

May 2, 2002

55568

Mr. George Dawes
Supervisor, Technical Services
Molycorp, Inc.
300 Caldwell Avenue
Washington, PA 15301

**Report to Summarize Sampling Activities
Washington, Pennsylvania Site**

Dear Mr. Dawes:

Harding ESE, Inc. (Harding ESE) has prepared this report to summarize the sampling activities performed at the Molycorp, Inc. (Molycorp) Site, in Washington, Pennsylvania (Figure 1). Sampling was performed for groundwater, surface water, and creek sediments at pre-determined locations. Site monitoring and sampling was conducted between March 11, and March 13, 2002 in accordance with the approved Proposal for the Site. Figure 2 shows each sampling location.

Severn Trent Laboratories, Inc. (STL) of St. Louis, Missouri performed sample analysis. Tables 1 through 3 provide a summary of the results of the analysis.

This report has been prepared for the sole use of Molycorp, Inc., and only intended beneficiaries of our work. No other party should rely on the information contained herein without prior written consent of Harding ESE.

Methodology

Harding ESE collected samples at the Molycorp, Inc. Site during the week of March 11, 2002. This event consisted of collection of groundwater levels, well redevelopment, well sampling, surface water sampling, and sediment sampling.

Well Sampling

On March 11, 2002, Harding ESE measured water levels at wells addressed in the approved Proposal for the Site. Terra Testing, Inc. (Terra Testing) of Washington, Pennsylvania, under supervision of Harding ESE personnel, redeveloped the following wells prior to sampling:

BR-1	BR-2	M-2	M-4	M-8
M-10	M-13	M-18	M-20	MW-24
MW-25	MW-26	MW-27	MW-28	MW-29
MW-31	UG-4			

Well redevelopment consisted of surging, as necessary to remove sediment from certain wells, and pumping until the well produced consistently low turbidity water. Indicator parameters (Turbidity, Temperature, pH, Conductivity) were monitored and logged. Well Development and Sampling Forms are provided in this report as Attachment I.

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Upon completion of redevelopment at the addressed wells, Harding ESE collected samples at each location. Prior to collection at each well, Harding ESE personnel repeated water level measurements to ensure recovery had occurred. Samples were collected by using a peristaltic pump and dedicated tubing using "low flow, low stress" procedures (i.e., minimal drawdown and turbidity less than 50 nephelometric turbidity units "NTU"). Each water sample was filtered in the field using a 0.45-micron filter.

PADEP personnel were onsite March 12, 2002 to "split" samples with Harding ESE. PADEP collected split samples from wells BR-1, MW-25, M-2, and M-18.

During redevelopment, Harding ESE and Terra Testing repaired the inner Poly Vinyl Chloride (PVC) riser at MW-10. The riser was apparently damaged in the past and was not accessible for redevelopment or sampling. The existing riser was cut out and replaced with a new one.

Surface Water and Sediment Sampling

Surface water and Sediment samples were collected from four locations in Chartiers Creek. These locations were identified by Molycorp personnel and have been identified as SS-1, SS-3, SS-4, SS-6, for the sediment samples and CR-1, CR-2, CR-3, and CR-4 for the surface water samples. Figure 2 shows each sampling location.

Surface water samples were collected by completely submersing a non-preserved transfer bottle into Chartiers Creek and filtering it into the correct laboratory supplied container using 0.45-micron filters.

Sediment samples were collected from the same locations as the surface water samples at a depth of 0 to 3 inches in Chartiers Creek.

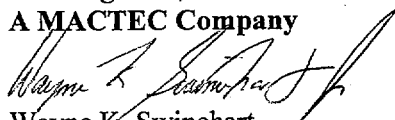
Analytical

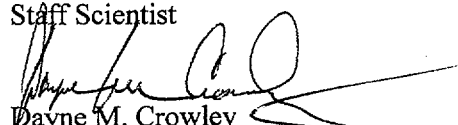
Samples collected at the Molycorp, Inc. site were sent to STL in St. Louis, Missouri for analysis of isotopes of Uranium (U), Thorium (Th), and Radium (Ra). Specifically, analysis was performed for U^{235} , U^{238} , Th^{230} , Th^{232} , Ra^{226} , and Ra^{228} . A summary of analytical results is in Table 1, Table 2, and Table 3.

We trust that this satisfies your requirements for the Sampling Activities performed at the Molycorp, Inc. facility. If you have any questions, please do not hesitate to contact us at (412) 279-6661.

Sincerely,

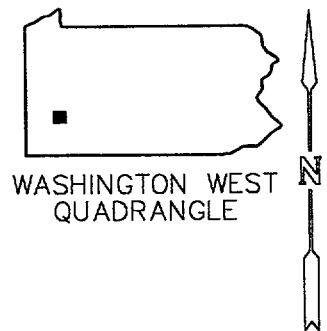
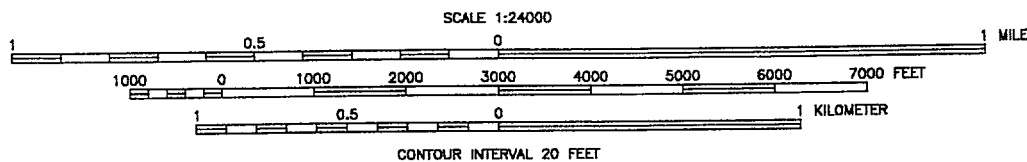
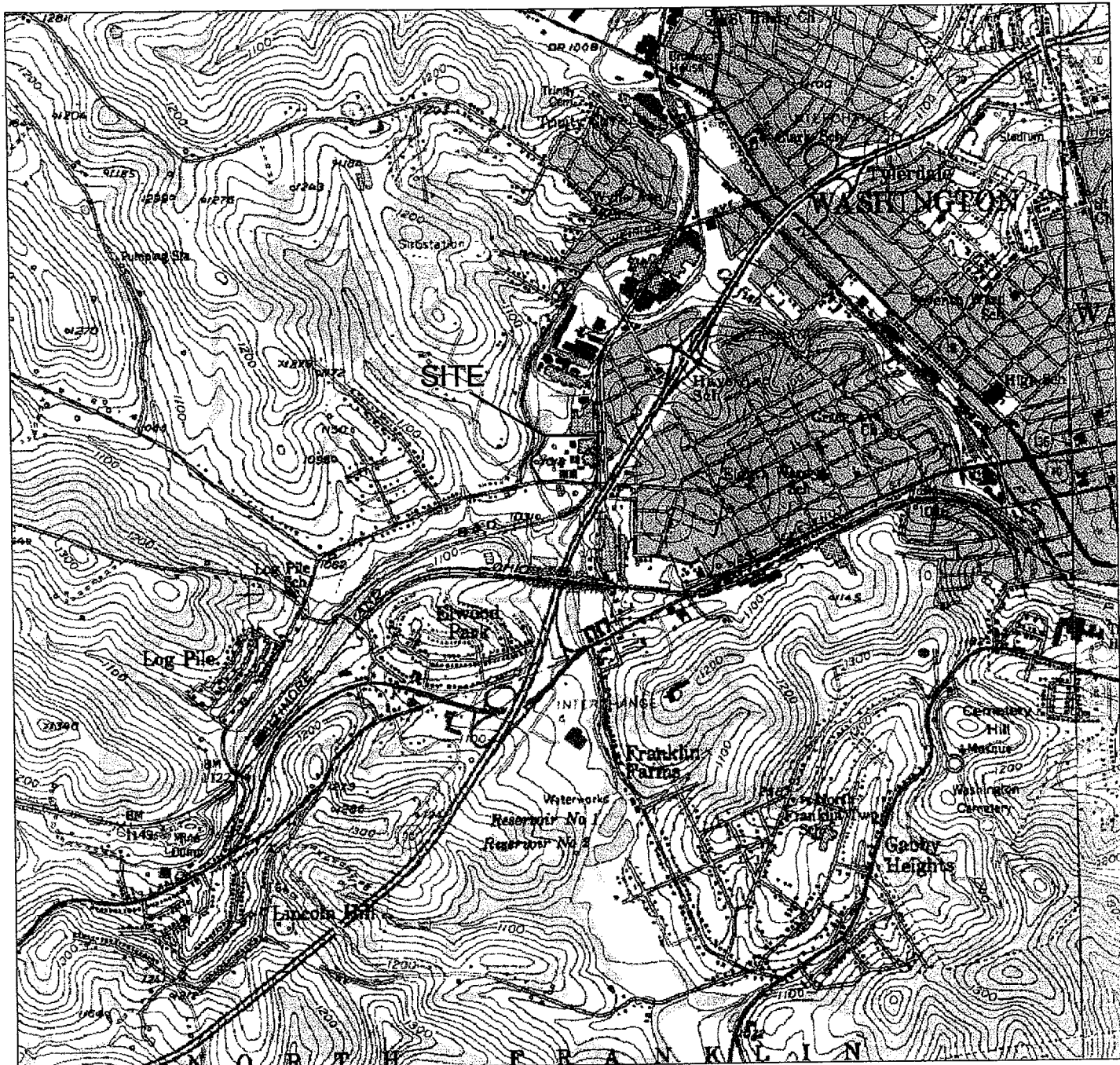
Harding ESE, Inc.
A MACTEC Company


