APPENDIX E

SEMI-VOLATILE ORGANIC COMPOUNDS

Semi-Volatile Organic Compounds (SVOCs) detected in Stormwater at West Valley View Road (WVV) from 2020 through 2023.

REDUCED SET	West Valley View Road (WVV)							
SVOCS in ug/L	12/30/2020	3/5/2021	11/9/2021	1/3/2022	3/15/2022	10/22/2022	3/13/2023	5/2/2023
Benzo(a)pyrene	ND	ND	ND	ND	0.0158	ND	0.0449	ND
Benzo(b)fluoranthene	0.0864	ND	ND	ND	ND	ND	ND	ND
Benzo(g,h,i)perylene	0.0695	ND	ND	ND	ND	ND	ND	ND
Chrysene	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	**0.136**	ND	ND	ND	0.0107	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	ND	ND	ND
Benzyl alcohol	ND	ND	ND	ND	0.125	ND	ND	**0.273**
Phenanthrene	**0.144**	ND	ND	ND	0.019	ND	ND	ND
Pyrene	**0.204**	ND	ND	ND	0.0139	ND	ND	ND
2-Methylphenol	**0.269**	0.124	ND	0.0477	ND	ND	ND	ND
3+4-Methylphenol(s)	**0.466**	**0.311**	ND	0.0436	ND	ND	ND	ND
Pentachlorophenol (PCP)	**0.875**	0.571	**0.242**	0.191	0.162	0.408	0.475	0.128
Bis(2-ethylhexyl)phthalate	**1.59**	ND	ND	ND	0.283	ND	ND	ND
Pyridine	ND	ND	0.149	ND	**0.214**	ND	ND	ND

Bold = Above RL
Orange = Above MDL, below RL (J-flagged data)
ND = Not detected above MDL

Semi-Volatile Organic Compounds (SVOCs) detected in Stormwater at North Ridge Terrace (NRT) from 2020 through 2023.

REDUCED SET	North Ridge Terrace (NRT)							
SVOCS in ug/L	12/30/2020	3/5/2021	11/9/2021	1/3/2022	3/15/2022	10/22/2022	3/13/2023	5/2/2023
Benzo(a)pyrene	ND	ND	**0.0351**	ND	0.0154	0.075	ND	ND
Benzo(b)fluoranthene	ND	ND	**0.0593**	ND	ND	ND	ND	ND
Benzo(g,h,i)perylene	ND	ND	**0.0255**	ND	ND	ND	ND	ND
Chrysene	ND	ND	**0.0434**	ND	ND	ND	ND	ND
Fluoranthene	ND	ND	0.0592	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ND	ND	**0.0277**	ND	ND	ND	ND	ND
Benzyl alcohol	ND	ND	ND	0.151	ND	ND	ND	ND
Phenanthrene	0.0421	0.042	**0.0267**	ND	0.013	ND	ND	ND
Pyrene	ND	ND	**0.0555**	0.0117	ND	ND	ND	ND
2-Methylphenol	ND	0.122	ND	0.0432	ND	ND	ND	ND
3+4-Methylphenol(s)	0.113	0.218	ND	0.0386	ND	ND	ND	ND
Pentachlorophenol (PCP)	ND	ND	0.143	ND	0.105	ND	ND	ND
Bis(2-ethylhexyl)phthalate	3.03	0.866	**0.473**	**0.431**	0.266	ND	ND	ND
Pyridine	ND	ND	0.114	ND	0.134	ND	ND	ND

