Gravatt, Dan

From: Gravatt, Dan
Sent: Monday, January 06, 2014 8:45 AM
To: Paul Rosasco
Cc: 'Warren, Victoria'; 'Muenks, Shawn'; jschu@usgs.gov; Field, Jeff
Subject: RE: October split sample results
Attachments: October 2013 WLF splits taken by MDNR for EPA.xls

Paul, here are the split results as requested. We do not yet have the USGS off-site well results; they are in USGS QA review.

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Principles and integrity are expensive, but they are among the very few things worth having.

From: Paul Rosasco [mailto:paulrosasco@emsidenver.com]
Sent: Tuesday, December 31, 2013 9:13 AM
To: Gravatt, Dan
Cc: 'Bob Jelinek'
Subject: October split sample results

Dan,

We are beginning to work on the October monitoring report and would like to include a comparison of the split sample results in the report. When you have a minute could you please forward the results of EPA's split samples to us. Thanks.

Also, once we complete the October report, we will also prepare a report on the results of our offsite sampling/split sampling. Again it would be good to include a comparison of the split sample results. Could you share the results from John's sampling with us? Thanks.

0714 40503363 53
Superfund
OU01 1/6/14

Parameter	Units		Qual	Dil_Factor		Qual	Dil_Factor		Qual	Dil_Factor		Qual	Dil_Factor		Qual	Dil_Factor		Qual	Dil_Factor		Qual	Dil_Factor		Qual	Dil_Factor		Qual	Dil_Factor		Qual	Dil_Factor		Qual	Dil_Factor		Qual	Dil_Factor
Volatile Organic Compounds		**PZ-104-SD**			**PZ-104-SD DUP**			**D-3**			**S-5**			**PZ-113-AD**			**PZ-102-SS**			**PZ-101-SS**			**D-83**			**D-6**			**I-9**			**D-93**			**S-82**			**D-85**		
Dichlorodifluoromethane	UG/L	ND	U	1	ND	U	10	ND	U	1	3.54		1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
Chloromethane	UG/L	ND	U	1	ND	U	10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
Vinyl chloride	UG/L	ND	U	1	ND	U	10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	1.71		1	39.4		1	0.610	J	1	ND	U	1
Bromomethane	UG/L	ND	U	1	ND	U	10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
Chloroethane	UG/L	1.47		1	ND	U	10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
Trichlorofluoromethane	UG/L	ND	U	1	ND	U	10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
1,1-Dichloroethylene	UG/L	ND	U	1	ND	U	10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
Acetone	UG/L	1260	E	1	1290		10	ND	U	1	ND	U	1	2.88	J	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	2.74	J	1	ND	U	1
Trichlorotrifluoroethane	UG/L	ND	U	1	ND	U	10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
Carbon disulfide	UG/L	ND	U	1	ND	U	10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
Methylene chloride	UG/L	ND	U	1	ND	U	10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
tert-Butyl methyl ether	UG/L	3.57		1	3.00	J	10	0.510	J	1	0.570	J	1	0.440	J	1	ND	U	1	0.320	J	1	1.20		1	2.74		1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
trans-1,2-Dichloroethylene	UG/L	ND	U	1	ND	U	10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
1,1-Dichloroethane	UG/L	ND	U	1	ND	U	10	ND	U	1	0.390	J	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	4.01		1	ND	U	1	ND	U	1
2-Butanone	UG/L	1310	E	1	1250		10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
cis-1,2-Dichloroethylene	UG/L	ND	U	1	ND	U	10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	0.390	J	1	ND	U	1	47.4		1	1.04		1	ND	U	1
Ethyl acetate	UG/L	ND	U	1	ND	U	10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
Bromochloromethane	UG/L	ND	U	1	ND	U	10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
Chloroform	UG/L	ND	U	1	ND	U	10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
1,1,1-Trichloroethane	UG/L	ND	U	1	ND	U	10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
Carbon tetrachloride	UG/L	ND	U	1	ND	U	10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
1,2-Dichloroethane	UG/L	14.1		1	15.8		10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
