TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Analytical Report for

Northwest Pipe

ASL Report #: R2485
Project ID: 682722.GW.05

Attn: Gretchen Gee

cc:

Jamie.beckett@ch2m.com

Authorized and Released By:

Kathy McKinley

Laboratory Project Manager
Kathy McKinley
541.243.0974
August 08, 2017

All analyses performed by TestAmerica ASL are clearly indicated. Any subcontracted analyses are included as appended reports as received from the subcontracted laboratory. The results included in this report only relate to the samples listed on the following Sample Cross-Reference page. This report shall not be reproduced except in full, without the written approval of the laboratory.

Any unusual difficulties encountered during the analysis of your samples are discussed in the attached case narratives.

Accredited in accordance with NELAP: Oregon (100022)

TestAmerica ASL
1100 NE Circle Boulevard, Suite 310
Corvallis, OR 97330
1-541-243-0980
www.testamericainc.com

Sample Receipt Comments

We certify that the test results meet all NELAP requirements.

Sample Cross-Reference

Sample ID	Client Sample ID	Date/Time Collected	Date Received
R248501	TRIPBLANK-072517-01	07/25/17 08:00	07/26/17
R248502	T4S1MW-09-072517-0	07/25/17 10:45	07/26/17
R248503	T4S1MW-03S-072517-0	07/25/17 12:40	07/26/17
R248504	MW-02-072517-0	07/25/17 14:05	07/26/17

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CASE NARRATIVE
GC/MS VOLATILES ANALYSIS

Project: Northwest Pipe **ASL SDG#:** R2485

With the exceptions noted as flags, footnotes, or detailed in the section below; standard operating procedures were followed in the analysis of the samples and no problems were encountered or anomalies observed.

All laboratory quality control samples were within established control limits, with any exceptions noted below, or in the associated QC summary forms.

Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. For diluted samples, the reporting limits are adjusted for the dilution required.

Calculations are performed before rounding to minimize errors in calculated values.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the section below, or in the sample receipt documentation.

Method(s):
SW8260C: SW5030

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Client Information

Client Sample ID: **TRIPBLANK-072517-01**

Project Name: Northwest Pipe
Sample Date: 07/25/2017
Sample Time: 08:00
Type: Grab
Matrix: Water

Lab Information

Lab Sample ID: **R248501**

Date Received: 07/26/2017
Dilution Factor: 1
Report Revision No.: 0

Analyte	CAS#	DL	RL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
GC/MS Volatiles								
cis-1,2-Dichloroethene	156-59-2	0.15	0.50	0.15	U	ug/L	SW8260C	07/26/2017
Trichloroethene (TCE)	79-01-6	0.15	0.50	0.15	U	ug/L	SW8260C	07/26/2017

Surrogate	% Recovery	Control Limits	Qualifier
Dibromofluoromethane	101	70-130	
1,2-Dichloroethane-d4	104	70-130	
Toluene-d8	101	70-130	
4-Bromofluorobenzene	96	70-130	

U=Not detected and reported as less than detection limit
J=Estimated value below reporting limit
E=Estimated value above calibration range
*=See case narrative
B=Analyte detected in blank

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Client Information

Client Sample ID: T4S1MW-09-072517-0

Project Name: Northwest Pipe
Sample Date: 07/25/2017
Sample Time: 10:45
Type: Grab
Matrix: Water

Lab Information

Lab Sample ID: R248502

Date Received: 07/26/2017
Dilution Factor: 1
Report Revision No.: 0

Analyte	CAS#	DL	RL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
GC/MS Volatiles								
cis-1,2-Dichloroethene	156-59-2	0.15	0.50	0.15	U	ug/L	SW8260C	07/26/2017
Trichloroethene (TCE)	79-01-6	0.15	0.50	0.15	U	ug/L	SW8260C	07/26/2017

Surrogate	% Recovery	Control Limits	Qualifier
Dibromofluoromethane	96	70-130	
1,2-Dichloroethane-d4	104	70-130	
Toluene-d8	97	70-130	
4-Bromofluorobenzene	92	70-130	

U=Not detected and reported as less than detection limit
J=Estimated value below reporting limit
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*=See case narrative
B=Analyte detected in blank

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Client Information

Client Sample ID: T4S1MW-03S-072517-0

Project Name: Northwest Pipe
Sample Date: 07/25/2017
Sample Time: 12:40
Type: Grab
Matrix: Water