Wayne K. Swinehart
Staff Scientist


Dayne M. Crowley
Principal Hydrogeologist

WKS/DMC/jlp

FIGURES



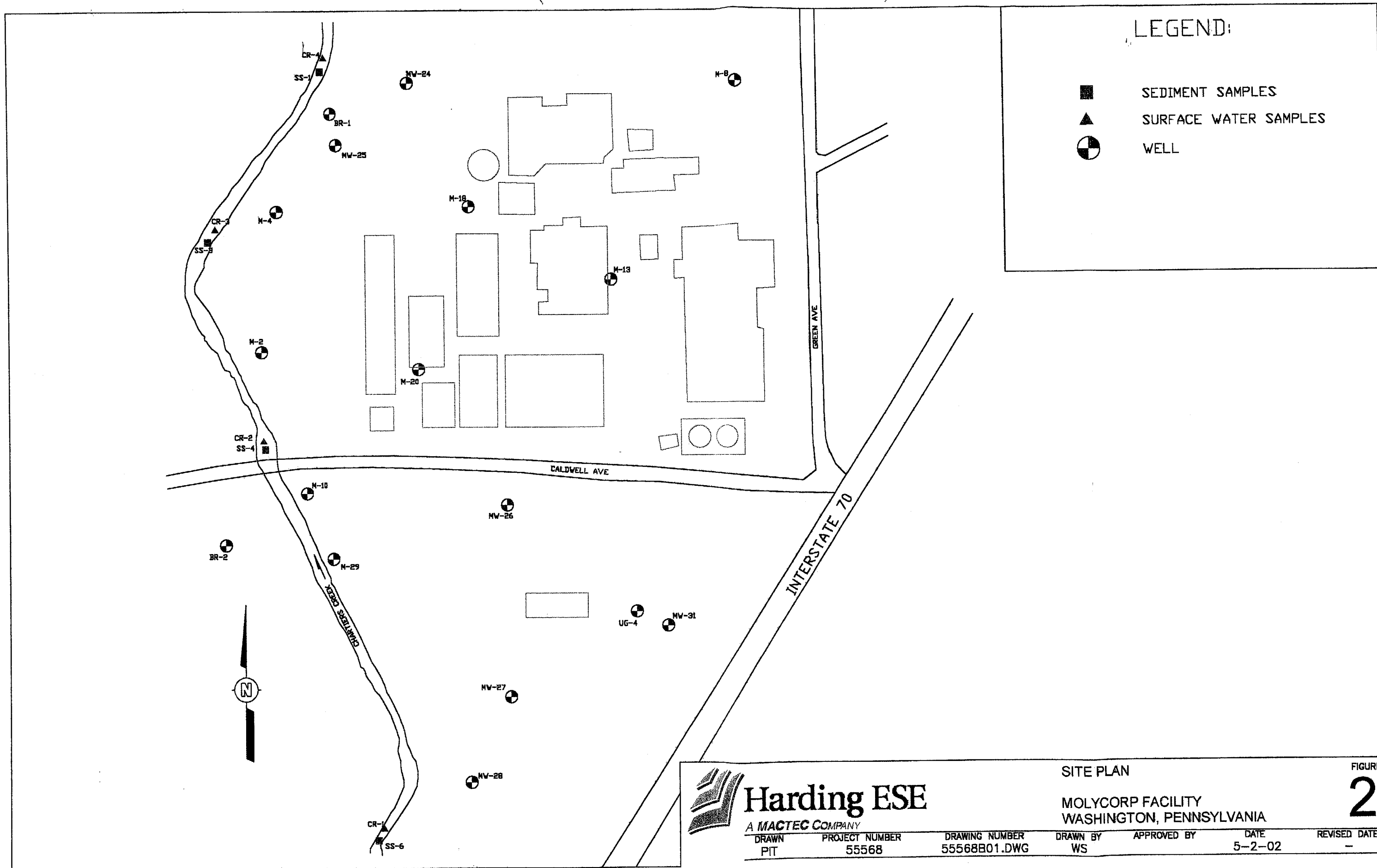
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A MACTEC COMPANY

SITE LOCATION MAP
MOLYCORP WASHINGTON PLANT
CANTON TOWNSHIP
WASHINGTON COUNTY

FIGURE

1

DRAWN	PROJECT NUMBER	DRAWING NUMBER	DRAWN BY	APPROVED BY	DATE	REVISED DATE
PIT	55351	55351A01.DWG	WS		2-27-02	-




LEGEND:

■ SEDIMENT SAMPLES

▲ SURFACE WATER SAMPLES

⊗ WELL

**Harding ESE**
A MACTEC COMPANY

SITE PLAN

MOLYCORP FACILITY
WASHINGTON, PENNSYLVANIA

DRAWN PIT	PROJECT NUMBER 55568	DRAWING NUMBER 55568B01.DWG	DRAWN BY WS	APPROVED BY	DATE 5-2-02	REVISED DATE -
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FIGURE
2