Benzene	UG/L	559	E	1	664		10	0.410	J	1	4.23		1	ND	U	1	ND	U	1	0.710	J	1	ND	U	1	ND	U	1	ND	U	1	2.51		1	ND	U	1	0.410	J	1
Trichloroethylene	UG/L	ND	U	1	ND	U	10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
1,2-Dichloropropane	UG/L	ND	U	1	ND	U	10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
Bromodichloromethane	UG/L	ND	U	1	ND	U	10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
cis-1,3-Dichloropropylene	UG/L	ND	U	1	ND	U	10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
4-Methyl-2-pentanone	UG/L	52.8		1	38.6	J	10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
Toluene	UG/L	173	E	1	199		10	ND	U	1	1.03		1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	0.370	J	1
trans-1,3-Dichloropropylene	UG/L	ND	U	1	ND	U	10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
1,1,2-Trichloroethane	UG/L	ND	U	1	ND	U	10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
2-Hexanone	UG/L	22.0		1	ND	U	10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
Tetrachloroethylene	UG/L	ND	U	1	ND	U	10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
Dibromochloromethane	UG/L	ND	U	1	ND	U	10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
1,2-Dibromoethane	UG/L	ND	U	1	ND	U	10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
Chlorobenzene	UG/L	2.54		1	ND	U	10	2.03		1	2.19		1	ND	U	1	ND	U	1	5.42		1	2.01		1	ND	U	1	0.340	J	1	ND	U	1	1.09		1	57.5		1
Ethylbenzene	UG/L	19.7		1	15.4		10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
m,p-Xylenes	UG/L	31.8		1	26.9		10	ND	U	1	5.80		1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
o-Xylene	UG/L	12.7		1	9.50	J	10	ND	U	1	4.02		1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
Styrene	UG/L	ND	U	1	ND	U	10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
Bromoform	UG/L	ND	U	1	ND	U	10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
Isopropylbenzene	UG/L	1.79		1	ND	U	10	ND	U	1	2.16		1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
1,1,2,2-Tetrachloroethane	UG/L	ND	U	1	ND	U	10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
1,2-Dibromo-3-chloropropane	UG/L	ND	U	1	ND	U	10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
1,2,3-Trichlorobenzene	UG/L	ND	U	1	ND	U	10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
Tetrahydrofuran	UG/L	1530	E	1	1610		10	36.9		1	39.2		1	46.0		1	ND	U	1	58.6		1	5.28		1	19.2		1	29.3		1	26.9		1	24.5		1	ND	U	1
Methyl acetate	UG/L	ND	U	1	ND	U	10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
Cyclohexane	UG/L	3.51		1	ND	U	10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
Methylcyclohexane	UG/L	ND	U	1	ND	U	10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
1,3-Dichlorobenzene	UG/L	ND	U	1	ND	U	10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
1,4-Dichlorobenzene	UG/L	4.83		1	ND	U	10	ND	U	1	7.73		1	ND	U	1	ND	U	1	0.890	J	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
1,2-Dichlorobenzene	UG/L	ND	U	1	ND	U	10	ND	U	1	2.30		1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
1,2,4-Trichlorobenzene	UG/L	ND	U	1	ND	U	10	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1	ND	U	1
1,4-Dioxane	UG/L	196		1	ND	U	10	88.1		1	77.2		1	102		1	ND	U	1	38.8	J	1	ND	U	1	123		1	147		1	109		1	100		1	ND	U	1
Total Radionuclides		**PZ-104-SD**			**PZ-104-SD DUP**			**D-3**			**S-5**			**PZ-113-AD**			**PZ-102-SS**			**PZ-101-SS**			**D-83**			**D-6**			**I-9**			**D-93**			**S-82**			**D-85**		
Radium-226	pCi/l	4.15		1	(No dup)			2.96		1	0.56	J	1	2.93		1	5.04		1	24.23		1	3.20		1	3.05		1	2.01		1	2.12		1	1.29		1	2.22		1
Radium-228	pCi/l	2.47		1				5.01		1	8.20		1	7.08		1	2.25		1	3.50		1	5.61		1	3.46		1	3.52		1	2.91	J	1	2.18		1	6.77		1
Sum of Radium Isotopes		6.62						7.97			8.76			10.01			7.30			27.74			8.80			6.51			5.53			5.03			3.47			9.00		
Thorium-228	pCi/l	0.10	U	1				0.08	U	1	0.10	U	1	0.01	U	1	0.63		1	0.03	U	1	0.12	U	1	0.12	U	1	0.07	U	1	0.24	J	1	0.02	U	1	1.58		1

