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March 14, 2000

Mr. Steve W. Shaffer, Health Physicist
Decommissioning and Laboratory Branch
U.S. Nuclear Regulatory Commission
Region 1, Mail Control No. 124941
475 Allendale Road
King of Prussia, PA 19406

Re: Sampling Results and the Proposed Radiological Sampling Plan for Building 1-5 Excavated Soil at the Prometcor Site (License No. STB-1451)

Dear Mr. Shaffer:

In accordance with your request and on behalf of Prometcor, Inc. (formerly Ronson Metals), McLaren/Hart, Inc (M/H) submits this letter as the proposed soil sampling plan for the excavated soil piles currently stored within the parking area at the Prometcor site. This letter also presents analytical results for previous soil samples collected in the excavated soils removed from Buildings 1 through 5. Forty soil samples (including both biased and composite) were collected from subject soil piles during sampling in October and December 1999. All samples were collected over the entire depth of the soil piles and were analyzed for ²²⁸Th and ²²⁶Ra. Analytical results for these samples are presented in Tables A-1 and A-2 (enclosed). McLaren/Hart used Severn Trent Laboratories (Whippany, New Jersey) for analyzing the samples for the above radionuclides.

Sampling Results for Building 1-5 Excavated Soils

Soils excavated during the remediation of Buildings 1-5 are currently stored in an engineered storage area located on the parking lot of the Prometcor site. Soils are stored in a number of distinct covered piles and are depicted in FIGURE 1 (enclosed). Physical separation between each pile has been maintained so that each pile can be easily identified and characterized according to radionuclide concentrations. Each soil pile can be traced to a specific building location at the site from where the material was excavated (e.g., RO1 represents soils removed from mid section area of Building 1). After excavation was completed, there were initially 17 piles stored in the parking lot. These are designated as RO-1, RO-2, etc. Piles RO-12 and RO-13 were later consolidated to increase the capacity of the storage area. RO-16 was divided into two piles to allow for easier sampling access. Both RO-12 and RO-13 were excavated on the same day from the northwest corner of Building 3. Similarly RO-10 and RO-15 were combined to facilitate access to other soil piles and to increase storage area. The volume of material in RO-15 was relatively small. RO-10 and RO-15 soils were excavated from the eastern side of Building 2. Descriptions and results for the October and December sampling are presented below.

NMSS/RGN-008



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October 1999 Sampling

Two rounds of sampling were conducted for these soils. The first sampling round was conducted in October 1999 during which 20 biased samples were collected. During this sampling round, soils were sampled from RO-1 through RO-9 and RO-12/13 (represents those soil piles that had been transferred to the storage area by the start of the October sampling). Two samples were collected from each pile. At each sampling location, soil was collected over a range of 0 to 3 feet in depth. Down-hole gamma readings collected with a collimated, NaI probe were used to ensure that each sample contained elevated soil. The intent of this sampling campaign was to determine the upper bounds of radionuclide concentrations in these piles. Hence soil samples were taken from areas of the pile exhibiting the highest microrentgen exposure readings at or near the surface. Therefore, concentrations of radionuclides measured in the October 1999 soil samples reasonably approximate the highest concentrations expected within each pile and are considered a biased assessment for an upper bound value for each pile. Results for the October samples are presented in Tables A-1 and A-2.

December 1999 Sampling

A second round of sampling was performed in December 1999 during which 20 unbiased soil samples were collected. This time samples were collected from soil piles designated RO-1 through RO-16 (FIGURE 1). To account for the inherent bias of the October sampling data, RO-1 through RO-9 and RO-12 were sampled again. This time, composite soil samples were taken from 3-4 sampling locations within each soil pile. Sampling locations were approximately, equally spaced across each pile. At each sampling location, an aggregate soil sample was collected over a depth that either ranged from the surface to the bottom of a pile or from the surface to a depth of above three to four feet, depending upon the geometry of each pile. Roughly equal volumes of soil were collected at each location. These soils were then thoroughly mixed, packaged, and sent to the lab for analysis as a composite sample. The purpose of collecting the composite samples over these depths is to closely approximate a three-dimensional concentration signature for each pile. Analytical results (concentration signature) for each composite sample therefore represent initial approximations of the mean concentrations for thorium and radium in each pile.

During the December sampling, soil samples over depth were also collected from piles RO-10, RO-11, and RO-13 through RO-16 and analyzed as discrete samples. These piles were not sampled during the October 1999 sampling event. Two to three samples were collected from each pile depending upon its volumetric size. Results for the December samples are presented in Tables A-1 and A-2.

