xylenes, total	22	2	0.84	ND	3.7	1.7	ND
PFOA (ng/L)	32.6	9	22.3	12.5	14.2	17.7	12.7
PFOS (ng/L)	104	1.8	70.2	53	64.2	62.4	63.8

STANDARDS

		NY-AWQS
ANALYTE	Sym bol	(ug/l)
1,1-Dichloroethane	1,1 DCA	5
Tetrachloroethene	PCE	5
1,2-Dichloroethane	1,2 DCA	0.6
1,1,1-Trichloroethane	1,1,1 TCA	5
Toluene	Toluene	5
Vinyl chloride	VC	2
1,1-Dichloroethene	1,1 DCE	5
trans-1,2-Dichloroethene	Trans-1,2 DCE	5
Trichloroethene	TCE	5
cis-1,2-Dichloroethene	cis01,2-DCE	5
p/m-Xylene	p/m-Xylene	5
o-Xylene	o-Xylene	5
Chloroform	Chloroform	7
Chromium, Total	Cr	50
Nickel, Total	Ni	100
1,4 Dioxane	1,4 D	1

	MW-210 DD	MW-210 DD	MW-210 DD	MW-210 DD	MW-210 DD	MW-210 DD	MW-210 DD
	2/12/2021	8/3/2021	10/25/2021	11/29/2021	3/24/2022	6/6/2022	9/26/2022
ANALYTE	Conc	Conc	Conc	Conc	Conc	Conc	Conc
1,1-DCA	360	280	260	13.1	ND	ND	3.6
1,2-DCA	9.1	ND	5.5	ND	ND	ND	ND
1,1,1-TCA	8,700	5,110	3,300	1,050	109	250	200
Toluene	37	ND	ND	ND	ND	ND	ND
VC	6.2	ND	4	ND	ND	ND	ND
1,1-DCE	420	645	16	1.85	ND	ND	ND
TCE	190	383	74	13.1	ND	0.43	ND
Cr	~	~	~	~	103	73	190.3
Ni	22.84	21.7	71.29	ND	<10	8.43	5.86
1,4-D	22.7	10.4	10.4	0.464	ND	0.134	0.154
PFOA (ng/L)	25.8	24.2	18.6	20.5	19.3	22.2	19.5
PFOS (ng/L)	164	255	10.4	153	110	105	139

	MW-214	MW-214	MW-214	MW-214	MW-214	MW-214	MW-214
	2/12/2021	8/4/2021	10/25/2021	11/24/2021	3/25/2022	6/7/2022	9/28/2022
ANALYTE	Conc	Conc	Conc	Conc	Conc	Conc	Conc
1,1-DCE	9.1	7.7	5.4	3.15	1.2	4.1	5.3
TCE	31	8.4	6.2	11.6	2.1	2.4	6.6
1,4-D	2.72	0.178	0.604	1.06	0.52	1.02	3.16
PFOA (ng/L)	22.4	20.1	20.2	ND	3.9	10	11.1
PFOS (ng/L)	46.9	34.6	28	ND	3.0	11.9	10.2

	MW-210 S	MW-210 S	MW-210 S	MW-210 S	MW-210 S	MW-210 S	MW-210 S
	9/15/2020	8/3/2021	10/26/2021	11/29/2021	3/24/2022	6/6/2022	9/26/2022
ANALYTE	Conc	Conc	Conc	Conc	Conc	Conc	Conc
1,1-DCA	62	119	98	ND	11.9	23	27
PCE	8.3	16.8	13	4.2	2.8	1.1	1
1,2-DCA	2.4	ND	ND	ND	ND	0.84	1.2
1,1,1-TCA	980	747	420	445	199	170	69
1,1-DCE	440	753	500	94	36	20	20
TCE	1,700	2,220	1,800	652	196	88	170
Xylene	~	~	~	~	6	ND	ND
1,4-D	240	75.3	308	322	37.3	157	138
Cr	~	~	~	~	1830	764.5	30.25
Ni	~	~	~	~	196	289.6	294.9
PFOA (ng/L)	53.9	53.2	49.6	42.6	10.9	17.8	16.7
PFOS (ng/L)	904	1860	1160	1620	361	186	645

	MW-210I	MW-210I	MW-210I	MW-210I	MW-210I	MW-210I	MW-210I
	9/15/2020	8/3/2021	10/26/2021	11/29/2021	3/24/2022	6/6/2022	9/26/2022
ANALYTE	Conc	Conc	Conc	Conc	Conc	Conc	Conc
1,1-DCA	180	55.3	89	32.3	37.6	39	50
PCE	15	6.8	6.8	1.71	3.9	2.8	3.7
1,2-DCA	6.3J	ND	3.1	0.99	1.6	1.1	1.3
1,1,1-TCA	4,200	329	1600	218	232	170	150
Toluene	24J	ND	8.7	0.67	ND	ND	ND
1,1-DCE	1200J	216	370	14.7	151	130	160
cis-1,2-DCE	ND	24.7	12	8.09	9.1	8.6	9
TCE	3,600	1,420	1100	486	1030	860	1000
Ni		89.9	182.1	114	281	249.2	265
1,4-D	294	53.9	168	391	37.2	168	159
PFOA (ng/L)	55.2	31.4	35.6	29.2	21.3	26.8	18.3
PFOS (ng/L)	558	601	448	542	358	429	331

