



# City of Beverly Hills Sand Pit Water Quality Update



Richard C. Slade & Associates LLC  
[www.rcslade.com](http://www.rcslade.com)



# Sampling Results

## Feb. 9<sup>th</sup> Sampling Results:

- Elevated TDS, iron, manganese, in all zones, as expected
- Hydrogen sulfide odor, as expected, in all zones
- Total Petroleum Hydrocarbons
  - Elevated “10,000 ppb” detection in middle zone does not appear in recent sample – only J-Flag detection
  - Lower level TPH detections in deep and shallow zone
- Some J-flag PFAS detections using new method
- Possible radioactive detections
  - (pending results from lab to determine effect of treatment plant)



# Preliminary Recommendations

- Meet with DDW to discuss new results
  - Determine if moving forward is “feasible” based on recent sample results
  - Review 50-foot control zone limitations and other issues
- Perform two (2) additional quarterly monitoring events
  - (May and August 2023)
- Continue water level monitoring



# Reminder – “J-Flags”

- Method Reporting Limit (MRL)
  - Lowest accurate measurement limit
  - Below this level, measurement error can be 50%
- Method Detection Limit (MDL)
  - the lowest concentration that can be detected (not measured), below MRL
- Values between MDL and MRL are “J-flagged”

**Analyte exists, but concentration uncertain**

**Reported as “Not Detect” (ND) for regulatory purposes**



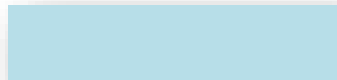
# Notes for Water Quality Slides

- Values Shown are “J-Flags”
- Three different sampling events are shown, sorted by depth
  - Feb 9, 2023; Mar 22, 2023; September 30, 2021
- Color coding
  - No cell shading = detection, below regulatory limit

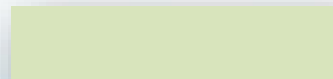
– Yellow = detection above regulatory limit



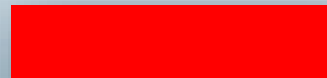
– Blue = J-Flag value



– Green = non-detect



– Red = results pending





# WQ Data – General – Deep

Analyte	Units	Regulatory Levels	SPMW-D	SPMW-D	SPMW Zone No. 1
			375 - 425 ft bgs	375 - 425 ft bgs	367 - 420 ft bgs
			2/9/2023	3/22/2022	9/30/2021
			Reporting to MDL	Reporting to MDL	Reporting to MDL
<b>General Physical Properties</b>					
Specific Conductance	µS/cm	1,600, 2,200 <sup>(1)</sup>	1,200	1,100	1,200
pH	pH units	6.5 to 8.5 (S)	7.81	8.2	8.2
Apparent Color	ACU	15 (S)	4.0	15	10
Odor	TON	3 (S)	4.0	1	2
Turbidity	NTU	5 (S)	0.75	1.2	1.66
<b>General Mineral Analytes and Others</b>					
Total Dissolved Solids (TDS)	mg/L	1,000, 1,500 <sup>(1)</sup>	610	630	660



# WQ Data – General – Middle

Analyte	Units	Regulatory Levels	SPMW-M	SPMW-M	SPMW Zone No. 2
			270 - 320 ft bgs	270 - 320 ft bgs	251 - 323 ft bgs
			2/9/2023	3/17/2022	11/10/2021
			Reporting to MDL	Reporting to MDL	Reporting to MDL
<b>General Physical Properties</b>					
Specific Conductance	µS/cm	0, 1,600, 2,200 <sup>(1)</sup>	1,300	1,200	1,200
pH	pH units	6.5 to 8.5 (S)	7.94	8.2	8.2
Apparent Color	ACU	15 (S)	ND (MDL not reported)	ND (< 3.0)	10
Odor	TON	3 (S)	1.0J	1	2
Turbidity	NTU	5 (S)	0.50	0.341	11.7
<b>General Mineral Analytes and Others</b>					
Total Dissolved Solids (TDS)	mg/L	0, 1,000, 1,500 <sup>(1)</sup>	780	800	810



# WQ Data – General – Shallow

Analyte	Units	Regulatory Levels	SPMW-S	SPMW-S
			200 - 220 ft bgs	200 - 220 ft bgs
			2/9/2023	3/15/2022
			Reporting to MDL	Reporting to MDL
<b>General Physical Properties</b>				
Specific Conductance	µS/cm	0, 1,600, 2,200 <sup>(1)</sup>	940	910
pH	pH units	6.5 to 8.5 (S)	8.00	8.2
Apparent Color	ACU	15 (S)	3.0	ND (< 3.0)
Odor	TON	3 (S)	1.0J	2
Turbidity	NTU	5 (S)	2.4	0.253
<b>General Mineral Analytes and Others</b>				
Total Dissolved Solids (TDS)	mg/L	0, 1,000, 1,500 <sup>(1)</sup>	500	550
Total Organic Carbon (TOC)	mg/L	0, 1.0, 2.0	0.5	0.5