TABLES

Table 1
Summary Radiological Testing Results
Groundwater Sampling
Molycorp, Inc. Site - Washington, Pennsylvania

Well ID	M-28		M-28 DUP		M-29		M-10		BR-2		BR-1	
	Result	T.U. ⁽¹⁾	Result	T.U. ⁽¹⁾	Result	T.U. ⁽¹⁾	Result	T.U. ⁽¹⁾	Result	T.U. ⁽¹⁾	Result	T.U. ⁽¹⁾
	(pCi/L) ⁽²⁾	(+/-)	(pCi/L) ⁽²⁾	(+/-)	(pCi/L) ⁽²⁾	(+/-)	(pCi/L) ⁽²⁾	(+/-)	(pCi/L) ⁽²⁾	(+/-)	(pCi/L) ⁽²⁾	(+/-)
Radionuclide												
Radium - 226	0.29	0.17	0.14	0.13	0.20	0.17	0.14	0.19	0.94	0.25	0.25	0.14
Radium - 228	0.64	0.40	0.67	0.41	0.60	0.40	0.46	0.40	1.09	0.40	1.26	0.45
Thorium - 228	0.05	0.13	-0.038	0.077	0.041	0.086	0.010	0.055	0.012	0.066	0.025	0.092
Thorium - 230	0.91	0.39	0.67	0.33	0.52	0.30	0.27	0.18	0.34	0.21	0.79	0.32
Thorium - 232	0.037	0.092	-0.056	0.039	0.06	0.10	0.020	0.052	-0.012	0.018	0.08	0.10
Uranium - 234	1.29	0.51	1.13	0.43	0.76	0.34	2.18	0.65	0.41	0.24	0.33	0.24
Uranium - 235	0.08	0.13	-0.00003	0.079	0.07	0.10	0.060	0.095	0	0	0.10	0.16
Uranium - 238	0.91	0.42	1.02	0.4	0.44	0.25	1.59	0.52	0.08	0.13	0.07	0.13
Physical Characteristics												
Water Level (ft-TOC)	10.50				10.82		9.75		2.33		9.00	
Temperature (°C)	12.29				8.40		11.15		12.14		13.50	
Spec. Conductance (mS)	1.73				1.08		0.834		2.98		3.47	
pH (S.U.)	7.30				7.04		7.63		8.63		6.87	
Turbidity (ntu)	198.0				999		102		161		4.80	

Notes: (1) T.U. indicates Total Uncertainty
(2) pCi/L indicates pico Curies per liter
(3) All samples field filtered.

Table 1 (Continued)
Summary Radiological Testing Results
Groundwater Sampling
Molycorp, Inc. Site - Washington, Pennsylvania

Well ID	MW-25		M-2		M-2 DUP		M-18		MW-24		MW-4	
	Result	T.U. ⁽¹⁾	Result	T.U. ⁽¹⁾	Result	T.U. ⁽¹⁾	Result	T.U. ⁽¹⁾	Result	T.U. ⁽¹⁾	Result	T.U. ⁽¹⁾
	(pCi/L) ⁽²⁾	(+/-)	(pCi/L) ⁽²⁾	(+/-)	(pCi/L) ⁽²⁾	(+/-)	(pCi/L) ⁽²⁾	(+/-)	(pCi/L) ⁽²⁾	(+/-)	(pCi/L) ⁽²⁾	(+/-)
Radionuclide												
Radium - 226	0.28	0.18	0.12	0.14	0.14	0.17	0.32	0.20	0.22	0.20	0.07	0.12
Radium - 228	0.56	0.43	0.57	0.43	0.40	0.54	0.48	0.52	0.52	0.48	0.41	0.47
Thorium - 228	0.005	0.049	-0.047	0.082	-0.01	0.11	0.07	0.12	0.08	0.11	0.05	0.13
Thorium - 230	0.32	0.19	0.37	0.24	0.19	0.18	0.55	0.36	1.02	0.41	0.48	0.31
Thorium - 232	0.004	0.048	0.07	0.12	0.07	0.13	0.09	0.15	0.018	0.063	0.026	0.091
Uranium - 234	1.77	0.64	1.20	0.50	1.13	0.48	0.82	0.48	0.55	0.34	0.81	0.35
Uranium - 235	0.21	0.22	0.19	0.22	0.27	0.24	0.15	0.21	0.16	0.18	0.028	0.072
Uranium - 238	1.22	0.51	0.89	0.40	0.97	0.43	0.65	0.42	0.12	0.17	0.62	0.31
Physical Characteristics												
Water Level (ft-TOC)	7.98		8.01				8.54		8.52		9.59	
Temperature (°C)	10.65		11.83				14.98		13.25		11.89	
Spec. Conductance (mS)	2.39		1.20				3.47		1.67		1.39	
pH (S.U.)	7.10		6.94				10.00		10.17		6.94	
Turbidity (ntu)	999		618				999		999		90.30	

Notes: (1) T.U. indicates Total Uncertainty
(2) pCi/L indicates pico Curries per liter
(3) All samples field filtered.

Prepared by: JLP
Checked by: DMC

Table 1 (Continued)
Summary Radiological Testing Results
Groundwater Sampling
Molycorp, Inc. Site - Washington, Pennsylvania

Well ID	M-13		M-8		M-26		M-31		UG-4		M-27		M-20	
	Result	T.U. ⁽¹⁾	Result	T.U. ⁽¹⁾	Result	T.U. ⁽¹⁾	Result	T.U. ⁽¹⁾	Result	T.U. ⁽¹⁾	Result	T.U. ⁽¹⁾	Result	T.U. ⁽¹⁾
	(pCi/L) ⁽²⁾	(+/-)	(pCi/L) ⁽²⁾	(+/-)	(pCi/L) ⁽²⁾	(+/-)	(pCi/L) ⁽²⁾	(+/-)	(pCi/L) ⁽²⁾	(+/-)	(pCi/L) ⁽²⁾	(+/-)	(pCi/L) ⁽²⁾	(+/-)
Radionuclide														
Radium - 226	0.34	0.18	0.09	0.14	0.34	0.18	0.05	0.12	0.09	0.13	0.27	0.18	0.71	0.23
Radium - 228	0.23	0.53	0.09	0.43	0.80	0.51	0.21	0.45	0.22	0.40	0.07	0.45	0.30	0.41
Thorium - 228	0.013	0.069	0.01	0.053	0.019	0.089	-0.01	0.078	0.05	0.10	-0.000006	0.059	0.09	0.15
Thorium - 230	0.32	0.21	0.62	0.28	0.44	0.22	0.55	0.26	0.51	0.25	0.59	0.29	0.37	0.21
Thorium - 232	-0.006	0.013	0.020	0.073	-0.038	0.028	0.059	0.087	0.033	0.07	-0.021	0.022	0.1	0.12
Uranium - 234	1.19	0.41	1.52	0.51	1.30	0.48	0.78	0.33	0.50	0.27	0.32	0.21	0.44	0.24
Uranium - 235	0.048	0.088	0.13	0.14	0.30	0.23	0.13	0.13	0.14	0.15	0.10	0.13	0.13	0.14
Uranium - 238	0.86	0.34	1.49	0.5	0.83	0.37	0.23	0.19	0.34	0.22	0.18	0.16	0.011	0.059
Physical Characteristics														
Water Level (ft-TOC)	10.92		6.02		2.45		18.90		7.30		7.61		8.80	
Temperature (°C)	12.61		10.88		12.35		13.80		12.16		11.65		16.03	
Spec. Conductance (mS)	2.44		1.14		0.822		1.99		1.81		0.85		1.44	
pH (S.U.)	6.60		7.06		6.99		7.17		7.27		9.78		7.40	
Turbidity (ntu)	47.8		107		30		999		449		18.3		999	

(1) T.U. indicates Total Uncertainty
Notes: (2) pCi/L indicates pico Curries per liter
(3) All samples field filtered.