Thorium-230	pCi/l	0.02 U 1		0.18 J 1	0.45 1	0.15 U 1	0.81 1	0.49 1	0.06 U 1	0.25 J 1	0.27 J 1	0.38 1	0.11 U 1	2.30 1
Thorium-232	pCi/l	-0.02 U 1		0.06 U 1	0.06 U 1	-0.01 U 1	0.66 1	0.10 U 1	0.02 U 1	0.13 J 1	0.03 U 1	0.08 U 1	-0.01 U 1	1.62 1
Sum of Thorium Isotopes		ND		0.18	0.45	ND	2.10	0.49	ND	0.38	0.27	0.62	ND	5.49
Uranium-234	pCi/l	0.05 U 1		0.20 J 1	-0.25 U 1	0.20 J 1	4.24 1	0.55 U 1	0.31 J 1	0.24 J 1	0.25 J 1	0.47 1	1.11 1	1.03 1
Uranium-235	pCi/l	0.08 U 1		0.12 U 1	0.73 U 1	0.11 U 1	0.43 1	0.00 U 1	0.02 U 1	0.02 U 1	0.09 U 1	0.03 U 1	0.20 U 1	0.17 J 1
Uranium-238	pCi/l	0.27 U 1		0.09 U 1	-0.05 U 1	0.06 U 1	2.61 1	0.16 U 1	0.11 U 1	0.07 U 1	0.17 J 1	0.19 J 1	0.59 1	1.19 1
Sum of Uranium Isotopes		ND		0.20	ND	0.20	7.28	ND	0.31	0.24	0.43	0.66	1.70	2.39
Dissolved Radionuclides		**PZ-104-SD**	**PZ-104-SD DUP**	**D-3**	**S-5**	**PZ-113-AD**	**PZ-102-SS**	**PZ-101-SS**	**D-83**	**D-6**	**I-9**	**D-93**	**S-82**	**D-85**
Radium-226	pCi/l	5.26 1	(No dup)	2.84 1	1.62 J 1	2.81 1	3.18 1	23.62 1	1.53 1	2.30 1	-0.01 U 1	1.97 1	1.18 1	1.61 1
Radium-228	pCi/l	1.60 J 1		6.55 1	2.05 J 1	7.71 1	1.55 J 1	3.08 1	4.53 1	4.70 1	4.48 1	4.85 1	5.68 1	6.36 1
Sum of Radium Isotopes		6.86		9.39	3.67	10.52	4.73	26.70	6.06	7.00	4.48	6.82	6.86	7.97
Thorium-228	pCi/l	-0.09 U 1		0.12 U 1	-0.05 U 1	0.14 U 1	0.05 U 1	-0.01 U 1	0.16 U 1	0.08 U 1	0.09 U 1	0.17 U 1	0.19 J 1	0.15 U 1
Thorium-230	pCi/l	0.25 J 1		0.21 J 1	0.38 J 1	0.03 U 1	0.17 J 1	0.45 J 1	0.32 J 1	0.41 J 1	0.13 U 1	0.18 J 1	0.20 J 1	0.45 J 1
Thorium-232	pCi/l	-0.02 U 1		-0.01 U 1	0.03 U 1	0.05 U 1	0.07 U 1	0.07 U 1	0.10 U 1	0.10 U 1	-0.09 U 1	0.06 U 1	0.03 U 1	0.18 J 1
Sum of Thorium Isotopes		0.25		0.21	0.38	ND	0.17	0.45	0.32	0.41	ND	0.18	0.39	0.63
Uranium-234	pCi/l	0.33 J 1		0.18 U 1	0.56 U 1	0.28 J 1	4.06 1	0.74 J 1	0.24 J 1	0.16 J 1	0.14 U 1	0.16 U 1	0.85 1	0.31 J 1
Uranium-235	pCi/l	0.07 U 1		0.03 U 1	-0.20 U 1	0.04 U 1	0.21 J 1	0.17 U 1	0.05 U 1	0.06 U 1	-0.01 U 1	0.03 U 1	0.07 U 1	0.08 U 1
Uranium-238	pCi/l	0.10 U 1		0.27 U 1	0.68 U 1	0.19 J 1	2.40 1	0.13 U 1	-0.02 U 1	-0.02 U 1	0.22 J 1	0.11 U 1	0.55 1	0.06 U 1
Sum of Uranium Isotopes		0.33		ND	ND	0.47	6.67	0.74	0.24	0.16	0.22	ND	1.40	0.31