# WQ Data – Metals – Deep

Analyte	Units	Regulatory Levels	SPMW-D	SPMW-D	SPMW Zone No. 1
			375 - 425 ft bgs	375 - 425 ft bgs	367 - 420 ft bgs
			2/9/2023	3/22/2022	9/30/2021
			Reporting to MDL	Reporting to MDL	Reporting to MDL
Cadmium, Total		5 (P)	ND (< 0.042)	ND (< 0.029)	0.033J
Cadmium, Dissolved		None	--	ND (< 0.029)	ND (< 0.012)
Chlorate		800 (NL)	ND (< 1.7)	ND (< 1.3)	ND (< 1.3)
Chromium, Total		50 (P)	0.52	0.93J	0.34J
Chromium, Dissolved		None	--	0.84J (BM)	0.68J (B4)
Chromium, Hexavalent (6+)		None	ND (< 0.0079)	ND (< 0.0090)	0.014J
Copper, Total	1,000 (S) & 1,300 (A)		0.47J	1.6J	0.70J
Copper, Dissolved		None	--	1.2J	0.83J
Iron, Total		300 (S)	130	76	<b>450</b>
Iron, Dissolved		None	--	44	14
Lead, Total		15 (ACL)	ND (< 0.083)	0.047J	0.070J
Lead, Dissolved		None	--	ND (< 0.046)	ND (< 0.038)
Manganese, Total		50 (S) & 500 (NL)	330	47	36
Manganese, Dissolved		None	--	48	34
Mercury, Total		2 (P)	ND (< 0.037)	ND (< 0.020)	ND (< 0.035)
Mercury, Dissolved		None	--	ND (< 0.020)	ND (< 0.035)
Nickel, Total		100 (P)	0.96J	0.87J	1.2J
Nickel, Dissolved		None	--	0.88J	1.1J
Perchlorate		6 (P)	ND (< 0.39)	ND (< 0.29)	ND (< 0.29)
Selenium, Total		50 (P)	ND (< 0.067)	1.6J	1.7J
Selenium, Dissolved		None	--	1.6J	1.3J
Silver, Total		100 (S)	ND (< 0.055)	ND (< 0.014)	0.063J
Silver, Dissolved		None	--	ND (< 0.014)	ND (< 0.14)
Thallium, Total		2 (P)	ND (< 0.021)	ND (< 0.041)	0.021J
Thallium, Dissolved		None	--	ND (< 0.041)	ND (< 0.020)
Vanadium, Total		50 (NL)	0.99J	18	0.12J
Vanadium, Dissolved		None	--	18	ND (< 0.034)
Zinc, Total		5,000 (S)	ND (< 1.7)	1.4J	1.6J
Zinc, Dissolved		None	--	2.3J	ND (< 1.2)



# WQ Data – Metals – Middle

Analyte	Units	Regulatory Levels	SPMW-M	SPMW-M	SPMW Zone No. 2
			270 - 320 ft bgs	270 - 320 ft bgs	251 - 323 ft bgs
			2/9/2023	3/17/2022	11/10/2021
			Reporting to MDL	Reporting to MDL	Reporting to MDL
Cadmium, Total		5 (P)	ND (< 0.042)	ND (< 0.029)	0.027J
Cadmium, Dissolved		None	--	ND (< 0.029)	0.027J
Chlorate		800 (NL)	ND (< 1.7)	ND (< 1.3)	1.7J
Chromium, Total		50 (P)	0.25	0.72J (B4)	4
Chromium, Dissolved		None	--	0.99J (BM)	0.36J
Chromium, Hexavalent (6+)		None	ND (< 0.0079)	ND (< 0.0090)	0.025
Copper, Total	1,000 (S) & 1,300 (A)		ND (< 0.23)	0.37J	9
Copper, Dissolved		None	--	ND (< 0.36)	0.64J
Iron, Total		300 (S)	ND (< 25)	6.2J	<b>1,600</b>
Iron, Dissolved		None	--	ND (< 2.6)	30
Lead, Total		15 (ACL)	ND (< 0.083)	ND (< 0.046)	0.56
Lead, Dissolved		None	--	ND (< 0.046)	ND (< 0.038)
Manganese, Total	50 (S) & 500 (NL)		25	38	41
Manganese, Dissolved		None	--	38	24
Mercury, Total		2 (P)	ND (< 0.037)	ND (< 0.020)	ND (< 0.035)
Mercury, Dissolved		None	--	ND (< 0.020)	ND (< 0.035)
Nickel, Total		100 (P)	0.97J	1.9J	3.9J
Nickel, Dissolved		None	--	1.8J	2.0J
Perchlorate		6 (P)	ND (< 0.39)	ND (< 0.29)	ND (< 0.29)
Selenium, Total		50 (P)	ND (< 0.067)	ND (< 0.26)	0.56J
Selenium, Dissolved		None	--	ND (< 0.26)	0.42J
Silver, Total		100 (S)	ND (< 0.055)	0.12J	ND (< 0.014)
Silver, Dissolved		None	--	ND (< 0.014)	ND (< 0.014)
Thallium, Total		2 (P)	ND (< 0.021)	ND (< 0.041)	ND (< 0.020)
Thallium, Dissolved		None	--	ND (< 0.041)	0.073J
Vanadium, Total		50 (NL)	13	20	18
Vanadium, Dissolved		None	--	20	13
Zinc, Total		5,000 (S)	ND (< 1.7)	1.8J	13J
Zinc, Dissolved		None	--	2.9J	3.3J



