WSP GROUNDWATER MONITORING REPORT

April 25, 2024

Under Agreed Order No. DE 13229, WSP is required to conduct groundwater monitoring to assess performance of the cleanup action in accordance with the Compliance Monitoring Plan approved by Ecology.

On April 25, 2024, groundwater monitoring well testing was conducted at the Washington State Penitentiary Landfill site by Sandra Treccani, Site Manager for the Department of Ecology, Dean Smith, and Kelly Fulbright, representatives for the Department of Corrections. The weather started out cool, around 50 degrees with a breeze, becoming warmer, yet windier with rain at times.

Six monitoring wells, MW-3, MW-5, MW-9, MW-11, MW-12, and MW-14 were chosen and approved by Ecology for testing. Groundwater levels were measured and noted on the attached field logs, as were the water quality parameters. Attempts were made to obtain both temperature and pH, using an OAKTON pH6+ handheld meter. The temperature probe malfunctioned, and we were unable to secure reliable temperatures. Deviation from prior multiparameter sampling was approved by Sandra Treccani.

A Geotech, Geocontrol PRO submersible bladder pump with dedicated bladders and tubing, was used for groundwater purging and sampling. The pump was decontaminated between monitoring wells with Liquinox and rinsed in distilled water. A new bladder was used at each well.

This was the first time we sampled through the flow-through cell. We did not decontaminate the cell prior to the first sample at MW-12. The cell was subsequently decontaminated thereafter along with the pump.

Water samples were sent to Eurofins Environmental Testing for analysis of **Tetrachloroethene (PCE), Manganese, Total Chromium,** and **Nitrates.**

All contaminates, except Nitrates in MW-3, MW-9, MW-11, and MW-12 were below the cleanup levels.

Dean Smith

Environmental Specialist

Washington State Department of Corrections

(509) 386-0388

ANALYTICAL RESULTS

Site Clean Up Levels			48	2240	5	2240	10
		ug/L	ug/L	ug/L	ug/L	ug/L	mg/L
Monitoring Well ID	Sample Collection Date	Hex Chrome	Total Chrome	RJ Lee Group Maganese	PCE	Eurofins Maganese	Nitrate
MW-3	5/24/2023	<PQL	2.24	6.08	ND	ND	26
	10/3/2023	x	ND	x	x	14	x
	12/19/2023	x	x	x	ND	x	x
	4/25/2024	x	ND	x	ND	ND	12
MW-5	5/23/2023	<PQL	4.11	11.23	0.9	8.1	1.8
	10/3/2023	x	2.7	x	x	18	x
	12/19/2023	x	x	x	0.67	x	x
	4/25/2024	x	3	x	ND	17	2.3
MW-9	5/24/2023	<PQL	15.24	765.2	ND	180	10
	12/19/2023	x	ND	x	ND	24	x
	4/25/2024	x	ND	x	ND	42	12
MW-11	5/23/2023	<PQL	5.67	224.3	0.71	62	24
	10/3/2023	x	ND	x	x	15	x
	12/19/2023	x	x	x	0.45	x	x
	4/25/2024	x	ND	x	0.43	7.8	16
MW-12	5/23/2023	<PQL	1.32	2.2	ND	ND	27
	10/3/2023	x	ND	x	x	44	x
	12/19/2023	x	x	x	ND	x	x
	4/25/2024	x	ND	x	ND	12	12
MW-14	5/24/2023	<PQL	1.47	2.3	ND	5.2	24
	10/3/2023	x	ND	x	x	150	x
	12/19/2023	x	x	x	ND	x	x
	4/25/2024	x	ND	x	ND	5.8	10

MW-3 Duplicate	5/24/2023	<PQL	1.1	2.07	ND	ND	26
	10/3/2023	x	ND	x	x	22	x
	12/19/2023	x	x	x	ND	x	x
	4/25/2024	x	ND	x	ND	1.7	13

FAINAL WATER QUALITY PARAMETERS

Monitoring Well ID	Sample Collection Date	pH	Conductivity	Dissolved Oxygen	Temperature (°C)	Turbidity	ORP
MW-3	5/24/2023	6.77	857	68.4	15	2.01	164.2
	10/3/2023	6.81	0.679	5.96	15.3	43.28	152
	12/19/2023	7.47	x	x	12.8	x	x
	4/25/2024	7.1	x	x	Not working	x	x
MW-5	5/23/2023	7.4	194.5	81.3	19.4	149	179.7
	10/3/2023	7.19	0.566	7.59	18	21	145
	12/19/2023	7.61	x	x	13.9	x	x
	4/25/2024	7.59	x	x	Not working	x	x
MW-9	5/24/2023	6.92	498.6	97.9	14.9	223.6	156.6
	12/19/2023	7.36	x	x	12.3	x	x
	4/25/2024	7.23	x	x	Not working	x	x
MW-11	5/23/2023	6.89	887	82.3	18.1	94.6	188
	10/3/2023	6.95	0.853	6.79	18.6	14	153
	12/19/2023	7.26	x	x	15.6	x	x
	4/25/2024	7.22	x	x	Not working	x	x
MW-12	5/23/2023	6.97	888	86.3	17.3	1.75	178.5
	10/3/2023	7.01	0.676	8	16.7	37	147
	12/19/2023	7.34	x	x	13.9	x	x
	4/25/2024	7.2	x	x	Not working	x	x
MW-14	5/24/2023	6.74	1046	84.2	16	4.12	168
	10/3/2023	6.81	0.833	7.83	16.1	58	146.3
	12/19/2023	7.25	x	x	12.4	x	x
	4/25/2024	7.15	x	x	Not working	x	x

Hit well bottom.

Well / Water / Pump Depth

Monitoring Well ID	Sample Collection Date	Well	Water	Pump
MW-3	5/24/2023	80'	72.73'	76'
	10/3/2023	78.7	74.94	77.5
	12/19/2023	78.7	73.66	76
	4/25/2024	80	73.41	75
MW-5	5/23/2023	102'	81.63'	93'
	10/3/2023	99.9	85.11	97.5
	12/19/2023	99.9	82.69	97
	4/25/2024	102	83.77	99
MW-9	5/24/2023	90'	83.18'	87'
	12/19/2023	90	84.38	85
	4/25/2024	88.75	84.15	86
MW-11	5/23/2023	76'	71.3'	74'
	10/3/2023	75.45	73.52	74
	12/19/2023	76	71	74
	4/25/2024	76	71.96	73
MW-12	5/23/2023	76'	70.8'	74'
	10/3/2023	75.45	73.55	74
	12/19/2023	76	71.78	74.5
	4/25/2024	76	71.96	73
MW-14	5/24/2023	74.6'	68.43'	71'
	10/3/2023	72.9	70.3	72
	12/19/2023	73	69.35	72
	4/25/2024		69.2	71

WEATHER: COOL SLIGHT BREEZE

Well Number MW-3
Project Name WSP GW Monitoring
Date 4-25-2024
Time On/Off Location 1114 PMP ON 1122 H^2O

Depth to Water 73.41
Depth of Well 80'
Pump Depth 75
Sampled By D Smith/S Treccani
Sampling Time 1145
Sample ID

Purge Time
Purge Flow Rate
Est Purge Volume
Actual Purge Volume

Time	pH	Cond	DO	Temp	Turb	ORP
1124	7.08					
1129	7.11					
1134	7.09					
1139	7.09					
1144	7.10					

Notes

Well Number MW-5 DUPLE
Project Name WSP GW Monitoring
Date 4-25-2024
Time On/Off Location 0906 PMP ON 0910 H^2O

Depth to Water 83.77
Depth of Well 102'
Pump Depth 99
Sampled By D Smith/S Treccani
Sampling Time 0939
Sample ID

Purge Time
Purge Flow Rate
Est Purge Volume
Actual Purge Volume

Time	pH	Cond	DO	Temp	Turb	ORP
0913	8.16					
0918	8.00					
0923	7.81					
0928	7.62					
0933	7.60					
0938	7.59					

Notes

WIND PICKED UP

Well Number MW-9 | Date 4-25-2024
Project Name | Time On/Off Location 1025 pump on 1029 H2O

Depth to Water 84.15 | Sampled By D Smith/S Treccani
Depth of Well 90' (88.75?) | Sampling Time 1053
Pump Depth 86 | Sample ID

Purge Time | Est Purge Volume
Purge Flow Rate | Actual Purge Volume

Time	pH	Cond	DO	Temp	Turb	ORP
1033	8.00					
1038	7.29					
1043	7.22					
1048	7.22					
1053	7.23					

