SAMPLING & ANALYSIS PLAN

Toxic Monitoring Program (TMP): Willamette Water

SECTION A. PROJECT MANAGEMENT

A1. TITLE AND APPROVAL SHEET

This is a Sampling and Analysis Plan (SAP) which falls under the umbrella of the project's Quality Assurance Project Plan DEQ09-LAB-0029-QAPP *Watershed Toxic Monitoring Program (TMP)*.
The original SAP was not approved until after annual review.

Jim Coyle, Project Officer	Date
Brian Boling, Organic Section Manager	Date
Raeann Haynes, Inorganic Section Manager	Date
Chris Redman, Quality Assurance Officer (QAO)	Date

State of Oregon
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A2. Distribution List

The following personnel will be emailed regarding all aspects of this SAP. Deviations from this abbreviated SAP must be communicated in writing (e-mail is acceptable) to all individuals identified in Table **1**. Notification of the availability of the final reports from the DEQ Laboratory will be emailed to the Project Coordinator, Field Operations Coordinator, and Laboratory Data Coordinator.

Table 1 **Distribution List**

Name	Phone	Email
Jim Coyle	(503)-693-5788	coyle.jim@deq.state.or.us
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A3. Project/Task Description

Sampling Organization: Oregon DEQ Laboratory and Environmental Assessment Division
Toxics Monitoring Program
Fund Code: 2008 Code: 40116
Subproject Code: 2026

Ambient Water Monitoring Program
Fund Code: 26296
Subproject Code: 206

Analytical Organization: Oregon DEQ Laboratory and Environmental Assessment Division
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Contact: Christopher L Redman

Table 2– Project/Task Responsibilities

Name	Project Title/Responsibility
Jim Coyle	Project Coordinator
Allen Hamel	Field Operations Coordinator
Shannon Swantek	Sample Coordinator

Name	Project Title/Responsibility
Sarah Rockwell	Data Coordinator
Brian Boling	Organic Section Manager
Raeann Haynes	Inorganic Section Manager
Chris Redman	Quality Assurance Officer
Dennis Ades	Water Quality Monitoring Section Manager

A4. Quality Objectives and Criteria

Samples will be analyzed and reported following standard DEQ Laboratory procedures. The laboratory's default analytical QA/QC procedures and criteria will be followed.

A5. Documentation and Records

Samples collected from the field will be returned to the analytical laboratory with the Chain of Custody form (DEQ06-LAB-0054-FORM). Final analytical reports generated by the DEQ Laboratory will follow standard laboratory practices. A link to the electronic versions of the reports (in pdf format) will be e-mailed to the Project Coordinator, Field Operations Coordinator, and the Data Coordinator. Once finalized, an electronic version of the report is also available in LASAR. An original hard copy of the report with the supporting QC documentation will be kept on file at the DEQ Laboratory.

SECTION B. DATA GENERATION AND ACQUISITION

B1. Sampling Design

Until recently, the State of Oregon lacked a statewide, systematic, toxic pollutant monitoring program to quantify the presence of toxics chemicals in its waters and aquatic biota, identify their sources (where possible) and to guide efforts towards their reduction. This document describes the sampling and analysis protocol for water toxics under the quality assurance project plan for the Toxics Monitoring Program (TMP) (DE09-LAB-0029-QAP) which was initiated in 2008 to document the status (distribution and intensity), measure trends (changes through time) and identify the primary local sources of toxic pollutants in its surface waters and aquatic biota.

A compilation of the water quality impaired stream segments in the Willamette basin are provided in Table 3.

Table 3– 303d Listed Segments of the Willamette Basin

WATERBODY NAME / LLID	RIVER MILE	PARAMETER	SEASON	LISTING STATUS	LIST DATE	RECEIVING WATER BODY
USGS HUC 17090001 Middle Fork Willamette - None						
USGS HUC 17090002 Coast Fork Willamette						
Dennis Creek 1230715435817	0 – 1.4	Mercury	Year Round	303(d)	2004	Saroute Creek (CF Willamette) 12230689435953
CF Willamette River 1230233440232	31.3 – 38.8	Mercury	Year Round	303(d)	2004	Willamette River 1227618456580
CF Willamette River 1230233440232	0 – 31.3	Mercury	Year Round	303(d)	2004	Willamette River 1227618456580
USGS HUC 17090003 Upper Willamette						
A-3 Drain 1111111111127	0 - 0	Dichloroethylenes	Year Round	303(d)	1998	Amazon Creek 1232651442279
A-3 Drain 1111111111127	0 - 0	Tetrachloroethylene	Year Round	303(d)	1998	Amazon Creek 1232651442279
A-3 Drain 1111111111127	0 - 0	Arsenic	Year Round	303(d)	1998	Amazon Creek 1232651442279
A-3 Drain 1231973440631	0 - 3	Mercury	Year Round	303(d)	2004	Amazon Creek 1232651442279
Amazon Creek 1232651442279	0 - 22.6	Dichloroethylenes	Year Round	303(d)	1998	Long Tom River 1232400443847
Amazon Creek 1232651442279	0 - 22.6	Tetrachloroethylene	Year Round	303(d)	1998	Long Tom River 1232400443847
Amazon Creek 1232651442279	0 - 22.6	Trichloroethylene	Year Round	303(d)	1998	Long Tom River 1232400443847
Amazon Creek 1232651442279	0 - 22.6	Arsenic	Year Round	303(d)	1998	Long Tom River 1232400443847
Amazon Creek 1232651442279	0 - 22.6	Copper	Year Round	303(d)	1998	Long Tom River 1232400443847
Amazon Creek 1232651442279	0 - 22.6	Copper	Year Round	303(d)	2004	Long Tom River 1232400443847
Amazon Creek 1232651442279	0 - 22.6	Lead	Year Round	303(d)	1998	Long Tom River 1232400443847
Amazon Creek 1232651442279	0 - 22.6	Lead	Year Round	303(d)	2002	Long Tom River 1232400443847
Amazon Creek Diversion Channel 1232967441013	0 – 3.5	Arsenic (tri)	Year Round	303(d)	2004	Amazon Creek 1232651442279
Amazon Creek Diversion Channel 1232967441013	0 – 3.5	Copper	Year Round	303(d)	2004	Amazon Creek 1232651442279
Amazon Creek Diversion Channel 1232967441013	0 – 3.5	Lead	Year Round	303(d)	2004	Amazon Creek 1232651442279
Amazon Creek Diversion Channel 1232967441013	0 – 3.5	Mercury	Year Round	303(d)	2004	Amazon Creek 1232651442279
Willow Creek 1231745440491	0 – 2.8	Arsenic	Year Round	303(d)	2002	Amazon Creek 1232651442279
Willamette River 1227618456580	**174.5 – 186.4**	**Arsenic**	**Year Round**	**303(d)**	**2002**	**Columbia River 1240483462464**
USGS HUC 17090004 McKenzie - None						
USGS HUC 17090005 North Santiam - None						
USGS HUC 17090006 South Santiam - None						
USGS HUC 17090007 Middle Willamette						
Pringle Creek 1230450449387	0 – 6.2	Dieldrin	Year Around	303(d)	2004	Willamette River 1227618456580

