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Mr. Steve M. Alexander
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Mr. Douglas R. Sherwood
Hanford Project Manager
U.S. Environmental Protection Agency
712 Swift Boulevard, Suite 5
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Dear Messrs. Alexander and Sherwood:

QUARTERLY RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) GROUNDWATER MONITORING DATA FOR THE PERIOD OCTOBER 1 THROUGH DECEMBER 31, 1996

- References: (1) RL ltr. to S. M. Alexander and D. R. Sherwood from M. J. Furman "Notification of Resampling for Total Organic Halogen (TOX) at Waste Management Area U-Tank Farm (WMA-U)," dtd. April 6, 1997.
- (2) RL ltr. to S. M. Alexander from M. J. Furman "Exceedance of Concentration Limits in Groundwater at 183-H Solar Evaporation Basins," dtd. September 27, 1996.
- (3) RL ltr. to S. M. Alexander from M. J. Furman "Proposal for Resource Conservation and Recovery Act (RCRA) Groundwater Monitoring at the 183-H Basins During the 100-HR-3 Interim Remedial Measure (IRM)," dtd. March 14, 1997.

The RCRA groundwater chemistry and water level data for the period October 1 through December 31, 1996, are publicly available in electronic form in the Hanford Environmental Information System (HEIS) database. The electronic availability of the data and the summary provided below fulfill the reporting requirements of WAC 173-303-400 (and by reference, 40 CFR 265.94). Verification of data included a completion check (requested analyses were received), quality control checks (field blanks, field duplicates, and blind samples), and project scientist evaluation.

Sixteen RCRA units were sampled during the reporting quarter (Table 1). Eight of the RCRA units that are monitored under indicator evaluation programs, six sites that are monitored under groundwater quality assessment programs, and two sites monitored under final status compliance programs were sampled.

COMPARISON TO CONCENTRATION LIMITS:

Contamination indicator parameter data (pH, conductivity, TOX, and total organic carbon) from downgradient wells were compared to background values at sites monitored under interim-status, indicator evaluation requirements, as described in 40 CFR 265.93. Contamination indicator parameters in downgradient wells were below the critical mean values for all sites sampled during the October through December 1996 quarter. Hence, there is no indication that these sites are impacting groundwater quality.

During a previous quarter (July through September 1996), a statistically significant increase in total TOX concentration was observed in one downgradient well monitored for the Single-Shell Tanks, WMA-U. The well was resampled in February 1997 and the elevated TOX was confirmed (Reference 1). An assessment program is not necessary because the source of the elevated TOX is carbon tetrachloride from an upgradient source, not WMA-U.

Two RCRA sites at Hanford, the 183-H Solar Evaporation Basins and the 300 Area Process Trenches, are monitored under final-status programs (WAC 173-303-645). Results of the fall 1997 sampling event for the 183-H Basins (four independent samples collected September through December 1996) were analyzed. Concentration limits were exceeded for chromium, nitrate, technetium-99, and uranium in some of the downgradient wells. Similar exceedances were reported to the State of Washington Department of Ecology (Ecology) in the past (Reference 2). A RCRA corrective action plan is being prepared for the site, with corrective action deferred to the 100-HR-1 and 100-HR-3 Operable Units, under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). A revised groundwater monitoring plan is being prepared to monitor the site during operation of a planned CERCLA interim remedial measure pump-and-treat system for chromium. The revised monitoring program was developed in a series of data quality objectives workshops involving the U.S. Department of Energy, Richland Operations Office (RL), Ecology, Pacific Northwest National Laboratory, and Bechtel Hanford, Inc. RL has submitted the proposed well list, constituent list, and sampling frequency to Ecology for concurrence (Reference 3).

300 Area Process Trenches wells were sampled in December 1996. Results will be evaluated after the rest of the four independent samples are received (January, February, and March 1997).

MONITORING CHANGES:

Groundwater sampling at Low-Level Burial Grounds WMA-4 has been rescheduled to the first and third quarter of each year (it previously was sampled in the second and fourth quarters). Because of the transition in schedule, WMA-4 was sampled only once in calendar year 1996 (second quarter). It was most recently sampled in January 1997 and results will be reported in the next quarterly letter.

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Evaluation of groundwater flow directions at the 216-A-36B Crib indicated that one of the wells formerly used to determine background conditions was no longer upgradient of the site. Background chemistry values were recalculated based on data from the two remaining upgradient wells. Contamination indicator parameters did not exceed the new critical mean values.

QUALITY CONTROL:

Results of the RCRA Quality Control (QC) program for the October through December 1996 quarter will be discussed in detail in the Annual Report for FY 1997. Highlights are summarized in the attachment. Quality control data that are not available in HEIS are available in electronic form upon request. The QC program indicated that the data were acceptable for use in the statistical comparisons discussed above.

The information contained in this letter is being submitted to Ecology in accordance with WAC 173-303-400 and WAC 173-303-645. If you have questions about this quarterly data transmittal, please contact me at 373-9630.

Sincerely,



M. J. Furman, Project Manager
Groundwater Project

GWP:RKS

Attachment

cc w/attach:
M. Hartman PNNL
S. Leja, Ecology
S. Luttrell, PNNL
R. Smith, PNNL

Table 1. Status of RCRA Sites, October-December, 1996.

