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*CONTAMINATED SOILS ADJACENT TO THE SEWAGE
TREATMENT PLANT INCINERATOR*

05/13/93

DOE-FN/EPA

DOE-1980-93

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RESPONSES



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DOE-1980-93

Mr. James A. Saric, Remedial Project Director
 U.S. Environmental Protection Agency
 Region V - 5HRE-8J
 77 W. Jackson Boulevard
 Chicago, Illinois 60604-3590

Mr. Graham E. Mitchell, Project Manager
 Ohio Environmental Protection Agency
 40 South Main Street
 Dayton, Ohio 45402-2086

Dear Mr. Saric and Mr. Mitchell:

CONTAMINATED SOILS ADJACENT TO THE SEWAGE TREATMENT PLANT INCINERATOR

The purpose of this letter is to transmit, for your review and approval, a comment response package addressing each of the comments received from both the U. S. EPA and Ohio EPA on the draft Work Plan Addendum for the Contaminated Soils Adjacent to the Sewage Treatment Plant Incinerator (STPI) Removal Action. Since the submittal of the Work Plan Addendum in January, significant changes have taken place with respect to the FEMP's approach for addressing both the on-property contamination as well as the off-property contamination adjacent to the STPI. Discussions have recently taken place between the adjacent property owner and DOE concerning the most appropriate course of action to address the contamination within the wooded area northeast of the STPI and the contamination adjacent to the property line, next to the former cow path. As a result of these discussions and the property owner's intentions for the land, DOE has committed to the property owner to remediate both areas to the removal action goal of 35 picocuries per gram of soil, total uranium.

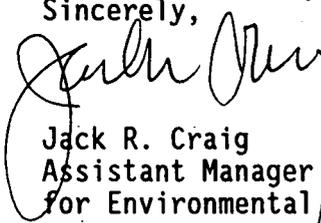
The second objective of the enclosed comment response package is to outline the proposed sampling plan for determining the total extent of off-property contamination associated with the STPI in order to achieve the removal action goal. Currently, the FEMP is working on finalizing the license agreement between the property owner and DOE as well as preparing the action plan to address the interim remediation of the off-property soils after the completion of the proposed additional off-property sampling. In addition to developing an action plan for addressing the excavation of additional off-property soils, the FEMP is also pursuing the excavation of additional on-property soils, specifically within the fenced STPI area. As the enclosed comment responses illustrate, the isotopic radiological data have indicated several radium-226 and thorium-230 "hot spots" southeast of the incinerator, within the fenced compound. As a result of these data and the extremely wet conditions which prevailed in late winter and early spring at the FEMP, the on-property excavations proposed in the work plan addendum were delayed until a

comprehensive plan could be established for addressing as much of the on-property contamination, both inside and outside the STPI fence, as possible. The schedule submitted with the draft work plan addendum committed to completing the excavation of contaminated on-property and off-property soils by May 15, 1993. Based on the increase scope of both the off-property and on-property excavations, it was not possible for DOE to meet this milestone date.

The timely completion of both the on and off-property soil excavations is dependent upon a number of factors. For the completion of the off-property soil excavations, the critical factor to the schedule is the determination of the final boundaries establishing the extent of the off-property contamination. Currently, the data seems to indicate that the off-property contamination above the action level is primarily within the approximately one-acre wooded area and the area immediately adjacent to the property line, next to the former cow path. If additional areas of contamination above the off-property action level are identified then additional time will be required. For the completion of the on-property soil excavations, the critical factor to the schedule is being able to address the radium and thorium contamination within the STPI compound considering the close proximity of the various structures and the gravel substrate which exists immediately below the surface soil within the fenced compound which could have in turn allowed extensive radionuclide migration. A discrete, small scale approach is envisioned for addressing these radium and thorium "hot spots" within the fenced STPI in order to meet the non-uranium action levels specified in the approved removal action work plan for Removal Action Number 17, The Improved Storage of Soil and Debris.

Upon your approval of the enclosed documentation and the completion of the action plan for addressing the on and off-property soils, DOE will submit the revised work plan addendum for your review and approval. Included in the revised work plan addendum will be revised milestone dates for completing all on-property and off-property excavations as well as the submittal date for the final report.

Sincerely,



Jack R. Craig
Assistant Manager
for Environmental Restoration

FN:RJJanke

Enclosure: As Stated

cc w/enc.:

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**Responses to General USEPA Comments on the
Removal Action 14 Work Plan Addendum**

Comment #1

DOE should re-evaluate the need to analyze soil samples for Volatile Organic Compounds (VOC). In a January 7, 1993 meeting, DOE presented data showing that perched ground water is contaminated by VOCs at concentrations up to 100 micrograms per liter ($\mu\text{g/L}$) of total VOCs.

Response #1

During previous sampling, eight locations were sampled for HSLs including both Volatile and Semi-Volatile Organics. Two of the samples were taken off-property and these results are found in Table 1B; three samples were taken within the STP fence, and an additional two samples were taken outside of the STP area but on-site, and these results are found in Table 2C. The only VOCs found in any of these samples were acetone, toluene, and methylene chloride. These compounds are known to be common laboratory contaminants and they were also found in several of the laboratory's blank samples.