WATERBODY NAME / LLID	RIVER MILE	PARAMETER	SEASON	LISTING STATUS	LIST DATE	RECEIVING WATER BODY
Pringle Creek 1230450449387	0 – 6.2	Heptachlor	Year Around	303(d)	2004	Willamette River 1227618456580
Pringle Creek 1230450449387	0 – 6.2	Copper	Year Around	303(d)	2002	Willamette River 1227618456580
Pringle Creek 1230450449387	0 – 6.2	Lead	Year Around	303(d)	2002	Willamette River 1227618456580
Pringle Creek 1230450449387	0 – 6.2	Zinc	Year Around	303(d)	2002	Willamette River 1227618456580
Champoeg Creek 1228818452551	0 – 7.5	Dieldrin	Year Around	303(d)	2002	Willamette River 1227618456580
USGS HUC 17090008 Yamhill						
WF Palmer Creek 1230779452146	0 – 5.2	Chlorpyriphos	Year Around	303(d)	1998	Palmer Creek (Yamhill) 1230703452218
USGS HUC 17090009 Molalla / Pudding						
Zollner Creek 1228266451046	0 – 7.8	Chlordane	Year Around	303(d)	2002	Pudding River 1227161452842
Zollner Creek 1228266451046	0 – 7.8	Dieldrin	Year Around	303(d)	2002	Pudding River 1227161452842
Zollner Creek 1228266451046	0 – 7.8	Arsenic	Year Round	303(d)	2004	Pudding River 1227161452842
Pudding River 1227161452842	0 – 35.4	DDT	Year Around	303(d)	1998	Willamette River 1227618456580
USGS HUC 17090010 Tualatin						
Koll Wetland 1111111111135	0 - 0	Chromium (Hex)	Year Round	303(d)	2002	Fanno Creek (Tualatin) 1227639453931
Koll Wetland 1111111111135	0 - 0	Copper	Year Round	303(d)	2002	Fanno Creek (Tualatin) 1227639453931
Koll Wetland 1111111111135	0 - 0	Lead	Year Round	303(d)	2002	Fanno Creek (Tualatin) 1227639453931
Koll Wetland 1111111111135	0 - 0	Silver	Year Round	303(d)	2002	Fanno Creek (Tualatin) 1227639453931
Koll Wetland 1111111111135	0 - 0	Zinc	Year Round	303(d)	2002	Fanno Creek (Tualatin) 1227639453931
Fanno Creek 1227639453931	0 – 13.9	Dieldrin	Year Around	303(d)	2004	Tualatin River 1226500453377
USGS HUC 17090011 Clackamas - None						
USGS HUC 17090012 Lower Willamette						
Johnson Creek 1226465454422	0 – 23.7	DDT	Year Around	303(d)	2004	Willamette River 1227618456580
Johnson Creek 1226465454422	0 – 23.7	Dieldrin	Year Around	303(d)	2004	Willamette River 1227618456580
Johnson Creek 1226465454422	0 – 23.7	PCB	Year Around	303(d)	2004	Willamette River 1227618456580
Johnson Creek 1226465454422	0 – 23.7	PAH	Year Around	303(d)	2002	Willamette River 1227618456580
Willamette River 1227618456580	**0 – 24.8**	**DDT**	**Year Round**	**303(d)**	**2002**	**Columbia River 1240483462464**
Willamette River 1227618456580	**0 – 24.8**	**Polynuclear Aromatic Hydrocarbons**	**Year Round**	**303(d)**	**2002**	**Columbia River 1240483462464**

Sampling design, collection, methods, and handling will be managed by the sampling organization identified in section A4. The sampling organization will ensure that all samples will be collected in the appropriate sample containers, preserved as identified in the appropriate reference methods, and transported to the analytical organization within the appropriate sample holding times, with the appropriate documentation, and under the appropriate sample transport conditions. The analytical laboratory assumes no responsibility for the quality of data resulting from samples that were collected, shipped, or stored under inappropriate conditions.

The locations and media to be sampled as part of the Toxic Monitoring Project are summarized in Table 4. The locations of ambient monitoring sites that will have Total Recoverable Metals added to the ambient suite of parameters are summarized in Table 5.