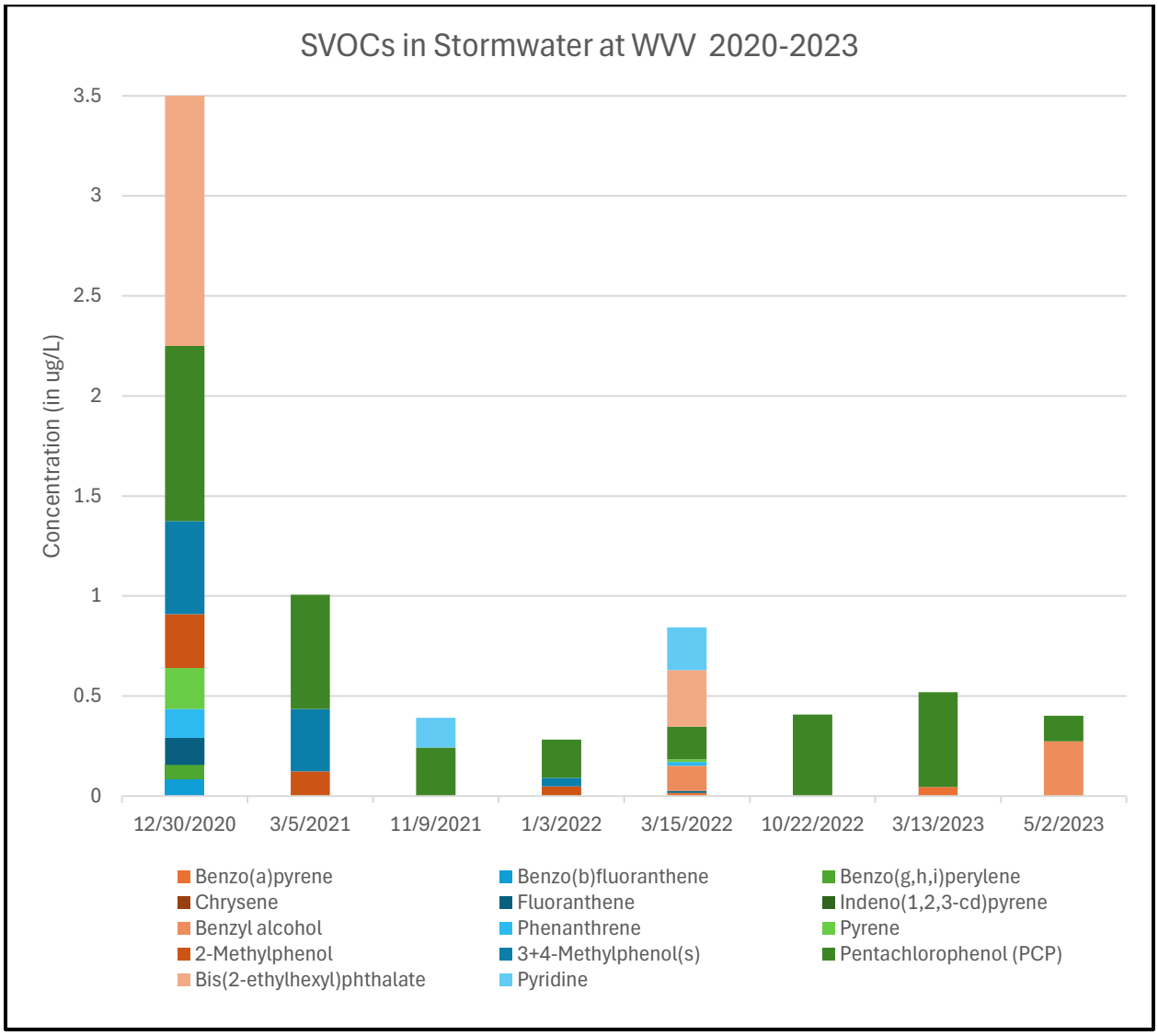
Bold = Above RL
Orange = Above MDL, below RL (J-flagged data)
ND = Not detected above MDL