Total Metals		**PZ-104-SD**	**PZ-104-SD DUP**	**D-3**	**S-5**	**PZ-113-AD**	**PZ-102-SS**	**PZ-101-SS**	**D-83**	**D-6**	**I-9**	**D-93**	**S-82**	**D-85**
Aluminum	UG/L	ND U 1	ND U 1	73.9 B 1	72.5 B 1	ND U 1	1890 1	ND U 1	85.4 B 1	ND U 1	ND U 1	208 1	ND U 1	2500 1
Antimony	UG/L	ND U 1	5.16 B 1	5.15 B 1	8.00 B 1	ND U 1	ND U 1	5.19 B 1	5.91 B 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1
Arsenic	UG/L	9.43 B 1	9.79 B 1	5.94 B 1	22.3 B 1	5.35 B 1	ND U 1	ND U 1	ND U 1	ND U 1	20.0 B 1	ND U 1	218 1	41.2 1
Barium	UG/L	600 1	597 1	2340 1	604 1	2270 1	323 1	560 1	1740 1	1310 1	1460 1	1200 1	867 1	1740 1
Beryllium	UG/L	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1
Boron	UG/L	634 1	630 1	1540 1	3240 1	1470 1	115 1	817 1	712 1	856 1	1410 1	1010 1	2570 1	243 1
Cadmium	UG/L	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1
Calcium	UG/L	117000 1	116000 1	248000 1	50300 1	281000 1	108000 1	158000 1	111000 1	215000 1	246000 1	275000 1	188000 1	305000 1
Chromium	UG/L	12.5 1	12.6 1	ND U 1	6.38 1	ND U 1	1.47 B 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	5.31 1
Cobalt	UG/L	3.27 B 1	2.99 B 1	6.42 1	13.1 1	5.60 1	1.68 B 1	1.52 B 1	ND U 1	1.84 B 1	2.33 B 1	ND U 1	6.28 1	16.1 1
Copper	UG/L	ND U 1	ND U 1	ND U 1	5.91 B 1	ND U 1	ND U 1	6.47 B 1	ND U 1	ND U 1	ND U 1	5.17 B 1	ND U 1	6.39 B 1
Iron	UG/L	8300 1	8300 1	31100 1	18000 1	36500 1	2840 1	1740 1	16400 1	17500 1	33400 1	21500 1	36900 1	72100 1
Lead	UG/L	ND U 1	ND U 1	ND U 1	6.20 B 1	ND U 1	ND U 1	4.84 B 1	4.24 B 1	ND U 1	ND U 1	ND U 1	5.11 B 1	18.8 1
Magnesium	UG/L	63600 1	63500 1	73100 1	66000 1	88200 1	41500 1	94500 1	42300 1	58700 1	69800 1	77800 1	74200 1	77200 1
Manganese	UG/L	169 1	168 1	518 1	149 1	648 1	250 1	81.4 1	423 1	502 1	1040 1	485 1	1490 1	1790 1
Molybdenum	UG/L	ND U 1	ND U 1	ND U 1	3.43 B 1	ND U 1	4.13 B 1	ND U 1	ND U 1	ND U 1	2.29 B 1	ND U 1	11.9 1	ND U 1
Nickel	UG/L	30.7 * 1	31.1 1	14.8 * 1	69.4 * 1	15.6 * 1	4.26 B* 1	19.1 * 1	3.75 B* 1	9.74 * 1	8.61 * 1	15.8 * 1	30.0 * 1	37.2 * 1
Phosphorous	UG/L	123 B 1	122 B 1	713 1	5980 1	741 1	148 B 1	105 B 1	606 1	509 1	755 1	668 1	735 1	2020 1
Potassium	UG/L	15400 1	15100 1	29300 1	242000 5	25300 1	3390 1	14800 1	45100 1	13100 1	19700 1	16800 1	17900 1	8160 1
Selenium	UG/L	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1