Table 4 Summary of the sampling locations, media, and expected number of samples

LASAR #	Site Name – TMP sites	Latitude	Longitude	No. of Samples
USGS HUC 17090001 Middle Fork Willamette				
10386	Middle Fork Willamette at Jasper	43.9982	-122.9053	2
USGS HUC 17090002 Coast Fork Willamette				
11275	Coast Fork Willamette at Mt. Pisgah PK	44.0100	-122.9851	2
USGS HUC 17090003 Upper Willamette				
10355	Willamette River at Harrisburg	44.2672	-123.1737	2
11140	Long Tom River at Stow Pit Road	44.3429	-123.2944	2
10373	Mary's River at Hwy 99W (Corvallis)	44.5566	-123.2636	2
10352	Willamette River at Old Hwy 34 Bridge	44.5655	-123.2554	2
11180	Calapooia River at Queen Road	44.6202	-123.1275	2
10350	Willamette River at Albany	44.6397	-123.1058	2
USGS HUC 17090004 McKenzie				
10376	McKenzie River at Coburg Road	44.1127	-123.0462	2
USGS HUC 17090005 North Santiam				
10792	North Santiam River at Greens Bridge	44.7087	-122.9711	2
USGS HUC 17090006 South Santiam				
10366	South Santiam River at Hwy 226	44.6362	-122.9236	2
USGS HUC 17090007 Middle Willamette				
10555	Willamette River at Marion Street	44.9461	-123.0415	2
10344	Willamette River at Wheatland Ferry	45.0906	-123.0443	2
10339	Willamette River at Canby Ferry	45.3003	-122.6907	2
USGS HUC 17090008 Yamhill				
10363	Yamhill River at Dayton	45.2236	-123.0716	2
USGS HUC 17090009 Molalla / Pudding				
10640	Pudding River at Hwy 211 (Woodburn)	45.1504	-122.7925	2
10637	Molalla River at Knights Bridge RD	45.2677	-122.7092	2
USGS HUC 17090010 Tualatin				
10456	Tualatin River at Boones Ferry Road	45.3861	-122.7563	2
USGS HUC 17090011 Clackamas				
10360	Clackamas River at Hwy 99E	45.3735	-122.6002	2
USGS HUC 17090012 Lower Willamette				

LASAR #	Site Name – TMP sites	Latitude	Longitude	No. of Samples
10611	Willamette River at Hawthorne Bridge	45.5133	-122.6699	2

Table 5: **Ambient sampling locations with additional Total Recoverable Metals.**

LASAR #	Site Name – Ambient Sites for TR Metals	Latitude	Longitude	No. of Samples
USGS HUC 17090001 Middle Fork Willamette				
10386	Middle Fork Willamette at Jasper	43.9982	-122.9053	5
USGS HUC 17090002 Coast Fork Willamette				
11275	Coast Fork Willamette at Mt. Pisgah PK	44.0100	-122.9851	5
USGS HUC 17090003 Upper Willamette				
10359	Willamette River at Hwy 126	44.0456	-123.0268	5
10355	Willamette River at Harrisburg	44.2672	-123.1737	9
11140	Long Tom River at Stow Pit Road	44.3429	-123.2944	5
10373	Mary’s River at Hwy 99W (Corvallis)	44.5566	-123.2636	5
10352	Willamette River at Old Hwy 34 Bridge	44.5655	-123.2554	9
11180	Calapooia River at Queen Road	44.6202	-123.1275	5
10350	Willamette River at Albany	44.6397	-123.1058	9
USGS HUC 17090004 McKenzie				
12252	McKenzie River at McKenzie Bridge	44.1742	-122.1614	5
10662	McKenzie River at Hendricks Bridge	44.0553	-122.8312	5
10376	McKenzie River at Coburg Road	44.1127	-123.0462	5
USGS HUC 17090005 North Santiam				
12559	North Santiam River at Coopers Ridge RD	44.6932	-122.0486	5
12553	North Santiam River at Gates School RD	44.7528	-122.4117	5
10792	North Santiam River at Greens Bridge	44.7087	-122.9711	5
USGS HUC 17090006 South Santiam				
10366	South Santiam River at Hwy 226	44.6362	-122.9236	5
USGS HUC 17090007 Middle Willamette				
10555	Willamette River at Marion Street	44.9461	-123.0415	9
10344	Willamette River at Wheatland Ferry	45.0906	-123.0443	5
10339	Willamette River at Canby Ferry	45.3003	-122.6907	9
USGS HUC 17090008 Yamhill				
10929	North Yamhill River at Poverty Bend RD	45.2519	-123.1742	5
10948	South Yamhill River at Hwy 99W	45.1687	-123.2069	5

LASAR #	Site Name – Ambient Sites for TR Metals	Latitude	Longitude	No. of Samples
10363	Yamhill River at Dayton	45.2236	-123.0716	5
USGS HUC 17090009 Molalla / Pudding				
10640	Pudding River at Hwy 211 (Woodburn)	45.1504	-122.7925	5
10917	Pudding River at Hwy 99E (Aurora)	45.2338	-122.7490	5
10637	Molalla River at Knights Bridge RD	45.2677	-122.7092	5
USGS HUC 17090010 Tualatin				
10461	Tualatin River at Rood Road	45.4901	-122.9506	5
10480	Beaverton Creek at Cornelius Pass Road	45.5209	-122.8988	5
10459	Tualatin River at Hwy 210 (Scholls)	45.4146	-122.9211	5
10458	Tualatin River at Elsner Road	45.3882	-122.8517	5
10469	Fanno Creek at Bonita Road	45.4151	-122.7539	5
10456	Tualatin River at Boones Ferry Road	45.3861	-122.7563	5
USGS HUC 17090011 Clackamas				
14008	Clackamas River at Memaloose RD	45.1582	-122.1515	5
13070	Clackamas River at McIver Park	45.2994	-122.3604	5
10360	Clackamas River at High Rocks	45.3735	-122.6002	5
USGS HUC 17090012 Lower Willamette				
11321	Johnson Creek at SE 17th Ave., Portland	45.4472	-122.6433	5
10611	Willamette River at Hawthorne Bridge	45.5133	-122.6699	9
10801	Swan Island Channel Midpoint	45.5638	-122.7091	5
10332	Willamette River at SP&S RR Bridge	45.5779	-122.7475	5
11201	Columbia Slough at Landfill Road	45.6105	-122.7531	5
USGS HUC 17080001 Lower Columbia - Sandy				
10616	Columbia River at Marker 47	45.6456	-122.7369	5

B2. Sampling Methods, Sample Handling, and Custody

A summary of the sampling containers, preservation requirements, and holding times is presented in Table 6.