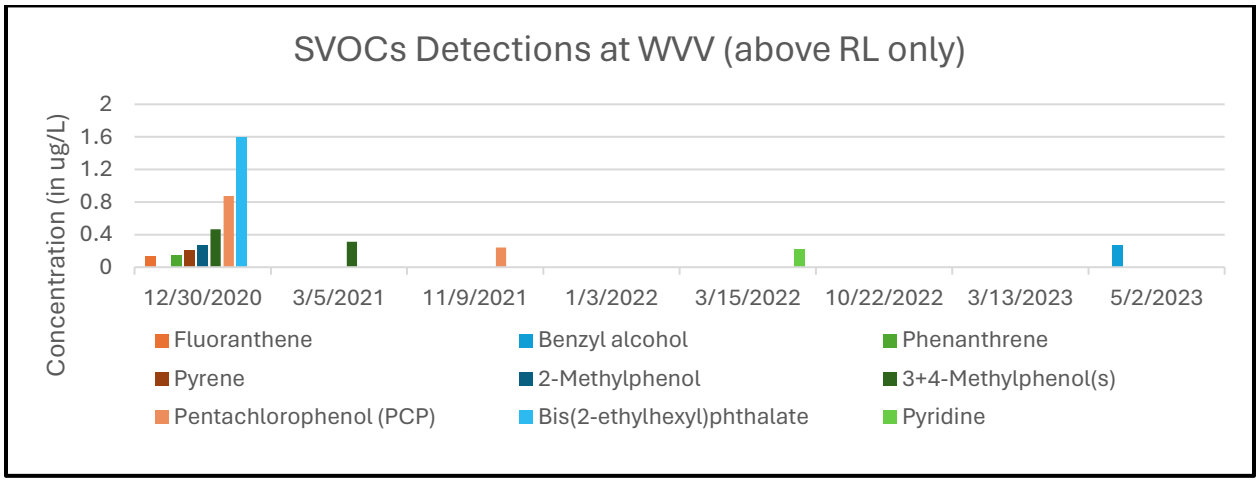
Semi-Volatile Organic Compounds (SVOCs) detected in Stormwater at Colver Road (CR) from 2020 through 2023.