Prepared by: JLP
Checked by: DMC

Table 2
Summary Radiological Testing Results
Surface Water Sampling
Molycorp, Inc. Site - Washington, Pennsylvania

Stream ID	CR-1		CR-2		CR-3		CR-4	
	Result	T.U. ⁽¹⁾	Result	T.U. ⁽¹⁾	Result	T.U. ⁽¹⁾	Result	T.U. ⁽¹⁾
	(pCi/L) ⁽²⁾	(+/-)	(pCi/L) ⁽²⁾	(+/-)	(pCi/L) ⁽²⁾	(+/-)	(pCi/L) ⁽²⁾	(+/-)
Radionuclide								
Radium - 226	0.06	0.12	0.12	0.13	0.03	0.12	-0.003	0.11
Radium - 228	0.31	0.39	0.23	0.38	0.02	0.37	0.16	0.37
Thorium - 228	-0.046	0.034	0.026	0.076	-0.015	0.022	-0.022	0.026
Thorium - 230	0.80	0.35	0.11	0.12	0.22	0.21	0.61	0.32
Thorium - 232	0.040	0.083	-0.030	0.025	-0.045	0.038	-0.007	0.014
Uranium - 234	0.28	0.20	0.31	0.20	0.33	0.20	0.41	0.25
Uranium - 235	-0.024	0.028	0.1	0.12	0.048	0.086	0.039	0.078
Uranium - 238	0.31	0.21	0.18	0.15	0.24	0.17	0.40	0.25

Notes: (1) T.U. indicates Total Uncertainty
(2) pCi/L indicates pico Curies per liter

Table 3
Summary Radiological Testing Results
Sediment Sampling
Molycorp, Inc. Site - Washington, Pennsylvania

Sediment ID	SS-1		SS-1 DUP		SS-3		SS-4		SS-6	
	Result	T.U. ⁽¹⁾	Result	T.U. ⁽¹⁾	Result	T.U. ⁽¹⁾	Result	T.U. ⁽¹⁾	Result	T.U. ⁽¹⁾
	(pCi/g) ⁽²⁾	(+/-)	(pCi/g) ⁽²⁾	(+/-)	(pCi/g) ⁽²⁾	(+/-)	(pCi/g) ⁽²⁾	(+/-)	(pCi/g) ⁽²⁾	(+/-)
Radionuclide										
Radium - 226	1.59	0.34	1.55	0.34	1.23	0.29	1.59	0.34	1.11	0.28
Radium - 228	1.52	0.42	1.55	0.46	1.05	0.40	1.32	0.40	1.36	0.41
Thorium - 228	1.46	0.51	1.17	0.45	1.25	0.39	1.53	0.51	0.83	0.31
Thorium - 230	1.40	0.49	1.36	0.50	0.98	0.33	1.08	0.39	0.98	0.34
Thorium - 232	1.02	0.39	1.13	0.43	0.73	0.27	1.08	0.39	0.68	0.26
Uranium - 234	0.95	0.35	-	-	0.73	0.28	0.96	0.35	1.02	0.37
Uranium - 235	0.18	0.15	-	-	0.067	0.078	0.19	0.15	0.13	0.13
Uranium - 238	1.24	0.41	-	-	0.93	0.32	1.02	0.37	0.79	0.31

Notes: (1) T.U. indicates Total Uncertainty
(2) pCi/g indicates pico Curies per gram

ATTACHMENT I

Well Development And Sampling Form
Molycorp Site, Washington, Pennsylvania

Well Identification M-18 Well Condition Good 2"

Redevelopment

Prepumping Water Level 8.43 ft-TOC Date 3-11-02 Time 10:35
Depth of Well _____ ft-TOC Water col _____ Well Vol _____
Redevelopment pumping rate _____ gpm Start time 1:53 End Time 1:23

		1 well vol	2 well vol	3 well vol	4 well vol	5 well vol	6 well vol	End
Time		0	5	10	25	30		
Temp.	Deg. C	12.72	13.61	14.15	13.71	14.98		
S.Cond	mS	3.09	3.34	3.44	3.41	3.47		
pH	S.U.	9.40	9.79	9.94	9.90	10.00		
Turbidity	ntu	999	999	999	429.0	999		
Tot Vol Pumped (gal)				5646	1000	1000		

Presample Water Level

Water levels at all site wells are to be measured within a 1 to 2 hour time period prior to sampling
Water level measurements for presampling should be conducted the day following development

Presample Water Level 8.54 ft-TOC Date 3-12-02 Time 14:15
Post Sampling Water Level _____ ft-TOC Date _____ Time _____

Sampling Information

Sampling devise: Peristaltic Pump Pump rate 1602 /min
Sample description: _____
Sample Turbidity 2100 Other _____
Sample coll. time 16:00 Was a split sample collected by others Yes/No
Sample Preservation HNO₃ Was sample field filtered Yes/No
Sample Identification M-18-0302 Chain of Custody # 02194
Laboratory Severn Trent Laboratories - St. Louis Airbill Number 790501170007

Remarks Well dry after 3rd reading
Drawdown to 11:00

Well Development And Sampling Form
MolyCorp Site, Washington, Pennsylvania

Well Identification M-2 Well Condition GOOD

Redevelopment

Prepumping Water Level 7.89 ft-TOC Date 3-11-02 Time 10:03
Depth of Well _____ ft-TOC Water col _____ Well Vol _____
Redevelopment pumping rate _____ gpm Start time 1:10 PM End Time 1:40

		1 well vol	2 well vol	3 well vol	4 well vol	5 well vol	6 well vol	End
Time		0	5	10	15	20		
Temp.	Deg. C	11.20	11.20	11.86	11.48	11.83		
S.Cond	mS	1.17	1.19	1.19	1.17	1.20		
pH	S.U.	6.85	6.91	7.26.90	6.95	6.94		
Turbidity	ntu	999.0	177.0	999.0	999.0	999.0		
Tot Vol Pumped (gal)		2.5 cn	5 cn	2 cn	1 cn	3 cn		

Presample Water Level

Water levels at all site wells are to be measured within a 1 to 2 hour time period prior to sampling
Water level measurements for presampling should be conducted the day following development

