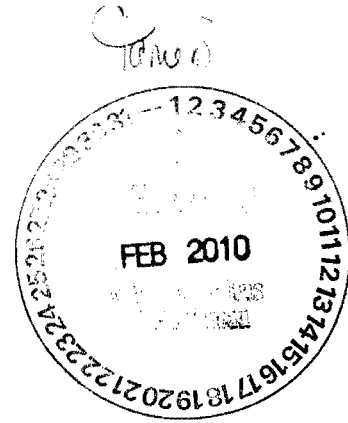




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ENTERED



Environmental Protection Division
Water Quality & RCRA Group (ENV-RCRA)
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Date: January 28, 2010
Refer To: ENV-RCRA-10-027
LAUR: 10-00256

Mr. William C. Olson, Bureau Chief
Ground Water Quality Bureau
New Mexico Environment Department
Harold Runnels Building, Room N2250
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502

Dear Mr. Olson:

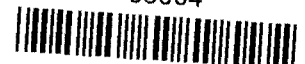
SUBJECT: GROUNDWATER DISCHARGE PLAN QUARTERLY REPORT, FOURTH QUARTER 2009, TA-50 RADIOACTIVE LIQUID WASTE TREATMENT FACILITY (DP-1132)

This letter is intended to serve as Los Alamos National Laboratory's quarterly Groundwater Discharge Plan (DP-1132) Report for the TA-50 Radioactive Liquid Waste Treatment Facility (RLWTF) for the fourth quarter (October, November, and December) of 2009. Since the first quarter of 1999, Los Alamos National Laboratory (Laboratory) has provided your agency with voluntary quarterly reports containing analytical results from effluent and groundwater monitoring.

Quarterly Monitoring Results, Mortandad Canyon Alluvial Groundwater Wells

Table 1.0 presents the analytical results from sampling conducted at four Mortandad Canyon alluvial wells, MCO-3, MCO-4B, MCO-6, and MCO-7, during the fourth quarter of 2009. Samples are submitted to General Engineering Laboratories (GEL), Charleston, SC, for analysis. All of the analytical results were below the New Mexico Water Quality Control Commission (NM WQCC) 3103 standards for nitrate-nitrogen (NO₃-N), fluoride (F), and total dissolved solids (TDS). Please note that the TDS result from alluvial well MCO-3 is a reanalysis result; the initial result reported by GEL of 1290 mg/L was not supported by the specific conductance measurement collected in the field. Reanalysis confirmed that the initial result was invalid.

Analytical results from the sampling of intermediate and regional aquifer wells in Mortandad Canyon can be accessed online at the Risk Analysis, Communication, Evaluation and Reduction (RACER) Web site (www.racernm.com).



RLWTF Effluent Monitoring Results

Table 2.0 presents the analytical results from the weekly composite sampling of the RLWTF's effluent for the fourth quarter of 2009. The final weekly composite (FWC) samples are flow-proportioned composite samples prepared from each tank of effluent generated by the RLWTF during a 7-day period. Samples are submitted to GEL for analysis. In addition, the TA-50 RLWTF analytical laboratory analyzes duplicate FWC samples as part of the Laboratory's compliance monitoring program.

All of the FWC results presented in Table 2.0 are below the NM WQCC 3103 standards for NO₃-N, F, and TDS with the exception of two NO₃-N results from 10/5/09 and 11/24/09. Data collected by the RLWTF prior to discharge confirmed that the effluent was compliant with NM WQCC 3103 standards. Data available post-discharge is contradictory suggesting that NO₃-N concentrations may have exceeded 10 mg/L. These results are discussed below.