# WQ Data – Metals – Shallow

Analyte	Units	Regulatory Levels	SPMW-S	SPMW-S
			200 - 220 ft bgs	200 - 220 ft bgs
			2/9/2023	3/15/2022
			Reporting to MDL	Reporting to MDL
Cadmium, Total		5 (P)	ND (< 0.042)	ND (< 0.029)
Cadmium, Dissolved		None	--	ND (< 0.029)
Chlorate		800 (NL)	ND (< 1.7)	ND (< 1.3)
Chromium, Total		50 (P)	0.28	ND (< 0.51)
Chromium, Dissolved		None	--	ND (< 0.51)
Chromium, Hexavalent (6+)		None	ND (< 0.0079)	0.028
Copper, Total	1,000 (S) & 1,300 (A)		0.30J	0.42J
Copper, Dissolved		None	--	0.37J
Iron, Total		300 (S)	33	44
Iron, Dissolved		None	--	24
Lead, Total		15 (ACL)	ND (< 0.083)	0.10J
Lead, Dissolved		None	--	0.11J
Manganese, Total		50 (S) & 500 (NL)	<b>110</b>	<b>84</b>
Manganese, Dissolved		None	--	<b>84</b>
Mercury, Total		2 (P)	ND (< 0.037)	ND (< 0.020)
Mercury, Dissolved		None	--	0.020J
Nickel, Total		100 (P)	0.59J	0.86J
Nickel, Dissolved		None	--	0.98J
Perchlorate		6 (P)	ND (< 0.39)	ND (< 0.029)
Selenium, Total		50 (P)	ND (< 0.067)	ND (< 0.26)
Selenium, Dissolved		None	--	ND (< 0.26)
Silver, Total		100 (S)	ND (< 0.055)	0.021J
Silver, Dissolved		None	--	ND (< 0.014)
Thallium, Total		2 (P)	ND (< 0.021)	ND (< 0.041)
Thallium, Dissolved		None	--	ND (< 0.041)
Vanadium, Total		50 (NL)	1.6J	2.5J
Vanadium, Dissolved		None	--	2.7J
Zinc, Total		5,000 (S)	1.8J	2.8J
Zinc, Dissolved		None	--	4.1J