Summary of Past Soil Sampling

The forty samples collected during October and December 1999 represent an average of one sample collected per 270 ft³ of soil. However, if the area covered by the composite samples is figured into the equation, this represents approximately one sample collected per 166 ft³ of soil. Average concentrations based on current sampling data were calculated for each pile as well as an average concentration for Ra-226 and Th-228 across

all piles (Tables A-1 and A-2). The average concentrations of Ra-226 and Th-228 based on all 40 measurements across all soil piles are:

^{226}Ra	45.3 pCi/g
^{228}Th	6.1 pCi/g

Proposed Additional Sampling

Based on the previous sampling results and the attached sampling map, M/H proposes the collection of sixteen, additional composite soil samples from the excavated soil piles. The purpose of these samples is to provide final estimates for the mean ^{228}Th and ^{226}Ra concentrations in each of the soil piles. One composite sample will be collected from each of the following soil piles: RO-1, RO-2, RO-3, RO-4, RO-5, RO-6, RO-7, RO-8, RO-9, RO-10/15, RO-11, RO-12/13, RO-14, and RO-16. Two composite samples will be collected from pile (RO-17). RO-17 is a smaller pile (approx. 20 yd³) that was not sampled during the October and December sampling activities. The same sampling approach used during the December 1999 sampling will be used to collect these additional composite samples. Soil samples from three to four new borehole locations within each pile will be collected and thoroughly mixed. At each borehole location, soil will be collected over a range from the surface to the bottom or from the surface to three or four feet deep. Aggregate soil from a given pile will then be thoroughly mixed, packaged, and sent to the lab for thorium and radium analysis. These additional samples will result in a total of fifty-six samples collected to date and should provide adequate representation of the thorium and radium concentrations.

We would appreciate your review and approval of the previous sampling results and the proposed sampling plan for the excavated soil piles. Upon your approval, M/H will finalize the characterization of these soils and submit a letter report to the USNRC that presents the final soil results. As we agreed, once you have reviewed and approved the final sampling data, Prometcor requests that the USNRC provide a written authorization to allow for the disposal and/or off-site shipment of these soils as non-hazardous, below USNRC's regulatory concern, and within the 10 pCi/g standard.

If you have any questions or comments, please feel free to contact me at (440) 684-8300 or you can use my pager at (800) 416-0949.

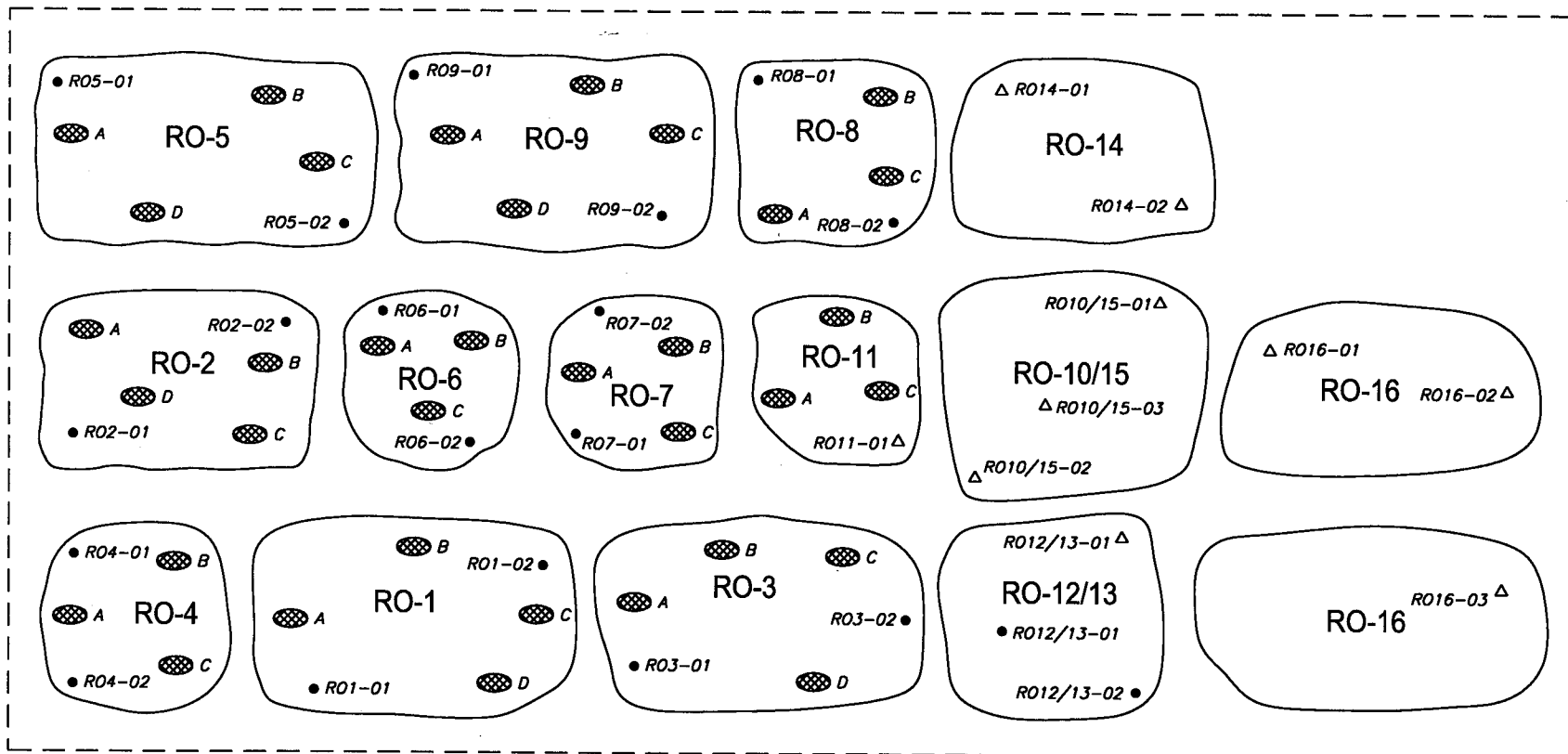
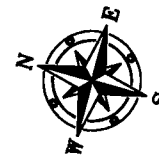
Sincerely,