	MW-210 D	MW-210 D	MW-210 D	MW-210 D	MW-210 D	MW-210 D	MW-210 D
	9/15/2020	8/3/2021	10/26/2021	11/29/2021	3/24/2022	6/6/2022	9/26/2022
ANALYTE	Conc	Conc	Conc	Conc	Conc	Conc	Conc
1,1-DCA	430	255	ND	1.01	ND	12	26
PCE	36	12.2	5.5	ND	ND	ND	0.59
1,2-DCA	22 J	6.3	ND	ND	ND	ND	1.2
1,1,1-TCA	12,000	3,160	700	236	228	300	270
Toluene	110	ND	ND	ND	ND	ND	ND
1,1-DCE	3,700	645	1.2	ND	ND	ND	ND
TCE	1,800	911	79	1.82	ND	5.1	84
1,4-D	151	41	0.865	ND	ND	3.71	11.4
Ni	~	~	~	~	1010	955.3	694.9
Cr	2.15	ND	533	5400	3600	1630	944.7
PFOA (ng/L)	63.6	41.6	30	28.1	21.7	22.4	17.6
PFOS (ng/L)	618	662	33.3	422	232	240	225

	MW-211DD	MW-211DD	MW-211DD	MW-211DD	MW-211DD	MW-211DD	MW-211DD
	2/12/2021	8/3/2021	10/25/2021	11/24/2021	3/25/2022	6/7/2022	9/28/2022
ANALYTE	Conc	Conc	Conc	Conc	Conc	Conc	Conc
1,1-DCA	42	20.5	21	20	7.1	6.7	2.7
1,1,1-TCA	440	7.9	95	40.8	9.6	5.4	2.2
Toluene	19	ND	ND	ND	ND	ND	ND
1,1-DCE	250	1.4	61	76.1	12.4	24	10
TCE	980	11.3	210	436	135	120	52
cis-1,2-DCE	13	5.1	5.1	10.5	3.7	4	2.5
1,2-DCA	ND	1.7	0.63	ND	ND	0.21	ND
Cr	143	ND	0.99	ND	ND	3.11	5.65
1,4-D	113	13.6	54.4	0.3	5.91	26.1	12.9
PFOA (ng/L)	42.4	27.6	30.3	22.8	21.4	21.6	11.2
PFOS (ng/L)	405	197	154	190	69.9	81.2	31

	MW-211D	MW-211D (R)	MW-211DR	MW-211DR	MW-211DR	MW-211DR	MW-211DR
	2/16/2021	8/3/2021	10/25/2021	11/24/2021	3/25/2022	6/7/2022	9/28/2022
ANALYTE	Conc	Conc	Conc	Conc	Conc	Conc	Conc
1,1-DCA	59	46.3	8.5	35.3	34.4	2.3	19
PCE	5.3	ND	2.7	1.36	ND	ND	ND
1,1,1-TCA	40	48	9.6	22.4	15.4	2	46
1,1-DCE	330	ND	20	167	158	11	61
TCE	2,600	48	230	890	859	75	320
cis-1,2-DCE	ND	25.5	4.5	17.6	16.3	1.5	12
1,4-D	326	36	43.1	3.040	42.8	63	111
PFOA (ng/L)	63.8	34.7	13.9	230	17.3	14.5	11.5
PFOS (ng/L)	526	478	175	18.3	181	185	121

	MW-212DD	MW-212DD	MW-212DD	MW-212DD	MW-212DD	MW-212DD	MW-212DD
	2/16/2021	8/3/2021	10/25/2021	11/24/2021	3/25/2022	6/7/2022	9/28/2022
ANALYTE	Conc	Conc	Conc	Conc	Conc	Conc	Conc
1,1-DCA	370	333	ND	1.67	20.8	26	ND
PCE	10	ND	ND	0.75	ND	0.58	ND
1,2-DCA	9.4	ND	ND	ND	ND	1.4	ND
1,1,1-TCA	10000	5790	1800	512	607	940	1000
Toluene	38	22.8	ND	ND	ND	ND	ND
VC	5.5	ND	ND	ND	ND	ND	ND
1,1-DCE	500	585	ND	ND	ND	ND	ND
TCE	450	358	6.6	2.5	ND	0.75	1.8
Cr	NS	ND	305.3	269	218	168.3	169.3
Ni	NS	ND	286.8	ND	ND	68.65	55.05
1,4-D	72.7	12.7	ND	0.3	0.0544	0.134	ND
PFOA (ng/L)	37.4	26.2	23.7	150	23.5	24.7	18.9
PFOS (ng/L)	369	292	210	19.4	149	158	124

	MW-207S	MW-207S	MW-207S	MW-207S	MW-207S	MW-207S	MW-207S
	9/15/2020	8/2/2021	10/27/2021	11/29/2021	3/23/2022	6/6/2022	9/26/2022
ANALYTE	Conc	Conc	Conc	Conc	Conc	Conc	Conc
1,1,1-TCA	140,000	37,000	7700	143	4720	32000	9900
1,1-DCE	1,600	ND	ND	ND	668	4.9	ND
TCE	520	ND	ND	ND	ND	48	63
Ni	419	<250	544.4	203	<10	4391	2137
Cr	86	292	1038	2850	282	1216	322
1,4-D	43.8	1.17	ND	ND	ND	7.17	16.8
PFOA (ng/L)	41.2	43	7.8	21.6	14.5	15.7	15.1
PFOS (ng/L)	292	381	14.4	118	68.3	75.1	121

	MW-207D	MW-207D	MW-207D	MW-207D	MW-207D	MW-207D	MW-207D
	9/15/2020	8/2/2021	10/27/2021	11/29/2021	3/23/2022	6/6/2022	9/26/2022
ANALYTE	Conc	Conc	Conc	Conc	Conc	Conc	Conc
Bromochloromethane	~	~	~	~	8.3	33	ND
Bromomethane					11.6	ND	ND
Chloromethane	~	~	~	~	64.3	ND	680
1,1-DCA	580	1010	250	ND	33.7	150	240
PCE	37	251	37	ND	ND	ND	ND
1,1,1-TCA	32,000	34,300	19000	1170	1580	4200	19000
Toluene	11.8	ND	ND	ND	ND	ND	ND
1,1-DCE	28,000	130	ND	ND	220	ND	ND
TCE	1000	ND	92	ND	27.5	83	38
Ni	314	1,920	199.1	144	1030	4319	2619
Cr	0.7	53.1	598	2500	1550	404.2	417.1
1,4-D	86.8	14	0.419	ND	0.396	36.3	19.5
PFOA (ng/L)	58.9	39.6	19.4	24.4	24	24.6	18.8
PFOS (ng/L)	437	339	94	203	190	271	130