Table 6 Summary of Sampling Parameters

Sample Type	Container	Preservation	Holding Time
Temperature	in-stream / bucket	None	Immediately
pH[i]	in-stream / bucket P - Reused, Washed, 1000 ml polyethylene bottle	Refrigerate on ice at 4°C	Immediate (30 hr)

Sample Type	Container	Preservation	Holding Time
Specific Conductance [i]	in-stream / bucket P - Reused, Washed, 1000 ml polyethylene bottle	Refrigerate on ice at 4°C	28 days
Dissolved Oxygen [i]	BOD bottle, P	Check sample for residual chlorine, if positive add 100 mg Sodium Thiosulfate per liter	0.5 h, 8h/8h[ii]
Turbidity [i]	in-stream / bucket P = Reused, Washed, 1000 ml polyethylene bottle	Refrigerate on ice at 4°C	48 hours
Total Solids	P = Reused, Washed, 1000 ml polyethylene bottle	Refrigerate on ice at 4°C	7 days
Total Suspended Solids	P = Reused, Washed, 1000 ml polyethylene bottle	Refrigerate on ice at 4°C	7 days
Total Recoverable Metals	TM = New, 250 ml or 500 ml polyethylene bottle	Add 25 drops HNO_3 to 250 ml bottle, 50 drops HNO_3 to 500 ml bottle [HNO_3 = Nitric acid]	6 months
Sulfate	DP = Reused, Washed, 250 ml polyethylene bottle for filtered sample.	Filter in Field (0.45 μ filter), and refrigerate at 4°C	28 days
Total Organic Carbon	1 R = Reused, Washed, 500 ml polyethylene bottle.	Add 12 drops conc. H_2SO_4 to 500 ml bottle and refrigerate. [H_2SO_4 = Sulfuric Acid]	28 days
Dissolved Organic Carbon	1 R = Reused, Washed, 500 ml polyethylene bottle for filtered sample.	Filter in Field (0.45 μ filter) then add 12 drops conc. H_2SO_4 to 500 ml bottle and refrigerate. [H_2SO_4 = Sulfuric Acid]	28 days
Organic Compounds by LC/MS/MS	2 X = New, 1L or 1.25L glass jar with Teflon lined lid	Refrigerate on ice at 4°C	Extraction – 7 days Analysis – 40 days
Pharmaceuticals and Personal Care Products by LC/MS/MS	2 X = New, 1L or 1.25L glass jar with Teflon lined lid	Refrigerate on ice at 4°C	Extraction – 7 days Analysis – 40 days
Steroids and Hormones by HRGC/HRMS	1 X = New, 1L or 1.25L glass jar with Teflon lined lid	Refrigerate on ice at 4°C	Extraction – 2 days Analysis – 40 days
Semi-Volatile Organic Compounds by GC/MS	2 CX = New, 1L or 1.25L glass jar with Teflon lined lid	Refrigerate on ice at 4°C	Extraction – 14 days Analysis – 40 days
Phenoxy Herbicides by GC/ECD	2 HV = New, 60 ml glass vial with Teflon lined septum	Refrigerate on ice at 4°C	Extraction – 14 days Analysis – 40 days
Volatile Organic Compounds by GC/MS	3 B = New, 40 ml glass vial with Teflon lined septum or an Amber 4 oz. TOX bottle	Refrigerate on ice at 4°C	Analysis – 14 days
Total Recoverable Metals	TM = New, 250 ml or 500 ml polyethylene bottle	Add 25 drops HNO_3 to 250 ml bottle, 50 drops HNO_3 to 500 ml bottle [HNO_3 = Nitric acid]	6 months

[i] A laboratory QC check on the field analysis is preformed on a randomly selected sample.
[ii] Analyze immediately. Winkler allows stabilization & holding for 8 hours until titration.

B3. Analytical Parameters, Methods, and Quality Control

A summary of the requested analytical parameters and methods is provided in Table 7. A summary of the data quality indicators for the requested analytical parameters is provided in Table 8. Standard DEQ Laboratory operating procedures will be following during the analyses of the samples, including analytical Quality Control measures and equipment inspection/maintenance.

The following analytical parameters were requested in the 2008 work plan but were not analyzed because the DEQ lacked the capability: Bisphenol A, Cotinine. Desethylatrazine, Glyphosate, mercury, Methylmercury, 4-nonylphenol, Triclosan, Tri (2-chloroehtyl) phosphate and Tri (dichloroisopropyl) phosphate.

Table 7: Summary of analytical parameters and methods

Sample Type	Analytical Parameters	Reference Method
Surface Water	Field parameter - Temperature	EPA 170.1
Surface Water	Field parameter - pH	EPA 150.1
Surface Water	Field parameter – Specific Conductance	EPA 120.1
Surface Water	Field parameter – Dissolved Oxygen	4500-0 C
Surface Water	Field parameter - Turbidity	SM 2130 B
Surface Water	Total Solids	2540 B
Surface Water	Total Suspended Solids	2540 D
Surface Water	Sulfate by IC	EPA 300.0
Surface Water	Total Organic Carbon	SM 5310 D
Surface Water	Dissolved Organic Carbon	SM 5310 D
Surface Water	Organic Compounds by LC/MS/MS	EPA 8321 B
Surface Water	Pharmaceuticals and Personal Care Products by LC/MS/MS	EPA 1694
Surface Water	Steroids and Hormones by HRGC/HRMS	EPA 1698
Surface Water	Semi-Volatile Organic Compounds by GC/MS	EPA 8270 C
Surface Water	Phenoxy Herbicides by GC/ECD	SM 6640
Surface Water	Volatile Organic Compounds by GC/MS	EPA 8260 B
Surface Water	Total Recoverable Metals	EPA 200.8