Lab Information

Lab Sample ID: R248503

Date Received: 07/26/2017
Dilution Factor: 1
Report Revision No.: 0

Analyte	CAS#	DL	RL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
GC/MS Volatiles								
cis-1,2-Dichloroethene	156-59-2	0.15	0.50	0.15	U	ug/L	SW8260C	07/26/2017
Trichloroethene (TCE)	79-01-6	0.15	0.50	0.15	U	ug/L	SW8260C	07/26/2017

Surrogate	% Recovery	Control Limits	Qualifier
Dibromofluoromethane	100	70-130	
1,2-Dichloroethane-d4	106	70-130	
Toluene-d8	99	70-130	
4-Bromofluorobenzene	95	70-130	

U=Not detected and reported as less than detection limit
J=Estimated value below reporting limit
E=Estimated value above calibration range
*=See case narrative
B=Analyte detected in blank

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Client Information

Client Sample ID: **MW-02-072517-0**

Project Name: Northwest Pipe
Sample Date: 07/25/2017
Sample Time: 14:05
Type: Grab
Matrix: Water

Lab Information

Lab Sample ID: **R248504**

Date Received: 07/26/2017
Dilution Factor: 1
Report Revision No.: 0

Analyte	CAS#	DL	RL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
GC/MS Volatiles								
cis-1,2-Dichloroethene	156-59-2	0.15	0.50	0.41	J	ug/L	SW8260C	07/26/2017
Trichloroethene (TCE)	79-01-6	0.15	0.50	0.15	U	ug/L	SW8260C	07/26/2017

Surrogate	% Recovery	Control Limits	Qualifier
Dibromofluoromethane	102	70-130	
1,2-Dichloroethane-d4	108	70-130	
Toluene-d8	102	70-130	
4-Bromofluorobenzene	94	70-130	

U=Not detected and reported as less than detection limit
J=Estimated value below reporting limit
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*=See case narrative
B=Analyte detected in blank

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Client Information

Client Sample ID: **WB1-0726**

Project Name: Northwest Pipe
Sample Date: N/A
Sample Time: N/A
Type: QC
Matrix: Water

Lab Information

Lab Sample ID: **WB1-0726**

Date Received: N/A
Dilution Factor: 1
Report Revision No.: 0

Analyte	CAS#	DL	RL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
GC/MS Volatiles								
cis-1,2-Dichloroethene	156-59-2	0.15	0.50	0.15	U	ug/L	SW8260C	07/26/2017
Trichloroethene (TCE)	79-01-6	0.15	0.50	0.15	U	ug/L	SW8260C	07/26/2017

Surrogate	% Recovery	Control Limits	Qualifier
Dibromofluoromethane	98	70-130	
1,2-Dichloroethane-d4	105	70-130	
Toluene-d8	100	70-130	
4-Bromofluorobenzene	96	70-130	

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J=Estimated value below reporting limit
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*=See case narrative
B=Analyte detected in blank

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Client Information

Project Name: Northwest Pipe
Type: QC
Matrix: Water

Lab Information

LCS ID: BS1W0726

Report Revision No.: 0
Dilution Factor: 1

Analyte	CAS#	Spike Amount	Sample Result	Units	%Recovery	Analysis Method	Date Analyzed
GC/MS Volatiles							
cis-1,2-Dichloroethene	156-59-2	20.0	19.4	ug/L	97	SW8260C	07/26/2017
Trichloroethene (TCE)	79-01-6	20.0	18.2	ug/L	91	SW8260C	07/26/2017

Surrogate	% Recovery	Control Limits	Qualifier
Dibromofluoromethane	100	70-130	
1,2-Dichloroethane-d4	103	70-130	
Toluene-d8	104	70-130	
4-Bromofluorobenzene	100	70-130	

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CASE NARRATIVE
GC/MS VOLATILES ANALYSIS

Project: Northwest Pipe **ASL SDG#:** R2485

With the exceptions noted as flags, footnotes, or detailed in the section below; standard operating procedures were followed in the analysis of the samples and no problems were encountered or anomalies observed.

All laboratory quality control samples were within established control limits, with any exceptions noted below, or in the associated QC summary forms.

Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. For diluted samples, the reporting limits are adjusted for the dilution required.

Calculations are performed before rounding to minimize errors in calculated values.