	MW-208 S	MW-208 S	MW-208 S	MW-208 S	MW-208 S	MW-208 S	MW-208 S
	9/16/2020	8/4/2021	10/26/2021	11/29/2021	3/28/2022	6/7/2022	9/27/2022
ANALYTE	Conc	Conc	Conc	Conc	Conc	Conc	Conc
1,1-DCA	12	30.3	5.4	ND	ND	ND	ND
1,1,1-TCA	55	460	76	12.8	0.55	ND	170
1,1-DCE	9.4	ND	ND	ND	ND	ND	ND
TCE	13	7.4	0.48	ND	ND	0.19	ND
PCE	44	5.7	0.78	ND	ND	ND	ND
Cr	ND	857	743.7	506	436	32.64	12.6
Ni	727.8	359	34.28	11.8	25000	11330	13080
1,4-D	2.22	0.74	0.514	ND	0.0586	0.189	0.183
PFOA (ng/L)	44.2	44.2	45	55.8	ND	ND	ND
PFOS (ng/L)	174	247	472	494	ND	0.63	ND

	MW-208 D	MW-208 D	MW-208 D	MW-208 D	MW-208 D	MW-208 D	MW-208 D
	9/16/2020	8/4/2021	10/26/2021	11/29/2021	3/28/2022	6/7/2022	9/27/2022
ANALYTE	Conc	Conc	Conc	Conc	Conc	Conc	Conc
1,1-DCA	26	26.7	22	16.1	18.4	30	23
1,2-DCA	~	~	~	~	2.9	7.4	9.2
1,1,1-TCA	31	13.8	31	18.4	31.9	30	38
1,1-DCE	6.8	ND	0.51	ND	4.4	1	0.8
TCE	15	6.6	11	ND	2.9	3.1	2.5
Cr	1,945	185	264.2	313	159	37.16	1.97
Ni	4,472	ND	31.23	132	286	879.1	1714
1,4-D	8.08	1.07	2.54	1.33	0.54	2.47	2.16
PFOA (ng/L)	139	114	90.7	144	78.3	80.4	63.6
PFOS (ng/L)	579	359	389	478	460	446	356

	MW-213	MW-213	MW-213	MW-213	MW-213	MW-213	MW-213
	2/12/2021	8/3/2021	10/25/2021	11/24/2021	3/25/2022	6/7/2022	9/28/2022
ANALYTE	Conc	Conc	Conc	Conc	Conc	Conc	Conc
1,1-DCA	35	29	32	29.8	18.9	12	11
1,2-DCA	~	~	~	~	6	3.7	4.8
1,2-DCP	ND	ND	5.4	ND	2.1	1.1	1.2
1,1,2-TCA	2.9	47.7	3.2	ND	ND	0.7	ND
PCE	64	1.9	10	9.78	1.3	0.59	1.1
VC	5.9	ND	5.4	6.6	2.1	4.4	2.6
1,1-DCE	5.4	143	7	6.43	0.76	1.1	3.9
TCE	18	418	13	25.4	0.62	2.4	22
cis-1,2-DCE	8	7.8	12	16.7	2.9	3.6	4.9
Ni	20.43	2270	8245	8580	<100	33.26	28.01
1,4-D	4.2	1.6	13.2	0.3	5.73	16.6	12.9
PFOA (ng/L)	44.2	25.5	62	73.3	62.9	63	47.9
PFOS (ng/L)	212	385	310	544	369	262	284

	MW-205S	MW-205S	MW-205S	MW-205S	MW-205S	MW-205S	MW-205S
	9/17/2020	8/4/2021	10/27/2021	11/29/2021	3/28/2022	6/7/2022	9/27/2022
ANALYTE	Conc	Conc	Conc	Conc	Conc	Conc	Conc
PCE	170	1140	1900	ND	ND	ND	0.6
TCE	14	1.9	28	ND	ND	ND	ND
Xylenes, total	82	10.4	ND	ND	ND	ND	ND
Ni	409.1	691	2834	11800	6860	13320	6919
Cr	NS	135	145.4	37.6	14.5	0.31	0.65
1,4-D	7.62	1.47	ND	ND	ND	0.38	0.441
PFOA (ng/L)	233	46.7	142	NA	ND	ND	0.354
PFOS (ng/L)	758	21	365	NA	ND	ND	0.768

	MW-205D	MW-205D	MW-205D	MW-205D	MW-205D	MW-205D	MW-205D
	9/17/2020	8/4/2021	10/26/2021	11/29/2021	3/25/2022	6/7/2022	9/27/2022
ANALYTE	Conc	Conc	Conc	Conc	Conc	Conc	Conc
1,1-DCA	15	8.8	5.2	ND (<200)	ND	ND	ND
PCE	280	92.4	39	ND (<200)	ND	ND	ND
1,1,1-TCA	230	0.56	11	ND (<200)	ND	ND	2.7
1,1-DCE	15	ND	ND	ND (<200)	ND	ND	1.9
TCE	36	12.3	8.1	ND (<200)	ND	ND	ND
Nickel	1057	7940	12880	20700	10500	50920	47620
Cr	NS	270	116.2	275	<10	2.61	0.45
1,4-Dioxane	5.06	0.774	1.44	ND	ND	0.609	0.249
PFOA (ng/L)	55.2	37.3	90.3	NA	ND	0.248	ND
PFOS (ng/L)	250	17.3	668	NA	ND	ND	ND