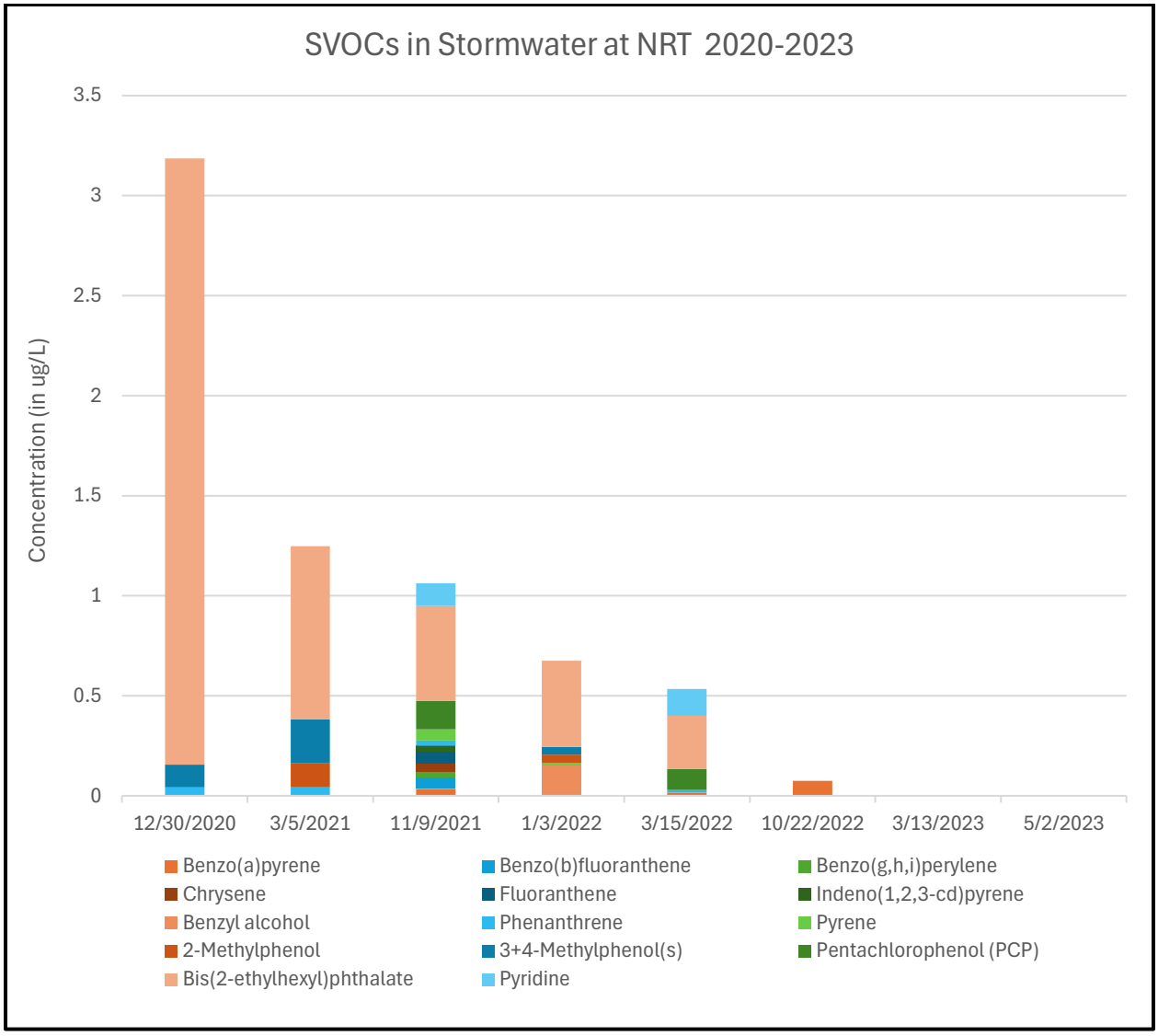
REDUCED SET	Colver Road (CR)							
SVOCS in ug/L	12/30/2020	3/5/2021	11/9/2021	1/3/2022	3/15/2022	10/22/2022	3/13/2023	5/2/2023
Benzo(a)pyrene	NA	NA	ND	ND	ND	0.0894	ND	ND
Benzo(b)fluoranthene	NA	NA	ND	ND	ND	0.0838	ND	ND
Benzo(g,h,i)perylene	NA	NA	ND	ND	ND	ND	ND	ND
Chrysene	NA	NA	ND	ND	ND	0.0423	ND	ND
Fluoranthene	NA	NA	ND	ND	0.013	0.0629	ND	ND
Indeno(1,2,3-cd)pyrene	NA	NA	ND	ND	ND	ND	ND	ND
Benzyl alcohol	NA	NA	ND	ND	ND	ND	ND	ND
Phenanthrene	NA	NA	ND	ND	**0.0344**	ND	ND	ND
Pyrene	NA	NA	ND	ND	ND	0.0699	ND	ND
2-Methylphenol	NA	NA	ND	0.0393	ND	ND	ND	ND
3+4-Methylphenol(s)	NA	NA	ND	0.0499	ND	ND	ND	ND
Pentachlorophenol (PCP)	NA	NA	0.174	0.200	0.124	1.290	ND	0.437
Bis(2-ethylhexyl)phthalate	NA	NA	ND	ND	0.344	ND	ND	ND
Pyridine	NA	NA	0.115	ND	0.13	ND	ND	ND

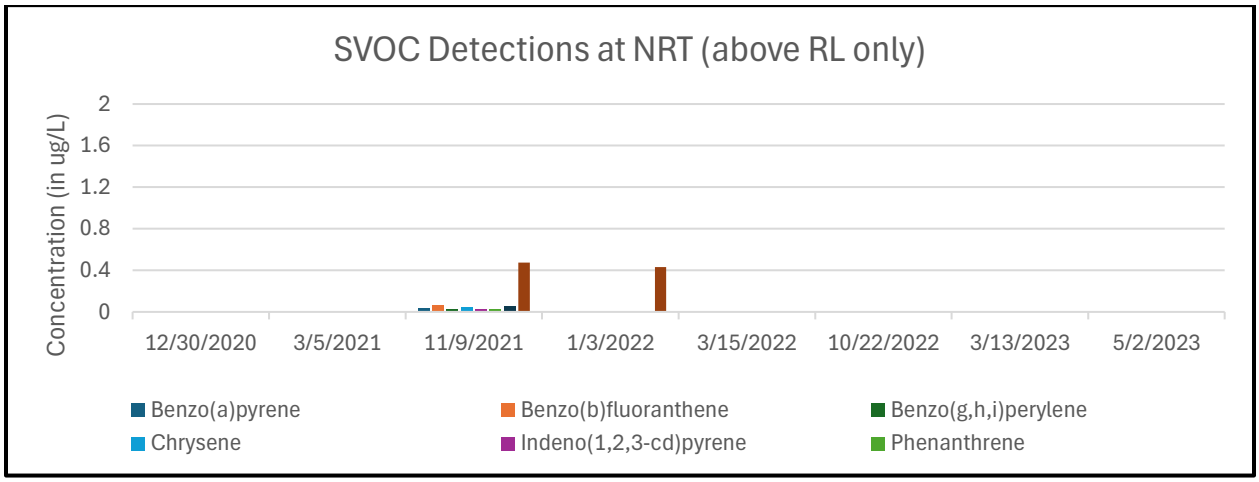
Bold = Above RL
Orange = Above MDL, below RL (J-flagged data)
ND = Not detected above MDL
NA = Not sampled on that date