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Method(s):
SW8260C-SIM: SW5030

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Client Information

Client Sample ID: **TRIPBLANK-072517-01**

Project Name: Northwest Pipe
Sample Date: 07/25/17
Sample Time: 08:00
Type: Grab
Matrix: Water

Lab Information

Lab Sample ID: **R248501**

Date Received: 07/26/17
Dilution Factor: 1
Report Revision No.: 0

Analyte	CAS#	DL	RL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
GC/MS Volatiles								
Vinyl Chloride	75-01-4	8.00	20.0	8.00	U	ng/L	SW8260C-SI	07/31/17
Tetrachloroethene (PCE)	127-18-4	5.00	20.0	5.00	U	ng/L	SW8260C-SI	07/31/17

Surrogate	% Recovery	Control Limits	Qualifier
Dibromofluoromethane	115	70-130	
1,2-Dichloroethane-d4	113	70-130	
Toluene-d8	91	70-130	
4-Bromofluorobenzene	124	70-130	

U=Not detected and reported as less than detection limit
J=Estimated value below reporting limit
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B=Analyte detected in blank

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Client Information

Client Sample ID: **T4S1MW-09-072517-0**

Project Name: Northwest Pipe
Sample Date: 07/25/17
Sample Time: 10:45
Type: Grab
Matrix: Water

Lab Information

Lab Sample ID: **R248502**

Date Received: 07/26/17
Dilution Factor: 1
Report Revision No.: 0

Analyte	CAS#	DL	RL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
GC/MS Volatiles								
Vinyl Chloride	75-01-4	8.00	20.0	8.00	U	ng/L	SW8260C-SI	07/31/17
Tetrachloroethene (PCE)	127-18-4	5.00	20.0	13.9	J	ng/L	SW8260C-SI	07/31/17

Surrogate	% Recovery	Control Limits	Qualifier
Dibromofluoromethane	120	70-130	
1,2-Dichloroethane-d4	118	70-130	
Toluene-d8	92	70-130	
4-Bromofluorobenzene	124	70-130	

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J=Estimated value below reporting limit
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B=Analyte detected in blank

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Client Information

Client Sample ID: T4S1MW-03S-072517-0

Project Name: Northwest Pipe
Sample Date: 07/25/17
Sample Time: 12:40
Type: Grab
Matrix: Water

Lab Information

Lab Sample ID: R248503

Date Received: 07/26/17
Dilution Factor: 1
Report Revision No.: 0

Analyte	CAS#	DL	RL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
GC/MS Volatiles								
Vinyl Chloride	75-01-4	8.00	20.0	8.00	U	ng/L	SW8260C-SI	07/31/17
Tetrachloroethene (PCE)	127-18-4	5.00	20.0	50.8		ng/L	SW8260C-SI	07/31/17

Surrogate	% Recovery	Control Limits	Qualifier
Dibromofluoromethane	120	70-130	
1,2-Dichloroethane-d4	118	70-130	
Toluene-d8	91	70-130	
4-Bromofluorobenzene	122	70-130	

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J=Estimated value below reporting limit
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*=See case narrative
B=Analyte detected in blank

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Client Information

Client Sample ID: **MW-02-072517-0**

Project Name: Northwest Pipe
Sample Date: 07/25/17
Sample Time: 14:05
Type: Grab
Matrix: Water

Lab Information

Lab Sample ID: **R248504**

Date Received: 07/26/17
Dilution Factor: 1
Report Revision No.: 0

Analyte	CAS#	DL	RL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
GC/MS Volatiles								
Vinyl Chloride	75-01-4	8.00	20.0	19.0	J	ng/L	SW8260C-SI	07/31/17
Tetrachloroethene (PCE)	127-18-4	5.00	20.0	451		ng/L	SW8260C-SI	07/31/17

Surrogate	% Recovery	Control Limits	Qualifier
Dibromofluoromethane	123	70-130	
1,2-Dichloroethane-d4	120	70-130	
Toluene-d8	91	70-130	
4-Bromofluorobenzene	124	70-130	

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J=Estimated value below reporting limit
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*=See case narrative
B=Analyte detected in blank

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Client Information

Client Sample ID: **WB1-0731**

Project Name: Northwest Pipe
Sample Date: N/A
Sample Time: N/A
Type: QC
Matrix: Water

Lab Information

Lab Sample ID: **WB1-0731**

Date Received: N/A
Dilution Factor: 1
Report Revision No.: 0

Analyte	CAS#	DL	RL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
GC/MS Volatiles								
Vinyl Chloride	75-01-4	8.00	20.0	8.00	U	ng/L	SW8260C-SI	07/31/17
Tetrachloroethene (PCE)	127-18-4	5.00	20.0	5.00	U	ng/L	SW8260C-SI	07/31/17