Notes

Well Number MW-11 | Date 4-25-2024
Project Name | Time On/Off Location

Depth to Water 71.96 | Sampled By D Smith/S Treccani
Depth of Well 76' | Sampling Time 0824 pump on 0826 H2O
Pump Depth 73 | Sample ID 0842

Purge Time | Est Purge Volume
Purge Flow Rate | Actual Purge Volume

Time	pH	Cond	DO	Temp	Turb	ORP
0827	8.15					
0832	7.40					
0837	7.24					
0841	7.22					

Notes

Well Number MW-12 DELTA
Project Name

Date 4-25-2024
Time On/Off Location 0720

Depth to Water 71.96
Depth of Well 76'
Pump Depth 73

Sampled By D Smith/S Treccani
Sampling Time 0733 pmp on 0737 H²O
Sample ID sample 0755

Purge Time
Purge Flow Rate

Est Purge Volume
Actual Purge Volume

Time	pH	Cond	DO	Temp	Turb	ORP
0738	7.17					
0744	7.24					
0749	7.21					
0754	7.20					

Notes SAMPLED THROUGH FLOW-THROUGH CELL FOR THE FIRST TIME W/O DECON
TEMP NOT WORKING 0755 SAMPLE

Well Number MW-14
Project Name

Date 4-25-2024
Time On/Off Location 1213 pmp on 1218 H2O

Depth to Water 69.2
Depth of Well 70'
Pump Depth 71'

Sampled By D Smith/S Treccani
Sampling Time 1240
Sample ID

Purge Time
Purge Flow Rate

Est Purge Volume
Actual Purge Volume

Time	pH	Cond	DO	Temp	Turb	ORP
1218	~~8.14~~ 7.22					
1223	7.10					
1228	7.10					
1233	7.14					
1238	7.15					

Notes

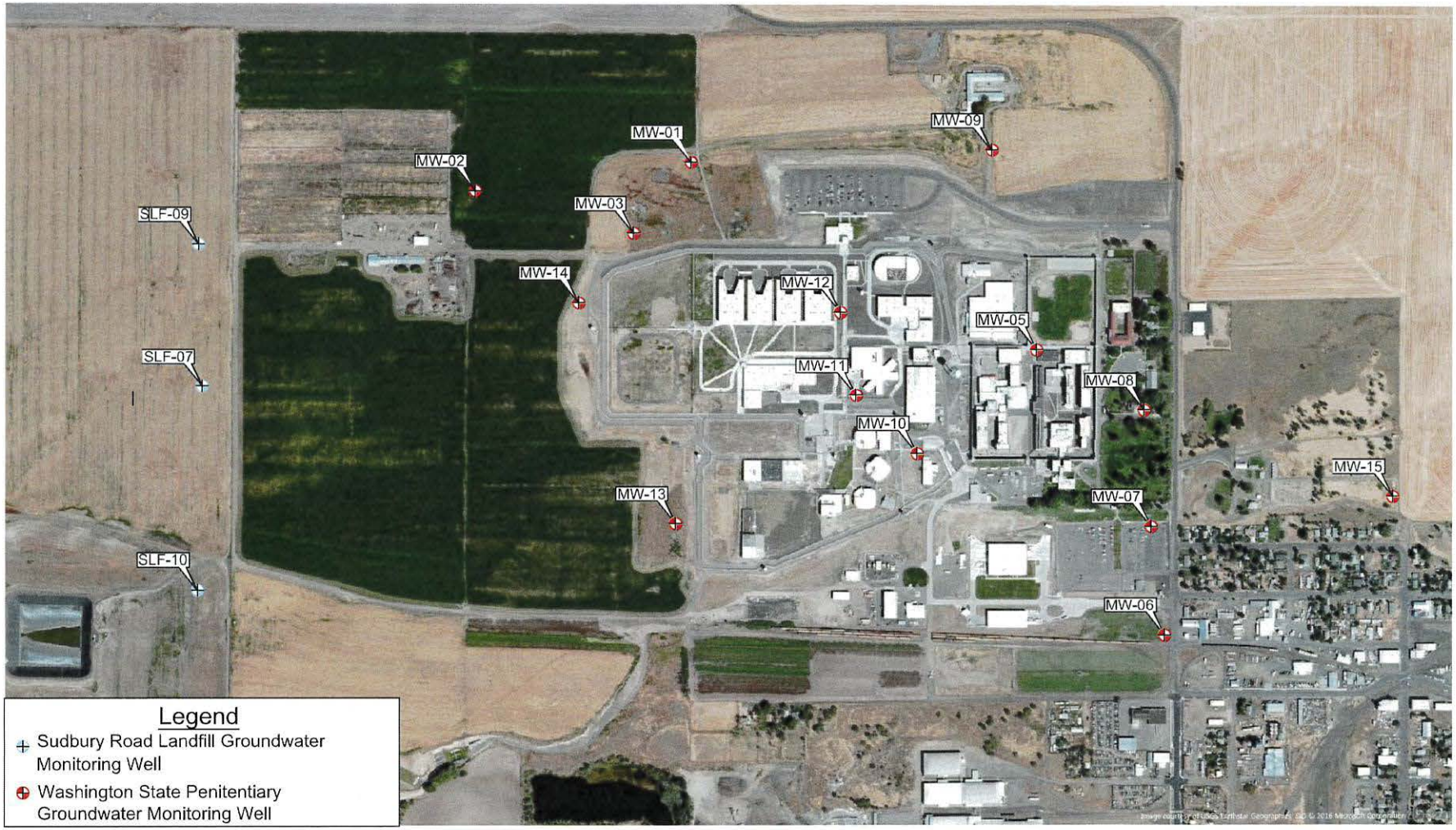
Well Number	SLF-9	Date	4-25-2024
Project Name		Time On/Off Location	
Depth to Water		Sampled By	D Smith/S Treccani
Depth of Well	211'	Sampling Time	1245
Pump Depth		Sample ID	
Purge Time		Est Purge Volume	
Purge Flow Rate		Actual Purge Volume	

Time	pH	Cond	DO	Temp	Turb	ORP

Notes

FIELD DUPLICATE OF MW 3

FULCRUM environmental consulting



ANT

Fulcrum Environmental Consulting, Inc.
406 North Second Street, Yakima, Washington 98901
p: 509.574.0839 f: 509.575.8453 efulcrum.net
Sampling Analysis Plan. 161801. LMW.091616

1313 North 13th Avenue
Walla Walla, Washington

Site Map

FIGURE
2

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Dean Smith
Washington State Dept of Corrections
1313 N 13th Ave - MS#37
Walla Walla, Washington 99362

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JOB DESCRIPTION

Bi-Annual Monitoring

JOB NUMBER

580-139334-1

Eurofins Seattle
5755 8th Street East
Tacoma WA 98424

See page two for job notes and contact information.

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Job Notes

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Authorization

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Authorized for release by
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Table of Contents

Job Narrative
580-139334-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

- Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 4/26/2024 11:00 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 2.5°C.

Receipt Exceptions
Samples were separated and listed on the COC by the container type. Samples that had the same collection date and time were logged in as one sample ID: MW1A 042524 N, MC, PCE (580-139334-1), MW3 042524 N, MC, PCE (580-139334-2), MW5 042524 N, MC, PCE (580-139334-3), MW9 042524 N, MC, PCE (580-139334-4), MW11 042524 N, MC, PCE (580-139334-5), MW12 042524 N, MC, PCE (580-139334-6) and MW14 042524 N, MC, PCE (580-139334-7).