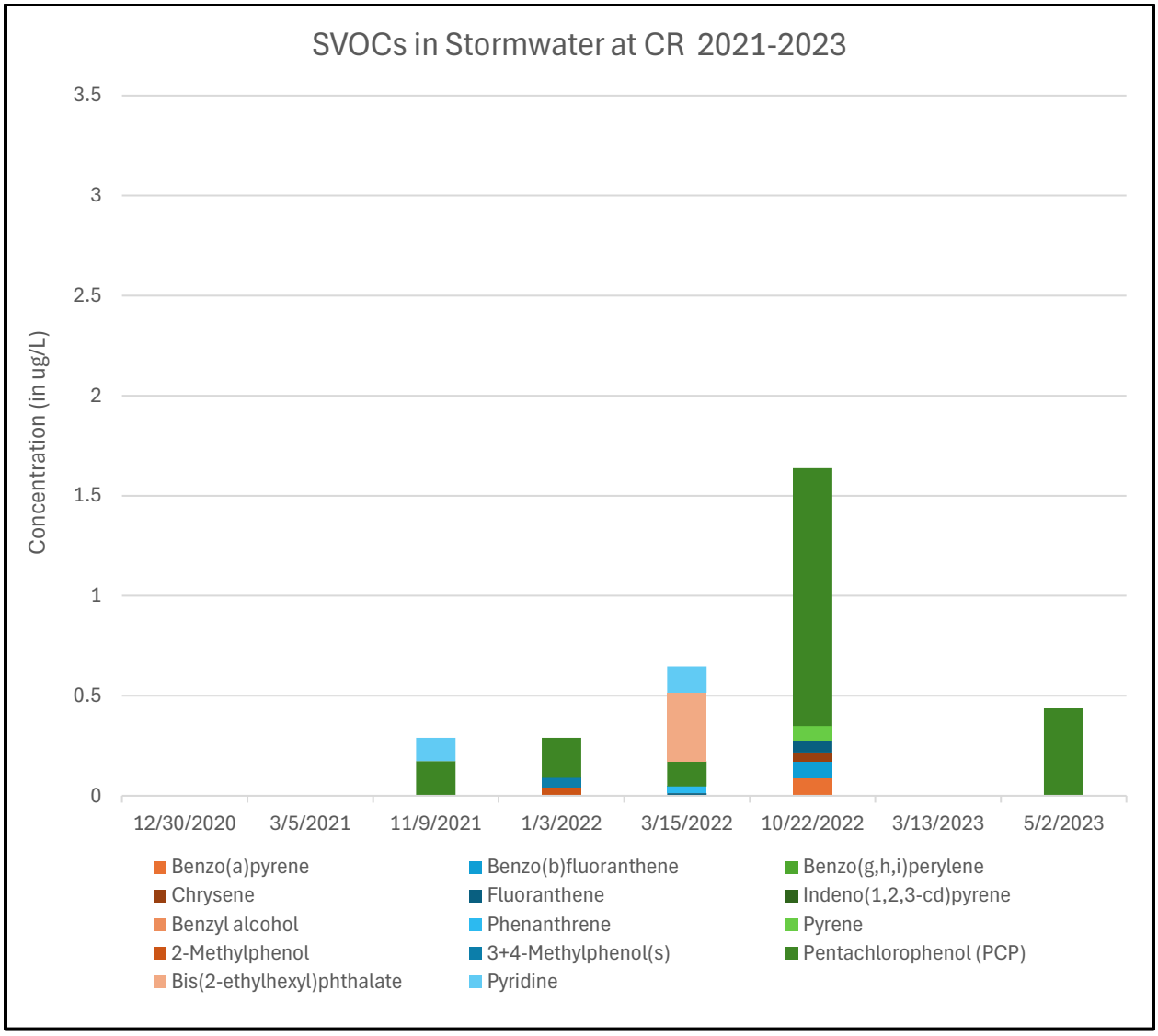
SVOC Concentrations in Stormwater at West Valley View (WVV), North Ridge Terrace (NRT), and Colver Road (CR) Sampling Locations from December 2020 through May 2023.