Silica	UG/L	27600 1	27500 1	34000 1	34900 1	38600 1	24600 1	37200 1	33700 1	32700 1	36800 1	37100 1	44000 1	47900 1
Silver	UG/L	ND U 1	ND U 1	ND U 1	ND U 1	1.03 B 1	ND U 1	ND U 1	ND U 1	1.43 B 1	1.30 B 1	ND U 1	ND U 1	ND U 1
Sodium	UG/L	114000 1	112000 1	360000 1	516000 5	334000 1	23300 1	116000 1	62300 1	137000 1	203000 1	193000 1	266000 1	152000 1
Strontium	UG/L	886 1	884 1	907 1	340 1	978 1	842 1	2320 1	738 1	758 1	1010 1	1060 1	1280 1	737 1
Thallium	UG/L	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1
Tin	UG/L	ND U 1	ND U 1	2.52 B 1	27.3 1	ND U 20	ND U 5	ND U 10	ND U 10	ND U 10	ND U 10	ND U 10	ND U 10	ND U 10
Uranium	UG/L	ND U 1	22.6 B 1	11.4 B 1	17.7 B 1	ND U 1	13.6 B 1	ND U 1	14.7 B 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1
Vanadium	UG/L	10.8 1	11.0 1	1.21 B 1	4.01 B 1	ND U 1	5.95 1	3.44 B 1	1.29 B 1	ND U 1	ND U 1	ND U 1	1.27 B 1	15.2 1
Zinc	UG/L	7.28 B 1	5.06 B 1	ND U 1	44.5 1	ND U 1	13.0 1	4.94 B 1	8.44 B 1	ND U 1	3.50 B 1	5.84 B 1	ND U 1	78.0 1
Dissolved Metals		**PZ-104-SD**	**PZ-104-SD DUP**	**D-3**	**S-5**	**PZ-113-AD**	**PZ-102-SS**	**PZ-101-SS**	**D-83**	**D-6**	**I-9**	**D-93**	**S-82**	**D-85**
Aluminum	UG/L	ND U 1	(No dup)	ND U 1	ND U 1	ND U 1	108 B 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	131 B 1	ND U 1
Antimony	UG/L	ND U 1		ND U 1	7.25 B 1	4.20 B 1	4.69 B 1	ND U 1	ND U 1	4.04 B 1	ND U 1	6.21 B 1	ND U 1	ND U 1
Arsenic	UG/L	10.6 B 1		ND U 1	15.1 B 1	ND U 1	ND U 1	8.37 B 1	ND U 1	ND U 1	22.3 B 1	ND U 1	219 1	40.5 1
Barium	UG/L	577 1		2530 1	583 1	2220 1	335 1	543 1	1720 1	1320 1	1480 1	1300 1	867 1	1510 1
Beryllium	UG/L	ND U 1		ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1
Boron	UG/L	599 1		1660 1	3280 1	1430 1	114 1	782 1	710 1	857 1	1450 1	1060 1	2530 1	250 1
Cadmium	UG/L	ND U 1		ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1
Calcium	UG/L	107000 1		282000 1	48300 1	281000 1	111000 1	159000 1	110000 1	215000 1	252000 1	275000 1	177000 1	255000 1
Chromium	UG/L	11.7 1		ND U 1	5.87 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1
Cobalt	UG/L	3.09 B 1		7.26 1	9.00 1	5.23 1	ND U 1	1.55 B 1	ND U 1	2.16 B 1	2.27 B 1	1.69 B 1	6.76 1	2.28 B 1
Copper	UG/L	ND U 1		ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1	ND U 1