Presample Water Level 8.01 ft-TOC Date 3-12-02 Time 14:15
Post Sampling Water Level _____ ft-TOC Date _____ Time _____

Sampling Information

Sampling devise: PERISTALTIC Pump Pump rate 16 oz / MIN
Sample description: ~~2R~~
Sample Turbidity 4100 Other _____
Sample coll. time 15:00 Was a split sample collected by others (Yes) No
Sample Preservation HNO₃ Was sample field filtered (Yes) No
Sample Identification ~~2R~~ HMW-M-2-0302 Chain of Custody # 012194
Laboratory Severn Trent Laboratories - St. Louis Airbill Number 7905 01170007

Remarks Well Dry from 2" well vol
Drawdown to 10'

Well Development And Sampling Form
MolyCorp Site, Washington, Pennsylvania

Well Identification MW #25 Well Condition GOOD

Redevelopment

Prepumping Water Level 7.77 ft-TOC Date 3-11-02 Time 9:45
Depth of Well _____ ft-TOC Water col _____ Well Vol _____
Redevelopment pumping rate _____ gpm Start time 10:30 End Time 12:15

		1 well vol	2 well vol	3 well vol	4 well vol	5 well vol	6 well vol	End
Time	<u>0</u>	<u>0</u>	<u>5 min</u>	<u>20 min</u>	<u>50 min</u>	<u>100 min</u>		
Temp.	Deg. C	<u>10.44</u>	<u>9.75</u>	<u>11.17</u>	<u>11.60</u>	<u>10.65</u>		
S.Cond	mS	<u>2.47</u>	<u>2.65</u>	<u>2.54</u>	<u>2.40</u>	<u>2.39</u>		
pH	S.U.	<u>7.25</u>	<u>7.27</u>	<u>7.64</u>	<u>7.07</u>	<u>7.30</u>		
Turbidity	ntu	<u>999.0</u>	<u>278.0</u>	<u>999.0</u>	<u>999.0</u>	<u>999.0</u>		
Tot Vol Pumped (gal)			<u>1.5 gal</u>	<u>1 gal</u>	<u>1 gal</u>	<u>.25 gal</u>		

Presample Water Level

Water levels at all site wells are to be measured within a 1 to 2 hour time period prior to sampling
Water level measurements for presampling should be conducted the day following development

Presample Water Level 7.98 ft-TOC Date 3-12-02 Time 12:30
Post Sampling Water Level _____ ft-TOC Date _____ Time _____

Sampling Information

Sampling devise: PERISTALTIC PUMP Pump rate 802 / MIN
Sample description: _____
Sample Turbidity 4100 Other _____
Sample coll. time 13:00 Was a split sample collected by others Yes / No
Sample Preservation HNO₃ Was sample field filtered Yes / No
Sample Identification MW-25 Chain of Custody # 012194
Laboratory Severn Trent Laboratories - St. Louis Airbill Number 7905 01170007

Remarks Stop Between Vol-2 and Vol-3 to let well recharge
slow well RECHARGE, WAIT 1/2 HOUR BETWEEN READINGS
Minimal Drawdown while pumping.

Well Development And Sampling Form
Molycorp Site, Washington, Pennsylvania

Well Identification BR-1 Well Condition Good

Redevelopment

Prepumping Water Level 8.98 ft-TOC Date 3-11-02 Time 9:40
Depth of Well _____ ft-TOC Water col _____ Well Vol _____
Redevelopment pumping rate _____ gpm Start time _____ End Time _____

		1 well vol	2 well vol	3 well vol	4 well vol	5 well vol	6 well vol	End
Time		0	5 min	10 min	15 min	20 min		
Temp.	Deg. C	12.98	13.39	13.72	13.71	13.50		
S.Cond	mS	3.60	3.53	3.51	3.50	3.47		
pH	S.U.	6.97	7.08	6.88	6.90	6.87		
Turbidity	ntu	999.0	81.3	16.6	13.5	4.8		
Tot Vol Pumped (gal)			5 gal	3.56 gal	3 gal	4 gal		

Presample Water Level

Water levels at all site wells are to be measured within a 1 to 2 hour time period prior to sampling
Water level measurements for presampling should be conducted the day following development

Presample Water Level 9.00 ft-TOC Date 3-12-02 Time 10:40
Post Sampling Water Level _____ ft-TOC Date _____ Time _____

Sampling Information

Sampling devise: PERISTALTIC Pump Pump rate 8 gal/min
Sample description: Water is ^{Deep} Blue - changed to clear by 3/19/02
Sample Turbidity 4100 Other _____
Sample coll. time 12:50/3-12-02 Was a split sample collected by others (Yes) / No
Sample Preservation HNO₃ Was sample field filtered (Yes) / No
Sample Identification ~~BR-1~~ HMW-BR1-0302 Chain of Custody # 012194
Laboratory Severn Trent Laboratories - St. Louis Airbill Number 7905 0117 0007

Remarks

Water is very deep Blue Color. Filter did not stain
nor remove blue color. Color did not change upon
acidification. Minimal Drawdown while pumping

Well Development And Sampling Form
Molycorp Site, Washington, Pennsylvania

Well Identification 31 Well Condition Good

Redevelopment

Prepumping Water Level 11:30
3-11-02 18:85 ft-TOC Date 3-12-02 Time 23:54
Depth of Well _____ ft-TOC Water col _____ Well Vol _____
Redevelopment pumping rate _____ gpm Start time 12:35 End Time 1:30

		1 well vol	2 well vol	3 well vol	4 well vol	5 well vol	6 well vol	End
Time		0	5	10	15	20	25	
Temp.	Deg. C	12.93	13.10	13.37	13.62	13.86	13.80	
S.Cond	mS	1.91	1.94	1.98	2.00	1.98	1.99	
pH	S.U.	7.12	6.88	7.04	7.23	7.34	7.17	
Turbidity	ntu	999.0	999.0	999.0	999.0	999.0	999.0	
Tot Vol Pumped (gal)		1 GAL	4 GAL	2 GAL	2 GAL	3 GAL	3 GAL	

Presample Water Level

Water levels at all site wells are to be measured within a 1 to 2 hour time period prior to sampling
Water level measurements for presampling should be conducted the day following development

Presample Water Level 18.90 ft-TOC Date 3-13-02 Time 16:05
Post Sampling Water Level _____ ft-TOC Date _____ Time _____

Sampling Information

Sampling devise: Peristaltic Pump Pump rate _____
Sample description: _____
Sample Turbidity <100 Other _____
Sample coll. time 16:10 Was a split sample collected by others Yes / No
Sample Preservation H₂O₂ Was sample field filtered Yes / No
Sample Identification HMW-M31-0302 Chain of Custody # 012194
Laboratory Severn Trent Laboratories - St. Louis Airbill Number 7903 4843 9090

Remarks Drawdown to 19.1'