# WQ Data – VOCs – Deep

Analyte	Units	Regulatory Levels	SPMW-D	SPMW-D	SPMW Zone No. 1
			375 - 425 ft bgs	375 - 425 ft bgs	367 - 420 ft bgs
			2/9/2023	3/22/2022	9/30/2021
			Reporting to MDL	Reporting to MDL	Reporting to MDL
<b>Selected Organic Analytes</b>					
Benzene	µg/L	1 (P)	ND (< 0.15)	ND (< 0.12)	ND (< 0.12)
Bis(2-ethylhexyl)phthalate (DEHP; Di(2-Ethylhexyl)phthalate)		4 (P)	ND (< 0.41; U-01)	ND (< 0.15; Q5)	0.35J
Carbon Disulfide		160 (NL)	ND (< 0.25)	ND (< 0.085)	ND (< 0.085)
Carbon Tetrachloride		0.5 (P)	ND (< 0.27)	ND (< 0.087)	0.20J
cis-1,3-Dichloropropene			ND (< 0.30)	ND (< 0.11)	0.12J
1,4-Dioxane		1 (NL)	ND (< 0.028)	0.034J	ND (< 0.018; Q5)
Ethyl tert-butyl ether (ETBE; Ethyl tertiary-butyl ether; tert-Butyl Ethyl Ether)		None	ND (< 1.0)	ND (< 0.17)	ND (< 0.17)
Methyl tert-butyl ether (MTBE)		5 (S) & 13 (P)	ND (< 0.94)	ND (< 0.074)	ND (< 0.074)
N-Nitrosodiethylamine (NDEA; N-nitroso-diethylamine)		0.01 (NL)	ND (< 0.00066)	0.0032 (B)	0.0022 (B**)
Nonhalogenated Organics by 8015/8015B (TPH)		None	--	60 (see below)	ND (see below)
Gasoline Range Organics (GRO; C4-C12)			--	ND (< 30)	ND (< 30)
Diesel Range Organics (DRO; C13-C22)			--	ND (< 33)	ND (< 35)
Oil Range Organics (ORO; C23-C32)			--	60 (B)	ND (< 35)
Diesel Range Organics (TPH - DRO by 8015B by 3510C; C10-C23)		None	130	--	--
Gasoline Range Organics (TPH - GRO by 8260B by 5030B)		None	ND (< 65)	--	--
Oil Range Organics (TPH - ORO by 8015B by 3510C; C25-C36)		None	ND (< 200)	--	--
Propachlor		90 (NL)		--	--
tert-Amyl methyl ether (TAME)		None	ND (< 0.59)	ND (< 0.11)	ND (< 0.11)
tert-Butyl alcohol (TBA; t-Butyl Alcohol; Tertiary butyl alcohol)		12 (NL)	4.1	ND (< 0.88)	ND (< 0.88)
Toluene		150 (P)	ND (< 0.29)	1.0	0.23J
Total Trihalomethanes (THMs)		80 (P)	ND (MDL not reported)	ND (< 0.062)	ND (< 0.062)
Bromodichloromethane			ND (< 0.24)	ND (< 0.12)	0.21J
Bromoform			ND (< 0.38)	ND (< 0.14; VC)	ND (< 0.14)
Chloroform (Trichloromethane)			ND (< 0.27)	ND (< 0.11)	ND (< 0.11)
Dibromochloromethane (Chlorodibromomethane)			ND (< 0.20)	ND (< 0.062)	ND (< 0.62)
Total Xylenes		1,750 (P)	ND (< 0.33)	ND (< 0.30)	ND (< 0.30)
m,p-Xylenes			ND (< 0.33)	ND (< 0.23)	ND (< 0.23)
o-Xylene			ND (< 0.20)	ND (< 0.072)	ND (< 0.072)





# WQ Data – VOCs – Middle

Analyte	Units	Regulatory Levels	SPMW-M	SPMW-M	SPMW Zone No. 2
			270 - 320 ft bgs	270 - 320 ft bgs	251 - 323 ft bgs
			2/9/2023	3/17/2022	11/10/2021
			Reporting to MDL	Reporting to MDL	Reporting to MDL
<b>Selected Organic Analytes</b>					
Benzene	µg/L	1 (P)	ND (< 0.15)	ND (< 0.12)	ND (< 0.12)
Bis(2-ethylhexyl)phthalate (DEHP; Di(2-Ethylhexyl)phthalate)		4 (P)	ND (< 0.41; U-01)	ND (< 0.15; BM)	ND (< 0.18)
Carbon Disulfide		160 (NL)	ND (< 0.25)	ND (< 0.085)	0.090J
Carbon Tetrachloride		0.5 (P)	ND (< 0.27)	ND (< 0.087)	ND (< 0.087)
cis-1,3-Dichloropropene			ND (< 0.30)	ND (< 0.11)	ND (< 0.11)
1,4-Dioxane		1 (NL)	ND (< 0.028)	ND (< 0.018)	ND (< 0.018)
Ethyl tert-butyl ether (ETBE; Ethyl tertiary-butyl ether; tert-Butyl Ethyl Ether)		None	ND (< 1.0)	ND (< 0.17)	ND (< 0.17)
Methyl tert-butyl ether (MTBE)		5 (S) & 13 (P)	ND (< 0.94)	ND (< 0.074)	ND (< 0.074)
N-Nitrosodiethylamine (NDEA; N-nitroso-diethylamine)		0.01 (NL)	ND (< 0.00066)	D (MDL Not Reported)	ND (MDL Not Reported)
Nonhalogenated Organics by 8015/8015B (TPH)		None	--	10,010 (see below)	ND (see below)
Gasoline Range Organics (GRO; C4-C12)			--	ND (< 30)	ND (< 30)
Diesel Range Organics (DRO; C13-C22)			--	9,600	ND (< 34)
Oil Range Organics (ORO; C23-C32)			--	410	ND (< 34)
Diesel Range Organics (TPH - DRO by 8015B by 3510C; C10-C23)		None	68J	--	--
Gasoline Range Organics (TPH - GRO by 8260B by 5030B)		None	ND (< 65)	--	--
Oil Range Organics (TPH - ORO by 8015B by 3510C; C25-C36)		None	ND (< 190)	--	--
Propachlor		90 (NL)		--	--
tert-Amyl methyl ether (TAME)		None	ND (< 0.59)	ND (< 0.11)	ND (< 0.11)
tert-Butyl alcohol (TBA; t-Butyl Alcohol; Tertiary butyl alcohol)		12 (NL)	1.2J	1.2J (FB @ 0.97J)	0.91J
Toluene		150 (P)	ND (< 0.29)	0.13J (FB @ 0.070J)	0.080J
Total Trihalomethanes (THMs)		80 (P)	ND (MDL not reported)	ND (< 0.062)	ND (< 0.062)
Bromodichloromethane			ND (< 0.24)	ND (< 0.12)	ND (< 0.12)
Bromoform			ND (< 0.38)	ND (< 0.14)	ND (< 0.14; VC)
Chloroform (Trichloromethane)			ND (< 0.27)	ND (< 0.11)	ND (< 0.11)
Dibromochloromethane (Chlorodibromomethane)			ND (< 0.20)	ND (< 0.062)	ND (< 0.062)
Total Xylenes		1,750 (P)	ND (< 0.33)	ND (< 0.30)	ND (< 0.30)
m,p-Xylenes			ND (< 0.33)	ND (< 0.23)	ND (< 0.23)
o-Xylene			ND (< 0.20)	ND (< 0.072)	ND (< 0.072)