Table 8 Data Quality Indicators

Parameter[i]	Target[ii] (LOQ)	Precision [iii]	Accuracy[iv]			
			MS	LCS	CCV	ICV
Field Measurements Methods from Manual Of Methods DEQ03-LAB-0036-SOP						
Field Temperature Units - °C	1	≤ ± 0.5	N/A	N/A	N/A	

Parameter[i]	**Target**[ii] **(LOQ)**	**Precision**[iii]	**Accuracy**[iv]			
			MS	**LCS**	**CCV**	**ICV**
Field Conductivity Units - µmhos/cm	1	≤ ± 10%	N/A	≤ ± 10%	N/A	N/A
Field pH Units - SU	Sensitivity to 0.1	≤ ± 0.3	N/A	N/A	N/A	N/A
Field Dissolved Oxygen Units – mg/L	1	≤ ± 0.3	N/A	N/A	N/A	≤ ± 0.2
Field Turbidity Units - NTU	1	≤ ± 20%	N/A	≤ ± 10%	N/A	N/A
Physical / Aggregate Constituents Method – 2540 B / D	**Units (mg/L)**					
Total Solids	10	≤ ± 20%	N/A	≤ ± 20%	N/A	N/A
Total Suspended Solids	1	≤ ± 20%	N/A	≤ ± 20%	N/A	N/A
Organic: / Aggregate Constituents Method – 5310 B	**Units (mg/L)**					
Total Organic Carbon	1	≤ ± 20%	≤ ± 25%	≤ ± 15%	≤ ± 10%	≤ ± 10%
Dissolved Organic Carbon	1	≤ ± 20%	≤ ± 25%	≤ ± 15%	≤ ± 10%	≤ ± 10%
Anion by Ion Chromatography Method 300.0	**Units (mg/L)**					
Sulfate	***LOQ (0.20)***	***≤ ± 20%***	***≤ ± 30%***	***≤ ± 10%***	***≤ ± 10%***	***≤ ± 10%***
Total Recoverable Metals by ICP/MS Method 200.8	**Units (µg/L)**					
Hardness	LOQ (0.75)	≤ ± 20%	≤ ± 30%	≤ ± 15%	≤ ± 10%	≤ ± 10%
Antimony	***2.0 (2.0)***	***≤ ± 20%***	***≤ ± 30%***	***≤ ± 15%***	***≤ ± 10%***	***≤ ± 10%***
Arsenic	***2.0 (2.0)***	***≤ ± 20%***[v]	***≤ ± 30%***[v]	***≤ ± 15%***	***≤ ± 10%***	***≤ ± 10%***
Barium	***2.0 (2.0)***	***≤ ± 20%***[v]	***≤ ± 30%***[v]	***≤ ± 15%***	***≤ ± 10%***	***≤ ± 10%***
Beryllium	***0.30 (0.30)***	***≤ ± 20%***[v]	***≤ ± 30%***[v]	***≤ ± 15%***	***≤ ± 10%***	***≤ ± 10%***
Cadmium	***0.30 (0.30)***	***≤ ± 20%***[v]	***≤ ± 30%***[v]	***≤ ± 15%***	***≤ ± 10%***	***≤ ± 10%***
Chromium	***1.0 (1.0)***	***≤ ± 20%***[v]	***≤ ± 30%***[v]	***≤ ± 15%***	***≤ ± 10%***	***≤ ± 10%***
Cobalt	***0.20 (0.20)***	***≤ ± 20%***[v]	***≤ ± 30%***[v]	***≤ ± 15%***	***≤ ± 10%***	***≤ ± 10%***
Copper	***1.5 (1.5)***	***≤ ± 20%***[v]	***≤ ± 30%***[v]	***≤ ± 15%***	***≤ ± 10%***	***≤ ± 10%***
Iron	LOQ (150)	≤ ± 20%[v]	≤ ± 30%[v]	≤ ± 20%	≤ ± 15%	≤ ± 15%
Manganese	***5.0 (5.0)***	***≤ ± 20%***[v]	***≤ ± 30%***[v]	***≤ ± 15%***	***≤ ± 10%***	***≤ ± 10%***
Nickel	***1.0 (1.0)***	***≤ ± 20%***[v]	***≤ ± 30%***[v]	***≤ ± 15%***	***≤ ± 10%***	***≤ ± 10%***
Lead	***1.5 (0.20)***	***≤ ± 20%***[v]	***≤ ± 30%***[v]	***≤ ± 15%***	***≤ ± 10%***	***≤ ± 10%***
Selenium	***2.0 (2.0)***	***≤ ± 20%***[v]	***≤ ± 30%***[v]	***≤ ± 15%***	***≤ ± 10%***	***≤ ± 10%***
Silver	***0.10 (0.10)***	***≤ ± 20%***[v]	***≤ ± 30%***[v]	***≤ ± 15%***	***≤ ± 10%***	***≤ ± 10%***
Thallium	LOQ (0.10)	≤ ± 20%[v]	≤ ± 30%[v]	≤ ± 15%	≤ ± 10%	≤ ± 10%
Uranium	LOQ (0.10)	≤ ± 20%[v]	≤ ± 30%[v]	≤ ± 15%	≤ ± 10%	≤ ± 10%
Vanadium	LOQ (4.0)	≤ ± 20%[v]	≤ ± 30%[v]	≤ ± 15%	≤ ± 10%	≤ ± 10%
Zinc	***3.0 (3.0)***	***≤ ± 20%***[v]	***≤ ± 30%***[v]	***≤ ± 15%***	***≤ ± 10%***	***≤ ± 10%***