GC/MS VOA
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Metals
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
Method 300_48HR: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for analytical batch 580-458451 were outside control limits for one or more analytes. See QC Sample Results for detail. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery is within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Client: Washington State Dept of Corrections
Project/Site: Bi-Annual Monitoring

Job ID: 580-139334-1

Client Sample ID: MW1A 042524 N, MC, PCE
Date Collected: 04/25/24 12:45
Date Received: 04/26/24 11:00

Lab Sample ID: 580-139334-1
Matrix: Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrachloroethene (PCE)	ND		1.0	0.41	ug/L			04/29/24 19:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*96*		*80 - 120*		*04/29/24 19:02*	*1*
4-Bromofluorobenzene (Surr)	*106*		*80 - 120*		*04/29/24 19:02*	*1*
Dibromofluoromethane (Surr)	*101*		*80 - 120*		*04/29/24 19:02*	*1*
1,2-Dichloroethane-d4 (Surr)	*103*		*80 - 120*		*04/29/24 19:02*	*1*

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		0.025	0.0027	mg/L		04/30/24 17:15	05/01/24 19:59	1
Manganese	**1.7**	**J**	20	1.7	ug/L		04/30/24 17:15	05/01/24 19:59	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N (EPA 300.0)	**13**		0.40	0.060	mg/L			04/26/24 17:11	2

Client: Washington State Dept of Corrections
Project/Site: Bi-Annual Monitoring

Job ID: 580-139334-1

Client Sample ID: MW3 042524 N, MC, PCE
Date Collected: 04/25/24 11:45
Date Received: 04/26/24 11:00

Lab Sample ID: 580-139334-2
Matrix: Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrachloroethene (PCE)	ND		1.0	0.41	ug/L			04/29/24 19:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*96*		*80 - 120*		*04/29/24 19:25*	*1*
4-Bromofluorobenzene (Surr)	*105*		*80 - 120*		*04/29/24 19:25*	*1*
Dibromofluoromethane (Surr)	*104*		*80 - 120*		*04/29/24 19:25*	*1*
1,2-Dichloroethane-d4 (Surr)	*106*		*80 - 120*		*04/29/24 19:25*	*1*

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		0.025	0.0027	mg/L		04/30/24 17:15	05/01/24 20:30	1
Manganese	ND		20	1.7	ug/L		04/30/24 17:15	05/01/24 20:30	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N (EPA 300.0)	**12**		0.40	0.060	mg/L			04/26/24 17:23	2

Client: Washington State Dept of Corrections
Project/Site: Bi-Annual Monitoring

Job ID: 580-139334-1

Client Sample ID: MW5 042524 N, MC, PCE
Date Collected: 04/25/24 09:39
Date Received: 04/26/24 11:00

Lab Sample ID: 580-139334-3
Matrix: Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrachloroethene (PCE)	ND		1.0	0.41	ug/L			04/29/24 19:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*95*		*80 - 120*		*04/29/24 19:48*	*1*
4-Bromofluorobenzene (Surr)	*105*		*80 - 120*		*04/29/24 19:48*	*1*
Dibromofluoromethane (Surr)	*102*		*80 - 120*		*04/29/24 19:48*	*1*
1,2-Dichloroethane-d4 (Surr)	*104*		*80 - 120*		*04/29/24 19:48*	*1*

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	**0.0030**	**J**	0.025	0.0027	mg/L		04/30/24 17:15	05/01/24 20:34	1
Manganese	**17**	**J**	20	1.7	ug/L		04/30/24 17:15	05/01/24 20:34	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N (EPA 300.0)	**2.3**	**F1**	0.20	0.030	mg/L			04/26/24 15:23	1

Client: Washington State Dept of Corrections
Project/Site: Bi-Annual Monitoring

Job ID: 580-139334-1

Client Sample ID: MW9 042524 N, MC, PCE
Date Collected: 04/25/24 10:53
Date Received: 04/26/24 11:00

Lab Sample ID: 580-139334-4
Matrix: Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrachloroethene (PCE)	ND		1.0	0.41	ug/L			04/29/24 20:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*96*		*80 - 120*		*04/29/24 20:11*	*1*
4-Bromofluorobenzene (Surr)	*105*		*80 - 120*		*04/29/24 20:11*	*1*
Dibromofluoromethane (Surr)	*101*		*80 - 120*		*04/29/24 20:11*	*1*
1,2-Dichloroethane-d4 (Surr)	*103*		*80 - 120*		*04/29/24 20:11*	*1*

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		0.025	0.0027	mg/L		04/30/24 17:15	05/01/24 20:37	1
Manganese	**42**		20	1.7	ug/L		04/30/24 17:15	05/01/24 20:37	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N (EPA 300.0)	**12**		0.40	0.060	mg/L			04/26/24 17:47	2

Client Sample ID: MW11 042524 N, MC, PCE
Date Collected: 04/25/24 08:42
Date Received: 04/26/24 11:00

Lab Sample ID: 580-139334-5
Matrix: Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrachloroethene (PCE)	**0.43**	**J**	1.0	0.41	ug/L			04/29/24 20:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*96*		*80 - 120*		*04/29/24 20:34*	*1*
4-Bromofluorobenzene (Surr)	*105*		*80 - 120*		*04/29/24 20:34*	*1*
Dibromofluoromethane (Surr)	*101*		*80 - 120*		*04/29/24 20:34*	*1*
1,2-Dichloroethane-d4 (Surr)	*103*		*80 - 120*		*04/29/24 20:34*	*1*

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		0.025	0.0027	mg/L		04/30/24 17:15	05/01/24 20:41	1
Manganese	**7.8**	**J**	20	1.7	ug/L		04/30/24 17:15	05/01/24 20:41	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N (EPA 300.0)	**16**		0.40	0.060	mg/L			04/26/24 17:58	2

Client: Washington State Dept of Corrections
Project/Site: Bi-Annual Monitoring

Job ID: 580-139334-1

Client Sample ID: MW12 042524 N, MC, PCE
Date Collected: 04/25/24 07:55
Date Received: 04/26/24 11:00

Lab Sample ID: 580-139334-6
Matrix: Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrachloroethene (PCE)	ND		1.0	0.41	ug/L			04/29/24 20:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*95*		*80 - 120*		*04/29/24 20:57*	*1*
4-Bromofluorobenzene (Surr)	*108*		*80 - 120*		*04/29/24 20:57*	*1*
Dibromofluoromethane (Surr)	*101*		*80 - 120*		*04/29/24 20:57*	*1*
1,2-Dichloroethane-d4 (Surr)	*103*		*80 - 120*		*04/29/24 20:57*	*1*

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		0.025	0.0027	mg/L		04/30/24 17:15	05/01/24 20:44	1
Manganese	**12**	**J**	20	1.7	ug/L		04/30/24 17:15	05/01/24 20:44	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N (EPA 300.0)	**12**		0.40	0.060	mg/L			04/26/24 18:10	2

Client: Washington State Dept of Corrections
Project/Site: Bi-Annual Monitoring

Job ID: 580-139334-1

Client Sample ID: MW14 042524 N, MC, PCE
Date Collected: 04/25/24 12:40
Date Received: 04/26/24 11:00

Lab Sample ID: 580-139334-7
Matrix: Water

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrachloroethene (PCE)	ND		1.0	0.41	ug/L			04/29/24 21:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*96*		*80 - 120*		*04/29/24 21:20*	*1*
4-Bromofluorobenzene (Surr)	*105*		*80 - 120*		*04/29/24 21:20*	*1*
Dibromofluoromethane (Surr)	*101*		*80 - 120*		*04/29/24 21:20*	*1*
1,2-Dichloroethane-d4 (Surr)	*104*		*80 - 120*		*04/29/24 21:20*	*1*

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		0.025	0.0027	mg/L		04/30/24 17:15	05/01/24 20:48	1
Manganese	**5.8**	**J**	20	1.7	ug/L		04/30/24 17:15	05/01/24 20:48	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N (EPA 300.0)	**10**		0.40	0.060	mg/L			04/26/24 18:22	2

Method: 8260D - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 580-457886/7
Matrix: Water
Analysis Batch: 457886

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrachloroethene (PCE)	ND		1.0	0.41	ug/L			04/29/24 15:20	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*95*		*80 - 120*		*04/29/24 15:20*	*1*
4-Bromofluorobenzene (Surr)	*105*		*80 - 120*		*04/29/24 15:20*	*1*
Dibromofluoromethane (Surr)	*101*		*80 - 120*		*04/29/24 15:20*	*1*
1,2-Dichloroethane-d4 (Surr)	*103*		*80 - 120*		*04/29/24 15:20*	*1*

Lab Sample ID: LCS 580-457886/4
Matrix: Water
Analysis Batch: 457886

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Tetrachloroethene (PCE)	5.00	4.95		ug/L		99	76 - 125

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*96*		*80 - 120*
4-Bromofluorobenzene (Surr)	*104*		*80 - 120*
Dibromofluoromethane (Surr)	*102*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*102*		*80 - 120*

Lab Sample ID: LCSD 580-457886/5
Matrix: Water
Analysis Batch: 457886

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Tetrachloroethene (PCE)	5.00	5.06		ug/L		101	76 - 125	2	13

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*97*		*80 - 120*
4-Bromofluorobenzene (Surr)	*105*		*80 - 120*
Dibromofluoromethane (Surr)	*102*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*104*		*80 - 120*

Method: 6010D - Metals (ICP)

