

40-8948

OHIO DEPARTMENT OF HEALTH

246 N. HIGH STREET
Post Office Box 118
Columbus, Ohio 43266-0118
Telephone: (614) 466-3543



GEORGE V. VOINOVICH
Governor

PETER SOMANI, M.D., Ph.D.
Director of Health

August 23, 1996

Mr. James Valenti
Environmental Manager
Shieldalloy Metallurgical Corp.
12 West Boulevard
Newfield, NJ 08344

Mr. Patrick Lee
Cyprus Foote Minerals Co.
9100 East Mineral Circle
Englewood, CO 80122

Re: ADDENDUM TO DATA QUALITY EVALUATION OF REMEDIAL INVESTIGATION
AND FEASIBILITY STUDY RADIOLOGICAL DATA FROM THE SHIELDALLOY
METALLURGICAL CORPORATION SITE IN CAMBRIDGE, OHIO

Gentlemen:

The Ohio Department of Health/Bureau of Radiation Protection is submitting the above-referenced document, dated 21 August 1996, on behalf of the State of Ohio. This addendum is to be considered part of the original report submitted by Dr. Thomas Rucker, SAIC, and is a data validation of the July 2, 1996 data packages that were not forwarded to Ohio with the original data packages.

The State of Ohio concurs with Dr. Rucker's addendum and its recommendations and requests that the companies implement them. In addition, for each radionuclide present at the site (including both the slag piles and the surrounding media) we request that the companies provide the MDA value that PTI used during data analysis, and the equation used to determine the MDA value. Additionally, the state recommends that a quality check be performed on the entire data set to ensure that the proper results have been entered in the database and the data tables.

NL1041

9610040040 960823
PDR ADOCK 04008948
C PDR

RECEIVED: NMISS/ADM

James Valenti
Patrick Lee
Page 2
August 23, 1996

If you have any questions regarding this issue, please feel free to contact me at (614) 644-2727.

Respectfully,

Kenneth R Donchatz for

RUTH H. VANDEGRIFT
Supervisor Contaminated Sites
Ohio Department of Health/Bureau of Radiation Protection

cc: S. Eves, SMC
W. Shields, PTI
J. Webb, ODH/BRP
O. Ackman, OEPA/SEDO
B. Blair, OEPA/SEDO
C. Stroup, OEPA/Central
J. Wendell, USEPA/Region V
M. Thaggard, USNRC/HQ
R. Karl, Ohio AGO/EES
L. Hoover, Ohio AGO/EES
J. Payne, Ohio AGO/EES
K. Donchatz, Ohio AGO/HHS
E. Porter, Ohio AGO/HHS
P. Whitehouse, OEPA/DERR
Y. Yeng, OEPA/DERR
RI/FS File

Addendum to Data Quality Evaluation of Remedial Investigation and Feasibility Study Radiological Data from the Shieldalloy Metallurgical Corporation Site in Cambridge, Ohio

This addendum is being added to the original report because it was discovered that the original data shipment did not contain all of the data packages. Therefore, the goal of validating 20% of the data packages was not met. Most of the missing data packages contained groundwater and surface water samples. Therefore, one water data package for each analysis type has been validated to meet the original goal. Since this validation was performed after the original data quality evaluation report was written, the results of the additional validation are summarized in this addendum.

The problems found in the review of the water data packages were similar to those found in the other data packages. This addendum will not repeat the general problems for each analysis type as they are the same as has previously been discussed. Other specific problems are as follows.

1.0 Analyses Performed by Alpha Spectroscopy

1.1 Isotopic Uranium Analyses

GW0012R

Validation was performed on Sample Digestion Group (SDG) Number GW0012R containing two groundwater samples and associated QC samples analyzed for $^{234/235/238}\text{U}$. The $^{234/235/238}\text{U}$ results in both samples were qualified as estimated due to low tracer recovery resulting in excessive uncertainty. The $^{235/238}\text{U}$ results for both samples were qualified as estimated because the Laboratory Control Sample (LCS) exceeded the acceptable recovery limits. The $^{235/238}\text{U}$ results for both samples were qualified as estimated because the Matrix Spike Sample (MSS) exceeded the acceptable recovery limits. $^{234/235}\text{U}$ results for both samples were also qualified as estimated because the ^{234}U duplicate analyses were not in agreement.

Of these deficiencies, only the ^{238}U analyses were qualified as estimated in the PTI validation summary, and then only on one sample (GW0022) because the MSS results exceeded acceptable recovery limits. The other sample was not qualified because it was less than the MDA. However, all ^{235}U results were qualified as estimated by PTI due to no LCS and no MSS analyses. This was unnecessary since LCS and MSS analyses for $^{238/234}\text{U}$ should suffice for ^{235}U as well.

The data are deemed, in general, to be usable, but should be considered to have additional uncertainty. However, the use of the MDA as the decision level for recording undetects will adversely affect the decisions made on the data.

1.2 Isotopic Thorium Analyses

SW0015R

Validation was performed on SDG Number SW0015R containing seven surface water samples and associated QC samples analyzed for $^{228/230/232}\text{Th}$. It was observed that the ^{229}Th tracer peak had a tendency to tail into the ^{230}Th peak. When the ^{230}Th result had an interference from the ^{229}Th tracer, the results were labeled as undetected (U) by the PTI validators and the result without an uncertainty was reported. This is not an upper limit for the ^{230}Th activity; therefore, it is recommended that the ^{230}Th results reported as undetects (U) in the analytical summary report be replaced with the net result with its associated uncertainty and qualified as UJ. In addition, this peak tailing interfered with the proper quantitation of the ^{230}Th results, in many cases overstating the true activity of ^{230}Th in the samples significantly. All ^{230}Th results were qualified as unusable due to interference from the ^{229}Th tracer trailing into the ^{230}Th peak.