Parameter[i]	Target[ii] (LOQ)	Precision [iii]	Accuracy[iv] MS	LCS	CCV	ICV
Organic Compounds by LC/MS/MS by Method 8321	**Units (ng/L)**					
Acetochlor	LOQ (5.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Alachlor	100 (5.0)	≤ ± 30%[VI]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Ametryn	LOQ (1.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Aminocarb	LOQ (1.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Atrazine	***50 (2 0)***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***[v]***	***[v]***
Azinphos Methyl	***100 (10.0)***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***[v]***	***[v]***
Baygon	LOQ (1.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Carbaryl	***100 (2.5)***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***[v]***	***[v]***
Carbofuran	***100 (1.0)***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***[v]***	***[v]***
DEET	***50 (2 5)***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***[v]***	***[v]***
Diuron	***100 (2 0)***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***[v]***	***[v]***
Fluometuron	LOQ (2 0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Imazapyr	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Imidacloprid	***100 (10.0)***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***[v]***	***[v]***
Linuron	LOQ (2 0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Methiocarb	LOQ (2 0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Methomyl	LOQ (1.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Metolachlor	50 (5.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Metribuzin	LOQ (2 0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Mexacarbate	LOQ (1.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Neburon	LOQ (2 5)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Oxyamyl	LOQ (1.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Prometon	LOQ (2 0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Prometryn	LOQ (1 0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Propazine	LOQ (2 0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Propiconazole	LOQ (10.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Pyraclostrobin	LOQ (2 0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Siduron	LOQ (1 0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Simazine	***50 (2 0)***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***[v]***	***[v]***
Simetryn	LOQ (2 0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Terbutryne	LOQ (1 0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Terbutylazine	LOQ (1 0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Pharmaceuticals and Personal Care Products by LC/MS/MS Method 1694	**Units (ng/L)**					

Parameter[i]	Target[ii] (LOQ)	Precision [iii]	Accuracy[iv] MS	LCS	CCV	ICV
Acetaminophen	LOQ (500)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Caffeine	LOQ (125)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Carbamazepine	***10 (10.0)***	**≤ ± 30%[v]**	**≤ ± 30%[v]**	**≤ ± 30%[v]**	[v]	[v]
Codeine	LOQ (25.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Diphenhydramine	LOQ (10.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Sulfamethoxazole	***10 (10.0)***	**≤ ± 30%[v]**	**≤ ± 30%[v]**	**≤ ± 30%[v]**	[v]	[v]
Venlafaxine	***50 (10.0)***	**≤ ± 30%[v]**	**≤ ± 30%[v]**	**≤ ± 30%[v]**	[v]	[v]
Carbamate Pesticides						
Semi-volatile Organic Compounds by GC/MS - Toxics by Method 8270C	**Units (ng/L)**					
Butylate	LOQ (70.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Cycloate	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
EPTC (Eptam)	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Molinate	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Pebulate	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Vernolate	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Chloroacetanilide Pesticides						
Semi-volatile Organic Compounds by GC/MS - Toxics by Method 8270C	**Units (ng/L)**					
Alachlor	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Butachlor	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Metolachlor	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Propachlor	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Insect Repellent						
Semi-volatile Organic Compounds by GC/MS - Toxics by Method 8270C	**Units (ng/L)**					
DEET (Project Selection)	***50 (20.0)***	**≤ ± 30%[v]**	**≤ ± 30%[v]**	**≤ ± 30%[v]**	[v]	[v]
MGK-264	LOQ (40.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Juvenile Hormone mimics						
Semi-volatile Organic Compounds by GC/MS - Toxics by Method 8270C	**Units (ng/L)**					
Pyriproxyfen	LOQ (50.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Organochlorine PesticidesSemi-volatile Organic Compounds by GC/MS - Toxics by Method 8270C	**Units (ng/L)**					
4,4`-DDD	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
4,4`-DDE	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]

Parameter[i]	Target[ii] (LOQ)	Precision [iii]	Accuracy[iv] MS	LCS	CCV	ICV
4,4`-DDT	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Aldrin	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
alpha-BHC	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
beta-BHC	LOQ (40.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
cis-Chlordane	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
delta-BHC	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Dieldrin	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Endosulfan I	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Endosulfan II	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Endosulfan sulfate	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Endrin	LOQ (80.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Endrin Aldehyde	LOQ (40.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Heptachlor	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Hexachlorobenzene	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Hexachlorocyclopentadiene	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Lindane (gamma-BHC)	LOQ (40.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Methoxychlor	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Pentachlorophenol	LOQ (80.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
trans-Chlordane	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
trans-Nonachlor	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Organophosphate Pesticides **Semi-volatile Organic Compounds by GC/MS - Toxics by Method 8270C**	**Units (ng/L)**					
Azinphos Methyl	***100 (20.0)***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***[v]***	***[v]***
Chlorpyriphos	***100 (20.0)***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***[v]***	***[v]***
Diazinon	***100 (20.0)***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***[v]***	***[v]***
Dichlorvos	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Dimethoate	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Disulfoton	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Ethoprophos	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Fenamiphos	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Imidan (Phosmet)	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Malathion	**100 (20.0)**	**≤ ± 30%[v]**	**≤ ± 30%[v]**	**≤ ± 30%[v]**	**[v]**	**[v]**
Methyl paraoxon	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Methyl Parathion	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Terbufos	LOQ (40.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Tetrachlorvinphos	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]