Also, 10% of the white metal boxes containing the excavated surface soils will be sampled for this same HSL organics list. There are currently approximately 180 WMBs from soil excavated within the Sewage Treatment Plant. A total of 18 WMBs will be sampled, 16 of the 18 WMBs contain surface soils (0-6"), the other two contain soils from the 6-12" level. The boxes have already been sampled for TCLP Metals for the purpose of determining waste disposition. The sampling for HSLs had to be postponed due to a current lack of laboratory capacity. As soon as lab capacity becomes available, the HSL sampling will be completed and the results documented in the final report.

**Responses to General USEPA Comments on the
Removal Action 14 Work Plan Addendum**

Comment #2

DOE should evaluate the risk to receptors of fugitive dust emissions from soil contaminated with uranium in the 35 to 100 picocurie per gram (pCi/g) range. This evaluation and possible future actions should be presented to EPA.

Response #2

Based on the below analyses, the maximum effective dose equivalent (EDE) an individual would receive resulting from soil contamination of 100 pCi/g would be 3.1 millirem (mrem) per year. This represents only 3% of the DOE 100 mrem/yr dose limit for members of the public.

Two kinds of analyses have been performed to determine the risk to receptors of fugitive dust emissions. In the first analysis, the receptor is an individual who spends on the average 4 hours per day, 365 days per year on land contaminated with 100 pCi/g of natural uranium down to one meter depth. The surface area of the contaminated land is assumed to be 1,000 m². This analysis was performed using RESRAD (ver. 4.6). RESRAD is a DOE code used extensively for calculation of radiological doses and risks resulting from soil contamination. The code is also recommended by DOE Order 5400.5 for derivation of soil clean-up criteria and detailed in the approved Risk Assessment Work Plan for the FEMP.

The receptor is assumed to be exposed to fugitive dust in the air and soil. The mass loading factor for dust inhalation is assumed to be 0.0001 g/m³. A value of 0.0002 is used in the RESRAD code as a default value for conditions that are representative of bare soil and some on-property activity such as farming and soil moving. Since a significant part of the off-property contaminated area under Removal Action 14 is a heavily wooded area, mass entrainment of soil should be considerably less than the 0.0002 g/m³ used in RESRAD. 0.0001 g/m³ is used as a conservative estimate to represent the conditions in the wooded area.

**Responses to General USEPA Comments on the
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RESRAD default values of 8,400 m³/yr and 36.5 g/yr are used for inhalation rate and soil ingestion rate, respectively. The value recommended by the USEPA (EPA 1991) for soil ingestion by an adult is 100 mg/d, which is equivalent to 36.5 g/yr, assuming the individual is exposed every day of the year.

The program has calculated that, under these conditions, the receptor receives an effective dose equivalent (EDE) of 3.1 mrem/yr. 1.8 mrem/yr of this dose is 50-year committed effective dose equivalent (CEDE) with 1.6 mrem/yr coming from dust inhalation and 0.16 mrem/yr from soil ingestion. The remaining 1.3 mrem/yr is due to external gamma irradiation.

The second analysis considered the transport of fugitive dust by wind and exposure of individuals down-wind. Based on a review of literature, a conservative value of 0.001 m/yr is used for the erosion rate of soil by wind. Assuming the contaminated area is 1,000 m² and the soil density is 2 g/cm³, 2,000 kg of soil is eroded per year. Assuming the soil is contaminated with 100 pCi/g of uranium, the total quantity of uranium entrained in one year is 2×10^8 pCi.

The doses to receptors down-wind were calculated using CAP88-PC (ver. 1.0) (EPA 1992). CAP88-PC is a personal computer version of the Clean Air Act Assessment Package-1988 (CAP-88), which is one of the codes specified by the USEPA in 40 CFR Part 61, Subpart H, for demonstrating compliance with the National Emission Standards for Hazardous Air Pollutants (NESHAP). The environmental transport model used in CAP88-PC is similar to that used in its predecessor, AIRDOS-EPA (Moore et al, 1979).

The pathways considered for the down-wind receptors include both external (plume exposure and exposure to ground surface) as well as internal (ingestion and inhalation). Conservative food growth and consumption parameters as recommended by USEPA (EPA 1989a) and default values in the CAP88-PC code (EPA 1992) were used.

Doses were calculated for receptors at distances 250 m and farther from the source in all 16 compass directions. The receptors were assumed to be exposed continuously 24 hr/d, 365 d/yr. The individual with the highest dose was a receptor at 250 m distance to the north. His total EDE, which is the sum of internal CEDE and external EDE, is calculated to be 0.2 mrem/yr. 97% of this dose is from inhalation of fugitive dust, 3% is due to ingestion of food products, and less than 0.1% is due to external exposure.

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The doses calculated for receptors can be converted to an incremental risk of lifetime fatal cancer by using the USEPA-recommended risk conversion factor of 5×10^{-4} per rem of exposure (EPA 1989b). For the on-property receptor this risk is approximately 10^{-6} per year of exposure, and for the off-site receptor at 250 m north, it is 10^{-7} per year of exposure.

Comment #3

Access to the off-property wooded area should be restricted (for example, fenced) until the final remedial action makes this area acceptable for unrestricted use.

Response #3

Preliminary discussions with the property owner have revealed that he was already planning on turning the wooded area into farmland in the near future. As a result, DOE plans to remediate the wooded area as well as the area adjacent to the property line, to the removal action goal for off-property soils, 35 picocuries per gram of soil for total uranium.