	MW-203	MW-203	MW-203	MW-203	MW-203	MW-203	MW-203
	9/9/2020	8/4/2021	10/26/2021	11/29/2021	3/24/2022	6/7/2022	9/27/2022
ANALYTE	Conc	Conc	Conc	Conc	Conc	Conc	Conc
PFOA (ng/L)	35	8.2	32.8	30.7	26.4	12.8	26.6
PFOS (ng/L)	78.9	1.8	83.8	81.9	75.4	13	43

LEGEND:

- MW-201 — WELL INSTALLED DURING SRI
- 75'-70' — SCREEN INTERVAL ELEVATION IN FEET AMSL
- MW-9D — MONITORING WELL INSTALLED DURING RI NO LONGER EXISTS
- 2,400 — Exceeds NY-AWQS: New York TOGS 1.1.1 Ambient Water Quality Standards and NY-TOGS-GA: New York TOGS 1.1.1 Groundwater Effluent Limitations
- IW-1 65' — INJECTION WELL LOCATION AND TERMINAL INSTALLATION ELEVATION IN FEET AMSL
- NT or NA — NOT ANALYZED

Scale 1"=10'

0 5 10 20 30 40

Well Construction Details

Well Location	Grade Elevation (ft-amsl)	Well Screen Top-bottom Elevation (ft amsl)	Well Screen Depth (ft-bg)
MW-201	77	75-70	2-7
MW-202	77	72-67	5-10
MW-203	77	67-62	10-15
MW-204	77	60-55	17-22
MW-205S	89	72-67	17-22
MW-205D	89	65-60	24-29
MW-206	77	72-67	5-10
MW-207S	77	55-45	22-32
MW-207D	77	38-28	39-49
MW-207DD	77	20-10	57-67
MW-208S	91	62.5-57.5	28.5-33.5
MW-208D	91	50-40	41-51
MW-209S	77	67-62	10-15
MW-209D	77	58-48	19-29
MW-210S	77	60-55	17-22
MW-210I	77	43-39	34-38
MW-210D	77	34-29	43-48
MW-210DD	77	20-10	57-67
MW-211D	87.5	34-29	48.5-53.5
MW-211DD	87.5	20-10	67.5-77.5
MW-212DD	87.5	10-0	77.5-87.5
MW-213	92	59-49	33-43
MW-214	88	55-45	33-43

NOTES:

1. THIS PLAN IS FOR LOCATING WELLS ONLY. OTHER SITE WORK SHOWN HERE IS NOT INTENDED FOR CONSTRUCTION.
2. ALL CONCENTRATIONS ARE IN ug/L (ppb).
3. NY-AWQS: NEW YORK TOGS 111 AMVIENT WATER QUALITY STANDARDS CRITERIA REFLECTS ALL ADDENDUM TO CRITERIA THROUGH JUNE 2004
4. NY-TOGS-GA: NEW YORK TOGS 111 GOUNDWATER EFFLUENT LIMITATIONS CRITERIA REFLECTS ALL ADDENDUM TO CRITERIA THROUGH JUNE 2004.

REFERENCE

1. EXIST CONDITIONS & BOUNDARY ARE TAKEN FROM "BOUNDARY SURVEY OF LOTS 46 THRU 49 AND 60 THRU 63 INCL. MAP OR PROPERTY BELONGING TO MARIA R. LAWTON, DECEASED" PREPARED BY H2M ARCHITECTS AND ENGINEERS DATED SEPT. 28, 2018.

SESI CONSULTING ENGINEERS D.P.C.
SOILS / FOUNDATIONS
SITE DESIGN
ENVIRONMENTAL
959 ROUTE 46E, 3RD FLOOR, PARSIPPANY, N.J. 07054 PH: 973-808-9050

rev	date	description	by

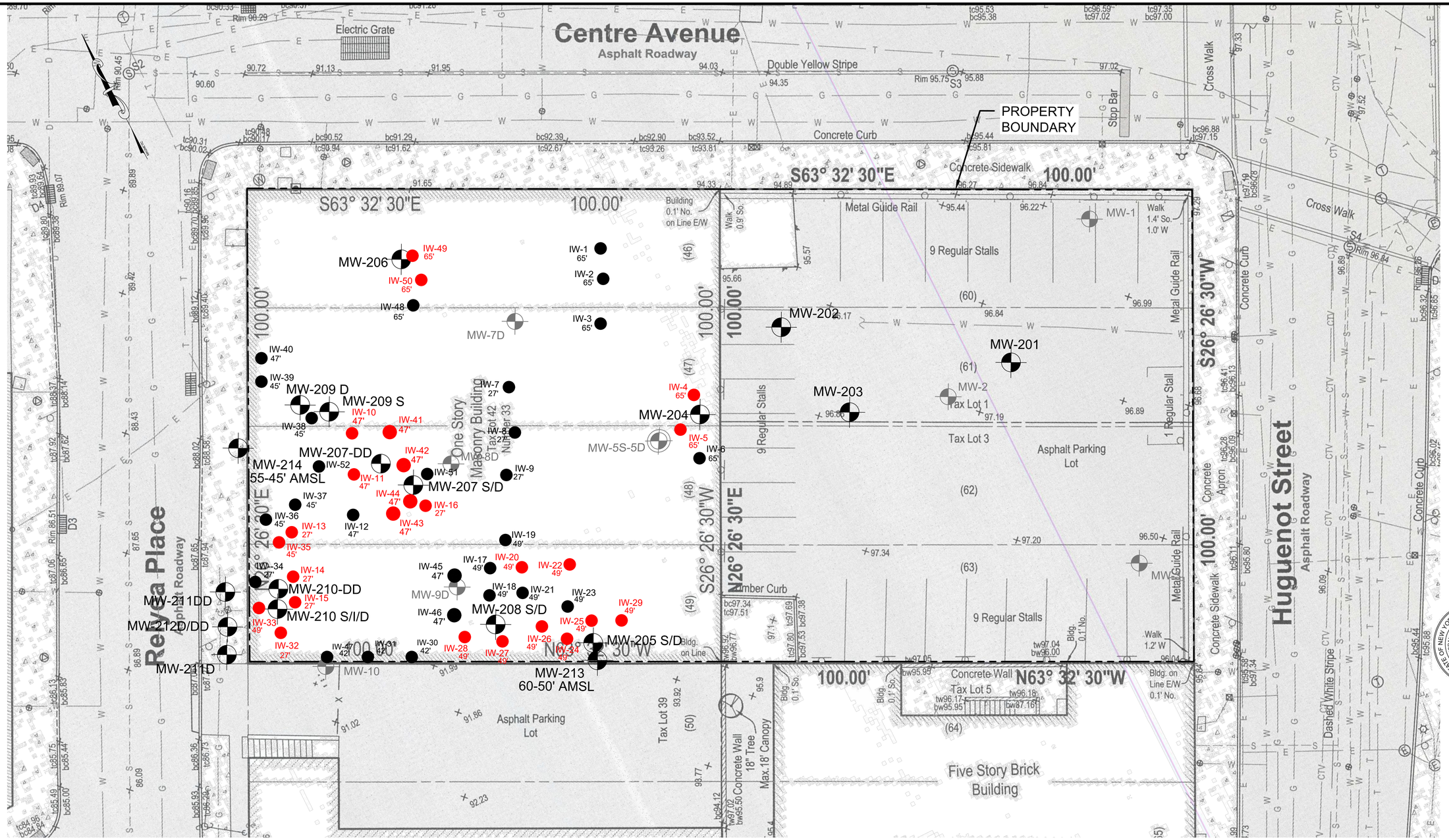
dwg by: aas
chk by: JAM
scale: AS NOTED
date: 11/22/2022