Lab Sample ID: MB 580-458030/13-A
Matrix: Water
Analysis Batch: 458233

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 458030

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		0.025	0.0027	mg/L		04/30/24 17:18	05/01/24 19:50	1
Manganese	ND		20	1.7	ug/L		04/30/24 17:18	05/01/24 19:50	1

Method: 6010D - Metals (ICP) (Continued)

Lab Sample ID: LCS 580-458030/14-A
Matrix: Water
Analysis Batch: 458233

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 458030

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chromium	1.00	1.08		mg/L		108	80 - 120
Manganese	1000	1040		ug/L		104	80 - 120

Lab Sample ID: LCSD 580-458030/15-A
Matrix: Water
Analysis Batch: 458233

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 458030

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chromium	1.00	1.06		mg/L		106	80 - 120	2	20
Manganese	1000	1030		ug/L		103	80 - 120	1	20

Lab Sample ID: 580-139334-1 MS
Matrix: Water
Analysis Batch: 458233

Client Sample ID: MW1A 042524 N, MC, PCE
Prep Type: Total Recoverable
Prep Batch: 458030

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Chromium	ND		1.00	1.08		mg/L		108	80 - 120
Manganese	1.7	J	1000	1030		ug/L		103	80 - 120

Lab Sample ID: 580-139334-1 MSD
Matrix: Water
Analysis Batch: 458233

Client Sample ID: MW1A 042524 N, MC, PCE
Prep Type: Total Recoverable
Prep Batch: 458030

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chromium	ND		1.00	1.08		mg/L		108	80 - 120	0	20
Manganese	1.7	J	1000	1010		ug/L		100	80 - 120	3	20

Lab Sample ID: 580-139334-1 DU
Matrix: Water
Analysis Batch: 458233

Client Sample ID: MW1A 042524 N, MC, PCE
Prep Type: Total Recoverable
Prep Batch: 458030

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chromium	ND		ND		mg/L		NC	20
Manganese	1.7	J	ND		ug/L		NC	20

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 580-458451/3
Matrix: Water
Analysis Batch: 458451

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	ND		0.20	0.030	mg/L			04/26/24 09:36	1

Lab Sample ID: LCS 580-458451/4
Matrix: Water
Analysis Batch: 458451

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Nitrate as N	5.00	4.99		mg/L		100	90 - 110

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCSD 580-458451/5
Matrix: Water
Analysis Batch: 458451

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Nitrate as N			5.00	4.99		mg/L		100	90 - 110	0	15

Lab Sample ID: 580-139334-3 MS
Matrix: Water
Analysis Batch: 458451

Client Sample ID: MW5 042524 N, MC, PCE
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Nitrate as N	2.3	F1	5.00	5.74	F1	mg/L		68	90 - 110

Lab Sample ID: 580-139334-3 MSD
Matrix: Water
Analysis Batch: 458451

Client Sample ID: MW5 042524 N, MC, PCE
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Nitrate as N	2.3	F1	5.00	6.08	F1	mg/L		75	90 - 110	6	15

Lab Chronicle

Client: Washington State Dept of Corrections
Project/Site: Bi-Annual Monitoring

Job ID: 580-139334-1

Client Sample ID: MW1A 042524 N, MC, PCE

Lab Sample ID: 580-139334-1
Matrix: Water
Date Collected: 04/25/24 12:45
Date Received: 04/26/24 11:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	457886	AA	EET SEA	04/29/24 19:02
Total Recoverable	Prep	3005A			458030	MCMS	EET SEA	04/30/24 17:15
Total Recoverable	Analysis	6010D		1	458233	JLS	EET SEA	05/01/24 19:59
Total/NA	Analysis	300.0		2	458451	CA	EET SEA	04/26/24 17:11

Client Sample ID: MW3 042524 N, MC, PCE

Lab Sample ID: 580-139334-2
Matrix: Water
Date Collected: 04/25/24 11:45
Date Received: 04/26/24 11:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	457886	AA	EET SEA	04/29/24 19:25
Total Recoverable	Prep	3005A			458030	MCMS	EET SEA	04/30/24 17:15
Total Recoverable	Analysis	6010D		1	458233	JLS	EET SEA	05/01/24 20:30
Total/NA	Analysis	300.0		2	458451	CA	EET SEA	04/26/24 17:23

Client Sample ID: MW5 042524 N, MC, PCE

Lab Sample ID: 580-139334-3
Matrix: Water
Date Collected: 04/25/24 09:39
Date Received: 04/26/24 11:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	457886	AA	EET SEA	04/29/24 19:48
Total Recoverable	Prep	3005A			458030	MCMS	EET SEA	04/30/24 17:15
Total Recoverable	Analysis	6010D		1	458233	JLS	EET SEA	05/01/24 20:34
Total/NA	Analysis	300.0		1	458451	CA	EET SEA	04/26/24 15:23

Client Sample ID: MW9 042524 N, MC, PCE

Lab Sample ID: 580-139334-4
Matrix: Water
Date Collected: 04/25/24 10:53
Date Received: 04/26/24 11:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	457886	AA	EET SEA	04/29/24 20:11
Total Recoverable	Prep	3005A			458030	MCMS	EET SEA	04/30/24 17:15
Total Recoverable	Analysis	6010D		1	458233	JLS	EET SEA	05/01/24 20:37
Total/NA	Analysis	300.0		2	458451	CA	EET SEA	04/26/24 17:47

Client Sample ID: MW11 042524 N, MC, PCE

Lab Sample ID: 580-139334-5
Matrix: Water
Date Collected: 04/25/24 08:42
Date Received: 04/26/24 11:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	457886	AA	EET SEA	04/29/24 20:34
Total Recoverable	Prep	3005A			458030	MCMS	EET SEA	04/30/24 17:15
Total Recoverable	Analysis	6010D		1	458233	JLS	EET SEA	05/01/24 20:41
Total/NA	Analysis	300.0		2	458451	CA	EET SEA	04/26/24 17:58

Lab Chronicle

Client: Washington State Dept of Corrections
Project/Site: Bi-Annual Monitoring

Job ID: 580-139334-1

Client Sample ID: MW12 042524 N, MC, PCE

Lab Sample ID: 580-139334-6

Date Collected: 04/25/24 07:55
Matrix: Water
Date Received: 04/26/24 11:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	457886	AA	EET SEA	04/29/24 20:57
Total Recoverable	Prep	3005A			458030	MCMS	EET SEA	04/30/24 17:15
Total Recoverable	Analysis	6010D		1	458233	JLS	EET SEA	05/01/24 20:44
Total/NA	Analysis	300.0		2	458451	CA	EET SEA	04/26/24 18:10

Client Sample ID: MW14 042524 N, MC, PCE

Lab Sample ID: 580-139334-7

Date Collected: 04/25/24 12:40
Matrix: Water
Date Received: 04/26/24 11:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8260D		1	457886	AA	EET SEA	04/29/24 21:20
Total Recoverable	Prep	3005A			458030	MCMS	EET SEA	04/30/24 17:15
Total Recoverable	Analysis	6010D		1	458233	JLS	EET SEA	05/01/24 20:48
Total/NA	Analysis	300.0		2	458451	CA	EET SEA	04/26/24 18:22

Laboratory References:

EET SEA = Eurofins Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: Washington State Dept of Corrections
Project/Site: Bi-Annual Monitoring

Job ID: 580-139334-1

Laboratory: Eurofins Seattle

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Washington	State	C788	07-13-24

Sample Summary

Client: Washington State Dept of Corrections
Project/Site: Bi-Annual Monitoring

Job ID: 580-139334-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-139334-1	MW1A 042524 N, MC, PCE	Water	04/25/24 12:45	04/26/24 11:00
580-139334-2	MW3 042524 N, MC, PCE	Water	04/25/24 11:45	04/26/24 11:00
580-139334-3	MW5 042524 N, MC, PCE	Water	04/25/24 09:39	04/26/24 11:00
580-139334-4	MW9 042524 N, MC, PCE	Water	04/25/24 10:53	04/26/24 11:00
580-139334-5	MW11 042524 N, MC, PCE	Water	04/25/24 08:42	04/26/24 11:00
580-139334-6	MW12 042524 N, MC, PCE	Water	04/25/24 07:55	04/26/24 11:00
580-139334-7	MW14 042524 N, MC, PCE	Water	04/25/24 12:40	04/26/24 11:00