- The final weekly composite (FWC) sample for 10/5/09 (ID# 50FWC-09-2834) was composited from two effluent tanks discharged during the previous week. Individual and composite analytical results from these two tanks are summarized below:

Sample Type	Sample Date	Analytical Laboratory	NO ₃ -N (mg/L)	NO ₂ -N (mg/L)	NO ₃ +NO ₂ -N (mg/L)
Effluent tank	9/23/09	RLWTF	9.4	4.4	
Effluent tank	9/30/09	RWLTF	7.8	2.3	
FWC	10/5/09	GEL			11.8
FWC	10/5/09	RLWTF	12.9	<0.1	

The samples collected from the effluent tanks on 9/23/09 and 9/30/09 were pre-discharge screening samples. In accordance with the RLWTF's standard operating procedure, the NO₃-N concentration is measured in each effluent tank prior to discharge to ensure compliance with the NM WQCC 3103 standard of 10 mg/L. The NO₃-N screening results—9.4 and 7.8 mg/L—confirmed that both effluent tanks met the standard for discharge. The average of these two NO₃-N results—a theoretical composite of the two tanks—is 8.6 mg/L.

In addition to pre-discharge screening analyses, a final weekly composite sample is also prepared from each effluent tank for analysis by both GEL and the RLWTF analytical laboratory. GEL reported a combined NO₃+NO₂-N concentration of 11.8 mg/L; this result is consistent with the calculated NO₃+NO₂-N concentration for the 9/23/09 and 9/30/09 effluent tanks of 11.95 mg/L.

In contrast, the RLWTF analytical laboratory's reported NO₃-N and NO₂-N results of 12.9 mg/L and <0.1 mg/L, respectively, in the FWC sample of 10/5/09 are not consistent with the individual effluent tank NO₃-N and NO₂-N measurements from 9/23/09 and 9/30/09. The absence of NO₂-N in the FWC sample—<0.1 mg/L—and the elevated concentration of NO₃-N—12.9 mg/L—indicate that all of the NO₂-N in the sample was oxidized to NO₃-N prior to analysis. As such, the FWC sample does not accurately represent the concentrations of NO₃-N in the two effluent tanks at the time of discharge.

- The final weekly composite (FWC) sample for 11/17/09 (ID# 50FWC-09-2839) was composited from a single effluent tank discharged during the previous week. Analytical results from this tank are summarized below:

Sample Type	Sample Date	Analytical Laboratory	NO ₃ -N (mg/L)	NO ₂ -N (mg/L)	NO ₃ +NO ₂ -N (mg/L)
Effluent tank	11/17/09	RLWTF	9.9	0.28	
FWC	11/24/09	GEL			11.2
FWC	11/24/09	RLWTF	12.8	<0.1	

A screening sample was collected on 11/17/09 from the effluent tank prior to discharge; the NO₃-N screening result—9.9 mg/L—confirmed that the effluent tank met the standard for discharge of 10 mg/L, albeit with little margin for analytical error.

The FWC result reported by GEL—11.2 mg/L—for NO₃+NO₂-N is consistent, within analytical error, with the calculated NO₃+NO₂-N concentration in the 11/17/09 screening sample of 10.2 mg/L.

In contrast, the RLWTF analytical laboratory's reported NO₃-N and NO₂-N results of 12.8 mg/L and <0.1 mg/L, respectively, are not consistent with the individual effluent tank measurement. These data suggest that NO₃-N concentration in the 11/17/09 effluent tank may have been near, or possibly greater, than the discharge limit of 10 mg/L. The following corrective action will be initiated by the RLWTF to ensure that effluent of marginal quality is not approved for discharge.

- The RLWTF's operators, following a standard operating procedure (SOP), use an effluent screening sheet for each effluent tank to record and compare pre-discharge screening data to the discharge limits, and then confirm that the effluent in a tank is suitable for discharge. Currently, the effluent screening sheet's discharge limit for NO₃-N is 10 mg/L, a threshold without allowance for analytical uncertainty. Under this corrective action, the RLWTF will review discharge limits on the effluent screening sheet and adjust each limit downward, as necessary, to account for method-specific analytical uncertainties.

Table 3.0 presents the final monthly composite (FMC) sample results for NO₃-N, ClO₄, F, and TDS for the fourth quarter of 2009. The FMC samples are flow-proportioned composite samples prepared from each tank of effluent generated by the RLWTF during the month. Analysis is by the TA-50 RLWTF analytical laboratory. All of the analytical results presented in Table 3.0 were below the NM WQCC 3103 standards for NO₃-N, F, and TDS with the exception of the October 2009 result for NO₃-N of 10.7 mg/L. This value is consistent with the higher NO₃-N concentrations in the October discharges.