CENTRE AVENUE DEVELOPMENT - SOUTH
33 CENTRE AVENUE
SECTION NO. 2, BLOCK NO. 437 LOT 42
NEW ROCHELLE, NEW YORK

title: GROUNDWATER MONITORING - ALL RESULTS (SEPT 2022)

job no. 12383
drawing no. FIG-1

N:\ACAD\12383\CAD\12383.DWG.GROUNDWATER MONITORING WELL NETWORK.DWG 11/22/22 10:35:38AM, yelena.zolotova, LAYOUT:F-1



LEGEND:

- MW-201 - MONITORING WELL
- MW-9D - MONITORING WELL INSTALLED DURING RI
- IW-1 65 - INJECTION WELL LOCATION AND TERMINAL INSTALLATION ELEVATION IN FEET AMSL
- IW-13 27 - PLANNED ZVI INJECTION WELL

Scale 1"=10'

0 5 10 20 30 40

NOTES:

1. THIS PLAN IS FOR LOCATING WELLS ONLY. OTHER SITE WORK SHOWN HERE IS NOT INTENDED FOR CONSTRUCTION.
2. ALL CONCENTRATIONS ARE IN ug/L (ppb).
3. NY-AWQS: NEW YORK TOGS 111 AMVIENT WATER QUALITY STANDARDS CRITERIA REFLECTS ALL ADDENDUM TO CRITERIA THROUGH JUNE 2004
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rev	date	description	by

dwg by: sss
chk by: JAM
scale: AS NOTED
date: 12/15/2021

SESI CONSULTING ENGINEERS
SOILS / FOUNDATIONS
SITE DESIGN
ENVIRONMENTAL
12A MAPLE AVE. PINE BROOK, NJ. 07058 PH: 973-808-9050

FUAD DAHAN, P.E.
PROFESSIONAL ENGINEER
N.Y. LIC. NO. 90531

CENTRE AVENUE DEVELOPMENT - SOUTH
33-35 CENTRE AVENUE
NEW ROCHELLE, NEW YORK

drawing title:
ZVI INJECTION WELL LOCATION PLAN

job no. 10567
drawing no. FIG-2

1 of 1

Attachment B:

Cascade Injection Proposal

Optimized In Situ Remediation Solutions

CASCADE

Remediation Services

Hugenot Site
33 Centre Avenue
New Rochelle, New York

Prepared For
SESI
8/26/2022

www.cascade-env.com

TABLE OF CONTENTS

INTRODUCTION

Cascade Remediation Services (Cascade) is pleased to present this Proposal for remediation services to SESI (Client) at the Hugenot site located in New Rochelle, New York (Site). Cascade's proposal provides for an integrated turnkey solution supporting injection of CleanER iZVI including cost-effective options for remediation and schedule optimization.

Cascade's follows these best practices on all projects that we support through our turnkey services with or without Cascade Chemistries. The result is that regardless of site complexity, a positive remediation return on investment (RORI) can be achieved.

Project Schedule

Cascade will mobilize from our Jackson, New Jersey office and assumes 9-hours on site per day, Monday through Friday. We estimate the remediation scope will take approximately 7 days to complete (1 setup day, 1 breakdown day and 5 days of injection services).

We are prepared to mobilize four weeks from notice to proceed. Additional considerations for mobilization are dependent upon amendment lead times based on current supply chain conditions. Currently, the lead time to prepare the Cascade Chemistries is four to six weeks following execution of a negotiated contract or Notice to Proceed.

Project Understanding

Cascade understands the following components of the project.

Project Understanding	Site Specific Data	Comments
Remediation Objective	Remediation to achieve reduction in contaminants in Plume	
Contaminants of Concern	Primary: TCA	
Lithology/Hydrogeology	Bedrock	
Cascade Chemistry	CleanER iZVI	
Cascade Chemistry Selection Basis	Requested by Client to further polish remaining TCA concentrations.	

In addition to the Summary provided below, Cascade has also provided value-added services to ensure best RORI achievable. These include:

- Manifolding to save time and lower cost, while maintaining key injection parameters control.

SUMMARY OF WORK

Cascade will provide injection services to reduce contaminant concentrations in bedrock at the New Rochelle Site. Twenty-six installed injection wells will be used to deliver approximately 3,000 lbs of iZVI. Cascade will procure and coordinate delivery of selected amendment. Cascade will also handle amendment on site, and if required cascade will procure a hydrant permit for water.