Eurofins Seattle
5755 8th Street East
Tacoma, WA 98424
Phone (253) 922-2310

Chain of Custody Record

eurofins | Environment Testing

Client Information	Sampler: Dean Smith	Lab PM: Schick, Laura	Carrier Tracking No(s):	COC No:
Client Contact: Dean Smith	Phone: 509-386-0388	E-Mail: Laura.Schick@et.eurofinsus.com	State of Origin:	Page: Page 1 of 2
Company: Washington State Dept of Corrections	PWSID:			Job #:
Address: 1313 N 13th Ave - MS#37	Due Date Requested:			
City: Walla Walla	TAT Requested (days):			
State, Zip: WA, 99362	Compliance Project: Δ Yes Δ No			
Phone: 509-386-0388	PO #: 310PO 2409734			
Email: dean.smith@doc1.wa.gov	WO #:			
Project Name: Bi-Annual Monitoring	Project #: 58019384			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	300_48HR - Nitrate only	6010D - Manganese & Chromium	8260D - Tetrachloroethene (PCE) only	Total Number of containers	Special Instructions/Note:
			Preservation Code:			N	D	A		
MW1A 042524 N	4/25/24	1245	G	Water		x				250 ml - unpreserved
MW1A 042524 MC	4/25/24	1245	G	Water			x			250 ml - Nitric Acid
MW1A 042524 PCE	4/25/24	1245	G	Water				x		Voa Vial 40 ml - HCL
MW3 042524 N	4/25/24	1145	G	Water		x				250 ml - unpreserved
MW3 042524 MC	4/25/24	1145	G	Water			x			250 ml - Nitric Acid
MW3 042524 PCE	4/25/24	1145	G	Water				x		Voa Vial 40 ml - HCL
MW5 042524 N	4/25/24	0939	G	Water		x				250 ml - unpreserved
MW5 042524 MC	4/25/24	0939	G	Water			x			250 ml - Nitric Acid
MW5 042524 PCE	4/25/24	0939	G	Water				x		Voa Vial 40 ml - HCL
MW9 042524 N	4/25/24	1053	G	Water		x				250 ml - unpreserved
MW9 042524 MC	4/25/24	1053	G	Water			x			

Possible Hazard Identification
x Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if s
☐ Return To Client x Disposal By L

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

580-139334 Chain of Custody

Empty Kit Relinquished by:	Date:	Time:	Method o

Relinquished by: Dean Smith	Date/Time: 04/25/2024 1321	Company	Received by: James Murphy	Date/Time: 4/26/24 1100	Company: EET N
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

I R 11 2.5/2.0 LB / Ice / other / UPS

Eurofins Seattle
5755 8th Street East
Tacoma, WA 98424
Phone (253) 922-2310

Chain of Custody Record

eurofins | Environment Testing

Client Information	Sampler: Dean Smith	Lab PM: Schick, Laura	Carrier Tracking No(s):	COC No:
Client Contact: Dean Smith	Phone: 509-386-0388	E-Mail: Laura.Schick@et.eurofinsus.com	State of Origin:	Page: Page 2 of 2
Company: Washington State Dept of Corrections	PWSID:			Job #:
Address: 1313 N 13th Ave - MS#37	Due Date Requested:			
City: Walla Walla	TAT Requested (days):			
State, Zip: WA, 99362	Compliance Project: Δ Yes Δ No			
Phone: 509-386-0388	PO #: 310PO 2409734			
Email: dean.smith@doc1.wa.gov	WO #:			
Project Name: Bi-Annual Monitoring	Project #: 58019384			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	300_48HR - Nitrate only	6010D - Manganese & Chromium only	8260D - Tetrachloroethene (PCE) only	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	D	A		
MW9 042524 PCE	4/25/24	1053	G	Water					X		Voa Vial 40 ml - HCL
MW11 042524 N	4/25/24	0842	G	Water			X				250 ml - unpreserved
MW11 042524 MC	4/25/24	0842	G	Water				X			250 ml - Nitric Acid
MW11 042524 PCE	4/25/24	0842	G	Water					X		Voa Vial 40 ml - HCL
MW12 042524 N	4/25/24	0755	G	Water			X				250 ml - unpreserved
MW12 042524 MC	4/25/24	0755	G	Water				X			250 ml - Nitric Acid
MW12 042524 PCE	4/25/24	0755	G	Water					X		Voa Vial 40 ml - HCL
MW14 042524 N	4/25/24	1240	G	Water			X				250 ml - unpreserved
MW14 042524 MC	4/25/24	1240	G	Water				X			250 ml - Nitric Acid
MW14 042524 PCE	4/25/24	1240	G	Water					X		Voa Vial 40 ml - HCL

Possible Hazard Identification
[x] Non-Hazard [ ] Flammable [ ] Skin Irritant [ ] Poison B [ ] Unknown [ ] Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
[ ] Return To Client [x] Disposal By Lab [ ] Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by: Dean Smith	Date/Time: 04/25/2024 1330	Company WSP	Received by: James McAlpine	Date/Time: 4/26/24	Company ET N
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

FR II 2.5 / 2.0 LB / ice / other / UPS

5/3/2024

Login Sample Receipt Checklist

Client: Washington State Dept of Corrections

Job Number: 580-139334-1

Login Number: 139334
List Number: 1
Creator: Prigge, Madison

List Source: Eurofins Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Instruction Manual

pH 5+ pH/°C
pH 6+ pH/°C/mV
Ion 6+ pH/°C/mV/Ion

OAKTON

EUTECH INSTRUMENTS
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CE

ISO 9001

68X243633 Rev 1-1 3/2011

Part of Thermo Fisher Scientific

Table of Contents

1. INTRODUCTION

Thank you for purchasing the pH 5+, pH 6+, or Ion 6+ meter. These microprocessor-based handheld meters are economical and easy to use. It has a large custom LCD (Liquid Crystal Display) for clear and easy reading.

The pH 5+ measures pH and temperature (°C). The pH 6+ and Ion 6+ meters measure pH, mV (ORP) and temperature.

Additionally, the Ion 6+ allows direct ion concentration measurement of various ions (mono and divalent). The mV mode is also useful for diagnosis of ion selective electrodes (ISE).

Meters include 4 alkaline "AAA" batteries, a rubber armor / stand, instruction manual, and warranty card. Please refer to **Section 8 Replacements and Accessories** for information on additional accessories and calibration solutions.

2. GETTING STARTED

2.1 Description of Keypad Functions

The pH 5+ and pH 6+ have four keys while the Ion 6+ meter has six keys on its splash-proof keypad. The common keys are **ON/OFF**, **HOLD/ENTER**, **CAL** and **MODE**. The Ion 6+ meter adds ▲ and ▼ keys.

ON/OFF: Powers meter on and off. Meter starts up in the mode that you last switched off from.

MODE/INC: Selects measurement mode for Ion, mV, pH and Temperature. Increment button for mV calibration (pH 6+ only).

CAL: Allows calibration for Ion, pH, mV or Temperature, or to abort calibration and return to measure without confirming a value.

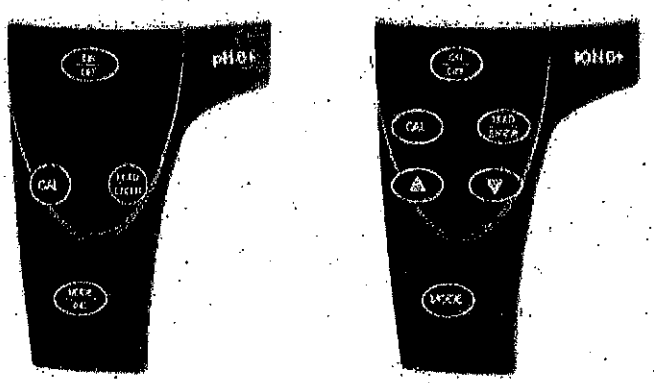
▲ (Ion 6+ only): Increment values during calibration mode.

▼ (Ion 6+ only): Decrement values during calibration mode.

HOLD: Freezes the measured reading for easy viewing.

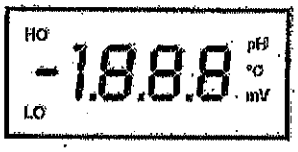
ENTER: Confirms calibration value.

pH 5+ and pH 6+ Ion 6+



2.2 Description of LCD Annunciators

The large custom LCD consists of 3½-digit segments which uses annunciators for pH, mV or °C (Temperature). No annunciator is shown in Ion mode. Other annunciators include "HO" (when HOLD function is activated) and "LO" (low battery condition).