In closing, monitoring data indicate that NO₃-N concentrations were possibly greater than 10 mg/L in one of the eleven effluent tanks discharged during the fourth quarter of 2009. In response, the RLWTF will initiate the following corrective measure: Discharge limits listed on the pre-discharge effluent screening sheet will be evaluated and adjusted downward, as

appropriate, to reflect method-specific analytical uncertainties. This correction will provide for a more conservative screening of effluent prior to discharge.

Please contact me at (505) 667-7969 if you would like additional information regarding this quarterly report.

Sincerely,



Robert Beers
Water Quality & RCRA Group (ENV-RCRA)

BB/lm

Cy: Glenn Saums, NMED/SWQB, Santa Fe, NM
James Bearzi, NMED/HWB, Santa Fe, NM
Steve Yanicak, LASO-GOV, M894
Hai Shen, LASO-EO, A316
Gene Turner, LASO-EO, A316
Michael Mallory, PADOPS, A102
J. Chris Cantwell, ADESHQ, K491
Randy Johnson, ENV-EAQ, E500
Mike Saladen, ENV-RCRA, K490
Robert C. Mason, TA55-DO, E583
Hugh McGovern, TA-55 RLW, E583
Pete Worland, PMT-3, E518
Chris Del Signore, PMT-3, E518
Steve Hanson, PMT-3, E518
ENV-RCRA File, K490
IRM-RMMSO, A150

Radioactive Liquid Waste Treatment Facility
Ground Water Discharge Plan (DP-1132) Quarterly Report
4th Quarter, 2009

Table 1.0. Mortandad Canyon Alluvial Well Sampling, 4th Quarter, 2009.

Sampling Location	Sample Filtered ² (F/N)	Sample Date	Perchlorate by LC/MS/MS ¹ (µg/L)	NO ₃ -N/NO ₂ -N (mg/L)	TKN ² (mg/L)	NH ₃ -N (mg/L)	TDS (mg/L)	F ⁻ (mg/L)
MCO-3	F	11/05/09	0.808	1.74J	0.592J-	<0.05	296H ⁵	0.40
MCO-4B	F	11/09/09	6.05	1.05J	0.074J	0.142J	281	0.63
MCO-6	F	11/10/09	7.82	1.07	0.045J-	<0.05	266	0.77
MCO-7	F	11/10/09	11.7	1.49	<0.10	<0.05	273	0.93
<i>NM WQCC 3103 Ground Water Standards</i>			<i>NA³</i>	<i>10 mg/L⁴</i>	<i>NA³</i>	<i>NA³</i>	<i>1000 mg/L</i>	<i>1.6 mg/L</i>

Notes:

¹LC/MS/MS means perchlorate analysis by Liquid Chromatography/Mass Spectrometry/Mass Spectrometry.

²All samples filtered with the exception of TKN.

³NA means that there is no NM WQCC 3103 standard for this analyte.

⁴The NM WQCC 3103 Ground Water Standard is for NO₃-N.

⁵Reanalysis result. See discussion.

J- means that the reported value is expected to be more uncertain than usual with a potential negative bias.

J means the reported value is greater than the Method Detection Limit (MDL) but less than the Reporting Limit (RL).

H means that the required extraction or holding time was exceeded.

Radioactive Liquid Waste Treatment Facility
Ground Water Discharge Plan (DP-1132) Quarterly Report
4th Quarter, 2009

Table 2.0. RLWTF Final Weekly Composite (FWC) Effluent Sampling, 4th Quarter, 2009.