As stated above, the results were only labeled as undetected (U) by the PTI validators when the ^{230}Th result had an interference from the ^{229}Th tracer and the result was reported without an uncertainty. The use of the data will result in a positive bias in the results. Also, the use of the MDA as the decision level for recording undetects will adversely affect the decisions made on the data.

1.3 ^{210}Po Analyses

GW0013R

Validation was performed on SDG Number GW0013R containing three groundwater samples and associated QC samples analyzed for ^{210}Po . The tracer recoveries for the samples were low. All ^{210}Po analyses were qualified as estimated due to the excessive uncertainty in the results from the low tracer recovery. This may have resulted in the MSS and duplicate results having significant error and being outside the appropriate limits. Therefore, no additional qualification was recommended.

None of the results for ^{210}Po analyses were qualified as estimated in the PTI validation summary for low tracer recovery or for any other reason. They suggested that the MSS was out due to calibration problems and therefore did not qualify the data.

The data are deemed, in general, to be usable, but with additional uncertainty. However, the use of the MDA as the decision level for recording undetects will adversely affect the decisions made on the data.

2.0 Analyses Performed by Gas Proportional Counting

2.1 ^{210}Pb Analyses

SW001R

Validation was performed on SDG Number SW0001R containing three surface water samples and associated QC samples analyzed for ^{210}Pb . The absorption curve is inverted from the direction it should take according to physical principles. The plateau data was also out of date. Only one set of efficiency and crosstalk data was provided; therefore, there is no means of comparison to the calibration date. The daily background verification was not within three standard deviations of the monthly background used for two of the three samples. Therefore, all results for Pb-210 were qualified as estimated.

Of these deficiencies, none were mentioned in the PTI validation summary. However, all ^{210}Pb results were qualified as estimated by PTI due to high alpha-to-beta crosstalk values. This was unnecessary since a chemical separation has removed potential alpha interferences.

The data are deemed, in general, to be usable, but should be considered to have additional uncertainty. However, the use of the MDA as the decision level for recording undetects will adversely affect the decisions made on the data.

2.2 $^{226/228}\text{Ra}$ Analyses

GW3001R

Validation was performed on SDG Number GW3001R containing eight groundwater samples and associated QC samples analyzed for $^{226/228}\text{Ra}$. An efficiency calibration was performed more than a year earlier. Plateau data was also out of date. In addition, the MSS was out of control for ^{226}Ra . Therefore, ^{226}Ra results for all samples were qualified as estimated.

Of these deficiencies, the ^{226}Ra analyses were qualified as estimated in the PTI validation summary only because the MSS was out of control. There was no mention of the other deficiencies.

The data are deemed, in general, to be usable, but should be considered to have additional uncertainty. However, the use of the MDA as the decision level for recording undetects will adversely affect the decisions made on the data.

3.0 Analyses Performed by Gamma Spectroscopy

GW3001R

Validation was performed on SDG Number GW3001R containing eight groundwater samples and associated QC samples analyzed for gamma-emitting isotopes. The reported MDAs did not meet the 20 pCi/L DQO limit for all of the target radionuclides except for ^{208}Tl (in all samples), ^{212}Pb (in six samples), and ^{214}Pa (in one sample). The MDAs exceeded the DQO detection limit by the following approximate amounts: $^{227}\text{Ac} \sim 3\text{x}$; $^{212}\text{Bi} \sim 5\text{x}$; $^{214}\text{Bi} \sim 2\text{x}$; $^{214}\text{Pb} \sim 1.5\text{x}$; $^{223}\text{Ra} \sim 24\text{x}$; $^{224}\text{Ra} \sim 13\text{x}$; $^{231}\text{Pa} \sim 15\text{x}$; $^{234}\text{Pa} \sim 2\text{x}$.

It was also noticed that the results for several samples in this batch were incorrectly reported (sample numbers swapped or otherwise incorrect) in Table 18 of the RI report, including samples GW3012, GW3003, GW3007, GW3009, GW3010, and GW3012.

None of these deficiencies were mentioned in the PTI validation summary. The PTI validation summary stated that all detection limits met project DQOs. However, all target isotopes not detected in the peak search but above the MDA were qualified as estimated (NJ) by PTI due to not being positively identified. This was unnecessary since a peak extraction was performed on the appropriate energy region, providing positive identification.

The data are deemed, in general, to be usable. However, the detection limits not being met and the use of the MDA as the decision level for recording undetects will adversely affect the decisions made on the data. Furthermore, the incorrect identification of sample results in the report needs to be corrected.

4.0 Analyses Performed by KFA

GW3001R

Validation was performed on SDG Number GW3001R containing eight groundwater samples and associated QC samples analyzed for total uranium. The analyses met the project DQOs and are acceptable for use without qualification.

5.0 Conclusion

The problems found in the review of the water data packages were similar to those found in the other data packages. However, data recording problems may be present in other data that has not been reviewed. Furthermore, in PTI's response to recommendations, it was noticed that in the tables the uncertainties were not correctly propagated when sample results were averaged. It is recommended that a QA check be performed on the entire data set to ensure that the proper results have been entered in the database and data tables.