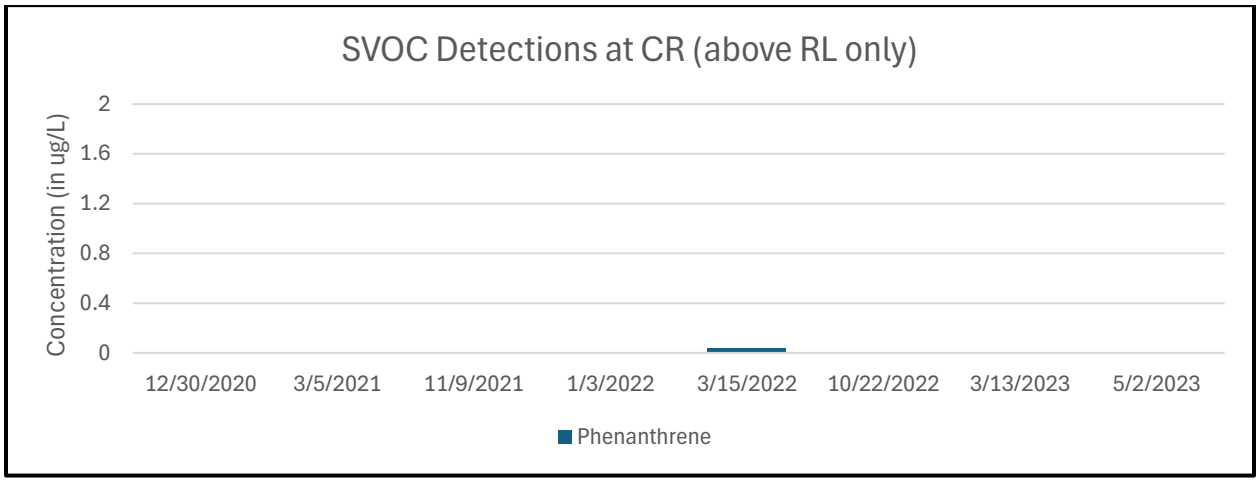





SVOCs in Stormwater at NRT 2020-2023
Concentration (in ug/L)
3.5
3
2.5
2
1.5
1
0.5
0
12/30/2020
3/5/2021
11/9/2021
1/3/2022
3/15/2022
10/22/2022
3/13/2023
5/2/2023
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(g,h,i)perylene
Chrysene
Fluoranthene
Indeno(1,2,3-cd)pyrene
Benzyl alcohol
Phenanthrene
Pyrene
2-Methylphenol
3+4-Methylphenol(s)
Pentachlorophenol (PCP)
Bis(2-ethylhexyl)phthalate
Pyridine


SVOC Detections at NRT (above RL only)
Concentration (in ug/L)
2
1.6
1.2
0.8
0.4
0
12/30/2020
3/5/2021
11/9/2021
1/3/2022
3/15/2022
10/22/2022
3/13/2023
5/2/2023
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(g,h,i)perylene
Chrysene
Indeno(1,2,3-cd)pyrene
Phenanthrene