# WQ Data – VOCs – Shallow

Analyte	Units	Regulatory Levels	SPMW-S	SPMW-S
			200 - 220 ft bgs	200 - 220 ft bgs
			2/9/2023	3/15/2022
			Reporting to MDL	Reporting to MDL
<b>Selected Organic Analytes</b>				
Benzene	µg/L	1 (P)	ND (< 0.15)	ND (< 0.12)
Bis(2-ethylhexyl)phthalate (DEHP; Di(2-Ethylhexyl)phthalate)		4 (P)	0.61J (U-01)	ND (< 0.15)
Carbon Disulfide		160 (NL)	0.56	ND (< 0.085)
Carbon Tetrachloride		0.5 (P)	ND (< 0.27)	ND (< 0.087)
cis-1,3-Dichloropropene			ND (< 0.30)	ND (< 0.11)
1,4-Dioxane		1 (NL)	ND (< 0.028)	0.037J
Ethyl tert-butyl ether (ETBE; Ethyl tertiary-butyl ether; tert-Butyl Ethyl Ether)		None	ND (< 1.0)	ND (< 0.17)
Methyl tert-butyl ether (MTBE)		5 (S) & 13 (P)	ND (< 0.94)	ND (< 0.074)
N-Nitrosodiethylamine (NDEA; N-nitroso-diethylamine)		0.01 (NL)	ND (< 0.00066)	D (MDL Not Reported; B
Nonhalogenated Organics by 8015/8015B (TPH)		None	--	ND (see below)
Gasoline Range Organics (GRO; C4-C12)			--	ND (< 30)
Diesel Range Organics (DRO; C13-C22)			--	ND (< 35)
Oil Range Organics (ORO; C23-C32)			--	ND (< 35)
Diesel Range Organics (TPH - DRO by 8015B by 3510C; C10-C23)		None	110 (O-05, U-01)	--
Gasoline Range Organics (TPH - GRO by 8260B by 5030B)		None	ND (< 65)	--
Oil Range Organics (TPH - ORO by 8015B by 3510C; C25-C36)		None	290J (O-05, U-01)	--
Propachlor		90 (NL)		--
tert-Amyl methyl ether (TAME)		None	ND (< 0.59)	ND (< 0.11)
tert-Butyl alcohol (TBA; t-Butyl Alcohol; Tertiary butyl alcohol)		12 (NL)	1.9J	ND (< 0.88)
Toluene		150 (P)	ND (< 0.29)	0.69
Total Trihalomethanes (THMs)		80 (P)	ND (MDL not reported)	ND (< 0.062)
Bromodichloromethane			ND (< 0.24)	ND (< 0.12)
Bromoform			ND (< 0.38)	ND (< 0.14)
Chloroform (Trichloromethane)			ND (< 0.27)	ND (< 0.11)
Dibromochloromethane (Chlorodibromomethane)			ND (< 0.20)	ND (< 0.062)
Total Xylenes		1,750 (P)	ND (< 0.33)	ND (< 0.30)
m,p-Xylenes			ND (< 0.33)	ND (< 0.23)
o-Xylene			ND (< 0.20)	ND (< 0.072)



