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Date: July 16, 2002
Refer to: RRES-WQH: 02-271

General (Groundwater, drinking water wells)

Mr. Pete Padilla
Environmental Compliance Officer
Department of Public Utilities
County of Los Alamos
P.O. Drawer 1030
Los Alamos, New Mexico 87544

SUBJECT: MONITORING RESULTS, SPECIAL DRINKING WATER MONITORING PROGRAM, LOS ALAMOS WATER SUPPLY WELLS

Dear Mr. Padilla:

As you are aware, under the Laboratory's Special Drinking Water Monitoring Program, the Los Alamos water supply wells are routinely sampled for tritium (³H), perchlorate (ClO₄), high explosives (HE), strontium-90 (Sr-90), nitrate/nitrite (NO₃/NO₂), and fluoride (F). Additionally, monitoring for diesel range organics (DRO) was recently added at four water supply wells in the vicinity of the TA-21 diesel spill site. This report provides analytical results for the following sampling events:

- (1) May sampling of PM-1, PM-2, PM-3, PM-5, O-1, and O-4 for low-level tritium;
- (2) May sampling of PM-1, PM-2, PM-3, PM-5, O-1, O-4, G-1A, G-2A, and G-3A for perchlorate;
- (3) May sampling of PM-2 and PM-5 for high explosives (HE);
- (4) May sampling of PM-1, PM-2, PM-3, and PM-5 for nitrate/nitrite and fluoride;
- (5) May sampling of PM-1, PM-2, PM-3, PM-5, O-1, O-4, G-1A, G-2A, and G-3A for Sr-90; and
- (6) May sampling of PM-1, PM-3, O-1, and O-4 for diesel range organics (DRO).

May Tritium Results

On May 18, 2002, the Laboratory sampled water supply wells PM-1, PM-2, PM-3, PM-5, O-1, and O-4 for low-level tritium analysis by the University of Miami's Tritium Laboratory. A copy of the analytical report has been enclosed in Attachment 1.0. In addition, Table 1.0 summarizes all of the 2002 tritium results that have been received to-date.



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Tritium was detected in the May sample from O-1 at 31.93 pCi/L (+/- 0.96 pCi/L). This result is consistent with previous tritium results obtained from O-1 during 2001 and 2002. The average tritium result from O-1 in 2001 was 31.60 pCi/L. The current EPA Maximum Contaminant Level (MCL) for tritium in drinking water is 20,000 pCi/L.

Tritium was also detected in water supply well PM-1 at a concentration of 0.99 pCi/L (+/- 0.29 pCi/L). Detections are defined as values three times greater than the individual measurement uncertainty. This result is consistent with the average tritium level found in the other water supply wells of 1 pCi/L.

May Perchlorate Results.

On May 18, 2002, the Laboratory sampled water supply wells PM-1, PM-2, PM-3, PM-5, O-1, O-4, G-1A, G-2A, and G-3A for perchlorate analysis. Water supply wells PM-4, G-4A, and G-5A were out-of-service at the time of sampling. Samples were submitted to General Engineering Laboratories (GEL), Charleston, SC, for perchlorate analysis by Method 314.0, Ion Chromatography. Copies of the analytical reports have been enclosed in Attachment 2.0. All 2002 perchlorate results received to-date are presented in Table 2.0.

GEL did not detect perchlorate in any of the samples at concentrations greater than their Method Detection Limit (MDL) of 1.45 ppb.

May HE Results

On May 18, 2002, the Laboratory collected samples from water supply wells PM-2 and PM-5 for high explosives (HE) analysis by GEL. Copies of the analytical reports have been enclosed in Attachment 3.0. All HE results are summarized Table 3.0.

No HE compounds were detected in the sample from PM-5 at concentrations greater than GEL's Method Detection Limit (MDL). An HE compound, RDX, was detected in the sample from PM-2 at a concentration of 0.12 ppb (MDL=0.10 ppb). However, this result was qualified with a 'P flag' due to poor precision. Therefore, this result should be considered an estimated value. A February 2002 sample from PM-2 was nondetect for RDX. An HE confirmation sample was collected from PM-2 on July 16, 2002.

May Nitrate/Nitrite Sampling

On May 18, 2002, the Laboratory collected samples from water supply wells PM-1, PM-2, PM-3, and PM-5 for nitrate/nitrite (as N) analysis by GEL. Copies of the analytical reports have been enclosed in Attachment 4.0. Table 4.0 summarizes the results. The nitrate/nitrite (as N) concentrations for water supply wells PM-1, PM-2, PM-3, and PM-5 are consistent with previous results obtained from these wells and the regional aquifer. The Laboratory will continue to monitor these wells quarterly for nitrate/nitrite.

May Fluoride Sampling

On May 18, 2002, the Laboratory collected samples from water supply wells PM-1, PM-2, PM-3, and PM-5 for fluoride analysis by GEL. Copies of the analytical reports have been enclosed in Attachment 4.0. Table 5.0 summarizes the results. The fluoride concentrations for water supply wells PM-1, PM-2, PM-3, and PM-5 are consistent with previous results obtained from these wells and the regional aquifer. The Laboratory will continue to monitor these wells quarterly for fluoride.