In the wooded area, the strategy will be to cut the trees above the soil line, probably 4 to 5 feet and then lifted to a clean staging area, in order to keep the trees from becoming externally contaminated with the residual contamination present in the surface soils. The plan being to minimize the volume of wastes generated from the action of addressing the contaminated soils in the wooded area. Due to the concentrations of uranium observed in the wooded area, measurable uptake levels of radionuclides in the trees is not expected. The trees would then be returned to the property owner. The remaining area would be remediated to the off-property action level of 35 pCi/g total uranium. After verification samples have been taken and evaluated, the land would then be returned to the property owner.

**Responses to General USEPA Comments on the
Removal Action 14 Work Plan Addendum**

Before this excavation can begin, however, additional off-property sampling must be completed to determine the areal extent of the contamination (see attached sampling strategy). There is a potential that the off-property contamination could extend beyond the wooded area and as a result affect two properties. Discussions have been initiated regarding access to the properties. The access will be needed for soil surveying and sampling, possible temporary access restrictions (e.g. construction fence installation) to off-property contaminated areas, and access for excavation of the contaminated areas. This effort is currently being coordinated with the property owner(s) and DOE Real Estate.

**Response to General OEPA Comment on the
Removal Action 14 Work Plan Addendum**

Comment #1

DOE must initiate efforts to control access to, delineate the extent of, and potentially excavate off-property contamination. The off-property soil sampling detected concentrations of uranium exceeding the 35 pCi/g action level. Soil samples were not analyzed for additional radionuclides, which may add to the potential off-property exposure. DOE must revise Phase III of the Removal Action to address off-site property soil contamination.

Response #1

Discussions with the property owner have revealed that he was already planning on turning the wooded area into farmland in the near future. As a result, the plan is to remediate the wooded area as well as the area adjacent to the property line, to the removal action goal for off-property soils.

In the wooded area, the strategy will be to cut the trees above the soil line, probably 4 to 5 feet and then lifted to a clean staging area, in order to keep the trees from becoming externally contaminated with the residual contamination present in the surface soils. The plan being to minimize the volume of wastes generated from the action of addressing the contaminated soils in the wooded area. Due to the concentrations of uranium observed in the wooded area, measurable uptake levels of radionuclides in the trees is not expected. The trees would then be returned to the property owner. The remaining area would be remediated to the off-property action level of 35 pCi/g total uranium. After verification samples have been taken and evaluated, the land would then be returned to the property owner.

Before these excavations can begin, however, additional off-property sampling must be completed to determine the areal extent of the contamination (see attached sampling strategy). There is a potential that the off-property contamination could extend beyond the wooded area and as a result affect two properties. Discussions have been initiated regarding access to the properties. The access will be needed for soil surveying and sampling, possible temporary access restrictions (e.g. construction fence installation) to off-property contaminated areas, and access for excavation of the contaminated areas. This effort is currently being coordinated with the property owner(s) and DOE Real Estate.

**Response to General OEPA Comment on the
Removal Action 14 Work Plan Addendum**

Additional walkover surveys, using the SPA-3, will be conducted to determine the "boundaries" of the contaminated off-property areas. For example, in order to determine the area east of the STP which contains radiological levels of 35 pCi/g or higher, linear transects will be used to determine the extent of contamination north and east of the incinerator off-property. The transects, running west-east, will be laid out every 100 feet. The SPA-3 will be moved eastward along these transects, starting at the property line, and surveys will be performed every 50 feet until two consecutive surveys yield readings below 35 pCi/g. This second survey point will delineate a boundary point. Intrusive samples will be taken at each boundary point at depths of 0-6 inches, 6-12 inches, and 12-24 inches and will be analyzed for isotopic uranium, isotopic thorium, radium 226, and radium 228 to verify the SPA-3 readings. The boundary points mark the furthest location from the property line that radiological contamination could potentially exist.

Once the area of potential contamination has been defined, a 25 by 25 foot grid will be established between the property line and the newly identified boundary points. The SPA-3 will be used to survey the intersections of this grid to evaluate the areal extent of contamination. Pending the finalization of the license agreements with the property owner(s), a construction fence will be installed to restrict access into the potentially contaminated area defined by the walkover surveys. In the area adjacent to the STP, soil contaminated at levels greater than 35 pCi/g will be removed. Post-excavation surveys and intrusive total uranium samples will be taken to verify that acceptable levels have been achieved. If needed, additional excavations will be performed in six-inch lifts until post-excavation surveys indicate that residual contamination levels are below 35 pCi/g total uranium.

A similar gridding system will be laid out for walkover surveying and intrusive soil sampling around the wooded area to accurately define the limits of contamination. Inside of the wooded area will be considered to be contaminated and will not be sampled further. DOE will then excavate the wooded area, removing the contamination to below the action level. An off-property implementation plan for addressing the contamination in the wooded is currently being developed and will be detailed in the revised Work Plan Addendum (WP2).