Surrogate	% Recovery	Control Limits	Qualifier
Dibromofluoromethane	112	70-130	
1,2-Dichloroethane-d4	109	70-130	
Toluene-d8	89	70-130	
4-Bromofluorobenzene	122	70-130	

U=Not detected and reported as less than detection limit
J=Estimated value below reporting limit
E=Estimated value above calibration range
*=See case narrative
B=Analyte detected in blank

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Client Information

Project Name: Northwest Pipe
Type: QC
Matrix: Water

Lab Information

LCS ID: BS1W0731

Report Revision No.: 0
Dilution Factor: 1

Analyte	CAS#	Spike Amount	Sample Result	Units	%Recovery	Analysis Method	Date Analyzed
GC/MS Volatiles							
Vinyl Chloride	75-01-4	250	213	ng/L	85	SW8260C-SIM	07/31/17
Tetrachloroethene (PCE)	127-18-4	250	223	ng/L	89	SW8260C-SIM	07/31/17

Surrogate	% Recovery	Control Limits	Qualifier
Dibromofluoromethane	110	70-130	
1,2-Dichloroethane-d4	109	70-130	
Toluene-d8	93	70-130	
4-Bromofluorobenzene	125	70-130	

U=Not detected and reported as less than detection limit
J=Estimated value below reporting limit
E=Estimated value above calibration range
*=See case narrative

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CASE NARRATIVE
HEADSPACE ANALYSIS

Project: Northwest Pipe **ASL SDG#:** R2485

With the exceptions noted as flags, footnotes, or detailed in the section below; standard operating procedures were followed in the analysis of the samples and no problems were encountered or anomalies observed.

All laboratory quality control samples were within established control limits, with any exceptions noted below, or in the associated QC summary forms.

Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. For diluted samples, the reporting limits are adjusted for the dilution required.

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Method(s):
RSK-175

TestAmerica ASL

Client Information

Client Sample ID: T4S1MW-09-072517-0

Project Name: Northwest Pipe
Sample Date: 07/25/17
Sample Time: 10:45
Type: Grab
Matrix: Water

Lab Information

Lab Sample ID: R248502

Date Received: 07/26/17
Report Revision No: 0

Analyte	CAS#	Dilution Factor	DL	RL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
GC Volatiles									
Methane	74-82-8	1	5.99	48.0	22.5	J	ug/L	RSK-175	07/27/17
Carbon dioxide	124-38-9	1	38.7	234	30800		ug/L	RSK-175	07/27/17

U=Not detected and reported as less than detection limit
J=Estimated value below reporting limit
E=Estimated value above calibration range
*=See case narrative
B=Analyte detected in blank

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TestAmerica ASL

Client Information

Client Sample ID: T4S1MW-03S-072517-0

Project Name: Northwest Pipe
Sample Date: 07/25/17
Sample Time: 12:40
Type: Grab
Matrix: Water

Lab Information

Lab Sample ID: R248503

Date Received: 07/26/17
Report Revision No: 0

Analyte	CAS#	Dilution Factor	DL	RL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
GC Volatiles									
Methane	74-82-8	1	4.95	39.7	4.95	U	ug/L	RSK-175	07/27/17
Carbon dioxide	124-38-9	1	36.4	220	18100		ug/L	RSK-175	07/27/17

U=Not detected and reported as less than detection limit
J=Estimated value below reporting limit
E=Estimated value above calibration range
*=See case narrative
B=Analyte detected in blank

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TestAmerica ASL

Client Information

Client Sample ID: MW-02-072517-0

Project Name: Northwest Pipe
Sample Date: 07/25/17
Sample Time: 14:05
Type: Grab
Matrix: Water

Lab Information

Lab Sample ID: R248504

Date Received: 07/26/17
Report Revision No: 0

Analyte	CAS#	Dilution Factor	DL	RL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
GC Volatiles									
Methane	74-82-8	1	6.29	50.5	5330		ug/L	RSK-175	07/27/17
Carbon dioxide	124-38-9	1	39.3	238	19300		ug/L	RSK-175	07/27/17

U=Not detected and reported as less than detection limit
J=Estimated value below reporting limit
E=Estimated value above calibration range
*=See case narrative
B=Analyte detected in blank

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TestAmerica ASL

Client Information

Lab Information

Method Blank ID: XB1-0727

Project Name: Northwest Pipe
Sample Date: N/A
Sample Time: N/A
Type: QC
Matrix: Water