2.3 Inserting & Removing the Rubber Armor / Stand

1. To remove meter from rubber armor, push out from the bottom edges of meter until it is completely out of boot. Ensure that cables of ISE/pH electrode or temperature probe are not connected. **Figure A.**

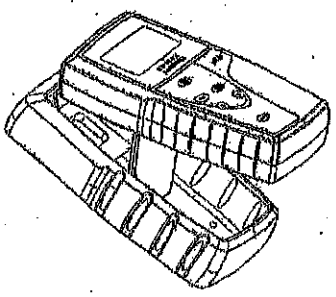


Figure A

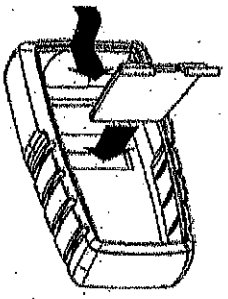
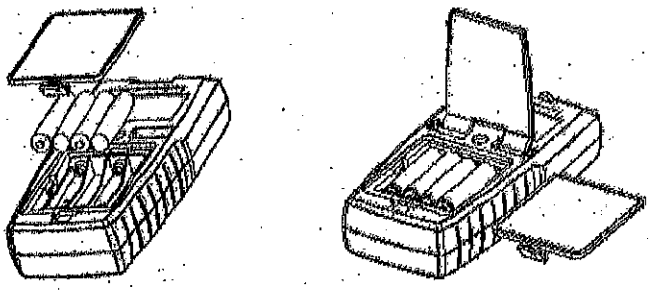


Figure B

2. To insert meter into armor, slide in from the top of meter before pushing the bottom edges of meter down to set it into position. Lift up the stand at the back of meter for bench top applications if necessary. **Figure B.**

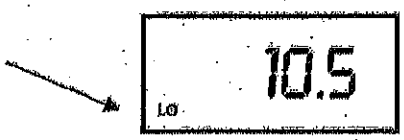
2.4 Inserting New Batteries

The battery compartment is found at the back of instrument. To open the battery compartment, push in the direction of arrow and lift up the cover. Note the polarity of battery before inserting into position. After replacement, place cover back and press down until it locks.



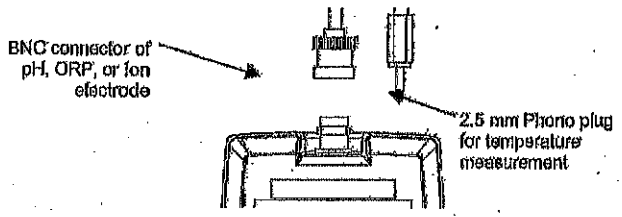
2.5 Battery Replacement

The "**LO**" annunciator of the LCD alerts you when battery power is running low. **Caution:** Power off the meter before changing battery.



2.6 Connecting the Electrode and Temperature Sensor

To connect the electrode into meter, align the BNC connector slots with the paste of meter's socket and rotate connector clockwise until it locks. Do not force when connecting. To remove, simply rotate the connector in counter-clockwise direction until it unlocks, and slide the connector off the socket.



Insert the mini phono jack of temperature sensor into the socket on the meter. Unplug the phono jack when not in use or you measure pH without any temperature compensation.

2.7 Conditioning the pH Electrode

For best results condition the pH electrode before use or if it has not been in use for a long time by soaking it into a container filled with pH 4 buffer solution for at least 1 hour and rinse before use.

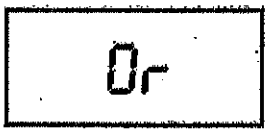
2.8 Switching the Meter On

1. Press **ON/OFF** key. All LCD segments will display momentarily as the meter performs a self-diagnostic test. The Ion 6+ will display "- - -" if the meter has not been calibrated or if the meter has been reset.

2. Press **MODE** key to choose the desired measurement mode.

   If a temperature probe is not connected, either 25.0°C (factory default) or the last calibrated temperature value is displayed. If a temperature probe is connected, the current measured temperature is displayed.

3. "Or" (Over range) indicates the reading exceeds the maximum. "Ur" (Under range) indicates the reading is under minimum measurement range (see Section 7 Specifications).



3. CALIBRATION

3.1 pH Calibration

The meter is capable of calibrating up to 3 pH values using USA or NIST (nSt) pH buffer standards or 2 pH values with Low Ionic (Pb) pH buffer standard. All new calibration values will automatically override existing data.

USA group	4.01, 7.00, 10.01
NIST group	4.01, 6.86, 9.18
Pb group	4.10, 6.97

For best results perform at least a 2-point calibration at room temperature (25 °C) using standard buffers. Begin with pH 7.00 (USA group), pH 6.86 (NIST group) or pH 6.97 (Pb group).

For a 1-point calibration, calibration should be performed with a pH buffer value closest to the expected sample value being measured.

The meter has automatic buffer recognition that identifies the correct pH buffer values during calibration. The meter will accept calibration values that are within +/-1.0 pH units of the expected value, otherwise the LCD will flash "**Er1**" and the value will not be accepted. Press **CAL** to abort calibration and resume measurement.

Always use new pH buffer solutions for calibration. Do not reuse buffer solutions as it may be contaminated and affect the calibration and accuracy of measurements. Promptly seal containers and store solutions in a dark, dry, cool environment.

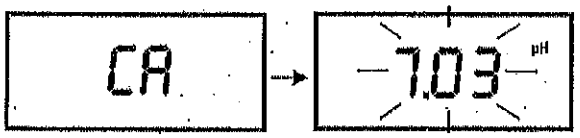
Before use, remove the plastic protective cap of pH electrode and condition the glass bulb by soaking it in tap water or pH buffer (preferably pH 4) for 1-2 hours. This hydrates the glass bulb if the electrode is too dry or has not been used recently. Always rinse the probes with clean water before and after each calibration/sample measurement to avoid cross-contamination. For details refer to section 5 on Electrode care and maintenance.

3.1.1 pH Calibration Procedure

1. Pour known pH buffer calibration standard solution into a clean, dry container, e.g. pH 7.00. Turn on meter and select pH mode by pressing **MODE** key if necessary.

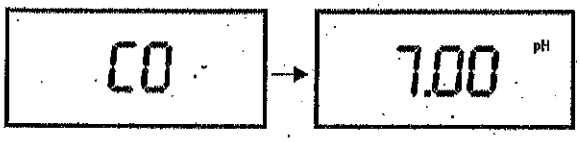
2. Dip the pH electrode and temperature probe into the solution. Swirl gently and wait for reading to stabilise (approx. 30 seconds depending on your electrode condition).

3. Press **CAL** to enter pH calibration mode. "**CA**" displays momentarily before the display flashes the current un-calibrated reading.



4. To abort or cancel calibration without accepting the new value, press **CAL** key. The meter will automatically revert to pH measurement mode.

5. Allow reading to stabilise if necessary. Press **ENTER** key to confirm calibration. "**CO**" displays momentarily before reverting to pH measurement mode.



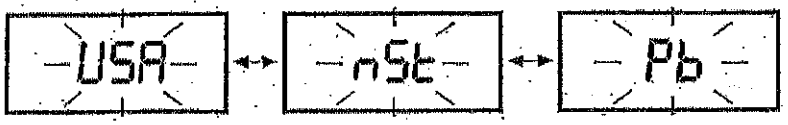
6. For highest accuracy, perform a multiple-point calibration. Repeat step 1 with additional pH buffer calibration standard solutions.

3.1.2 Changing the pH Buffer Group

You can calibrate with pH standards of either USA, NIST (nSt) or Low Ionic (Pb) pH buffer groups. The factory default is USA. To abort buffer group selection press **CAL** to revert to pH measurement mode.

1. Press and hold **MODE** while switching the meter on using the **ON/OFF** key. The display shows "**bUF**" blinking.

2. Press **ENTER** key to begin buffer group selection mode. Use the **MODE** key to toggle between USA, NIST or Pb as shown below.



Press ENTER key to confirm your selection. The meter will automatically revert to pH measurement mode. The meter will save the selected group indefinitely until changed.

3.1.3 Resetting User Calibrated Values

The calibrated pH/mV/Ion values can be reset to factory default using the procedure below. Temperature offset will not be reset using this procedure. To abort press **CAL** to revert to measurement mode.

1. Press and hold **CAL** while switching the meter on using the **ON/OFF** key. The LCD shows "**rSt**" blinking.
2. Press **ENTER** key to confirm. The meter automatically clears all stored pH/Ion calibration or mV offset values and reverts to measurement mode.