# WQ Data – PFAS – Deep

Analyte	Units	Regulatory Levels	SPMW-D	SPMW-D	SPMW Zone No. 1
			375 - 425 ft bgs	375 - 425 ft bgs	367 - 420 ft bgs
			2/9/2023	3/22/2022	9/30/2021
			Reporting to MDL	Reporting to MDL	Reporting to MDL
<b>Per- and Polyfluorinated Alkyl Substances (PFAS) by EPA 537.1</b>					
11-chloroeicosafluoro-3-oxaur	µg/L	None	Analyzed by 533	ND (< 0.00030)	ND (< 0.00030)
4,8-dioxa-3H-perfluorononanoic acid (ADONA)			Analyzed by 533	ND (< 0.00060)	ND (< 0.00060)
9-chlorohexadecafluoro-3-oxanone-sulfonic acid (9-Cl-Hexafluoropropylene oxide dimer acid (HFPO-DA)			Analyzed by 533	ND (< 0.00030)	ND (< 0.00030)
N-ethyl Perfluorooctanesulfonamidoacetic acid (EtFOS)			Analyzed by 533	ND (< 0.0010)	ND (< 0.0010)
N-methyl Perfluorooctanesulfonamidoacetic acid (NMe)			--	0.00080J	ND (< 0.00042)
Perfluorobutanesulfonic acid (PFBS)		0.5 (NL)	Analyzed by 533	ND (< 0.00037)	ND (< 0.00037)
Perfluorodecanoic acid (PFDA)		None	Analyzed by 533	ND (< 0.00031)	ND (< 0.00031)
Perfluorododecanoic acid (PFDoA; PFDoDA)			Analyzed by 533	ND (< 0.00054)	ND (< 0.00054)
Perfluoroheptanoic acid (PFHpA)			Analyzed by 533	ND (< 0.00039)	ND (< 0.00039)
Perfluorohexanesulfonic acid (PFHxS)		0.003 (NL)	Analyzed by 533	0.00084J	ND (< 0.00032)
Perfluorohexanoic acid (PFHxA)		None	Analyzed by 533	0.00070J	ND (< 0.00046)
Perfluorononanoic acid (PFNA)			Analyzed by 533	ND (< 0.00040)	ND (< 0.00040)
Perfluorooctanesulfonic acid (PFOS)		0.0065 (NL)	Analyzed by 533	0.00084J	ND (< 0.00043)
Perfluorooctanoic acid (PFOA)		0.0051 (NL)	Analyzed by 533	ND (< 0.00038)	ND (< 0.00038)
Perfluorotetradecanoic acid (PFTA; PF		None	--	ND (< 0.00054)	ND (< 0.00054)
Perfluorotridecanoic acid (PFTrDA)			--	ND (< 0.00046)	ND (< 0.00046)
Perfluoroundecanoic acid (PFUnA; PFUnDA)			Analyzed by 533	ND (< 0.00042)	ND (< 0.00042)
<b>Per- and Polyfluorinated Alkyl Substances (PFAS) by EPA 533</b>					
11Cl-PF3OUdS	µg/L	None		ND (< 0.00073)	Analyzed by 537.1
4:2 FTS				ND (< 0.00069)	--
6:2 FTS				ND (< 0.00064)	--
8:2 FTS				ND (< 0.00056)	--
9Cl-PF3ONS				ND (< 0.00069)	Analyzed by 537.1
ADONA				ND (< 0.00059)	Analyzed by 537.1
HFPO-DA				ND (< 0.00076)	Analyzed by 537.1
NFDHA				ND (< 0.00062)	--
PFBA				0.51J	--
PFBS		0.5 (NL)		ND (< 0.00038)	Analyzed by 537.1
PFDA		None		ND (< 0.00053)	Analyzed by 537.1
PFDoA				ND (< 0.00054)	Analyzed by 537.1
PFEESA				ND (< 0.00037)	--
PFHpA				ND (< 0.00054)	Analyzed by 537.1
PFHpS				ND (< 0.00050)	--
PFHxA				1.1J	Analyzed by 537.1
PFHxS		0.003 (NL)		ND (< 0.00082)	Analyzed by 537.1
PFMBA		None		ND (< 0.00051)	--
PFMPA				ND (< 0.00035)	--
PFNA				ND (< 0.00073)	Analyzed by 537.1
PFOA		0.0051 (NL)		ND (< 0.00076)	Analyzed by 537.1
PFOS		0.0065 (NL)		ND (< 0.00056)	Analyzed by 537.1
PFPeA		None		ND (< 0.00037)	--
PFPeS				ND (< 0.00041)	--
PFUnA				ND (< 0.00040)	Analyzed by 537.1