Jack Buddenbaum, CHP
Supervising Health Scientist

Enclosures (Figure 1, Tables A-1 and A-2)


cc: Daryl Holcomb
Dr. Edward David
Tal Ijaz
Marc Cicalese



MANUFACTURERS PLACE

LEGEND:

- LIMITS OF SOIL STORAGE AREA
- x — FENCE LINE
- SAMPLED 10/99
- △ SAMPLED 12/99
- ⊗ LOCATION FOR COMPOSITE SAMPLE PER SOIL PILE.

FIGURE 1	
SAMPLING LOCATIONS OF IMPACTED SOIL PILES WITHIN THE SOIL STORAGE AREA (SSA)	
PROMETCOR NEWARK, NEW JERSEY	
	
DRWN: T.J.G.	CHK'D: T.I.
SCALE: NONE	DATE: 03/13/00

DWG: 56000223 03/13/00

**TABLE A-1
 PROMETCOR SOIL PILES
 SAMPLING RESULTS FOR RADIUM-226**

PILE DESIGNATION	Estimated Volume * cu. yards.	OCTOBER 1999 SAMPLING		DECEMBER 1999 SAMPLING				PILE AVERAGE Ra-226 (pCi/g)	
		Soil Sample-01	Soil Sample-02	Composite Soil Sample	Soil Sample-01	Soil Sample-02	Soil Sample-03		
		Ra-226 (pCi/g)	Ra-226 (pCi/g)	Ra-226 (pCi/g)	Ra-226 (pCi/g)	Ra-226 (pCi/g)	Ra-226 (pCi/g)		
RO-1	30	53.83	43.93	46.92				48.23	
RO-2	30	157.49	141.92	122.97				140.79	
RO-3	22	111.59	117.04	78.80				102.48	
RO-4	22	48.13	48.09	32.70				42.97	
RO-5	22	35.88	34.96	26.16				32.33	
RO-6	22	36.94	59.22	47.31				47.82	
RO-7	22	50.59	47.85	32.56				43.67	
RO-8	30	29.51	23.62	17.19				23.44	
RO-9	22	43.60	23.30	41.50				36.13	
RO-11	30			13.99	11.76			12.88	
RO-12/13	44	43.81	38.14		9.77			30.57	
RO-14	30				10.25	21.33		15.79	
RO-10/15	41				17.23	15.46	24.32	19.00	
RO-16	22				31.44	9.81	12.23	17.83	
<u>389</u>									
<i>Average Ra-226 Concentration Across all Measurements (pCi/g)</i>								<u>45.33</u>	

NOTE: Ra-226 results are based on an average of Bi-214 and Pb-214 concentrations
 * Estimated volumes based on capacity of Roll-Off Containers

**TABLE A-2
 PROMETCOR SOIL PILES
 SAMPLING RESULTS FOR THORIUM-228**

PILE DESIGNATION	Estimated Volume *	OCTOBER 1999 SAMPLING		DECEMBER 1999 SAMPLING				PILE AVERAGE Th-228 (pCi/g)
		Soil Sample-01	Soil Sample-02	Composite Soil Sample	Soil Sample-01	Soil Sample-02	Soil Sample-03	
		Th-228 (pCi/g)	Th-228 (pCi/g)	Th-228 (pCi/g)	Th-228 (pCi/g)	Th-228 (pCi/g)	Th-228 (pCi/g)	
RO-1	30	10.13	8.82	9.37				9.44
RO-2	30	9.09	9.50	7.50				8.70
RO-3	22	14.24	7.36	8.21				9.94
RO-4	22	8.57	6.74	6.24				7.18
RO-5	22	5.80	5.56	4.87				5.41
RO-6	22	5.89	8.96	7.43				7.43
RO-7	22	7.85	6.77	6.21				6.94
RO-8	30	4.32	3.99	3.30				3.87
RO-9	22	7.00	4.12	6.34				5.82
RO-11	30			2.61	2.44			2.53
RO-12/13	44	7.10	6.42		1.79			5.10
RO-14	30				2.18	3.47		2.83
RO-10/15	41				3.51	3.15	4.02	3.56
RO-16	22				6.32	2.56	2.33	3.74
	389							
<i>Average Th-228 Concentration Across all Measurements (pCi/g)</i>								6.05

* Estimated volumes based on capacity of Roll-Off Containers