Date Received: N/A
Report Revision No: 0

Analyte	CAS#	Dilution Factor	DL	RL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
GC Volatiles									
Methane	74-82-8	1	14.3	114	14.3	U	ug/L	RSK-175	07/27/17
Carbon dioxide	124-38-9	1	56.6	342	56.6	U	ug/L	RSK-175	07/27/17

U=Not detected and reported as less than detection limit
J=Estimated value below reporting limit
E=Estimated value above calibration range
*=See case narrative
B=Analyte detected in blank

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Client Information

Project Name: Northwest Pipe
Type: QC
Matrix: Water

Lab Information

LCS ID: BS1X0727

Report Revision No.: 0
Dilution Factor: 1

Analyte	CAS#	Spike Amount	Sample Result	Units	%Recovery	Analysis Method	Date Analyzed
GC Volatiles							
Methane	74-82-8	593	596	ug/L	100	RSK-175	07/27/17
Carbon dioxide	124-38-9	3180	3080	ug/L	97	RSK-175	07/27/17

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E=Estimated value above calibration range
*=See case narrative

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CASE NARRATIVE
METALS ANALYSIS

Project: Northwest Pipe **ASL SDG#:** R2485

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Method(s):
E200.7: FLDFLT

TestAmerica ASL

Client Information

Project Name: Northwest Pipe

Date Received: 07/26/17
Type: See C.O.C.
Matrix: Water

Lab Information

Lab Batch ID: R2485

Report Revision No.: 0

Client Sample ID	Lab Sample ID	Dilution Factor	DL	RL	Result	Qual	Units	Date Analyzed
Iron: E200.7								
Dissolved Metals								
T4S1MW-09-072517-0	R248502F	1	10.0	100	32.1	J	ug/L	08/02/17
T4S1MW-03S-072517-0	R248503F	1	10.0	100	10.0	U	ug/L	08/02/17
MW-02-072517-0	R248504F	1	10.0	100	5910		ug/L	08/02/17
Total Metals								
WB10-0802	WB10-0802	1	10.0	100	10.0	U	ug/L	08/02/17

U=Not detected and reported as less than detection limit
J=Estimated value below reporting limit
E=Estimated value above calibration range
*=See case narrative

B=Analyte detected in blank

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Client Information

Project Name: Northwest Pipe
Type: QC
Matrix: Water

Lab Information

Blank Spike ID: BS10W0802

Report Revision No: 0
Dilution Factor: 1

Analyte	Spike Amount	Result	Units	%Recovery	Analysis Method	Prep Method	Date Analyzed
Metals							
Iron	50000	51300	ug/L	103	E200.7	E200.2	08/02/17

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*=See case narrative

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CASE NARRATIVE
GENERAL CHEMISTRY ANALYSIS

Project: Northwest Pipe **ASL SDG#:** R2485

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Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. For diluted samples, the reporting limits are adjusted for the dilution required.

Calculations are performed before rounding to minimize errors in calculated values.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the section below, or in the sample receipt documentation.

Method(s):
E300.0A

TestAmerica ASL

Client Information

Project Name: Northwest Pipe

Date Received: 07/26/17
Type: See C.O.C.
Matrix: Water

Lab Information

Lab Batch ID: R2485

Analysis Method: E300.0A
Units: mg/L
Report Revision No.: 0

Client Sample ID	Lab Sample ID	Dilution Factor	DL	RL	Chloride Result	Qualifier	Date Analyzed
General Chemistry							
T4S1MW-09-072517-0	R248502	1	0.020	0.20	2.34		08/03/17
T4S1MW-03S-072517-0	R248503	1	0.020	0.20	1.90		08/03/17
MW-02-072517-0	R248504	1	0.020	0.20	3.14		08/03/17
WB1-0803	WB1-0803	1	0.020	0.20	0.096	J	08/03/17

U=Not detected and reported as less than detection limit
J=Estimated value below reporting limit
E=Estimated value above calibration range
*=See case narrative