# WQ Data – PFAS – Middle

Analyte	Units	Regulatory Levels	SPMW-M	SPMW-M	SPMW Zone No. 2
			270 - 320 ft bgs	270 - 320 ft bgs	251 - 323 ft bgs
			2/9/2023	3/17/2022	11/10/2021
			Reporting to MDL	Reporting to MDL	Reporting to MDL
<b>Per- and Polyfluorinated Alkyl Substances (PFA)</b>					
11-chloroeicosafuoro-3-oxaur	µg/L	None	Analyzed by 533	ND (< 0.00030)	ND (< 0.00030)
4,8-dioxa-3H-perfluorononanoic acid (ADONA)			Analyzed by 533	ND (< 0.00060)	ND (< 0.00060)
9-chlorohexadecafluoro-3-oxanone-sulfonic acid (9-Cl-Hexafluoropropylene oxide dimer acid (HFPO-DA)			Analyzed by 533	ND (< 0.00030)	ND (< 0.00030)
N-ethyl Perfluorooctanesulfonamidoacetic acid (EtFOS)			Analyzed by 533	ND (< 0.0010)	ND (< 0.0010)
N-methyl Perfluorooctanesulfonamidoacetic acid (NMe)			--	ND (< 0.00042)	ND (< 0.00042)
Perfluorobutanesulfonic acid (PFBS)		0.5 (NL)	Analyzed by 533	ND (< 0.00058)	ND (< 0.00058)
Perfluorodecanoic acid (PFDA)		None	Analyzed by 533	ND (< 0.00037)	ND (< 0.00037)
Perfluorododecanoic acid (PFDoA; PFDoDA)			Analyzed by 533	ND (< 0.00031)	ND (< 0.00031)
Perfluoroheptanoic acid (PFHpA)			Analyzed by 533	ND (< 0.00054)	ND (< 0.00054)
Perfluorohexanesulfonic acid (PFHxS)		0.003 (NL)	Analyzed by 533	ND (< 0.00039)	ND (< 0.00039)
Perfluorohexanoic acid (PFHxA)		None	Analyzed by 533	ND (< 0.00032)	ND (< 0.00032)
Perfluorononanoic acid (PFNA)			Analyzed by 533	0.00058J	0.00047J
Perfluorooctanesulfonic acid (PFOS)		0.0065 (NL)	Analyzed by 533	ND (< 0.00040)	ND (< 0.00040)
Perfluorooctanoic acid (PFOA)		0.0051 (NL)	Analyzed by 533	ND (< 0.00043)	ND (< 0.00043)
Perfluorotetradecanoic acid (PFTA; PF		None	--	ND (< 0.00038)	ND (< 0.00038)
Perfluorotridecanoic acid (PFTTrDA)			--	ND (< 0.00054)	ND (< 0.00054)
Perfluoroundecanoic acid (PFUnA; PFUnDA)			Analyzed by 533	ND (< 0.00046)	ND (< 0.00046)
<b>Per- and Polyfluorinated Alkyl Substances (PFA)</b>					
11Cl-PF3OUdS	µg/L	None	ND (< 0.00089)	Analyzed by 537.1	Analyzed by 537.1
4:2 FTS			ND (< 0.00083)	--	--
6:2 FTS			ND (< 0.00078)	--	--
8:2 FTS			ND (< 0.00068)	--	--
9Cl-PF3ONS			ND (< 0.00084)	Analyzed by 537.1	Analyzed by 537.1
ADONA			ND (< 0.00071)	Analyzed by 537.1	Analyzed by 537.1
HFPO-DA			ND (< 0.00092)	Analyzed by 537.1	Analyzed by 537.1
NFDHA			ND (< 0.00075)	--	--
PFBA			ND (< 0.00061)	--	--
PFBS		0.5 (NL)	ND (< 0.00046)	Analyzed by 537.1	Analyzed by 537.1
PFDA		None	ND (< 0.00064)	Analyzed by 537.1	Analyzed by 537.1
PFDoA			ND (< 0.00065)	Analyzed by 537.1	Analyzed by 537.1
PFEESA			ND (< 0.00045)	--	--
PFHpA			ND (< 0.00065)	Analyzed by 537.1	Analyzed by 537.1
PFHpS			ND (< 0.00060)	--	--
PFHxA			ND (< 0.00072)	Analyzed by 537.1	Analyzed by 537.1
PFHxS		0.003 (NL)	ND (< 0.00099)	Analyzed by 537.1	Analyzed by 537.1
PFMBA		None	ND (< 0.00062)	--	--
PFMPA			ND (< 0.00042)	--	--
PFNA			ND (< 0.00088)	Analyzed by 537.1	Analyzed by 537.1
PFOA		0.0051 (NL)	ND (< 0.00092)	Analyzed by 537.1	Analyzed by 537.1
PFOS		0.0065 (NL)	ND (< 0.00068)	Analyzed by 537.1	Analyzed by 537.1
PFPeA		None	ND (< 0.00045)	--	--
PFPeS			ND (< 0.00050)	--	--
PFUnA			ND (< 0.00050)	Analyzed by 537.1	Analyzed by 537.1