Site	Sampled Oct-Dec, 1996	Statistical exceedance
Indicator Evaluation Sites [40 CFR 265.93(b)] (sampled semiannually)		
100-D Ponds	No	Not applicable
1301-N Facility	No	Not applicable
1325-N Facility	No ^a	Not applicable
1324-N/NA Site	No	Not applicable
A-29 Ditch	Yes	No
A-36B Crib	Yes	No
A-10 Crib	Yes	No
B-63 Trench	Yes	No
S-10 Pond and Crib	Yes	No
LERF	No	Not applicable
LLBG WMA 1	Yes	No
LLBG WMA 2	Yes	No
LLBG WMA 3	No	Not applicable
LLBG WMA 4	No	Not applicable
SST WMA A-AX	Yes	No
SST WMA C	No	Not applicable
SST WMA U	No	Previous exceedance ^b
NRDWL	No	Not applicable
Groundwater Quality Assessment Sites [40 CFR 265.93(d)] (sampled quarterly)		
Six sites ^c	X	Not required
Final Status Sites (WAC 173-303-645)		
300 Area Process Trenches	X	Not applicable ^d
183-H Basins ^e	X	Yes

LLBG = Low-Level Burial Grounds

SST = Single-Shell Tanks

WMA = Waste Management Area

^a Only well N-43 was sampled during the October through December 1996 quarter; it had been postponed from the previous quarter when the rest of the network was sampled. TOX exceeded its critical mean, but the values are suspect. Well N-43 was removed from the 1325-N network as of 1 October 1996, so it will not be resampled and the site will not enter assessment monitoring.

^b SST WMA U was not sampled during the October-December 1996 quarter. However, sampling in February 1997 confirmed a TOX exceedance observed in the

July-Sept 1996 quarter.

°B-Pond, U-12 Crib, SST WMA B-BX-BY, SST WMA S-SX, SST WMA T, SST WMA TX-TY.

^d Sampled semiannually with four independent samples. Statistical evaluations will be performed after data from all four independent samples received.

^e Site has entered corrective action because of previous exceedances.

Attachment: Quality control results, October-December, 1996.

Completeness: Completeness of data is determined by dividing the number of results that have not been rejected or flagged as suspect because of associated QC concerns by the total number of results received during the quarter. Greater than 90% completeness is considered acceptable. A completeness of 90% was achieved during the October through December, 1996 quarter, with none of the data rejected, and 10% flagged as suspect. The suspect data may be useful for general interpretive use but should not be used to make regulatory decisions.

Field QC data: Results of field duplicate pairs were evaluated to determine if they were within 20% relative percent difference. During the October through December 1996 quarter, 3 of 428 duplicate results were out of limits. Field blanks were analyzed for contamination. Most of these were within acceptable limits, but 20% of the ICP metals results showed unacceptable contamination. The most serious contamination was for sodium, barium, and calcium, where most or all of the 11 blanks were contaminated at levels greater than twice the method detection limit. Sodium contamination in the blanks averaged 550 $\mu\text{g/L}$, barium averaged 5.4 $\mu\text{g/L}$, and calcium averaged 363 $\mu\text{g/L}$. These levels of contamination are much lower than the concentrations of these constituents naturally found in Hanford groundwater, so the potential effect on data use is negligible. Groundwater results that are associated with the contaminated field blanks are flagged in the database. The blank contamination problem was evident in results from two separate laboratories, so the contamination was apparently not introduced in the laboratory. Efforts to determine the cause of contamination therefore are focusing on sampling activities and equipment.

Laboratory QC data: During the October-December 1996 quarter, PNNL sent blind samples to the laboratory in triplicate containing known concentrations of cyanide, chromium, nitrate, fluoride, carbon tetrachloride, chloroform, trichloroethylene, cobalt-60, cesium-137, iodine-129, strontium-90, technetium-99, plutonium-239, uranium-238, and tritium. Laboratory accuracy and precision were acceptable for all but fluoride, cyanide, and plutonium-239. All three fluoride results were less than half the spike value. The three cyanide samples were spiked at 400 $\mu\text{g/L}$. One of the results was 629 $\mu\text{g/L}$, nearly double the other two results. One of the three plutonium-239 results was twice the spike value, while the other two were acceptable. Results of future blind samples will be evaluated to determine if there is a pattern of unacceptable results for these constituents. Fluoride, cyanide, and plutonium-239 results from this reporting quarter should not be used for regulatory decisions.

The analytical laboratory participated in a U.S. Environmental Protection Agency water pollution program in November, 1996. 96% of results were within acceptable limits. The laboratory failed to meet limits for chlordane for the second time in a row, and has been asked to provide corrective action. Chlordane is not a constituent of concern at any of the Hanford RCRA units. The radiochemistry laboratory participated in an Environmental Radioactivity Laboratory intercomparison study program. Results were within control limits for all constituents evaluated.

Transition of analytical laboratories. The RCRA monitoring program now uses Quanterra Environmental Services in St. Louis, Missouri for all routine laboratory analyses. During the period of transition (July through September, 1996), split samples from selected wells were collected and analyzed by three laboratories. An evaluation of data comparability is included in the 1996 groundwater annual report (M. J. Hartman and P.E. Dresel, editors, 1997, Hanford Site Groundwater Monitoring for Fiscal Year 1996, PNNL-11470, Pacific Northwest National Laboratory, Richland, Washington).