Well Development And Sampling Form
Molycorp Site, Washington, Pennsylvania

Well Identification MW-26 Well Condition Good 2" Flash

Redevelopment

Prepumping Water Level 2.31 ft-TOC Date 3-12-02 Time 2:39
Depth of Well _____ ft-TOC Water col _____ Well Vol _____
Redevelopment pumping rate _____ gpm Start time 3:15 End Time 4:00

		1 well vol	2 well vol	3 well vol	4 well vol	5 well vol	6 well vol	End
Time		0	5	10	15	20	25	
Temp.	Deg. C	9.46	10.82	11.60	12.33	12.14	12.35	
S.Cond	mS	0.674	0.742	0.785	0.748	0.772	0.822	
pH	S.U.	7.38	7.10	7.12	7.11	7.02	6.99	
Turbidity	ntu	58.0	122.0	304.0	138.0	40.1	30.3	
Tot Vol Pumped (gal)		1 GA	1 GA	2 GA	1 GA	1 GA	1 GA	

Presample Water Level

Water levels at all site wells are to be measured within a 1 to 2 hour time period prior to sampling
Water level measurements for presampling should be conducted the day following development

Presample Water Level 2.45 ft-TOC Date 3-13-02 Time 15:15
Post Sampling Water Level _____ ft-TOC Date _____ Time _____

Sampling Information

Sampling devise: Peristaltic Pump Pump rate _____
Sample description: _____
Sample Turbidity <100 Other _____
Sample coll. time 15:20 Was a split sample collected by others Yes / No
Sample Preservation H₂O₂ Was sample field filtered Yes / No
Sample Identification HMW-M26-0302 Chain of Custody # 012194
Laboratory Severn Trent Laboratories - St. Louis Airbill Number 7903 4843 9020

Remarks Pump Dry Between 2 and 3, and 3 and 4
Drawdown to 4.35'

Well Identification M-8 Well Condition GOOD 2" FLUSH

Redevelopment

Prepumping Water Level 6.06 ft-TOC Date 3-21-02 Time 10:50
Depth of Well _____ ft-TOC Water col _____ Well Vol _____
Redevelopment pumping rate _____ gpm Start time 7:50 End Time _____

		1 well vol	2 well vol	3 well vol	4 well vol	5 well vol	6 well vol	End
Time		0	5	10	25 30	35	45	
Temp.	Deg. C	10.5	10.68	10.72	11.38	11.41	10.88	
S.Cond	mS	1.02	1.03	1.06	1.11	1.11	1.14	
pH	S.U.	7.29	7.35	7.22	7.15	7.11	7.06	
Turbidity	ntu	582.0	999	999	999	999	107	
Tot Vol Pumped (gal)		→	2 GAL	3 GAL	1 GAL	.5 GAL	2 GAL	

Presample Water Level

Water levels at all site wells are to be measured within a 1 to 2 hour time period prior to sampling
Water level measurements for presampling should be conducted the day following development

Presample Water Level 6.02 ft-TOC Date 3-13-02 Time 11:40
Post Sampling Water Level _____ ft-TOC Date _____ Time _____

Sampling Information

Sampling devise: Peristaltic Pump Pump rate 2002/min
Sample description: _____
Sample Turbidity <100 Other _____
Sample coll. time 11:45 Was a split sample collected by others Yes (No)
Sample Preservation HNO₃ Was sample field filtered Yes No _____
Sample Identification HMW-M8-0302 Chain of Custody # 012194
Laboratory Severn Trent Laboratories - St. Louis Airbill Number 7903 4843 9098

Remarks WEL CONTINUING TO DAY OF REPAIR 4" 2 GR PULVER @ LOW RATE.
Drawdown to 8.39', Dropped 1.0' in 1min. 35sec

Well Development And Sampling Form
Molycorp Site, Washington, Pennsylvania

Well Identification M-13 Well Condition GOOD 2" FLUSH
BLACKTOP

Redevelopment

Prepumping Water Level 10.84 ft-TOC Date 3-11-02 Time 10:45
Depth of Well _____ ft-TOC Water col _____ Well Vol _____
Redevelopment pumping rate _____ gpm Start time 15:50 End Time 16:10

		1 well vol	2 well vol	3 well vol	4 well vol	5 well vol	6 well vol	End
Time		0	5	20				
Temp.	Deg. C	14.26	14.62	12.61				
S.Cond	mS	2.36	2.52	2.44				
pH	S.U.	6.48	6.39	6.60				
Turbidity	ntu	730	92.9	4785				
Tot Vol Pumped (gal)		→	36L	1 GAL				

Presample Water Level

Water levels at all site wells are to be measured within a 1 to 2 hour time period prior to sampling
Water level measurements for presampling should be conducted the day following development

Presample Water Level 10.92 ft-TOC Date 3-13-02 Time 10:45
Post Sampling Water Level _____ ft-TOC Date _____ Time _____

Sampling Information

Sampling devise: Peristaltic Pump Pump rate 802/min.

Sample description: _____

Sample Turbidity <100 Other _____

Sample coll. time 10:50 Was a split sample collected by others Yes / (No)

Sample Preservation HNO3 Was sample field filtered Yes / No

Sample Identification HMW-M13-0302 Chain of Custody # 012194

Laboratory Severn Trent Laboratories - St. Louis Airbill Number 7903 4893 9090

Remarks Well Dry AFTER 4 GAL SLOW RECHARGE

Drawdown to 12.92'

Well Development And Sampling Form
Molycorp Site, Washington, Pennsylvania

Well Identification BR-2 Well Condition Good 2"

Redevelopment

Prepumping Water Level 11:25
3-11-02 2.60 ft-TOC Date 3-12-02 Time 01:46
Depth of Well _____ ft-TOC Water col _____ Well Vol _____
Redevelopment pumping rate _____ gpm Start time 2:30 End Time 2:55

		1 well vol	2 well vol	3 well vol	4 well vol	5 well vol	6 well vol	End
Time		0	5	10	15	20		
Temp.	Deg. C	11.78	12.04	11.92	12.05	12.14		
S.Cond	mS	2.97	2.58	2.97	2.98	2.98		
pH	S.U.	8.61	8.72	8.71	8.71	8.63		
Turbidity	ntu	627.0	326.0	319.0	158.0	161.0		
Tot Vol Pumped (gal)		1GAL	3GAL	3GAL	3GAL	3GAL		

Presample Water Level

Water levels at all site wells are to be measured within a 1 to 2 hour time period prior to sampling
Water level measurements for presampling should be conducted the day following development

Presample Water Level 2.33 ft-TOC Date 3-13-02 Time 15:40
Post Sampling Water Level _____ ft-TOC Date _____ Time _____

Sampling Information

Sampling devise: Peristaltic Pump Pump rate _____

Sample description: _____

Sample Turbidity 2100 Other _____

Sample coll. time 15:45 Was a split sample collected by others Yes No

Sample Preservation H2O2 Was sample field filtered Yes / No

Sample Identification HMW-BR2-0302 Chain of Custody # 012193

Laboratory Severn Trent Laboratories - St. Louis Airbill Number 7903 4843 9240

Remarks Drawdown to 2.92'