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May Sr-90 Results

On May 18, 2002, the Laboratory collected samples from water supply wells PM-1, PM-2, PM-3, PM-5, O-1, O-4, G-1A, G-2A, and G-3A for Sr-90 analysis by GEL. Copies of the analytical reports have been enclosed in Attachment 5.0. All Sr-90 results are summarized Table 6.0.

No Sr-90 was detected in any of the samples. A detection for Sr-90 is defined as an analytical result that is equal to or greater than three times the one sigma analytical uncertainty and greater than the Minimum Detectable Activity (MDA).

May DRO Results

On May 18, 2002, the Laboratory sampled water supply wells PM-1, PM-3, O-1, and O-4 for Diesel Range Organics (DRO) analysis by GEL. Copies of the analytical reports have been enclosed in Attachment 6.0. All DRO results are summarized Table 7.0. All results were non detect for DRO compounds with the exception of a single result from O-1 of 0.076 mg/L (MDL=0.05 mg/L). Three samples collected from O-1 in February, March, and April were all nondetect for DRO. A DRO confirmation sample was collected from O-1 on July 16, 2002. Monthly sampling will continue at these four water supply wells for DRO compounds.

Summary

- Tritium was detected in the May samples from O-1 and PM-1 at 31.93 pCi/L (+/- 0.96 pCi/L) and 0.99 pCi/L (+/- 0.29 pCi/L), respectively. These results are consistent with previous tritium results obtained from these wells.
- No perchlorate was detected in PM-1, PM-2, PM-3, PM-5, O-1, O-4, G-1A, G-2A, and G-3A at concentrations greater than GEL's MDL of 1.45 ppb.
- RDX was detected in the May sample from PM-2 at a concentration of 0.12 ppb. Since this result was qualified with a 'P flag' (poor precision), it should be considered an estimated value. A confirmation sample was collected from PM-2 on July 16, 2002.
- No Sr-90 was detected in PM-1, PM-2, PM-3, PM-5, O-1, O-4, G-1A, G-2A, and G-3A at concentrations greater than GEL's MDA.
- Diesel range organics (DRO) were detected in the May sample from O-1 at a concentration of 0.076 mg/L. Three prior monthly samples at O-1 were nondetect. A confirmation sample was collected from O-1 on July 16, 2002.

Please contact me at (505) 667-7969 should you have any questions regarding these results.

Sincerely,



Bob Beers

Water Quality & Hydrology Group

BB/tml

Mr. Pete Padilla
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Attachments: a/s

- Cy: B. Bartels, NMED/DWB, Santa Fe, New Mexico, w/att.
S. Yanicek, DOE/NMED/OB, w/att., MS J993
T. Glasco, Los Alamos County, New Mexico, w/att.
J. Vozella, DOE/OLASO, w/att., MS A316
M. Johansen, DOE/OLASO, w/att., MS A316
G. Turner, DOE/OLASO, w/att., MS A316
K. Agogino, DOE/AL, Albuquerque, New Mexico, w/att.
J. Holt, ADO, w/o att., MS A104
B. Stine, ADO, w/att., MS A104
B. Ramsey, RRES-DO, w/att., MS J591
K. Hargis, RRES-DO, w/att., MS J591
C. Nylander, RRES-DO, w/att., MS M992
D. Stavert, RRES-EP, w/att., MS J978
S. Rae, RRES-WQH, w/att., MS K497
D. Rogers, RRES-WQH, w/att., MS K497
RRES-WQH File, w/att., MS K497
IM-5, w/att., MS A150

Table 1.0 Special Drinking Water Monitoring Results for Tritium (pCi/L) in 2002.

Sample Date	PM-1		PM-2		PM-3		PM-4		PM-5		O-1	
	Result	Uncertainty										
1/16/02											29.38	0.96
2/23/02												
3/14/02											26.76	0.89
4/18/02												
4/28/02												
5/18/02	0.99	0.29	-0.03	0.29	-0.19	0.29			-0.06	0.29	31.93	0.96

Sample Date	O-4		G-1A		G-2A (GR-2)		G-3A (GR-3)		G-4A (GR-4)		G-5A (GR-1)	
	Result	Uncertainty	Result	Uncertainty	Result	Uncertainty	Result	Uncertainty	Result	Uncertainty	Result	Uncertainty
2/23/02	-0.16	0.29	-0.16	0.29	0.00	0.29	0.03	0.29	0.19	0.29	-0.32	0.29
5/18/02												

Notes:

"Uncertainty" means the analytical uncertainty (+/-). Uncertainties are expressed as one standard deviation (1 sigma).

The federal Maximum Contaminant Level (MCL) for tritium in drinking water is 20,000 pCi/L.

All units are pCi/L.

Analytical Laboratory: University of Miami Tritium Laboratory

Table 2.0 Special Drinking Water Monitoring Results for Perchlorate (ppb) in 2002.