**Response to General OEPA Comment on the
Removal Action 14 Work Plan Addendum**

The additional off-property sampling, locations C and D as illustrated in Figure 2, have been sampled for isotopic uranium, isotopic thorium, radium 226 and radium 228 (see Table 3). Sample locations D-2 and D-3 were found to have elevated radium-226 and thorium-230 results as shown below:

	Depth (in.)	Radium-226 pCi/g	Thorium-230 pCi/g
D-2	0-2	13.80	24.0
D-2	2-4	11.90	14.0
D-2	4-6	15.30	20.0
D-3	0-2	4.55	7.4
D-3	2-4	4.74	6.7
D-3	4-6	4.37	6.7

All other C and D locations were found to have Ra-226, Ra-228, Th-230, and Th-232 results below the residual concentration guideline of 5 pCi/g defined in DOE Order 5400.5. Soils from locations D-2 and D-3 will be excavated to remove the Ra-226 and Th-230 contamination. Difficulty is expected in verifying the radium and thorium levels in a "real-time" manner. To date, there are no field instrumentation capable of determining radium and thorium concentrations separately.

In addition to finding Ra-226 and Th-230 contamination off-property, four locations on-property were found to have elevated levels of these radionuclides (see Table 2B). Locations ASI-14, ASI-15, ASI-16, and ASI-17 (all within the STP fence) were found to have the following analytical results:

	Depth (in.)	Radium-226 pCi/g	Thorium-230 pCi/g
ASI-14	0-2	12.50	33.2
ASI-14	2-4	13.40	25.6
ASI-14	4-6	15.40	28.9
ASI-14	6-12	3.84	6.9
ASI-14	12-18	1.37	1.4
ASI-15	0-2	16.60	31.9
ASI-15	2-4	17.80	30.2
ASI-15	4-6	11.20	26.0
ASI-15	6-12	4.06	5.2
ASI-15	12-18	1.26	1.9

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	Depth (in.)	Radium-226 pCi/g	Thorium-230 pCi/g
ASI-16	0-2	5.4	17.1
ASI-16	2-4	6.29	12.8
ASI-16	4-6	9.31	16.4
ASI-16	6-12	12.40	19.7
ASI-16	12-18	3.10	4.0
ASI-17	0-2	15.70	47.0
ASI-17	2-4	15.60	46.7
ASI-17	4-6	14.50	8.2
ASI-17	6-12	4.10	6.8
ASI-17	12-18	1.16	1.2

For these locations, all of the 18-24 inch soil samples had Ra-226 and Th-230 results were below 5.0 pCi/g. The soil in these locations will be extracted in order to remove the radium and thorium contamination. Verification samples will be taken to ensure that the radium/thorium contamination has been removed.

It is important to note that none of the analytical results for Removal Action 14 have gone through data validation. The data are not expected to be validated until mid-summer.

**Responses to Specific OEPA Comments on the
Removal Action 14 Work Plan Addendum**

Comment #1

Section 3.1, Pg.6, 2nd paragraph: The sampling of containers proposed here is not reflective of the sampling detailed in the original work plan. Sampling should be aimed at the initial surface soils, those most likely to receive airborne contaminants. Dioxin sampling should be aimed at these boxes.

Response #1

The surface soils that have been excavated will be the focus of the sampling and characterization. The *Removal Action Number 14 Work Plan* (RAWP), dated July 1992, calls for the analysis of analytes depicted in Table 1A as well as TCLP metals for the containerized soils. Dioxin (2,3,7,8-Tetrachlorodibenzo-p-dioxin) is included in the Table 1A analytes. Section 3.1 of the WPA2 will be revised to include the following statement:

"In order to adequately characterize the excavated surface soil to reflect potential airborne contaminants, one sample will be collected from ten percent (10%) of the white metal boxes (WMBs) containing excavated soil and each sample will be analyzed for Table 1A (RAWP) and TCLP metals as outlined in the Data Quality Objective for Excavated and Containerized Soil Sampling, Table 2A of the RAWP. Emphasis was placed on sampling WMBs containing surface soils (0-6")."

There are currently approximately 180 WMBs from soil excavated within the Sewage Treatment Plant. A total of 18 WMBs will be sampled. 16 of these 18 WMBs contain surface soils (0-6"); the other two contain soils from the 6-12" level. The boxes have already been sampled for TCLP Metals for the purpose of determining waste disposition, completion of Material Evaluation Form or the RCRA determination. The sampling for HSLs had to be postponed due to a lack of laboratory capacity. As soon as lab capacity becomes available, the HSL sampling will be completed and the results submitted with the final report.

**Responses to Specific OEPA Comments on the
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In addition to the boxes of soil excavated from within the STP, there are additional boxes of soil from excavations completed outside of the STP fence that have not been sampled to date. Once all excavations has been completed, there may be an additional 200-250 WMBs, with 10% of these being sampled, emphasis placed on sampling the surface soils. However, if the Material Evaluation Form (MEF) determines the soils to be non-RCRA, then future excavations will be stockpiled, per RA#17 Procedures and Controls, in the northeast corner of the production area with the appropriate phase I controls.

Comment #2

Section 5.0, Pg. 12, OFF-PROPERTY: DOE has failed to provide sufficient justification for not being pro-active towards the off-property contamination exceeding 35 pCi/g. DOE may not allow this contamination to simply wait for OU5 characterization. Phase III of the Removal Action must be redesigned to address off-property contamination.

Response #2

As described in the previous comment responses, discussions have been initiated regarding access to the two off-site properties for which additional investigative surveys are to be performed. The access will be needed for soil surveying and sampling, possible temporary access restrictions (e.g. construction fence installation) to off-property contaminated areas, and access for remedial activities (e.g. excavation). These areas will be surveyed with the SPA-3 to determine the boundaries of the contaminated soils that are to be excavated. These surveying results will be confirmed by laboratory analyses as discussed in the response to OEPA General Comment #1.