Well Development And Sampling Form
Molycorp Site, Washington, Pennsylvania

Well Identification M-10 Well Condition RISER Bent, REPLACED 2" 722

Redevelopment

Prepumping Water Level 9.43 ft-TOC Date 3-11-02 Time 11:00

Depth of Well _____ ft-TOC Water col _____ Well Vol _____

Redevelopment pumping rate _____ gpm Start time 9:45 End Time 10:05

		1 well vol	2 well vol	3 well vol	4 well vol	5 well vol	6 well vol	End
Time		0	5	10	15	20		
Temp.	Deg. C	10.38	10.90	10.97	11.08	11.15		
S.Cond	mS	.651	.687	.746	1.800	.834		
pH	S.U.	8.0	7.77	7.69	7.64	7.63		
Turbidity	ntu	999	999	999	249.0	102.0		
Tot Vol Pumped (gal)		1 GAL	3 GAL	2 GAL	3 GAL			

Presample Water Level

Water levels at all site wells are to be measured within a 1 to 2 hour time period prior to sampling
Water level measurements for presampling should be conducted the day following development

Presample Water Level 9.25 ft-TOC Date 3-13-02 Time 14:50

Post Sampling Water Level _____ ft-TOC Date _____ Time _____

Sampling Information

Sampling devise: Peristaltic Pump Pump rate _____

Sample description: _____

Sample Turbidity <100 Other _____

Sample coll. time 14:55 Was a split sample collected by others Yes ☒ No

Sample Preservation HNO₃ Was sample field filtered Yes / No

Sample Identification HML-M10-0302 Chain of Custody # 012193

Laboratory Severn Trent Laboratories - St. Louis Airbill Number 7903 4843 9204

Remarks Well Drilled UP AFTER 1 GAL PUMPED

Drawdown to 9.88'

Well Development And Sampling Form
Molycorp Site, Washington, Pennsylvania

Well Identification M-29 Well Condition GOOD 2" P20

Redevelopment

Prepumping Water Level 10.63 ft-TOC Date 3-11-02 Time 11:05

Depth of Well _____ ft-TOC Water col _____ Well Vol _____

Redevelopment pumping rate _____ gpm Start time 9:00 End Time 9:35

		1 well vol	2 well vol	3 well vol	4 well vol	5 well vol	6 well vol	End
Time		0	5	10	35			
Temp.	Deg. C	8.34	8.86	8.40	* NO RECHARGE			
S.Cond	mS	1.07	1.07	1.08				
pH	S.U.	7.28	7.03	7.04				
Turbidity	ntu	999	999	999				
Tot Vol Pumped (gal)		1 GAL	.25 GAL	.5 GAL				

Presample Water Level

Water levels at all site wells are to be measured within a 1 to 2 hour time period prior to sampling
Water level measurements for presampling should be conducted the day following development

Presample Water Level 10.82 ft-TOC Date 3-13-02 Time 14:10

Post Sampling Water Level _____ ft-TOC Date _____ Time _____

Sampling Information

Sampling devise: Peristaltic Pump Pump rate _____

Sample description: _____

Sample Turbidity <100 Other _____

Sample coll. time 14:30 Was a split sample collected by others Yes NO

Sample Preservation HNO3 Was sample field filtered Yes No

Sample Identification HMW-M29-0302 Chain of Custody # 012193

Laboratory Severn Trent Laboratories - St. Louis Airbill Number 7903 4843 9240

Remarks Was dry up c 1 c.c. Saw RECHARGE

Drawdown to 13.8'

High turbidity before filter, low after.

Well Development And Sampling Form
Molycorp Site, Washington, Pennsylvania

Well Identification 28 Well Condition Good 2"

Redevelopment

Prepumping Water Level 11.10
3-11-02
10.48 ft-TOC Date 3-12-02 Time _____
Depth of Well _____ ft-TOC Water col _____ Well Vol _____
Redevelopment pumping rate _____ gpm Start time 10:20 AM End Time 10:50

		1 well vol	2 well vol	3 well vol	4 well vol	5 well vol	6 well vol	End
Time		0	5	10	15	20		
Temp.	Deg. C	11.94	12.14	12.19	12.15	12.29		
S.Cond	mS	2.28	2.00	1.87	1.81	1.73		
pH	S.U.	7.26	7.36	7.39	7.28	7.30		
Turbidity	ntu	999.0	284.0	128.0	345.0	198.0		
Tot Vol Pumped (gal)		1941	2 GAI.	2 GAI	3 GAI	3 GAI		

Presample Water Level

Water levels at all site wells are to be measured within a 1 to 2 hour time period prior to sampling
Water level measurements for presampling should be conducted the day following development

Presample Water Level 10.50 ft-TOC Date 3-13-02 Time 13:40
Post Sampling Water Level _____ ft-TOC Date _____ Time _____

Sampling Information

Sampling devise: Peristaltic Pump Pump rate _____
Sample description: _____
Sample Turbidity 6100 Other _____
Sample coll. time 13:45 Was a split sample collected by others Yes / No
Sample Preservation HNO₃ Was sample field filtered Yes / No
Sample Identification HMW-M28-0302 Chain of Custody # 012193
Laboratory Severn Trent Laboratories - St. Louis Airbill Number 7903 4843 9240

Remarks Drawdown to +0.5 10.55!

Well Development And Sampling Form
Molycorp Site, Washington, Pennsylvania

Well Identification 27 Well Condition Good

Redevelopment

Prepumping Water Level 11:13
3.1102 ft-TOC Date 3-12-02 Time 22:18
Depth of Well _____ ft-TOC Water col _____ Well Vol _____
Redevelopment pumping rate _____ gpm Start time 11:00 End Time 11:25

		1 well vol	2 well vol	3 well vol	4 well vol	5 well vol	6 well vol	End
Time		0	5	10	15	20		
Temp.	Deg. C	11.47	11.54	11.94	11.63	11.65		
S.Cond	mS	0.86	0.854	0.877	0.851	0.851		
pH	S.U.	9.80	9.78	9.45	9.82	9.78		
Turbidity	ntu	45.2	51.3	999.0	20.0	18.3		
Tot Vol Pumped (gal)		2 GAI	3 GAI	3 GAI	3 GAI	3 GAI		

Presample Water Level

Water levels at all site wells are to be measured within a 1 to 2 hour time period prior to sampling
Water level measurements for presampling should be conducted the day following development

Presample Water Level 7.61 ft-TOC Date 3-13-02 Time 13:20
Post Sampling Water Level _____ ft-TOC Date _____ Time _____

Sampling Information

Sampling devise: Peristaltic Pump Pump rate _____

Sample description: _____

Sample Turbidity 2100 Other _____

Sample coll. time 13:20 Was a split sample collected by others Yes/No

Sample Preservation H₂O₂ Was sample field filtered Yes/No

Sample Identification HMW-M37-0302 Chain of Custody # 012194

Laboratory Severn Trent Laboratories - St. Louis Airbill Number 7903 4843 9240

Remarks

Surge Before Vol-3
Drawdown to 8.64'