SVOCs in Stormwater at CR 2021-2023
Concentration (in ug/L)
3.5
3
2.5
2
1.5
1
0.5
0
12/30/2020
3/5/2021
11/9/2021
1/3/2022
3/15/2022
10/22/2022
3/13/2023
5/2/2023
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(g,h,i)perylene
Chrysene
Fluoranthene
Indeno(1,2,3-cd)pyrene
Benzyl alcohol
Phenanthrene
Pyrene
2-Methylphenol
3+4-Methylphenol(s)
Pentachlorophenol (PCP)
Bis(2-ethylhexyl)phthalate
Pyridine


SVOC Detections at CR (above RL only)
Concentration (in ug/L)
2
1.6
1.2
0.8
0.4
0
12/30/2020
3/5/2021
11/9/2021
1/3/2022
3/15/2022
10/22/2022
3/13/2023
5/2/2023
Phenanthrene

Semi-Volatile Organic Compounds (SVOCs) detected in Bear Creek at Oak Street (BCOS) and US Cellular Park (BCUC) from 2020 to 2022.

REDUCED SET	Bear Creek at Oak St (BCOS)		REDUCED SET	Bear Creek at US Cellular (BCUC)				
SVOCS in ug/L	1/3/2022	10/22/2022	SVOCS in ug/L	11/4/2020	11/15/2020	12/17/2020	1/3/2022	10/22/2022
Benzo(a)pyrene	ND	ND	Benzo(a)pyrene	ND	ND	**0.54**	ND	0.0171
Benzo(b)fluoranthene	ND	ND	Benzo(b)fluoranthene	ND	ND	ND	ND	0.0155
Naphthalene	0.232	ND	Naphthalene	ND	ND	ND	0.0209	ND
Benzyl alcohol	0.112	ND	Benzyl alcohol	ND	ND	ND	0.204	ND
Pyrene	ND	ND	Pyrene	ND	ND	ND	ND	0.00992
Pentachlorophenol (PCP)	0.172	ND	Pentachlorophenol (PCP)	ND	ND	ND	0.122	ND

Bold = Above RL
Orange = Above MDL, below RL (J-flagged data)
ND = Not detected above MDL

Water Quality Based Assessment Thresholds for Aquatic Life Toxicity for Fluoranthene and Pentachlorophenol at pH 6.5.

Water Quality-Based Assessment Thresholds

Derived using the Assessment Threshold Algorithms in the Water Quality Goals Staff Report, on the web at http://www.waterboards.ca.gov/water_issues/programs/water_quality_goals/docs/wq_goals_text.pdf

Constituent / Parameter (Synonym)	Water Quality Objective or Promulgated Criterion	Numeric Thresholds Recommended to Implement Objective or Criterion: Source of Numeric Threshold (footnotes in parentheses are at bottom of table)	Numeric Threshold	Units	G=Groundwater IS=Inland SW E=EB/Estuary O=Ocean	Assessment Thresholds Rec to Protect Desig. Beneficial Uses: Inland Surface Waters: MUN-MCL	MUN-Toxicity	Aquatic Life & Consump	AGR	CAS Number
Fluoranthene	Toxicity - humans	USEPA IRIS Reference Dose (a)	280	ug/L	G					206-44-0
		USEPA National Recomm. WQ Criteria, water & fish consump.	20	ug/L	IS					
		USEPA National Recomm. WQ Criteria, fish consumption	20	ug/L	E & O					
	CTR - humans	California Toxics Rule (USEPA) for sources of drinking water	300	ug/L	IS	X	X	X		
		California Toxics Rule (USEPA) for other waters	370	ug/L	IS & E					
	CA Ocean Plan - humans	Human Health Protection Objective, fish consumption	15	ug/L	O					
	Toxicity - fw aquatic life	USEPA National Recomm. WQ Criteria, acute tox info / 10	398	ug/L	IS					
	Toxicity - sw aquatic life	USEPA National Recomm. WQ Criteria, chronic tox info / 10	1.6	ug/L	E & O					
		USEPA National Recomm. WQ Criteria, acute tox info / 10	4	ug/L	E & O					
Pentachlorophenol	Chemical Constituents	California Primary MCL	1	ug/L	G & IS					87-86-5
	Tastes and Odors	Taste & Odor Threshold (USEPA)	30	ug/L	G & IS					
	Toxicity - humans	California Public Health Goal for Drinking Water	0.3	ug/L	G					
		USEPA National Recomm. WQ Criteria, water & fish consump.	0.03	ug/L	IS					
		USEPA National Recomm. WQ Criteria, fish consumption	0.04	ug/L	E & O					
	CTR - humans	California Toxics Rule (USEPA) for sources of drinking water	0.28	ug/L	IS	X	X			
		California Toxics Rule (USEPA) for other waters	8.2	ug/L	IS & E					
	CTR - fw aquatic life	California Toxics Rule (USEPA), 4-day average at pH 6.5	4	ug/L	IS			X		
		California Toxics Rule (USEPA), 1-hour average at pH 6.5	5.3	ug/L	IS					
	CTR - sw aquatic life	California Toxics Rule (USEPA), 4-day average	7.9	ug/L	E					
		California Toxics Rule (USEPA), 1-hour average	13	ug/L	E					
	CA Ocean Plan - aq life	Aquatic Life Protection Objective, 6-month median (b)	1	ug/L	O					
		Aquatic Life Protection Objective, daily maximum (b)	4	ug/L	O					
		Aquatic Life Protection Objective, instantaneous maximum (b)	10	ug/L	O					