The remedial measures to be applied to the off-property contamination includes excavation of soil in the area until the residual uranium levels are found to be below the 35 pCi/g action level. Any areas found to have elevated radium/thorium levels will also be remediated.

**Responses to Specific OEPA Comments on the
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Comment #3

Section 5.0, Pg.12, OFF-PROPERTY: If DOE decides not to remove Uranium levels > 35 pCi/g, then DOE should take action (e.g. fencing, acquisition, etc.) to limit to these area until final remediation takes place.

Response #3

As stated in previous responses, DOE is now pursuing the necessary means to ensure that the action level for the off-property soils is achieved.

Comment #4

Appendix I, Figure 1: Location Number 11 detected Uranium near 100 pCi/g and 30 pCi/g of thorium. Additionally Cesium-137 and radium were detected. No additional sampling occurred around this point in any of the subsequent sampling points. DOE must include an evaluation of contamination in the area of the sampling location within the revised Phase III.

Response #4

The 36.9 pCi/g of Th-234 listed in the results of analyzing the Location #11 sample is due to U-238 with which it is in secular equilibrium. The nearly 100 pCi/g of total uranium seen in the sample is made up of approximately 46 to 48 pCi/g each of U-238 and U-234, and a small amount of U-235, seen as approximately 2.27 pCi/g. Since Th-234, half-life of 24 days, is the immediate, short-lived daughter of U-238, one would certainly expect to see a concentration similar, given experimental error, to U-238 which is approximately 46 pCi/g.

The Ra-226 concentration observed in the sample was 1.11 pCi/g. The recently completed background study found that the mean background concentration for Ra-226 in the soil was found, preliminarily, to be 1.5 pCi/g. Therefore, DOE sees no reason to re-sample based on either the Th-234 or Ra-226.

The Cs-137 sample did, however, show a somewhat higher concentration than the mean background concentration for Cs-137. Location #11 showed a value of 1.2 pCi/g whereas the background showed a mean of 0.379 pCi/g and an upper tolerance level (UTL) of 0.711 pCi/g. Considering that most of the rest of the correlation samples showed Cs-137

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concentrations below the UTL, and the associated Ra-226 and Ac-227 samples were also correspondingly low, the Cs-137 results were felt to be in error. The original soil sample taken from Location #11 has been submitted to the on-site laboratory to be re-analyzed for Cs-137. Results are expected by the end of June and will be included in the final report.

**Responses to Specific OEPA Comments on the
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Comment #5

Appendix II, Radiological Walkover Survey: The walkover survey data supports the previous comment about additional sampling and potential excavation around Location Number 11.

Response #5

The original map shows Location #11 as being off-property. After checking with the sampling contractor, these coordinates were found to be in error. The revised coordinates should be North 480452 and East 1383296. These revised coordinates place the sampling point on-property. The revised coordinates for Location #11 have been verified in the field. Also, four additional SPA-3 survey measurements were performed within a foot of Location #11 and the results are provided in the table below.

Sample Location #11 Re-Surveying Results			
North Coordinate	East Coordinate	Reading (cpm)	Comments
480453	1383296	4515	one foot North of Location #11
480452	1383297	4370	one foot East of Location #11
480451	1383296	4345	one foot South of Location #11
480452	1383295	4540	one foot West of Location #11

NOTE: SPA-3 readings: 5000 cpm \equiv 100 pCi/g and 4000 cpm \equiv 35 pCi/g uranium.

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Comment #6

Appendix IV, Figure 2: Based upon review of the sampling locations and data, it is evident that DOE has failed to even delineate the extent of soils exceeding 35 pCi/g of Uranium off-property. Phase III of the Removal Action should be aimed at addressing off-property soils with Uranium concentrations in excess of 35 pCi/g as well as assessing other radionuclides present.

Response #6

As discussed in the response to OEPA General Comment #1, efforts are currently underway to delineate the extent of soil contamination surrounding the two off-property areas already determined as having total uranium contamination greater than 35 pCi/g. Additional surveys and intrusive samples will be taken to delineate the off-property contamination. The strategy for collecting these additional data are enclosed. The C and D location samples previously collected were also analyzed for isotopic uranium, isotopic thorium, radium 226, and radium 228. Results of these samples are in Table 3.

Comment #7

Appendix IV, Table 3 and Figure 2: Since C-1 is 47.3 pCi/g, DOE needs to collect additional samples north and east of this point to determine the extent of contamination. This information will be necessary for the OU5 RI Report.

Response #7

See responses to OEPA General Comment #1 and Specific Comment #6. Additional walkover surveys will be conducted, as described in Appendix V, to determine the extent of off-property contamination. This walkover will include the areas north and east of location C-1. Intrusive samples will be taken at the boundaries to verify the walkover surveys.

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Comment #8

Appendix IV, Table 2, and Figure 2: Because ASI-2 is 152.0 pCi/g, DOE needs to collect additional samples between this point and C-4 to determine the extent of contamination and evaluate the need for excavation of on-property soils.

Response #8

The original walkover survey map did not delineate all of the survey points taken north of the incinerator. On the map it appears that there is a data gap between the leading edge of the 100 pCi/g plume and the off-property area northeast of the incinerator when in actuality there are survey points in this area. This data was already in the Walkover Survey Results table included in the Work Plan Addendum, but the survey points were not included on the map because no locations were found to exceed the 100 pCi/g action level.