Well Development And Sampling Form
Molycorp Site, Washington, Pennsylvania

Well Identification UG4 Well Condition Good

Redevelopment

Prepumping Water Level 7.43 ft-TOC Date 3-11-02 Time 11:15 22:53
Depth of Well _____ ft-TOC Water col _____ Well Vol _____
Redevelopment pumping rate _____ gpm Start time 11:35 End Time 12:05

		1 well vol	2 well vol	3 well vol	4 well vol	5 well vol	6 well vol	End
Time		0	5	10	15	20	25	
Temp.	Deg. C	11.71	11.98	11.99	12.18	12.20	12.16	
S.Cond	mS	1.80	1.81	1.81	1.79	1.80	1.81	
pH	S.U.	7.24	7.11	7.22	7.27	7.13	7.27	
Turbidity	ntu	192.0	798.0	972.0	883.0	765.0	449.0	
Tot Vol Pumped (gal)		3 GAI	3 GAI	2 GAI	4 GAI	3 GAI	3 GAI	

Presample Water Level

Water levels at all site wells are to be measured within a 1 to 2 hour time period prior to sampling
Water level measurements for presampling should be conducted the day following development

Presample Water Level 7.30 ft-TOC Date 3-13-02 Time 13:00
Post Sampling Water Level _____ ft-TOC Date _____ Time _____

Sampling Information

Sampling devise: Peristaltic Pump Pump rate _____
Sample description: _____
Sample Turbidity 2100 Other _____
Sample coll. time 13:05 Was a split sample collected by others Yes / No
Sample Preservation HNO₃ Was sample field filtered Yes / No
Sample Identification HMW-UG4-0302 Chain of Custody # 012194
Laboratory Severn Trent Laboratories - St. Louis Airbill Number 7903 4843 9240

Remarks Drawdown to 7.65'

Well Development And Sampling Form
Molycorp Site, Washington, Pennsylvania

Well Identification M-20 Well Condition Good 2' FLUSH
BLACK TOP

Redevelopment

Prepumping Water Level 8.94 ft-TOC Date 3-11-02 Time 10:40
Depth of Well _____ ft-TOC Water col _____ Well Vol _____
Redevelopment pumping rate _____ gpm Start time 15:12 End Time 15:37

		1 well vol	2 well vol	3 well vol	4 well vol	5 well vol	6 well vol	End
Time		0	8:10	15	25	30		
Temp.	Deg. C	15.38 15.38	16.19	16.03	15.90	16.03		
S.Cond	mS	1.44	1.45	1.46	1.45	1.44		
pH	S.U.	7.65	7.43	7.42	7.41	7.40		
Turbidity	ntu	-	999	999	999	999		
Tot Vol Pumped (gal)		→	562L	362L	262L	562L		

Presample Water Level

Water levels at all site wells are to be measured within a 1 to 2 hour time period prior to sampling
Water level measurements for presampling should be conducted the day following development

Presample Water Level 8.80 ft-TOC Date 3/13/02 Time 10:10
Post Sampling Water Level _____ ft-TOC Date _____ Time _____

Sampling Information

Sampling devise: Peristaltic Pump Pump rate 200/min
Sample description: Dark, "cruddy" water
Sample Turbidity 200 before filter Other _____
200 after filter
Sample coll. time 10:20 Was a split sample collected by others Yes (No)
Sample Preservation HNO₃ Was sample field filtered Yes/No
Sample Identification HMW-M20-0302 Chain of Custody # 012194
Laboratory Severn Trent Laboratories - St. Louis Airbill Number 7903 48946367

Remarks BLACK WATER
Drawdown to 9.10'

Well Development And Sampling Form
Molycorp Site, Washington, Pennsylvania

Well Identification M-4 Well Condition GOOD 4" wal

Redevelopment

Prepumping Water Level 9.70 ft-TOC Date 3-14-02 Time 10:05
Depth of Well _____ ft-TOC Water col 1-2-5 Well Vol _____
Redevelopment pumping rate _____ gpm Start time 12:23 End Time 13:00

		1 well vol	2 well vol	3 well vol	4 well vol	5 well vol	6 well vol	End
Time		0	5 MIN	10 MIN	35 MIN			
Temp.	Deg. C	11.04	11.86	11.00	11.89			
S.Cond	mS	0.912	0.93	1.26	1.37			
pH	S.U.	7.25	7.11	6.89	6.94			
Turbidity	ntu	430	202.0	100.0	45.0			
Tot Vol Pumped (gal)			8941	1612	200			

90.3

Presample Water Level

Water levels at all site wells are to be measured within a 1 to 2 hour time period prior to sampling
Water level measurements for presampling should be conducted the day following development

Presample Water Level 9.59 ft-TOC Date 3/13/02 Time 8:50
Post Sampling Water Level _____ ft-TOC Date _____ Time _____

Sampling Information

Sampling devise: Peristaltic Pump Pump rate 802/min

Sample description: Blue, but lighter than BR-1, filter took away some blue

Sample Turbidity < 3100 Other _____

Sample coll. time 9:45 Was a split sample collected by others Yes (No)

Sample Preservation HNO₃ Was sample field filtered (Yes) No

Sample Identification HMLW-MH-0302 Chain of Custody # 012194

Laboratory Severn Trent Laboratories - St. Louis Airbill Number 7903 4844 6362

Remarks Sample turned clear by 3-19-02
Dredged to 10.241

Well Development And Sampling Form
Molycorp Site, Washington, Pennsylvania

Well Identification MW-24

Well Condition GOOD

2"

Redevelopment

Prepumping Water Level 8.58 ft-TOC Date 3-11-02 Time 10:20

Depth of Well _____ ft-TOC Water col _____ Well Vol _____

Redevelopment pumping rate _____ gpm Start time 14:30 End Time _____

		1 well vol	2 well vol	3 well vol	4 well vol	5 well vol	6 well vol	End
Time		0	5	10	20	25		
Temp.	Deg. C	12.56	12.46	12.59	12.91	13.25		
S.Cond	mS	1.77	1.71	1.70	1.71	1.67		
pH	S.U.	11.06	10.53	10.50	10.55	10.17		
Turbidity	ntu	999	85.0	12.93	220.0	999		
Tot Vol Pumped (gal)		→	3 gal	6 gal	1 gal	1 gal		

Presample Water Level

Water levels at all site wells are to be measured within a 1 to 2 hour time period prior to sampling
Water level measurements for presampling should be conducted the day following development

Presample Water Level 8.52 ft-TOC Date 3-13-02 Time 8:15

Post Sampling Water Level _____ ft-TOC Date _____ Time _____

Sampling Information

Sampling devise: PERISTALTIC PUMP Pump rate 802 /min

Sample description: _____

Sample Turbidity 4100 Other _____

Sample coll. time 9:30 Was a split sample collected by others Yes / No

Sample Preservation HNO₃ Was sample field filtered Yes / No

Sample Identification ^{HMW} MW-24-0302 Chain of Custody # 012194

Laboratory Severn Trent Laboratories - St. Louis Airbill Number 7903 45446367

Remarks Drawdown to 9.0'