Notes:

(a) Assumes 70 kg body weight, 2 liters per day drinking water consumption, and 20 percent relative source contrubution. An additional undertainty factor of 10 is used for Class C carcinogens.

(b) For chlorinated phenolics.

CTR California Toxics Rule

MFL Million fibers per liter; limited to fibers longer than 10 um.

NTR National Toxics Rule

fw freshwater

tox toxicity

Beneficial Uses:

MUN-MCL = Municipal or Domestic Supply with default selection of drinking water Maximum Contaminant Level (MCL) when available

MUN-Toxicity = Municipal or Domestic Supply with consideration of human toxicity thresholds that are more stringent than drinking water MCLs

AGR = Agricultural Water Uses, including irrigation supply and stock watering

Aquatic Life & Consump = Supporting protection of aquatic life and consumption of aquatic organisms (assume consumption of both water and aquatic organisms in fresh waters)

Where no numeric aquaric life protective criteria exist, 1/10 of the published toxic level for the most sensitive aquatic life species will be considered protective. For the most recent toxic levels see http://cfpub.epa.gov/ecotox/.

Note: The Aquatic Life Water Quality Guidance Value for Acute Toxicity due to Fluoranthene in Freshwater is listed as 3,980 ug/L in Table 31 of OAR 340-041-8033

Calculations for PCP Acute and Chronic Aquatic Life Criterion based on pH levels of 7 to 8.99 recorded in the Almeda Post-Fire Water Quality Monitoring Study – from Table 30 of OAR 340-041-8033.

Pentacholophenol - from Oregon Table 30 Aquatic Life Criteria

Freshwater aquatic life values for pentachlorophenol are expressed as a function of pH, and are calculated as follows: CMC=(exp(1.005(pH)-4.869); CCC=exp(1.005(pH)-5.134).

Range of pH Values for Bear Creek collected during the study: Lowest/Means/Highest values observed++

pH	Acute CMC ug/L*	Chronic CCC ug/L**
7.00	8.7	6.7
8.20	29.1	22.4
8.70	48.2	36.9
8.99	64.5	49.4

Oregon Table 30: *Acute criterion is the Criterion Maximum Concentration (CMC) applied as a one-hour average concentration. **Chronic criterion is the Criterion Continuous Concentration (CCC) applied as a 96-hour (4 days) average concentration. The CMC and CCC criteria may not be exceeded more than once every three years.

++ From: Compilation and Assessment of Bear Creek Water Quality Data Collected After the Almeda Drive Fire; Aquatic Ecosystem Sciences LLC Ashland, Oregon 2024
March 2019 the mean pH of sites downstream of the burn (8.7) was greater than in the burn (8.0), whereas in March 2020 the mean pH of sites downstream of the burn (8.2) was less than those in the burn (8.6). This occurred in March, April, May, and August of 2020, and again in early 2021 and summer 2021. The highest pH value 8.99 in the study area occurred 02/23/2023, the lowest value in the study area 7.00 ocurred 10/20/2022