Proposed Remediation Approach and Cost Summary

The estimated costs for injection services at the New Rochelle, NY site are provided below. These prices include the following: 1 day set up; 1 day breakdown; 5 days of field injection services, water hydrant permit, frac tank for water storage, project manager oversight; report submittal, per diems for the crew, etc. If some of these items are not needed (frac tank, hydrant permit, etc); Cascade can revise costs for SESI.

Due to the volatile pricing environment, taxes and delivery costs are TBD.

SESI						
Center Avenue Development						
New Rochelle, NY						
Colloidal ZVI Chemical Reduction						
Date:	8/26/2022			Prepared By	Eliot	
Budget Estimate						
Treatment Zone						
			Unit	**Value**	Comments	
Treatment Interval Avg.			ft	30	Well average	
Application Type			type	Grid		
Injection						
			Unit	**Total**		
Locations			#	26	Wells	
Total Gallons Injected			gallons	16442	2x ISCO Volume since iZVI won't distribute post injection	
wt% iZVI injected			%	0.9%	recommended injection well dose	
Total Manifolded Injection Rate			gpm	12	4 simultaneous wells	
Injection Days			days	5		
Quantity and Cost						
CleanER-iZVI						
			Units	Total		Price
Total (No tax and shipping)			lbs	3083		$27,747
Total Injection						
			Units	Total		Price
Total			Days	7		$37,305
Total Injection and iZVI						
					Total	**$ 65,052**

Reporting

Cascade will provide in an Excel format, a daily summary of injection volumes per interval, measured pressures and flows at each of the injection locations. At the completion of the project, the field logs and relevant field notes will be reviewed and evaluated for quality and accuracy prior to the submittal of a final injection report, which will include:

- Location of each borehole
- Volume and depth interval of the solutions applied to each injection location
- Collected data for injection flow, gallons per minute, pressure, and volume

Proposal Assumptions and Clarifications

Due to a volatile pricing environment, Cascade is unable to guarantee the pricing for a period longer than three months for field services from the date of the bid submittal. If the work extends past 11/26/2022, the agreement can be amended to extend the period of performance and address any potential adjustment in pricing resulting from actual increases in costs of labor, materials, and fuel. If you would like to discuss it further, please feel free to reach out to Christine Jurczak.

1. This quotation is firm for 90 days.
2. Our proposal assumes the following conditions:
3. Work performed Non-Union, Non-Prevailing Wage unless otherwise noted
4. Work hours assumed 10 hours per day on-site; Monday through Friday.
5. Level D PPE is included and supplemental PPE for amendment handling and contaminant exposure. If higher level PPE is required, additional costs will be quoted. Estimated costs include, where applicable, mobilization/demobilization, rentals, drums, HASP/SDS/Reporting. These costs do not include, where applicable, traffic control, water conditioning, security, utility locates and location clearing, or any unique logistical considerations not identified in this proposal.
6. Cascade will procure the proposed amendments, arrange shipping and coordination of deliveries to the site. The costs provided in do not include shipping and taxes. Due to the volatile pricing environment taxes and shipping are TBD.
7. Cascade will unload and store amendments during field implementation. Client is responsible for leftover amendment and amendment containers.
8. Project will be overseen by a CASCADE project manager who will assist with pre-project planning, monitoring daily performance, reporting, and addressing project concerns. Injection data will be available to the Client site representative at all times. Compiled field data from the injection event will be submitted to the Client in electronic format upon completion
9. Cascade will procure a hydrant permit. Cascade assumes that the hydrant used, will be no more than 100’ away from injection and mixing area(s), costs for a frac tank are also included for water storage.
10. The Client will obtain all necessary regulatory approvals or permits related to the work and make all necessary notifications
11. Site is secure; temporary fencing is not needed. If fencing is required, additional costs will be provided by Cascade
12. It is assumed that the work area will be free of surface obstructions allowing easy access to our injection system, conveyance hoses, and crews so as not to cause any production/schedule delays. It is assumed that CASCADE can store equipment onsite overnight.
13. Additional safety and/or site-specific training is not required. If client and/or property owner requests such training, extra costs may be incurred.
14. Portable sanitary facilities will be provided by Client
15. Circumstances encountered during the performance of these services could warrant additional time or expense (e.g., lower injection rates and/or higher injection pressures lightning, and client-imposed injection restrictions or downtime). We will notify Client site representative immediately of any such circumstances that could affect the completion time or costs of the engagement. The Client acknowledges that although this proposal may contain remediation options, CRS bears no responsibility for remediation results or impact to existing conditions. The Client indemnifies, holds harmless and shall defend CRS and affiliates against claims or actions, including third party claims or actions, arising from any remediation design, results, or impact to existing conditions.

We appreciate the opportunity to provide you with our estimate and proposal. If you need any additional information, please contact Christine Jurczak at cjurczak@cascade-env.com.

Cascade Remediation Services, LLC

By	*Christine Jurczak*	By	
Name	Christine Jurczak	Name	
Title	Operations Manager	Title	
Date	8/26/2022	Date	

Please sign below to acknowledge acceptance of this estimate and proposal and authorize Cascade to begin with final contract and work authorization.