Parameter[i]	Target[ii] (LOQ)	Precision[iii]	Accuracy[iv]			
			MS	LCS	CCV	ICV
Otherwise not classified Pesticides						
Semi-volatile Organic Compounds by GC/MS - Toxics by Method 8270C	**Units (ng/L)**					
2,4-Dinitrotoluene	LOQ (40.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
2,6-Dinitrotoluene	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Bromacil	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Carboxin	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Chlorobenzilate(a)	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Chloroneb	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Chlorothalonil	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Chlorpropham	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Diphenamid	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Etridiazole	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Fenarimol	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Fluridone	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Hexazinone	***LOQ (20.0)***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***[v]***	***[v]***
Isophorone	LOQ (40.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Metribuzin	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Napropamide	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Norflurazon	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Pendimethalin	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Pronamide	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Tebuthiuron	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Terbacil	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Triadimefon	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Tricyclazole	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Trifluralin	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Phthalate Pesticide						
Semi-volatile Organic Compounds by GC/MS - Toxics by Method 8270C	**Units (ng/L)**	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Dacthal	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Phthalates and Related Plasticizers						
Semi-volatile Organic Compounds by GC/MS - Toxics by Method 8270C	**Units (ng/L)**					
Bis(2-ethylhexyl)adipate	LOQ (100)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Bis(2-ethylhexyl)phthalate	LOQ (500)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]

Parameter[i]	Target[ii] (LOQ)	Precision [iii]	Accuracy[iv]			
			MS	LCS	CCV	ICV
Butylbenzylphthalate	LOQ (200)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Diethylphthalate	***50 (40.0)***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***[v]***	***[v]***
Dimethylphthalate	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Pyrethroid Pesticide **Semi-volatile Organic Compounds by GC/MS - Toxics by Method 8270C**	**Units** **(ng/L)**					
Fenvalerate+Esfenvalerate	LOQ (100)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Permethrin	***50 (40.0)***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***[v]***	***[v]***
Triazine Herbicides **Semi-volatile Organic Compounds by GC/MS - Toxics by Method 8270C**	**Units** **(ng/L)**					
Ametryn	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Atraton	LOQ (80.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Atrazine	***50 (80.0)***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***[v]***	***[v]***
Cyanazine	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Prometon	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Prometryn	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Propazine	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Simazine	***50 (40.0)***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***[v]***	***[v]***
Simetryn	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Terbutryne	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Poly-BromoDiphenyl Ethers (PBDEs) **Semi-volatile Organic Compounds by GC/MS - Toxics by Method 8270C**	**Units** **(ng/L)**					
PBDE-17	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
PBDE-28	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
PBDE-47	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
PBDE-66	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
PBDE-71	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
PBDE-85	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
PBDE-99	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
PBDE-100	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
PBDE-138	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
PBDE-139	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
PBDE-153	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]

Parameter[i]	Target[ii] (LOQ)	Precision [iii]	Accuracy[iv]			
			MS	LCS	CCV	ICV
PBDE-154	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
PBDE-183	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Poly-ChloroBiphenyls (PCBs)Semi-volatile Organic Compounds by GC/MS - Toxics by 8270C	**Units (ng/L)**					
Polycyclic Aromatic HydrocarbonsSemi-volatile Organic Compounds by GC/MS - Toxics by 8270C	**Units (ng/L)**					
Acenaphthene	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Acenaphthylene	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Anthracene	**50.0 (20.0)**	**≤ ± 30%[v]**	**≤ ± 30%[v]**	**≤ ± 30%[v]**	**[v]**	**[v]**
Benzo(a)anthracene	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Benzo(a)pyrene	***50.0 (20.0)***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***[v]***	***[v]***
Benzo[b]fluoranthene	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Benzo[g,h,i]perylene	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Benzo[k]fluoranthene	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Chrysene	***50.0 (20.0)***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***[v]***	***[v]***
Dibenz[a,h]anthracene	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Fluoranthene	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Fluorene	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Indeno[1,2,3-cd]pyrene	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Phenanthrene	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Pyrene	***50.0 (20.0)***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***[v]***	***[v]***
Phenoxy Herbicides by GC/ECD Method 6640B	**Units (µg/L)**					
2,4-D	***0.1 (0.1)***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***[v]***	***[v]***
2,4-DB	LOQ (0.6)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
2,4,5-T	LOQ (0.1)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
3,5-Dichlorobenzoic acid	LOQ (0.3)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Acifluorfen	LOQ (0.2)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Bentazon	LOQ (0.6)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Dicamba	LOQ (0.3)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Dichloroprop	LOQ (0.3)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Dinoseb	LOQ (0.3)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
MCPA	LOQ (20.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
MCPP	LOQ (50.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Pentachlorophenol	***LOQ (0.1)***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***[v]***	***[v]***
Picloram	LOQ (0.6)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]

Parameter[i]	Target[ii] (LOQ)	Precision [iii]	Accuracy[iv]			
			MS	LCS	CCV	ICV
Silvex	LOQ (0.1)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Triclopyr	***0.1 (0.3)***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***[v]***	***[v]***
Chloramben	LOQ (0.6)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Steroids and Hormones by HRGC/HRMS 1698	**Units (ng/L)**					
17a-Estradiol	LOQ (5.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
17a-Ethynyl Estradiol	***5.0 (2.0)***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***[v]***	***[v]***
17ß-Estradiol	***5.0 (2.0)***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***[v]***	***[v]***
Estriol	***5.0 (2.0)***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***[v]***	***[v]***
Estrone	***5.0 (2.0)***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***[v]***	***[v]***
Cholesterol	LOQ (75.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Coprostanol	LOQ (5.0)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Volatile Organics by GC/MS Method 8260B Units – mg/L						
1,2-Dichloroethane	LOQ(0.0005)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
1,2-Dichloropropane	LOQ(0.0005)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
1,2-Dimethylbenzene	***LOQ (0.0005)***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***[v]***	***[v]***
1,3,5-Trimethylbenzene	LOQ(0.0005)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
1,3-Dichlorobenzene	LOQ(0.0005)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
1,3-Dichloropropane	LOQ(0.0005)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
1,4/1,3-Dimethylbenzene	***LOQ (0.001)***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***[v]***	***[v]***
1,4-Dichlorobenzene	LOQ(0.0005)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
2,2-Dichloropropane	LOQ(0.0005)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
2-Butanone (MEK)	LOQ (0.05)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
2-Chloroethyl Vinyl Ether	LOQ(0.0005)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
2-Chlorotoluene	LOQ(0.0005)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
4-Chlorotoluene	LOQ (0.001)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
4-isopropyltoluene	LOQ(0.0005)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
4-Methyl-2-Pentanone (MIBK)	LOQ (0.0012)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Acetone	LOQ (0.0015)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Acrolein (2-Propenal)	LOQ (0.0015)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Benzene	***0.0005 (0.0005)***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***[v]***	***[v]***
Bromobenzene	LOQ(0.0005)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Bromochloromethane	LOQ(0.0005)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Bromodichloromethane	LOQ(0.0005)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]