As a result, the survey map, Figure 1, has been updated to include ALL survey points taken during the original walkover survey.

Comment #9

Appendix IV, Table 2: Is the data for Location #8 and #29 correct? The data indicates increasing concentrations with depth.

Response #9

Samples taken during the sampling for locations ASI-1 through ASI-19 were duplicated and sent to both the on-site laboratory and an off-site laboratory. Off-site laboratory results indicate that for Location #8 there was a possible sample mix-up at the on-site laboratory. Off-site lab results show the total uranium results to be 167 pCi/g, 131 pCi/g, 81 pCi/g, 34 pCi/g, 4 pCi/g, and 2 pCi/g, respectively.

The first six inches of the soil sample taken from Location #29 was composed of crushed rock and loose soil, as verified in the field. The second six inch level is where soil was encountered with a uranium content of 140.5 pCi/g. The area has now been excavated and as specified in the workplan it will be verified to be below the 100 pCi/g action level.

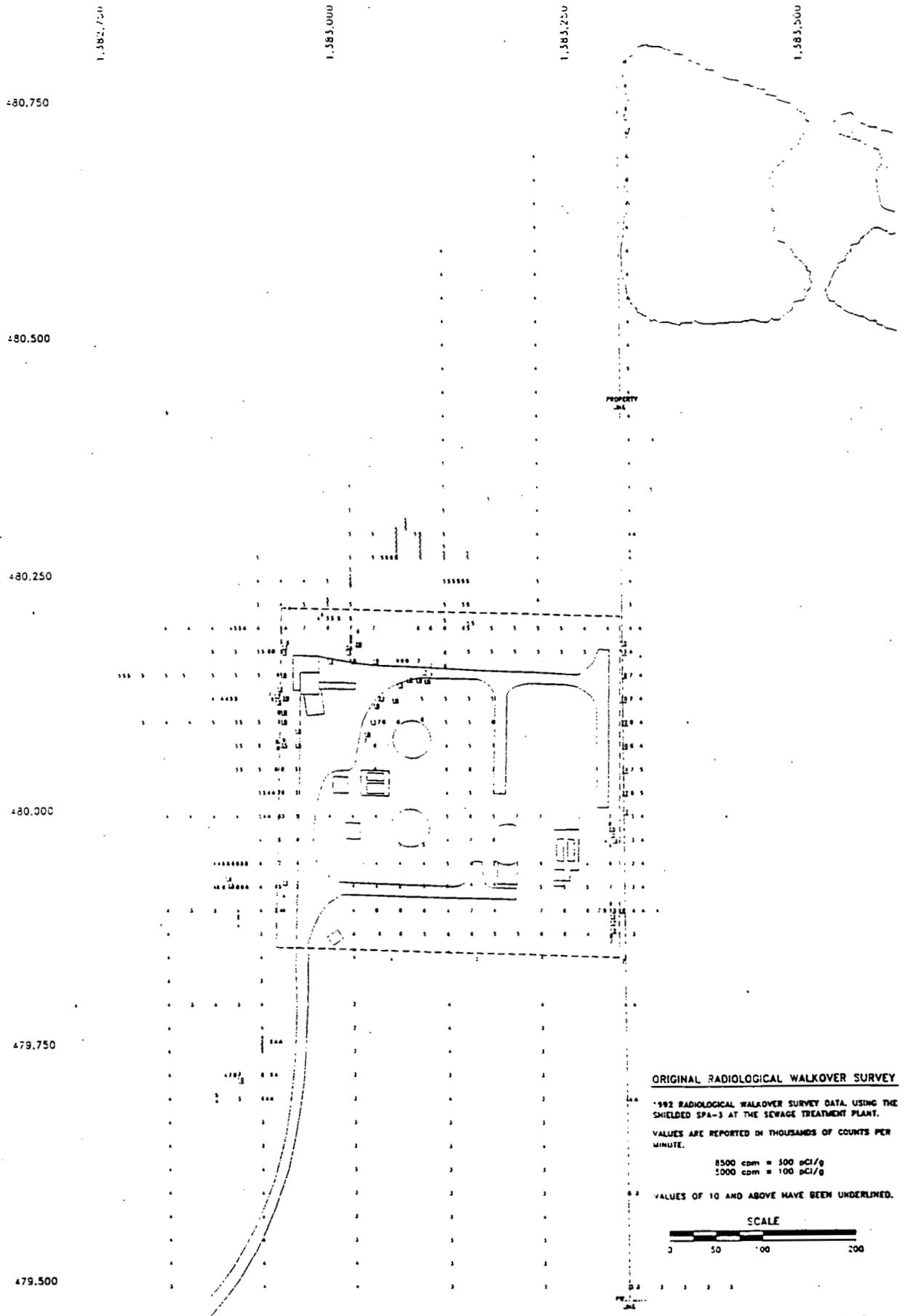


FIGURE 1, RADIOLOGICAL WALKOVER SURVEY MAP