SESI

_____

Authorized Signature Date

_____

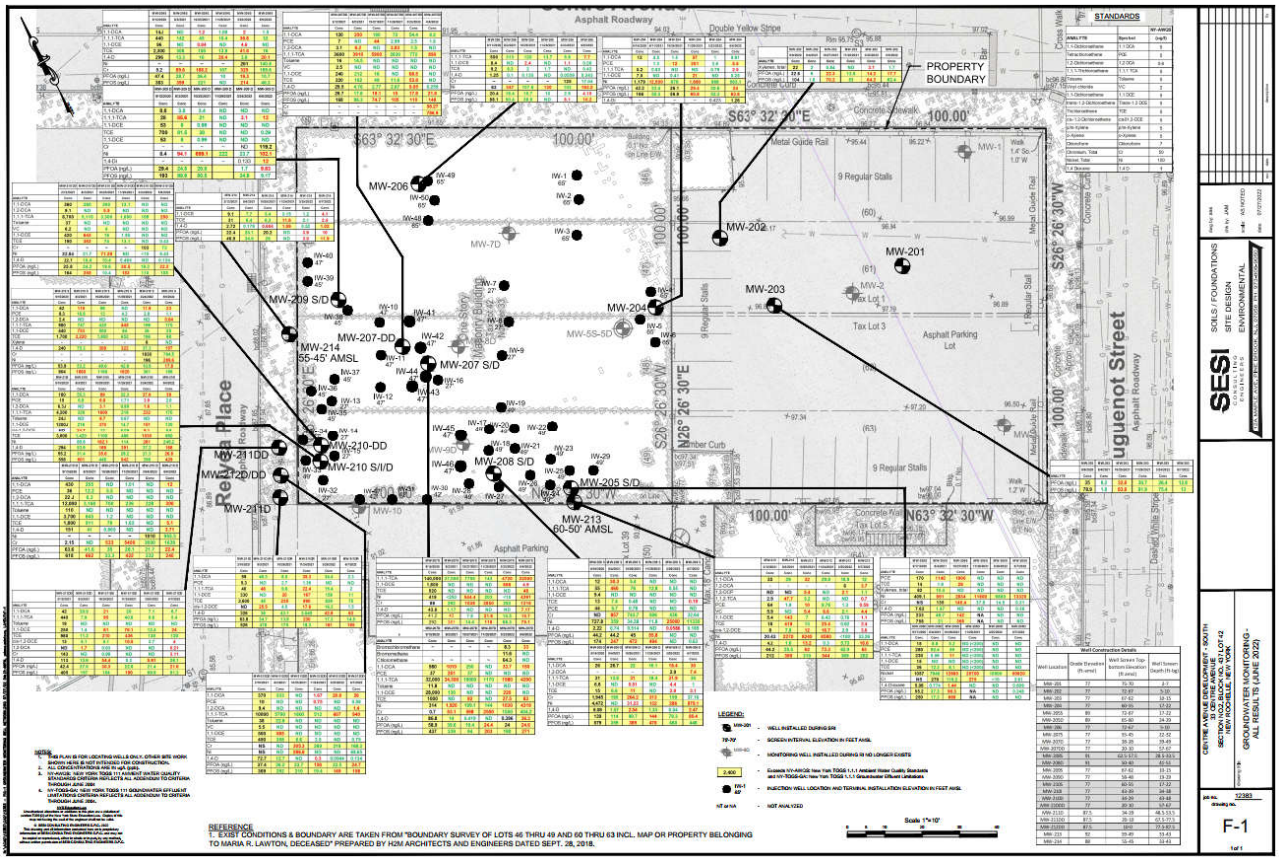
Name (Print) P.O. or Project #.

Signature above confirms signee has reviewed the cost estimate and proposal and agrees with remediation approach, assumptions, and budgetary costs. The next steps toward project implementation:

1. Sign Cost Estimate and Proposal.
2. Finalize Contract Documents incorporating this proposal.
3. Cascade to schedule project after all local and regulatory permits, access agreements, pre-payments for chemistries have been completed.
4. Client and Cascade participate in pre-mobilization project call finalizing all project requirements, equipment to be utilized and contingencies
5. Cascade implements remediation.
6. Cascade and Client work collaboratively in evaluating post remediation groundwater data until remediation goals have been met.

FIGURES

Injection Locations on Site Figure. Doesn't include wells already injected with PlumeStop.



ATTACHMENTS

Attachment A: CleanER-iZVI Spec Sheet.

CASCADE
DRILLING | TECHNICAL SERVICES

Cascade New Turnkey in Situ Remediation Chemistries: Colloidal ZVI / CleanER®-*i*ZVI

Cascade Remediation Services, a leading provider of environmental remediation technology and services, and Höganäs Environment Solutions, LLC, the world's leading supplier of iron-based media, are pleased to introduce an injectable zero valent iron (iZVI) technology specifically developed for the remediation of chlorinated solvent (CVOC) soil and groundwater contamination.

Höganäs CleanER-iZVI Remediation Technology

Developed by Höganäs Environment Solutions, LLC, CleanER-***i***ZVI is a directly injectable form of Zero Valent Iron (ZVI) for the remediation for the cleanup of CVOCs. Based on Höganäs' highly engineered zero-valent iron (ZVI) media, CleanER-***i***ZVI is optimized for direct injection via DPT, injection wells, and other methods and formulated to promote broad dispersion in the subsurface at low injection pressures. The CleanER-ZVI family of products includes formulations for remediation of CVOCs, as well as removal of heavy metal contaminants such as hexavalent chromium, arsenic, and selenium. See Figure 1 below.

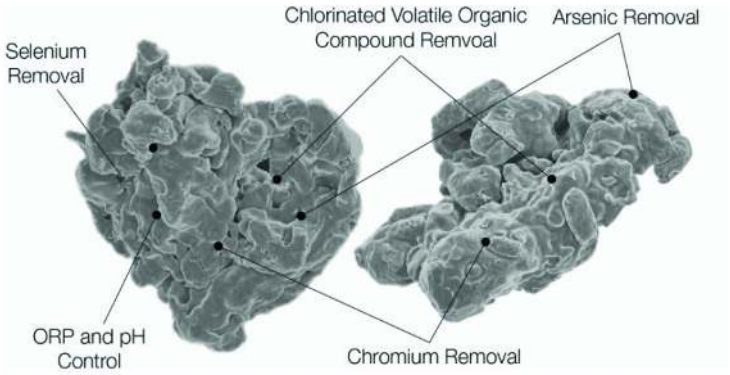


Figure 1

CleanER-***i***ZVI delivers superior injectability and distribution through the combination of the worlds most advanced metallurgy, advanced surfactant / dispersant chemistry, and advanced blending technologies, and is offered as a precisely blended liquid-suspension concentrate. Delivered as a neat product that is diluted onsite, CleanER-***i***ZVI accelerates treatment and delivers multiple cost-saving advantages for environmental remediation projects including