Sample Date	Analytical Lab	PM-1	PM-2	PM-3	PM-4	PM-5	O-1	O-4	G-1A	G-2A (GR-2)	G-3A (GR-3)	G-4A (GR-4)	G-5A (GR-1)
1/16/02	GEL			<0.801		<0.801	<0.801						
1/16/02	GEL-duplicate sample			0.884J									
1/16/02	Acculabs			0.37J		0.30J	1.51						
1/16/02	Acculabs-duplicate sample						1.55						
1/16/02	Babcock			<2.2		<2.2	2.3J						
2/27/02	GEL			<0.801		<0.801	<0.801						
3/14/02	GEL			<0.958		<0.958	<0.958						
4/18/02	GEL			<0.958		<0.958	<0.958						
4/18/02	GEL-duplicate sample			<0.958		<0.958	<0.958						
5/18/02	GEL	<1.45	<1.45	<1.45	OS	<1.45	<1.45	<1.45	<1.45	<1.45	<1.45	OS	OS

Notes:

"J" means the result is estimated because it is below the analytical laboratory's Reporting Limit (RL), but above the Method Detection Limit (MDL).

Babcock means E.S. Babcock & Sons Inc. that has an RL of 4 ppb and an MDL of 2.2 ppb.

GEL means General Engineering Laboratories that has an RL of 4 ppb and an MDL between 0.801 ppb and 0.958 ppb.

Acculabs means Acculabs, Inc. that has an RL of 0.50 ppb and an MDL of 0.25 ppb.

"OS" means the well was out-of-service at the time of sampling.

Table 3.0. Special Drinking Water Monitoring Results for High Explosives (ppb) in 2002.

Sample Date	PM-1	PM-2	PM-3	PM-4	PM-5	O-1	O-4	G-1A	G-2A	G-3A	G-4A	G-5A
2/23/02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2/23/02				ND ²								
5/18/02				OS								

Notes:

¹RDX was detected in the PM-2 sample at 0.12 ppb. A "P flag" data qualifier was assigned by GEL to indicate poor precision.

²Duplicate sample.

"ND" means that the target analytes were not detected above the analytical laboratory's detection limit.

"OS" means that the well was out-of-service.

Analytical Laboratory

General Engineering Laboratories, Charleston, SC

Table 4.0. Special Drinking Water Monitoring Results for Nitrate/Nitrite (as N) in 2002.

Sample Date	Analytical Lab	PM-1 (mg/L)	PM-2 (mg/L)	PM-3 (mg/L)	PM-4 (mg/L)	PM-5 (mg/L)
2/23/02	GEL	0.450	0.280	0.440	0.290	0.270
2/23/02	GEL-duplicate				0.280	
5/18/02	GEL	0.52	0.32	0.47	OS	0.3

Notes:

GEL means the General Engineering Laboratories

OS means the well was out-of-service at the time of sampling.

Table 5.0. Special Drinking Water Monitoring Results for Fluoride in 2002.

Sample Date	Analytical Lab	PM-1 (mg/L)	PM-2 (mg/L)	PM-3 (mg/L)	PM-4 (mg/L)	PM-5 (mg/L)
2/23/02	GEL	0.209	0.193	0.265	0.234	0.224
2/23/02	GEL-duplicate				0.161	
5/18/02	GEL	0.26	0.347	0.301	OS	0.339

Notes:

GEL means the General Engineering Laboratories

OS means the well was out-of-service at the time of sampling.

Table 6.0 Special Drinking Water Monitoring Results for Sr-90 (pCi/L) in 2002.

Sample Date: May 18, 2002				
Location	Result	Minimum Detectable Activity (MDA)	Uncertainty ¹ (+/-)	Detection? (Y/N) ²
PM-1	-0.0434	0.165	0.0432	N
PM-2	OS			
PM-3	-0.0216	0.150	0.0391	N
PM-4	OS			
PM-5	0.0085	0.0821	0.0241	N
O-1	OS			
O-4	0.0442	0.151	0.0414	N
G-1A	OS			
G-2A (GR-2)	0.0402	0.140	0.0383	N
G-3A (GR-3)	OS			
G-4A (GR-4)	OS			

Notes:

¹Uncertainties are expressed as one standard deviation (1-sigma).

²A detection is defined as a value that is equal to or greater than three times the uncertainty (three times one standard deviation or 3-sigma) and is greater than the MDA (Minimum Detectable Activity).

All units are pCi/L.

OS means that the well was out-of-service at the time of sampling.

Analytical Laboratory

General Engineering Laboratories, Charleston, SC

Table 7.0 Special Drinking Water Monitoring Results for Diesel Range Organics (DRO) in 2002.

Sample Date	Analytical Lab	PM-1 (mg/L)	PM-3 (mg/L)	O-1 (mg/L)	O-4 (mg/L)
2/23/02	GEL	0.2	<0.05	<0.05	<0.05
2/23/02	GEL-duplicate sample				<0.05
3/18/02	GEL	<0.05	<0.05	<0.05	<0.05
3/18/02	GEL-duplicate sample				<0.05
4/18/02	GEL	<0.048	<0.048	<0.048	<0.048
4/18/02	GEL-duplicate sample				<0.048
5/18/02	GEL	<0.05	<0.05	<0.05	<0.05

Notes:

GEL means General Engineering Laboratories.