# WQ Data – PFAS – Shallow

Analyte	Units	Regulatory Levels	SPMW-S	SPMW-S
			200 - 220 ft bgs	200 - 220 ft bgs
			2/9/2023	3/15/2022
			Reporting to MDL	Reporting to MDL
<b>Per- and Polyfluorinated Alkyl Substances (PFA)</b>				
11-chloroeicosafluoro-3-oxaur	µg/L	None	Analyzed by 533	ND (< 0.00030)
4,8-dioxa-3H-perfluorononanoic acid (ADONA)			Analyzed by 533	ND (< 0.00060)
9-chlorohexadecafluoro-3-oxanone-sulfonic acid (9-Cl-Hexafluoropropylene oxide dimer acid (HFPO-DA)			Analyzed by 533	ND (< 0.00030)
N-ethyl Perfluorooctanesulfonamidoacetic acid (EtFOS)			--	ND (< 0.00042)
N-methyl Perfluorooctanesulfonamidoacetic acid (NMe)			--	ND (< 0.00058)
Perfluorobutanesulfonic acid (PFBS)		0.5 (NL)	Analyzed by 533	ND (< 0.00037)
Perfluorodecanoic acid (PFDA)		None	Analyzed by 533	ND (< 0.00031)
Perfluorododecanoic acid (PFDoA; PFDoDA)			Analyzed by 533	ND (< 0.00054)
Perfluoroheptanoic acid (PFHpA)			Analyzed by 533	ND (< 0.00039)
Perfluorohexanesulfonic acid (PFHxS)		0.003 (NL)	Analyzed by 533	0.00038J
Perfluorohexanoic acid (PFHxA)		None	Analyzed by 533	0.00062J
Perfluorononanoic acid (PFNA)			Analyzed by 533	ND (< 0.00040)
Perfluorooctanesulfonic acid (PFOS)		0.0065 (NL)	Analyzed by 533	ND (< 0.00043)
Perfluorooctanoic acid (PFOA)		0.0051 (NL)	Analyzed by 533	ND (< 0.00038)
Perfluorotetradecanoic acid (PFTA; PF		None	--	ND (< 0.00054)
Perfluorotridecanoic acid (PFTDA)			--	ND (< 0.00046)
Perfluoroundecanoic acid (PFUnA; PFUnDA)			Analyzed by 533	ND (< 0.00042)
<b>Per- and Polyfluorinated Alkyl Substances (PFA)</b>				
11Cl-PF3OUdS	µg/L	None	ND (< 0.00089)	Analyzed by 537.1
4:2 FTS			ND (< 0.00083)	--
6:2 FTS			ND (< 0.00078)	--
8:2 FTS			ND (< 0.00068)	--
9Cl-PF3ONS			ND (< 0.00084)	Analyzed by 537.1
ADONA			ND (< 0.00071)	Analyzed by 537.1
HFPO-DA			ND (< 0.00092)	Analyzed by 537.1
NFDHA			ND (< 0.00075)	--
PFBA			ND (< 0.00061)	--
PFBS		0.5 (NL)	ND (< 0.00046)	Analyzed by 537.1
PFDA		None	ND (< 0.00064)	Analyzed by 537.1
PFDoA			ND (< 0.00065)	Analyzed by 537.1
PFEESA			ND (< 0.00045)	--
PFHpA			ND (< 0.00065)	Analyzed by 537.1
PFHpS			ND (< 0.00060)	--
PFHxA			ND (< 0.00072)	Analyzed by 537.1
PFHxS		0.003 (NL)	ND (< 0.00099)	Analyzed by 537.1
PFMBA		None	ND (< 0.00062)	--
PFMPA			ND (< 0.00042)	--
PFNA			ND (< 0.00088)	Analyzed by 537.1
PFOA		0.0051 (NL)	ND (< 0.00092)	Analyzed by 537.1
PFOS		0.0065 (NL)	ND (< 0.00068)	Analyzed by 537.1
PFPeA		None	ND (< 0.00045)	--
PFPeS			ND (< 0.00050)	--
PFUnA			ND (< 0.00050)	Analyzed by 537.1