Monitoring Period	Sample Composite Date	Sample ID#	Analysis by RLWTF ¹		Analysis by General Engineering Laboratories, Inc.			
			NO ₃ -N (mg/L)	NO ₂ -N (mg/L)	NO ₃ , NO ₂ -N (mg/L)	Perchlorate by LC/MS/MS (ug/L)	Fluoride (mg/L)	TDS (mg/L)
October	10/5/09	50FWC-09-2834	12.9 ⁷	<0.1	11.8	<0.2	0.342	308
	10/13/09	50FWC-09-2835	4.0	2.7	7.03	<0.2	0.072J	67
	10/19/09	50FWC-09-2836	8.5	0.1	9.20	<0.2	0.062J	102
	10/29/09	50FWC-09-2837	9.4	<0.1	8.38	<0.2	0.082J	108
November	11/9/09	50FWC-09-2838	7.9	<0.1	7.55J	<0.2	0.088J	94HJ-
	11/24/09	50FWC-09-2839	12.8 ⁸	<0.1	11.2J	<0.2	0.125J-	143
	11/30/09	50FWC-09-2840	7.4	0.7	7.38	<0.2	0.093J	118
December	12/7/09	50FWC-09-2841	7.5	<0.1	6.73	0.062J	0.105	131
	12/16/09	50FWC-09-2842	3.4	0.5	3.90	<0.2	0.068J	46
	12/22/09	50FWC-09-2843	3.7	0.3	3.85	<0.2	0.067J	72
4th Quarter 2009 Averages³ (mg/L)			7.8	0.5	7.7	0.19	0.11	119
<i>NM WQCC 3103 Ground Water Standards</i>			<i>10 mg/L</i>	<i>NA⁵</i>	<i>10 mg/L⁴</i>	<i>NA⁵</i>	<i>1.6 mg/L</i>	<i>1000 mg/L</i>

Notes:

¹Analysis by the TA-50 Radioactive Liquid Waste Treatment Facility's analytical laboratory.

²No Discharge means that the RLWTF did not discharge any effluent during the 7-day period preceding the composite date.

³4th quarter 2009 averages include the results from September 2009, if applicable.

⁴The NM WQCC Regulation 3103 Ground Water Standard is for nitrate (NO₃-N).

⁵NA means that there is no NM WQCC 3103 standard for this analyte.

⁶Pending means that the analytical results were pending at the time this report was prepared.

⁷Individual effluent tank measurements taken by the RLWTF laboratory prior to discharge were 9.4 and 7.8 mg/L.

⁸Individual effluent tank measurement taken by the RLWTF laboratory prior to discharge was 9.9 mg/L.

J means the reported value is greater than the Method Detection Limit (MDL) but less than the Reporting Limit (RL).

H means that the analytical hold time was exceeded.

J- means that the reported value is expected to be more uncertain than usual with a potential negative bias.

*Radioactive Liquid Waste Treatment Facility
Ground Water Discharge Plan (DP-1132) Quarterly Report
4th Quarter, 2009*

Table 3.0. RLWTF Final Monthly Composite (FMC) Effluent Sampling, 4th Quarter, 2009.

Monitoring Period	RLWTF FMC Results ¹			
	NO ₃ -N (mg/L)	Perchlorate by IC ² (ug/L)	TDS (mg/L)	F (mg/L)
October	10.7	<1	164	0.15
November	9.7	<1	150	0.06
December	4.7	<1	128	0.05
<i>NM WQCC 3103 Ground Water Standards</i>	<i>10 mg/L</i>	<i>NA³</i>	<i>1000 mg/L</i>	<i>1.6 mg/L</i>

Notes:

¹Analysis by the TA-50 Radioactive Liquid Waste Treatment Facility's analytical laboratory.

²IC means EPA Method 314.0, perchlorate analysis by Ion Chromatography.

³NA means that there is no NM WQCC 3103 standard for this analyte.

DATA CERTIFICATION

Los Alamos National Laboratory TA-50 Radioactive Liquid Waste Treatment Facility

Document Title and Date:

**Ground Water Discharge Plan Quarterly Report, Fourth Quarter 2009,
TA-50 Radioactive Liquid Waste Treatment Facility (DP-1132)
January 28, 2010**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name of certifying official (Group Leader, or above)	Title	Organization	Date Signed
Hugh McGovern	RLW ops mgr	RLW	1/27/10