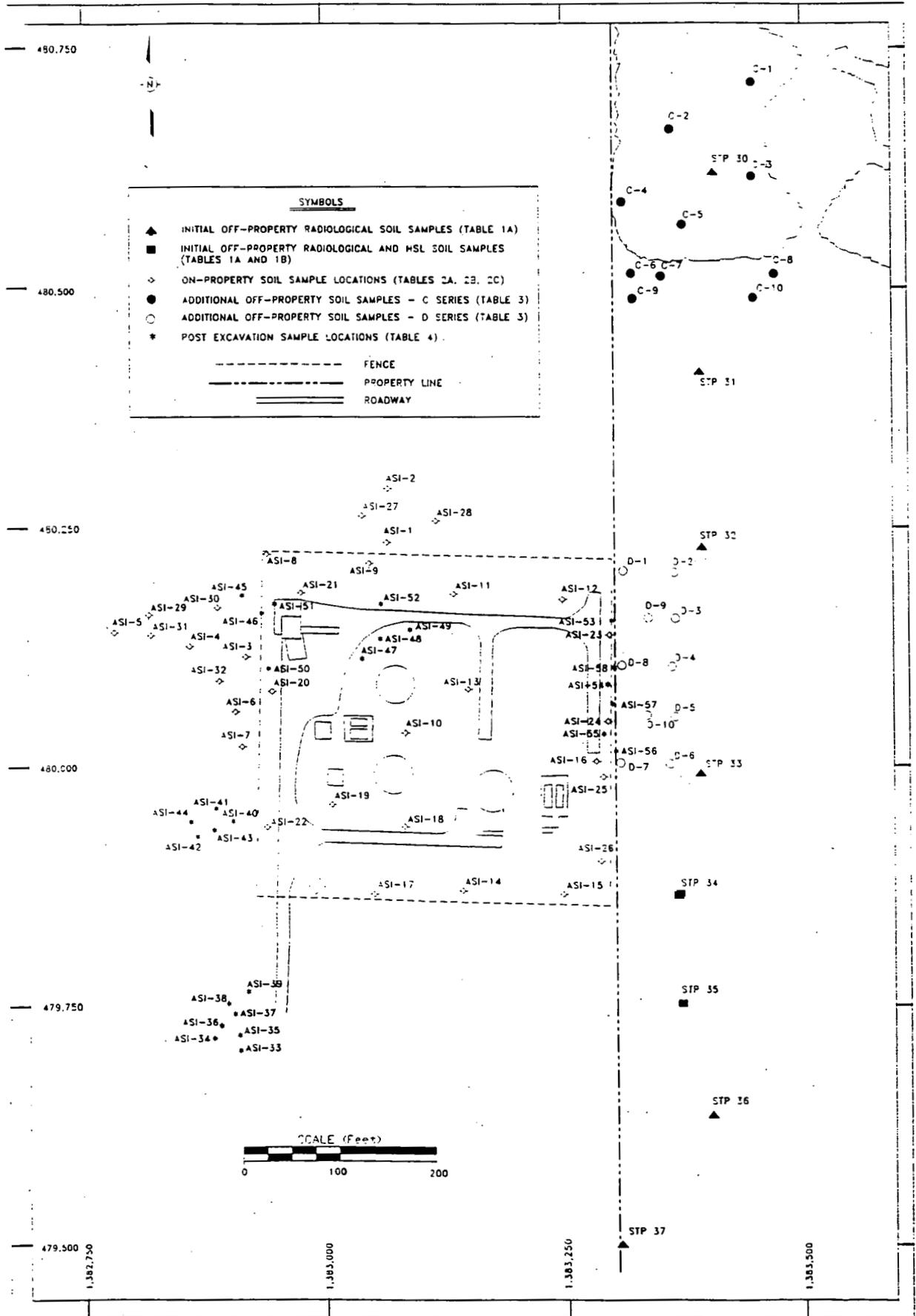


FIGURE 2, SOIL SAMPLE LOCATION MAP

TABLE 1A - INITIAL OFF-PROPERTY SOIL SAMPLING DATA - ISOTOPIC RADIOLOGICAL RESULTS

Soil Sample Location	Depth (in.)	ASI ID #	Ru-106 (pCi/g)	Cs-137 (pCi/g)	Ra-226 (pCi/g)	Ra-228 (pCi/g)	Th-228 (pCi/g)	Th-230 (pCi/g)	Th-232 (pCi/g)	U-234 (pCi/g)	U235/			Total U (ug/g)	Total U (pCi/g)
											U-236 (pCi/g)	U-238 (pCi/g)	U-238 (pCi/g)		
STP 30	Surface	102422	<1.0	0.67	1.29	1.33	1.49	2.03	1.26	23.80	1.56	26.00	86.50	58.47	
STP 31	Surface	102423	<1.0	0.17	1.42	1.10	1.44	1.55	1.06	6.99	<0.6	6.53	26.70	18.05	
STP 32	Surface	102424	<1.0	0.22	1.12	1.40	1.30	1.46	1.00	7.41	0.61	7.22	25.20	17.04	
STP 33	Surface	102425	<1.0	0.34	1.31	1.51	1.43	1.36	1.16	5.77	<0.6	6.12	15.90	10.75	
STP 34	Surface	102430	<1.0	0.22	1.37	1.29	1.37	1.81	1.04	5.65	<0.6	5.48	20.70	13.99	
STP 35	Surface	102431	<1.0	0.31	1.39	1.28	1.29	1.65	1.13	7.77	<0.6	7.77	30.70	20.75	
STP 36	Surface	102426	<1.0	0.47	1.15	1.17	1.20	1.47	1.05	6.20	<0.6	6.27	23.00	15.55	
STP 37	Surface	102427	<1.0	0.29	1.18	1.19	1.41	1.89	1.23	6.14	<0.6	6.02	24.80	16.76	