Iron	UG/L	**7920**		1	**34700**		1	**15300**		1	**35900**		1	**880**		1	**1100**		1	**16300**		1	**17600**		1	**33200**		1	**21100**		1	**35200**		1	**53300**		1
Lead	UG/L	**ND**	U	1	**ND**	U	1	**ND**	U	1	**ND**	U	1	**ND**	U	1	**7.80**	B	1	**ND**	U	1	**ND**	U	1	**ND**	U	1	**ND**	U	1	**ND**	U	1	**ND**	U	1
Magnesium	UG/L	**58700**		1	**81700**		1	**63700**		1	**87400**		1	**42400**		1	**94300**		1	**42300**		1	**59000**		1	**71100**		1	**79700**		1	**69800**		1	**65600**		1
Manganese	UG/L	**152**		1	**558**		1	**130**		1	**627**		1	**210**		1	**69.0**		1	**404**		1	**500**		1	**1070**		1	**437**		1	**1460**		1	**965**		1
Molybdenum	UG/L	**ND**	U	1	**ND**	U	1	**ND**	U	1	**ND**	U	1	**4.28**	B	1	**ND**	U	1	**ND**	U	1	**ND**	U	1	**3.10**	B	1	**ND**	U	1	**11.4**		1	**ND**	U	1
Nickel	UG/L	**29.1**	*	1	**15.5**	*	1	**42.0**	*	1	**15.1**	*	1	**1.73**	B*	1	**11.3**	*	1	**2.71**	B*	1	**9.59**	*	1	**8.39**	*	1	**8.24**	*	1	**32.1**	*	1	**5.31**	*	1
Phosphorous	UG/L	**95.9**	B	1	**770**		1	**5390**		1	**718**		1	**ND**	U	1	**79.6**	B	1	**597**		1	**508**		1	**738**		1	**649**		1	**770**		1	**327**		1
Potassium	UG/L	**16100**		1	**29600**		1	**241000**		5	**25000**		1	**3250**		1	**14400**		1	**44900**		1	**13200**		1	**20400**		1	**16500**		1	**18400**		1	**8400**		1
Selenium	UG/L	**ND**	U	1	**ND**	U	1	**ND**	U	1	**ND**	U	1	**ND**	U	1	**ND**	U	1	**ND**	U	1	**ND**	U	1	**ND**	U	1	**ND**	U	1	**ND**	U	1	**ND**	U	1
Silica	UG/L	**25200**		1	**36500**		1	**34700**		1	**37700**		1	**19800**		1	**36200**		1	**33100**		1	**32600**		1	**37500**		1	**39100**		1	**43900**		1	**41800**		1
Silver	UG/L	**ND**	U	1	**1.10**	B	1	**ND**	U	1	**ND**	U	1	**ND**	U	1	**ND**	U	1	**ND**	U	1	**ND**	U	1	**ND**	U	1	**1.30**	B	1	**ND**	U	1	**1.57**	B	1
Sodium	UG/L	**116000**		1	**367000**		1	**524000**		5	**334000**		1	**24700**		1	**109000**		1	**62200**		1	**138000**		1	**212000**		1	**197000**		1	**274000**		1	**158000**		1
Strontium	UG/L	**822**		1	**996**		1	**329**		1	**974**		1	**860**		1	**2300**		1	**732**		1	**755**		1	**1040**		1	**1050**		1	**1210**		1	**695**		1
Thallium	UG/L	**ND**	U	1	**ND**	U	1	**ND**	U	1	**ND**	U	1	**ND**	U	1	**ND**	U	1	**ND**	U	1	**ND**	U	1	**ND**	U	1	**ND**	U	1	**ND**	U	1	**ND**	U	1
Tin	UG/L	**ND**	U	1	**2.82**	B	1	**22.0**		1	**ND**	U	1	**ND**	U	5	**ND**	U	10	**ND**	U	10	**ND**	U	10	**ND**	U	20	**ND**	U	10	**ND**	U	10	**ND**	U	20
Uranium	UG/L	**ND**	U	1	**ND**	U	1	**14.0**	B	1	**ND**	U	1	**19.5**	B	1	**ND**	U	1	**ND**	U	1	**ND**	U	1	**ND**	U	1	**ND**	U	1	**ND**	U	1	**ND**	U	1
Vanadium	UG/L	**10.1**		1	**1.37**	B	1	**3.97**	B	1	**1.13**	B	1	**ND**	U	1	**3.93**	B	1	**ND**	U	1	**ND**	U	1	**ND**	U	1	**ND**	U	1	**1.20**	B	1	**1.06**	B	1
Zinc	UG/L	**ND**	U	1	**ND**	U	1	**9.24**	B	1	**ND**	U	1	**ND**	U	1	**ND**	U	1	**ND**	U	1	**ND**	U	1	**ND**	U	1	**ND**	U	1	**4.91**	B	1	**ND**	U	1