3.2 Ion Calibration (Ion 6+)

The Ion 6+ meter is capable of 2 or 3 point ion calibration with standard solutions. The Ion 6+ will display "- - -" if the meter has not been calibrated or if the meter has been reset.

To abort ion calibration press **CAL** to revert to measurement mode.

Ion calibration values are not stored into the meter's non-volatile memory. Ion calibration data is lost once the meter is reset and when the batteries are being removed and replaced.

Error message "**Er2**" is displayed after a single point calibration is completed. Recalibrate using minimum of 2 points.

Calibration values are successfully stored if the ISE (Ion Selective Electrode) slope is within the specified tolerance of 15-90mV/decade, otherwise an error message "**Er3**" is displayed.

If any of calibration points are not within 1 decade of each other, an error message "**Er4**" will be shown at the end of calibration process. The ion calibration options

available include 0.1, 1.0, 10.0, 100.0 ppm. Recalibrate and ensure that consecutive calibration points are 1 decade apart from each other.

Ensure that you use new or fresh standard solutions during calibration. Do not reuse ion standard solution as it may be contaminated and affect the calibration and accuracy of measurements. Store standard solutions in a dry, cool environment if possible. Check that ISE's and ion standard solutions are kept in good condition for best results.

Before use, remove any plastic protective cap of ISE (at the tip of sensor) and refer to electrode instruction manual for proper operation. Rinse probes before and after each calibration or sample measurement to avoid cross-contamination.

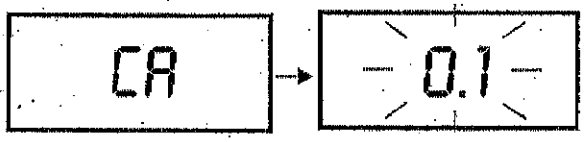
3.2.1 Ion Calibration Procedure

The Ion 6+ can measure various ions. Ion measurement requires ion selective electrodes (ISE)—(sold separately) which measure a specific ion of interest—such as ammonia or fluoride.

The available ion calibration values for the Ion 6+ are 0.1, 1.0, 10.0, and 100.0 ppm. Pick any 2 or 3 consecutive values to use and prepare the corresponding ion calibration solutions. Turn on the meter and select Ion mode by pressing MODE key if necessary. **For best results, always begin with your lowest standard value, followed by the next lowest standard.**

1. Dip the ISE into your standard solution. Add ISA if required. Swirl it gently. Press **CAL** key to begin calibration mode.

2. The display shows "**CA**" (to indicate calibration mode) momentarily followed by "**0.1**" flashing. To select the appropriate standard, use ▲ and ▼ keys.

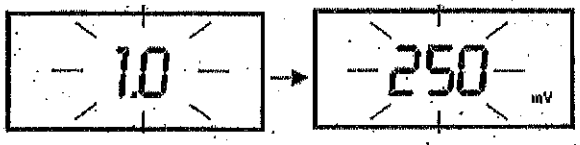


3. Press **ENTER** to confirm that the ppm value is the desired standard. The displayed value now shows the corresponding mV reading for the selected ppm value selected. Allow the reading to stabilise.

4. When the mV reading is stable, press **ENTER** to complete the 1st point calibration. The display will show the next highest calibration standard value. Rinse the electrode with clean water.

5. Dip the electrode into your next highest standard solution. Add ISA if required. Swirl it gently. Press **CAL** key to begin calibration mode.

6. Press **ENTER** to confirm that the ppm value is the desired standard. The displayed value now shows the corresponding mV reading for the selected ppm value selected. Allow the reading to stabilise.



7. When the mV reading is stable, press **ENTER** to complete the 2nd point calibration. The display will show the next highest calibration standard value. Rinse the electrode with clean water.

8. To calibrate a 3rd point, repeat steps 6 & 7. To exit from 2-point calibration, press **CAL** key.

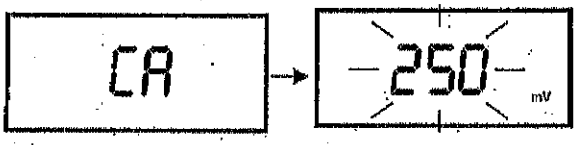
9. The ISE slope in mV value "**PXX mV**" will momentarily display before reverting to Ion measurement mode.

If the calibration is not successfully stored into its memory, an error message "Er3" will be displayed. This occurs when the slope is lower than 15mV/decade or higher than 90mV/decade.

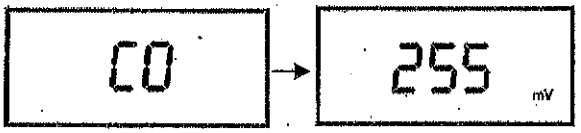
3.3 Millivolt (mV) Calibration (pH 6+ only)

mV calibration is performed for Oxidization Reduction Potential (ORP / Redox) measurements, where you can adjust its mV value as a base value for measurements. To abort press **CAL** to revert to measurement mode.

1. Press **MODE** key to enter mV mode, the LCD displays "**mV**".
2. Dip the ORP electrode into a known standard solution, (e.g. Quinhydrone 255) and swirl it until the reading stabilizes.
3. Press **CAL** key to enter mV calibration. The LCD shows "**CA**" momentarily before flashing the mV reading.



4. To proceed calibration use **INC** key to adjust the reading to your desired value. The maximum adjustment you can make is ± 50 mV. Pressing **INC** key continuously allows you to scroll to the maximum allowable value and then loops back to the minimum allowable value.
5. Press **ENTER** key to confirm calibration. The display shows "CO" momentarily and meter reverts to measurement mode showing the current set value.

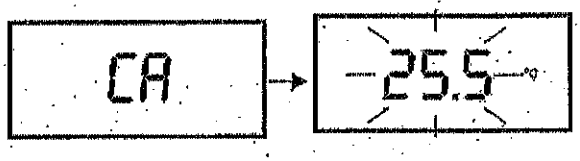


3.4 Temperature Calibration

3.4.1 With Temperature Probe

The temperature probe (ECPH5TEM01P) provided with the meter is factory-calibrated. Over time, temperature calibration may drift and require calibration. If there is a need to replace with the new probe you should calibrate the temperature probe prior to pH calibration.

1. Connect your temperature probe to the meter. Press **MODE** key to enter the Temperature mode until "°C" annunciator appears in the LCD.
2. Compare the displayed value to a NIST certified thermometer or other thermometer known to be accurate. For best accuracy, place both the probe and thermometer in a constant temperature bath.
3. Press **CAL** key to enter temperature calibration mode. The LCD shows "**CA**" momentarily and displayed reading flashes.



4. Press ▲ and ▼ keys (for Ion 6+) or **INC** key (for pH 5+ / pH 6+) until the LCD display shows the desired temperature. The meter allows an adjustable maximum value of ± 5 °C from factory default.
5. To cancel or abort this operation, press **CAL** key. Note no new value will be stored into its meter's non-volatile memory. To confirm calibration, press **ENTER** key. The LCD displays "**CO**" momentarily, and the meter reverts to measurement mode.

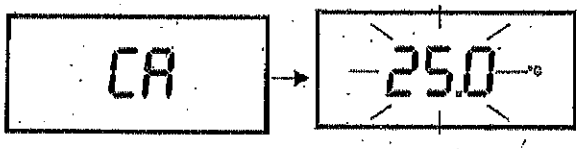
3.4.2 Without Temperature Probe (no ATC)

If no temperature probe is used, the meter compensates for pH response based on a temperature value manually set by you or at 25.0 °C (factory default).

1. Press **MODE** key to enter into Temperature mode until "°C" shows in LCD.

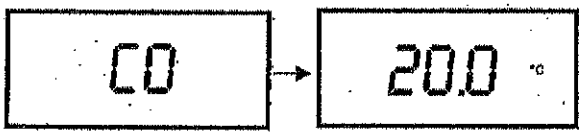
2. Compare the displayed value to NIST certified thermometer or thermometer known to be accurate (dipped into a constant temperature bath).

3. Press **CAL** key to enter temperature calibration mode. The LCD shows "**CA**" momentarily and displayed reading flashes. Note that this displayed value should either be 25.0 °C or last set temperature value.



4. Press ▲ and ▼ key (for Ion 8) or **INC** key (for pH 5/6) until the displays shows the desired temperature. You can set any value from 0 to 100 °C.

5. To cancel or abort this operation, press **CAL** key. Note no new value will be stored into its meter's non-volatile memory. To confirm calibration, press **ENTER** key. The LCD displays "**CO**" momentarily, and the meter reverts to measurement mode.