Parameter[i]	Target[ii] (LOQ)	Precision[iii]	Accuracy[iv]			
			MS	LCS	CCV	ICV
Bromoform	LOQ(0.0005)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Bromomethane	LOQ(0.0005)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Carbon Disulfide	LOQ(0.0005)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Carbon Tetrachloride	LOQ(0.0005)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Chlorobenzene	LOQ(0.0005)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Chloroethane	LOQ(0.0005)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Chloroform	LOQ(0.0005)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Chloromethane	LOQ(0.0005)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
cis-1,2-Dichloroethylene	LOQ(0.0005)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
cis-1,3-Dichloropropene	LOQ(0.0005)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Dibromochloromethane	LOQ(0.0005)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Dibromomethane	LOQ(0.0005)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Dichlorodifluoromethane	LOQ(0.0005)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Ethyl Benzene	***0.0005 (0.0005)***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***[v]***	***[v]***
Hexachloro-1,3-Butadiene	LOQ(0.0005)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Isopropylbenzene (Cumene)	LOQ (0.0006)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Methylene Chloride	LOQ(0.0005)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
MtBE	LOQ(0.0005)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Naphthalene	LOQ(0.0005)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
n-butylbenzene	LOQ(0.0005)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
n-Propylbenzene	LOQ(0.0005)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
sec-Butylbenzene	LOQ (0.001)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Styrene	LOQ(0.0005)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
tert-Butylbenzene	LOQ(0.0005)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
trans-1,3-Dichloropropene	LOQ(0.0005)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Trichloroethylene	***0.0005 (0.0005)***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***≤ ± 30%[v]***	***[v]***	***[v]***
Trichlorofluoromethane	LOQ(0.0005)	≤ ± 30%[v]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]
Vinyl Chloride	LOQ(0.0005)	≤ ± 30%[VI]	≤ ± 30%[v]	≤ ± 30%[v]	[v]	[v]

[i] (Parameters in Bold Italics are 2008 Project parameters of concern per work plan). Shaded cells in the Target column indicate the target value is less than the lab's LOQ and will be reported to the LOQ.
[ii] The target level is the anticipated reporting level for this project. A target level of "LOQ" means the laboratory will use its current LOQ. If the requested target level is less than the laboratories LOQ, the laboratory will report the result down to the laboratory's LOQ.
[iii] The precision control limit is to be used to evaluate both field duplicate and laboratory duplicate samples. Use the laboratory's current duplicate control limits, unless specified otherwise.
[iv] Actual laboratory control limits may vary, since laboratories are expected to revise control limits over time. Some QC measures are not applicable (NA) to the test method. Use the laboratory's current accuracy control limits, unless specified otherwise.

[v] Laboratory control limits vary within each compound and method. Use the laboratory's current method description for specific limits. All data is reviewed against current method criteria

B4. Data Management

Analytical data generated by the laboratory will be sent to the Project Coordinator as a link to the pdf report in an email. The DEQ Laboratory will maintain hard copies of the analytical reports, including all analytical QC measurements. Unless otherwise arranged, data generated by the DEQ Laboratory will be moved to the Laboratory Analytical Storage and Retrieval Database (LASAR) following release to the Project Coordinator. Data in LASAR is publicly available through the DEQ website at http://deq12.deq.state.or.us/lasar2/default.aspx.

SECTION C. ASSESSMENT AND OVERSIGHT

Overall project assessment and oversight, including field activities, will be the responsibility of the Project Coordinator. Laboratory assessment and oversight will be provided by DEQ Laboratory management and Quality Assurance Officers as defined in the Laboratory's Quality Manual or for cause. Any analytical anomalies or delays encountered during laboratory operations will be communicated to the Project Coordinator in writing (e-mail is acceptable). The Project Coordinator will also be notified in writing of any data quality limitations that may be the result of laboratory operations.

SECTION D. DATA VALIDATION AND USABILITY

The DEQ Laboratory will provide standard data review, verification, and validation on all analytical data generated by this project. The extent of the data review, verification, and validation is limited to the analytical processes only. However, in the best judgment of the DEQ QAO, any data that may be inaccurate, misleading, or otherwise fails the DEQ Laboratory's quality standards due to field or sampling activities will be identified in the final analytical report. Moreover, this data will be appropriately qualified when transferred to the Laboratory Analytical Storage and Retrieval Database (LASAR). All data verification, validation, and assessment activities for project purposes are the responsibility of the Project Coordinator.

Appendix A - Revision History

The plan author must increment the revision number with each approved revision. A new document is assigned a revision number of 1.0. The revision number of a plan that receives routine or minor editing is updated by incrementing the minor number by one (i.e., 1.0 becomes 1.1) The revision number of a document that has undergone major revisions is updated by incrementing the major number by one and setting the minor number to zero (i.e., 1.1 becomes 2.0). Revisions to documents should be clearly identified in a "Revision History" section of the document. The Revision History documents the specific changes made to the controlled document, who made the changes, and the date (month and year) the changes were made.

Table 9 – Revision History

Revision	Date	Changes	Editor
1.0	6-Jan-10	Initial document	Rockwell / Redman