B=Analyte detected in blank

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TestAmerica ASL

Client Information

Project Name: Northwest Pipe

Date Received: 07/26/17
Type: See C.O.C.
Matrix: Water

Lab Information

Lab Batch ID: R2485

Analysis Method: E300.0A
Units: mg/L
Report Revision No.: 0

Client Sample ID	Lab Sample ID	Dilution Factor	DL	RL	Sulfate Result	Qualifier	Date Analyzed
General Chemistry							
T4S1MW-09-072517-0	R248502	1	0.040	0.20	7.16		08/03/17
T4S1MW-03S-072517-0	R248503	1	0.040	0.20	12.4		08/03/17
MW-02-072517-0	R248504	1	0.040	0.20	5.88		08/03/17
WB1-0803	WB1-0803	1	0.040	0.20	0.040	U	08/03/17

U=Not detected and reported as less than detection limit
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*=See case narrative
B=Analyte detected in blank

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Client Information

Lab Information

Lab Batch ID: R2485

Project Name: Northwest Pipe
Type: QC
Matrix: Water

Report Revision No.: 0

LCS ID	Analyte	Spike Amount	Sample Result	Units	% Recovery	Analysis Method	Date Analyzed
General Chemistry							
BS1W0803	Chloride	5.00	5.11	mg/L	102	E300.0A	08/03/17
BS1W0803	Sulfate	5.00	4.87	mg/L	97	E300.0A	08/03/17

U=Not detected and reported as less than detection limit
J=Estimated value below reporting limit
E=Estimated value above calibration range
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Client Information

Client Sample ID: **MW-02-072517-0**

Project Name: Northwest Pipe
Type: QC
Matrix: Water

Lab Information

Report Revision No.: 0

Analyte	CAS#	MS %Recovery	MSD %Recovery	RPD	QC Limits	RPD Limits	Analysis Method
General Chemistry							
Sulfate	14808-79-8	104	110	3	85-115	15	E300.0A
Chloride	16887-00-6	104	106	1	85-115	15	E300.0A

U=Not detected and reported as less than detection limit
J=Estimated value below reporting limit
E=Estimated value above calibration range
*=See case narrative

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CASE NARRATIVE
GENERAL CHEMISTRY ANALYSIS

Project: Northwest Pipe **ASL SDG#:** R2485

With the exceptions noted as flags, footnotes, or detailed in the section below; standard operating procedures were followed in the analysis of the samples and no problems were encountered or anomalies observed.

All laboratory quality control samples were within established control limits, with any exceptions noted below, or in the associated QC summary forms.

Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. For diluted samples, the reporting limits are adjusted for the dilution required.

Calculations are performed before rounding to minimize errors in calculated values.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the section below, or in the sample receipt documentation.

Method(s):
E353.2

TestAmerica ASL

Client Information

Project Name: Northwest Pipe

Date Received: 07/26/17
Type: See C.O.C.
Matrix: Water

Lab Information

Lab Batch ID: R2485

Analysis Method: E353.2
Units: mg/L
Report Revision No.: 0

Client Sample ID	Lab Sample ID	Dilution Factor	DL	RL	Nitrate-N Result	Qualifier	Date Analyzed
General Chemistry							
T4S1MW-09-072517-0	R248502	4	0.011	0.040	1.94		07/26/17 16:43
T4S1MW-03S-072517-0	R248503	4	0.011	0.040	3.79		07/26/17 16:45
MW-02-072517-0	R248504	1	0.0028	0.010	0.27		07/26/17 16:18
WB1-072617	WB1-072617	1	0.0028	0.010	0.0028	U	07/26/17

U=Not detected and reported as less than detection limit
J=Estimated value below reporting limit
E=Estimated value above calibration range
*=See case narrative

B=Analyte detected in blank

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TestAmerica ASL

Client Information

Project Name: Northwest Pipe

Date Received: 07/26/17
Type: See C.O.C.
Matrix: Water

Lab Information

Lab Batch ID: R2485

Analysis Method: E353.2
Units: mg/L
Report Revision No.: 0

Client Sample ID	Lab Sample ID	Dilution Factor	DL	RL	Nitrite-N Result	Qualifier	Date Analyzed
General Chemistry							
T4S1MW-09-072517-0	R248502	1	0.0030	0.010	0.0030	U	07/26/17 15:29
T4S1MW-03S-072517-0	R248503	1	0.0030	0.010	0.0030	U	07/26/17 15:30
MW-02-072517-0	R248504	1	0.0030	0.010	0.0030	U	07/26/17 15:30
WB1-072617	WB1-072617	1	0.0030	0.010	0.0030	U	07/26/17

U=Not detected and reported as less than detection limit
J=Estimated value below reporting limit
E=Estimated value above calibration range
*=See case narrative