- Direct injection into either wells or DPT injection points at sub-fracture pressures

- Rapid dispersion in the subsurface via the most advanced surfactant / dispersant chemistry available
- Minimized potential for daylighting via water-miscible formulation
- Flexible chemistry that allows up to 80:1 dilution to customize distribution & residence time for the specific needs of each project

CleanER-*i*ZVI also fosters all the known benefits of ZVI biotic/abiotic reactions to rapidly accelerate treatment results via:

- Up to 2 years of persistence in the subsurface to overcome back diffusion issues at these highly heterogeneous sites.
- Neat, pre-blended ZVI suspension that eliminates clumping and other ZVI blending issues in the field.
- Simple mixing and dilution without the need for further suspension chemistry.
- Easily integrated as a combined remedy with other remediation chemistries and amendments to support anaerobic bioremediation or activated carbon sequestration.

Attachment C:

Injection Details Tables

Table 1
Proposed ZVI Injection Details By Well
C360182 - Centre Ave Development South

Injection Well Location	Grade Elevation (ft amsl)	Final Depth (FT BGS)	Date IW Installed	Final Elevation (Ft amsl)	Injection Elevation (Ft amsl)	Weight of ZVI (lbs)	Concentration of ZVI (%)	Volume Injected (gal)
IW-4	77	12	8/26/2020	65	77	57	0.9	305
IW-5	77	12	8/26/2020	65	77	57	0.9	305
IW-10	77	30	8/25/2020	47	57	143	0.9	763
IW-11	77	30	8/23/2020	47	57	143	0.9	763
IW-14	77	32	8/19/2020	27	77	153	0.9	814
IW-15	77	28	8/18/2020	27	77	134	0.9	712
IW-16	77	50	8/20/2020	27	67	239	0.9	1271
IW-18	81	32	8/17/2020	49	81	153	0.9	814
IW-24	81	32	8/14/2020	49	81	153	0.9	814
IW-25	81	32	8/14/2020	49	81	153	0.9	814
IW-26	81	32	8/15/2020	49	81	153	0.9	814
IW-27	81	32	8/15/2020	49	81	153	0.9	814
IW-28	77	28	8/15/2020	49	77	134	0.9	712
IW-29	81	32	8/16/2020	49	81	153	0.9	814
IW-32	77	28	8/18/2020	49	77	134	0.9	712
IW-33	77	28	8/18/2020	49	77	134	0.9	712
IW-35	77	32	8/20/2020	45	77	153	0.9	814
IW-41	77	30	8/25/2020	47	77	143	0.9	763
IW-42	77	30	8/25/2020	47	77	143	0.9	763
IW-43	77	30	8/22/2020	47	77	143	0.9	763
IW-44	77	30	8/25/2020	47	77	143	0.9	763
IW-49	77	12	6/5/2021	65	77	57	0.9	305
IW-50	77	12	6/5/2021	65	77	57	0.9	305

Table 4.2
Injection Well Construction Details
33 Centre Avenue, New Rochelle, NY

Well Location	Grade Elevation (ft amsl)	Final Depth (FT BGS)	Date IW Installed	Final Elevation (Ft amsl)	IW Construction
IW-1	77'	12	8/12/2020	65	Screened 2-12'
IW-2	77'	12	8/12/2020	65	Screened 2-12'
IW-3	77'	12	8/12/2020	65	Screened 2-12'
IW-4	77'	12	8/26/2020	65	Gravel
IW-5	77'	12	8/26/2020	65	Gravel
IW-6	77'	12	8/26/2020	65	Gravel
IW-7	77'	50	8/19/2020	27	Open
IW-8	77'	50	8/20/2020	27	Open
IW-9	77'	50	8/19/2020	27	Open
IW-10	77'	30	8/25/2020	47	Opened
IW-11	77'	30	8/23/2020	47	Opened
IW-12	77'	30	8/20/2020	47	Opened
IW-13	77'	32	8/19/2020	27	Gravel
IW-14	77'	32	8/19/2020	27	Gravel
IW-15	77'	28	8/18/2020	27	Gravel
IW-16	77'	50	8/20/2020	27	Open
IW-17	81'	32	8/17/2020	49	Gravel
IW-18	81'	32	8/17/2020	49	Gravel
IW-19	77'	28	8/18/2020	49	Gravel
IW-20*	81'	32	8/17/2020	49	Gravel
IW-21	81'	32	8/15/2020	49	Gravel
IW-22	81'	32	8/14/2020	49	Gravel
IW-23	81'	32	8/14/2020	49	Gravel
IW-24	81'	32	8/14/2020	49	Gravel
IW-25	81'	32	8/14/2020	49	Gravel
IW-26	81'	32	8/15/2020	49	Gravel
IW-27	81'	32	8/15/2020	49	Gravel
IW-28	77'	28	8/15/2020	49	Gravel
IW-29	81'	32	8/16/2020	49	Gravel
IW-41	77'	30	8/25/2020	47	Gravel
IW-42	77'	30	8/25/2020	47	Opened
IW-43	77'	30	8/22/2020	47	Gravel
IW-44	77'	30	8/25/2020	47	Opened
IW-45	77'	30	8/25/2020	47	Gravel
IW-46*	77'	30	8/25/2020	47	Gravel
IW-48	77'	12	6/5/2021	65	Open
IW-49	77'	12	6/5/2021	65	Open
IW-50	77'	12	6/5/2021	65	Open
IW-51	77'	50	9/13/2021	27'	Open
IW-52	77	30	10/24/2021	47	Open