ND	U	1
6.37	B	1
6.45	B	1
558		1
ND	U	1
815		1
ND	U	1
159000		1
1.01	B	1
1.69	B	1
ND	U	1
1800		1
ND	U	1
94500		1
81.0		1
ND	U	1
12.0	*	1
99.0	B	1
15000		1
ND	U	1
37000		1
ND	U	1
117000		1
2350		1
ND	U	1
ND	U	10
ND	U	1
3.46	B	1
4.98	B	1

This is a duplicate of total metals data for PZ-101-SS.

NOTES:

Samples collected for EPA by MDNR personnel and analyzed at their contract laboratories due to Government Shutdown during PRP's field sampling mobilization.

MDNR used Eberline in Oak Ridge, TN for rad analyses, and GEL Labs in Charleston, SC for VOCs and metals.

Field notes indicate VOC sample vials from wells D-3, S-5, PZ-113-AD effervesced so preservative was removed.

VOCs by 8260B, Metals by 6010B, Isotopic U by EML U-02 MOD, Isotopic Th by EML Th-01 MOD, Ra226 by 903.0 MOD, Ra228 by 904.0 MOD.

The PZ-104-SD duplicate was run at a 10x dilution for all VOCs, 1x for other analytes.

Trip Blanks were all ND for all VOCs.

Totals of isotopes of each radionuclide do not include U-coded isotopes.

E qualifier means result exceeds instrument calibration range.

* added to a qualifier means a QC recovery is outside the acceptance criteria.

B qualifier means the analyte was detected in the method blank.

Cross-reference from laboratory analytical report sample IDs to actual well numbers (from e-mail from Shawn Muenks to Dan Gravatt 11/12/2013)

A=PZ-104-SD	Ending numbers indicate field filtration and analyte suite
B=D-3	1 = total rads, unfiltered
C=S-5	2 = dissolved rads, filtered
D=PZ-113-AD	3 = total metals, unfiltered
E=PZ-102-SS	4 = dissolved metals, filtered
F=PZ-101-SS	5 = VOCs
G=D-83	
H=D-6	
I=I-9	
J=D-93	
K=S-82	
L=D-85	

Client SampleID	Parameter	Result	Units	Qualifiers	Dilution Factor
WLL20131007A1 DUP	Radium-226	3.44	pCi/l		1
WLL20131007A1 DUP	Radium-228	1.40	pCi/l	J	1
WLL20131008G1 DUP	Thorium-228	0.14	pCi/l	U	1
WLL20131008G1 DUP	Thorium-230	0.18	pCi/l	J	1
WLL20131008G1 DUP	Thorium-232	0.02	pCi/l	U	1
WLL20131007C1 DUP	Uranium-234	-0.27	pCi/l	U	1
WLL20131007C1 DUP	Uranium-235	0.20	pCi/l	U	1
WLL20131007C1 DUP	Uranium-238	0.39	pCi/l	U	1
WLL20131008E1 DUP	Radium-226	5.72	pCi/l		1
WLL20131008E1 DUP	Radium-228	3.57	pCi/l		1
WLL201310008E2 DUP	Thorium-228	0.11	pCi/l	U	1
WLL201310008E2 DUP	Thorium-230	0.06	pCi/l	U	1
WLL201310008E2 DUP	Thorium-232	0.03	pCi/l	U	1
WLL20131008F1 DUP	Uranium-234	0.34	pCi/l	U	1
WLL20131008F1 DUP	Uranium-235	0.05	pCi/l	U	1
WLL20131008F1 DUP	Uranium-238	0.41	pCi/l	J	1

Note: these duplicate results don't include a full set of parameters for any given sample so were omitted from the master summary table on the other tab in this worksheet.