B=Analyte detected in blank

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Client Information

Lab Information

Lab Batch ID: R2485

Project Name: Northwest Pipe
Type: QC
Matrix: Water

Report Revision No.: 0

LCS ID	Analyte	Spike Amount	Sample Result	Units	% Recovery	Analysis Method	Date Analyzed
General Chemistry							
BS1W0726	Nitrite-N	0.76	0.82	mg/L	108	E353.2	07/26/17

U=Not detected and reported as less than detection limit
J=Estimated value below reporting limit
E=Estimated value above calibration range
*=See case narrative

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Client Information

Client Sample ID: **MW-02-072517-0**

Project Name: Northwest Pipe
Type: QC
Matrix: Water

Lab Information

Report Revision No.: 0

Analyte	CAS#	MS %Recovery	MSD %Recovery	RPD	QC Limits	RPD Limits	Analysis Method
General Chemistry							
Nitrite-N	14797-65-0	102	102	0.1	90-110	15	E353.2

U=Not detected and reported as less than detection limit
J=Estimated value below reporting limit
E=Estimated value above calibration range
*=See case narrative

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CASE NARRATIVE
GENERAL CHEMISTRY ANALYSIS

Project: Northwest Pipe **ASL SDG#:** R2485

With the exceptions noted as flags, footnotes, or detailed in the section below; standard operating procedures were followed in the analysis of the samples and no problems were encountered or anomalies observed.

All laboratory quality control samples were within established control limits, with any exceptions noted below, or in the associated QC summary forms.

Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. For diluted samples, the reporting limits are adjusted for the dilution required.

Calculations are performed before rounding to minimize errors in calculated values.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the section below, or in the sample receipt documentation.

Method(s):
SM5310B

TestAmerica ASL

Client Information

Project Name: Northwest Pipe

Date Received: 07/26/17
Type: See C.O.C.
Matrix: Water

Lab Information

Lab Batch ID: R2485

Analysis Method: SM5310B
Units: mg/L
Report Revision No.: 0

Client Sample ID	Lab Sample ID	Dilution Factor	DL	RL	Total Organic Carbon Result	Qualifier	Date Analyzed
General Chemistry							
T4S1MW-09-072517-0	R248502	1	0.20	0.50	0.69		08/03/17
T4S1MW-03S-072517-0	R248503	1	0.20	0.50	0.56		08/03/17
MW-02-072517-0	R248504	1	0.20	0.50	1.52		08/03/17
WB2-0802	WB2-0802	1	0.20	0.50	0.20	U	08/02/17

U=Not detected and reported as less than detection limit
J=Estimated value below reporting limit
E=Estimated value above calibration range
*=See case narrative

B=Analyte detected in blank

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Client Information

Lab Information

Lab Batch ID: R2485

Project Name: Northwest Pipe
Type: QC
Matrix: Water

Report Revision No.: 0

LCS ID	Analyte	Spike Amount	Sample Result	Units	% Recovery	Analysis Method	Date Analyzed
General Chemistry							
BS2W0802	Total Organic Carbon	5.00	4.76	mg/L	95	SM5310B	08/03/17

U=Not detected and reported as less than detection limit
J=Estimated value below reporting limit
E=Estimated value above calibration range
*=See case narrative

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CH2MHILL Applied Sciences Laboratory — TEST AMERICA
CHAIN OF CUSTODY RECORD
AND AGREEMENT TO PERFORM SERVICES

Chain of Custody Record

1100 NE Circle Blvd. Suite 300
Corvallis, OR 97330
(541) 768-3120

Client Contact

Project Name: NWP
Project # or PO #: 682782.GW.05
Company Name: CH2M HILL
Address: 2020 SW 4th Ave, STE 300
City/State/Zip: Portland, OR 97201
Project Manager: Gretchen Gee
Phone #:
Report to email: gretchen.gee@ch2m.com

Analysis Turnaround Time

TAT is Calander days
TAT if different from below ____
☒ 21 days (STD)
☐ 14 days * ☐ 3 day *
☐ 7 days * ☐ 2 days *
☐ 5 days * ☐ 1 day *
* (Surcharges will apply)