4. MEASUREMENT

4.1 Taking Measurements

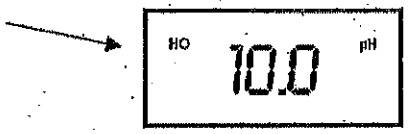
1. Before measurement, rinse pH/ORP electrode or Ion Selective Electrode and temperature probe with clean water to remove any impurities stuck onto the bodies of probes.
2. Power on the meter using **ON/OFF** key. Press **MODE** key to select your desired mode of operation (pH, mV, Ion, or Temperature).
3. Dip and stir both probes gently into an aqueous test sample, swirl gently and wait for the reading to stabilise. Note the reading. Freeze the displayed if desired—for details refer to Section 4.3.
4. Rinse probes with clean water before taking next reading or storage.

4.2 Millivolt (mV) Reference Check (Ion 6+ only)

The mV mode in Ion 6+ can be used for the diagnosis of ISE or pH electrode condition. Press **MODE** to access mV mode, the "**mV**" annunciator in LCD is displayed. The displayed value shows the absolute mV value of ISE or pH electrode being measured.

4.3 Holding a Reading

To freeze or hold your displayed reading momentarily, press **HOLD** key once. The LCD displays "**HO**" annunciator to indicate the HOLD function is activated.



4.4 Releasing a Held Reading

Press **HOLD** key once again to deactivate the HOLD function or to release your frozen reading. The meter reverts to current measurement mode, and the "**HO**" annunciator disappears from the LCD.

5. ELECTRODE CARE AND MAINTENANCE

For best results, keep the ISE capped dry and pH/ORP electrode bulb wet. Store the pH/ORP glass bulb with pH electrode storage solution. **NEVER** use deionised water for storage. Wash electrodes with clean water after each use.

Your ISE or pH electrode is susceptible to contamination or dirt. Clean as needed using mild detergent and warm water. Blot the probe gently with a soft tissue paper. Avoid excessive drying of the glass membrane and avoid touching it with your fingers. Recalibrate after cleaning.

6. TROUBLESHOOTING

Problem	Cause	Solution
No display	Batteries not in place.	a) Insert batteries. b) Re-insert batteries in correct polarity.
"----" on display	Ion 6+ does not have 2 point calibration	Perform 2 or 3 point Ion calibration.
"LO" displays in the LCD	Low battery	Replace batteries.
Unstable reading	a) Electrode not deep enough in sample b) Dirty electrode. c) Broken electrode	a) Place electrode deeper in sample. b) Clean electrode and recalibrate. c) Replace electrode.
"Er1" display	Buffer value out of tolerance	Use new pH buffer solution and recalibrate. Ensure correct pH buffer group was selected.
"Er2" display	Single point calibration	Perform at least 2 point calibration. (Ion 6+).
"Er3" display	ISE slope not within the specified tolerance	Check ISE is in good working condition-refer to ISE manual (Ion 6+).
"Er4" display	Any calibration points not within 1 decade	Ensure any calibration points between each other must be within 1 decade. (Ion 6+)
Not able to calibrate	a) Display freezes b) Faulty electrode c) Inaccurate buffer	a) Release reading by pressing HOLD. b) Replace electrode. c) Replace expired buffer solutions.

7. SPECIFICATIONS

Model		pH 5+	pH 6+	Ion 6+
Ion Range	0.01 to 1999 ppm			✓
Resolution	0.01 ppm for 0.01 to 0.99 ppm; 0.1 ppm for 1.0 to 199.9 ppm; 1 ppm for 200 to 1999 ppm			✓
Accuracy	+/- 1% of reading			✓
No. of Calibration Pts	2 to 3 points (minimum 2 pts)			✓
pH Range	0.00 to 14.00 pH	✓	✓	✓
Resolution	0.01 pH	✓	✓	✓
Accuracy	+/- 0.01 pH	✓	✓	✓
pH Slope Range	80 to 120%	✓	✓	✓
No. of Calibration Pts	1 to 3 points (push-button)	✓	✓	✓
Buffer Options	pH 4.01, 7.00, 10.01 (USA) pH 4.01, 6.86, 9.18 (NIST) pH 4.10, 6.87 (Pb)	✓	✓	✓
Temperature Range	0.0 to 100.0 °C	✓	✓	✓
Resolution	0.1 °C	✓	✓	✓
Accuracy	+/- 0.5 °C	✓	✓	✓
Temperature Comp.	Automatic / Manual (0 to 100 °C)	✓	✓	✓
Millivolt Range	-1000 to +1000 mV		✓	
Resolution	1 mV		✓	
Accuracy	+/- 2 mV		✓	
Millivolt Range	-500 to 500 mV			✓
Resolution	0.1 mV for -200 to 200 mV; 1 mV for 200 to 500 mV			✓
Accuracy	+/- 0.2 and 2 mV resp.			✓
Features				
Auto-Buffer Recognition	Yes			
Hold Function	"HO"			
Auto Shut Off	After 17 minutes			
Low Battery Indication	"LO"			
Display	Single Custom LCD			
Operating Temperature	0 to 50 °C			
Power Requirements	4 x "AAA" Alkaline Batteries			
Battery Life	500 hours			
Meter Dim./Weight	15.7 x 8.5 x 4.2 cm / 265 g			

8. REPLACEMENTS AND ACCESSORIES

Item Description	Part number Ordering Code	
	Eutech Instruments	Oakton Instruments
pH 5+ with ATC probe	ECPH501PLUS 01X244911	35613-50
pH 5+ with pH and ATC probes	—	35613-52
pH 5+ with pH and ATC probes and solutions in hard carrying case	ECPH502PLUSK 01X244912	—
pH 5+ with pH/ATC probe and solutions in hard carrying case	ECPH503PLUSK 01X244913	35613-54
pH 6+ with ATC probe	ECPH601PLUS 01X245025	35613-20
pH 6+ with pH and ATC probes	—	35613-22
pH 6+ with ATC probe and solutions in hard carrying case	ECPH601PLUSK 01X245028	—
pH 6+ with pH and ATC probes and solutions in hard carrying case	ECPH602PLUSK 01X245026	—
pH 6+ with pH/ATC probe and solutions in hard carrying case	ECPH603PLUSK 01X246027	35613-24
Ion 6+ with ATC probe	ECION601PLUS 01X256409	35613-60
Ion 6+ with pH and ATC probes and solutions in hard carrying case	ECION602PLUSK 01X256410	35613-62
ATC Probe, Stainless Steel, 84 x 3 mm	PH5TEM01P 01X021804	35613-06
pH electrode, plastic, gel-filled, single-junction	ECFC7252101B 01X099412	69001-65
pH electrode, plastic, gel-filled, double-junction	ECFC7252201B 01X099417	35641-51
pH electrode, glass, refillable, double-junction	ECFG7370101B 93X218819	35805-04
pH/ATC electrode, plastic, gel-filled, single-junction	ECFE7352901B 01X218964	35811-71

Item Description	Part number Ordering Code	
	Eutech Instruments	Oakton Instruments
pH/ATC electrode, plastic, gel-filled, double-junction	—	35811-72
ORP electrode, plastic, gel-filled, single-junction	EOFC7960101B 01X256612	59001-75
ORP electrode, plastic, gel-filled, double-junction	EOFC7960201B 01X256613	59001-77
pH 1.68 buffer solution, 480 mL bottle	ECBU1BT	00654-01
pH 4.01 buffer solution, 480 mL bottle (1 pint)	ECBU4BT	00654-00
pH 4.01 buffer sachets, 20 mL x 20 pcs.	ECBU4BS	35653-01
pH 6.86 buffer solution, 480 mL bottle	ECBU686BT	00654-03
pH 7.00 buffer solution, 480 mL bottle (1 pint)	ECBU7BT	00654-04
pH 7.00 buffer sachets, 20 mL x 20 pcs.	ECBU7BS	35653-02
pH 9.18 buffer solution, 480 mL bottle	ECBU918BT	00654-07
pH 10.01 buffer solution, 480 mL bottle (1 pint)	ECBU10BT	00654-08
pH 10.01 buffer sachets, 20 mL x 20 pcs.	ECBU10BS	35653-03
pH 12.45 buffer solution, 480 mL bottle	ECBU12BT	00654-12
pH 4.01, 7.00, & 10.01 buffer pack, 480 mL bottles	—	05942-10
Electrode Storage Solution	ECRE005	00653-04
Electrode Cleaning Solution	ECDPCBT	00653-06