Preservation Used

2	2	3	4	1	1			

Analysis Requested

Sample Identification (Limit of 20 characters)	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix (Water, Soil, Air)	Total # of Cont.	SW8260C (VOCs)	SW8260 SIM (VOCs - SIM)	SM 5310 (Geochem H2S)	E200.7F (Diss Metals)	RSK-175	E300.0 & E #353.2 (GW Anions)				Sample Specific Notes:	Lab ID:
TRIPBLANK-072517-01	7/25/17	0600	G	W	4	2	2									1
T4S1MW-09-072517-0	7/25/17	1045	G	W	12	3	3	1	1	3	1					2
T4S1MW-08-072517-0	7/25/17	1240	G	W	12	3	3	1	1	3	1					3
MW-02-072517-0	7/25/17	1405	G	W	12	3	3	1	1	3	1					4

For Lab Use Only:

SDG: 82485
Custody Seals Intact? ☒ Yes ☐ No
Hand delivered? ☐ Yes ☒ No
Cooler Temp 0.8°C
Therm ID No. 173 Therm Exp. 10/14/17
Packing Material: Circle Below
Ice Blue Ice Box Bubble Wrap
Radiological Screen? ☐ Yes ☒ No

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other ____

Possible Hazard Identification:
Are samples hazardous? ☐ Yes ☒ No
If yes, select hazard(s): ☐ Listed ☐ Ignitable ☐ Corrosive ☐ Reactive ☐ Toxic
If YES or NO is not checked above, samples will be assumed hazardous and hazardous disposal fees will be applied.

Sample Disposal (A fee may be added if samples are retained longer than 30 day per client request, samples are returned to client, or classified as hazardous.)
☐ Return to Client ☒ Disposal by Lab ☐ Archive for ____ months

Sampled By: Jennifer Ulrich Date/Time: 7/25/2017 1400
Received by: Date/Time:
Received in Laboratory by: Date/Time: 7/26/17 1050

Relinquished by: Jennifer Ulrich Date/Time: 7/25/17 1600
Relinquished by: Date/Time:

Shipped Via: ☐ UPS ☐ Fed-Ex ☐ USPS ☐ Other Tracking #:

Special Instructions/QC Requirements

TestAmerica ASL

Sample Receipt Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

SDG ID: R2485 Date Received: 7/26/2017

Client/Project: NWP Received by: PC

Were custody seals intact and on the outside of the cooler?			☑	Yes	☐	No	☐	N/A
Shipping Record:	☐	Hand Delivered	☑	On File	☐	COC		
Radiological Screening for DoD			☐	Yes	☐	No	☑	N/A
Packing Material:	☐	Hand Delivered	☑	Ice	☐	Blue Ice	☐	Box
Temp OK? (<6C) Therm ID: TH173 Exp. 10/14/17	0.8°C		☑	Yes	☐	No	☐	N/A
Was a Chain of Custody (CoC) Provided?			☑	Yes	☐	No	☐	N/A
Was the CoC correctly filled out (If No, document below)			☑	Yes	☐	No	☐	N/A
Did sample labels agree with COC? (If No, document below)			☐	Yes	☑	No	☐	N/A
Did the CoC list a correct bottle count and the preservative types (No=Correct on CoC)			☑	Yes	☐	No	☐	N/A
Were the sample containers in good condition (not broken or leaking)?			☑	Yes	☐	No	☐	N/A
Was enough sample volume provided for analysis? (If No, document below)			☑	Yes	☐	No	☐	N/A
Containers supplied by ASL?			☑	Yes	☐	No	☐	N/A
Any sample with < 1/2 holding time remaining? If so contact LPM and document below.			☐	Yes	☑	No	☐	N/A
Samples have multi-phase? If yes, document on SRER			☐	Yes	☑	No	☐	N/A
All water VOCs free of air bubbles? No, document on SRER			☑	Yes	☐	No	☐	N/A
pH of all samples met criteria on receipt? If "No", preserve and document below.			☑	Yes	☐	No	☐	N/A
Dissolved/Soluble metals filtered in the field?			☑	Yes	☐	No	☐	N/A
Dissolved/Soluble metals have sediment in bottom of container? If so document below.			☐	Yes	☑	No	☐	N/A

Preservation Adjustment

Sample ID	Reagent	Reagent Lot Number	Volume Added	Initials/Date-Time	24 hour pH check Initials/Time

Did pH of all metals samples preserved upon receipt meet criteria 24 hours after preservation? ☐ Yes ☐ No

Sample Exception Report (The following exceptions were noted)

1. One number missing from R2485-03 ID on COC. Logged in per bottle labels of T4S1MW-03S-072517-0
2. RSK on COC does not identify parameters
3. Metals on COC does not identify parameters

Client was notified on: 7/26/17 Client contact: Gretchen Gee

Resolution to Exception:
Table of required parameters were submitted.