TABLE 1B - INITIAL OFF-PROPERTY SOIL SAMPLING DATA - HSL RESULTS

Volatile Organic Results, ug/kg			
Soil Sample Location	Depth (in.)	ID #	(RQLs)**
STP 34	Surface	102430	50
STP 35	Surface	102431	9 BJ
			6 BJ
			10
			2 BJ
			2 BJ
			21 B

Semi-volatile Organic Results, ug/kg			
Soil Sample Location	Depth (in.)	ID #	(RQLs)**
STP 34	Surface	102430	2400
STP 35	Surface	102431	130 J
			170 J

The full HSL list was analyzed, only analytes for which one sample had a result above the detection limit is listed.

All Dioxin Results were below the laboratory's detection limit.

--* = Results were below the laboratory's detection limit.
 ** Required Quantitation Limit per SCQ, Table 2-4.

ORGANIC DATA QUALIFIERS:
 B = The analyte was also found in the associated blank.
 J = Result is an estimated value.

TABLE 1B - INITIAL OFF-PROPERTY SOIL SAMPLING DATA - HSL RESULTS

Inorganic Results, mg/kg

Soil Sample Location	Depth (in.)	ID #	(UTL)**	Aluminum	Arsenic	Barium	Calcium	Chromium	Cobalt	Copper	Iron	Lead
STP 34	Surface	102430		10200	7.9 N	68.4	1320	13.4	9 B	11.9	14400	27.1 *
STP 35	Surface	102431		12900	7.3 + N	74.5	2590	17	11 B	10.5	18500	18.1 *

Soil Sample Location	Depth (in.)	ID #	(UTL)**	Magnesium	Manganese	Nickel	Potassium	Selenium	Silicon	Sodium	Vanadium	Zinc
STP 34	Surface	102430		3334	2516	27.3	1402	0.72	1984	60	35.3	68.5
STP 35	Surface	102431		2450	610 *	15.4	1420	0.54 BW	1980 EN*	45.7 B	26.9	46.3

Soil Sample Location	Depth (in.)	ID #	(UTL)**	Cyanide	pH
STP 34	Surface	102430		0.14 B	5.26
STP 35	Surface	102431		0.29 B	6.36

The full HSL list was analyzed, only analytes for which at least one sample had a result above the detection limit is listed.

-- = Results were below the laboratory's detection limit.
 ** Upper 95% Tolerance Limit, Background Study Report: FEMP-05BG-2, March 19, 1993.

INORGANIC DATA QUALIFIERS:

- B = Reported value was less than the Contract Required Detection Limit (CRQL), but greater than the Instrument Detection Limit (IDL).
- * = Duplicate analysis not within control limits.
- N = Spiked sample results were not within control limits.
- E = Result is an estimated value due to the presence of interference.
- W = Post-digestion spike is not out of control limits, but sample absorbance is less than 50% of spike absorbance.

TABLE 2A - ON-PROPERTY SOIL SAMPLING DATA - TOTAL URANIUM RESULTS

Sample Location	Total Uranium (pCi) Results at Various Depths											
	0-2"	2-4"	4-6"	6-12"	12-18"	18-24"	24-30"	30-36"	36-42"	42-48"		
ASI-1	166.9	165.5	49.3	< 7.4	< 7.4							
ASI-2	152.0	136.5	52.7	< 7.4	< 7.4							
ASI-3	79.7	57.4	56.8	18.9	23.0							
ASI-4	31.1	20.3	12.2	< 7.4	< 7.4							
ASI-5	164.9	152.7	115.5	23.0	< 7.4							
ASI-6	158.8	110.8	41.2	13.5	< 7.4							
ASI-7	97.3	92.6	60.8	13.5	9.5							
ASI-8	207.4	141.9	30.4	< 7.4	< 7.4	172.3						
ASI-9	153.4	114.2	120.3	33.8	< 7.4	< 7.4						
ASI-10	113.5	77.0	36.5	16.2	9.5	< 7.4						
ASI-11	133.1	93.2	54.1	18.9	< 7.4	< 7.4						
ASI-12	108.1	52.0	< 7.4	91.2	< 7.4	< 7.4						
ASI-13	56.8	50.7	32.4	11.5	< 7.4	< 7.4						
ASI-14	67.6	58.1	41.9	15.5	< 7.4	< 7.4						
ASI-15	75.7	70.3	37.8	14.2	< 7.4	< 7.4						
ASI-16	66.2	70.3	68.2	28.4	12.2	< 7.4						
ASI-17	74.3	73.7	9.5	56.8	< 7.4	< 7.4						
ASI-18	51.4	42.6	42.6	12.8	< 7.4	< 7.4						
ASI-19	< 7.4	< 7.4	< 7.4	< 7.4	< 7.4	< 7.4						
ASI-20						206.1	209.5	67.6	39.2	33.1		
ASI-21					83.8	< 7.4	< 7.4	< 7.4	< 7.4	< 7.4	< 7.4	
ASI-22		228.4		104.1	74.3	< 7.4	< 7.4	< 7.4	< 7.4	19.6		
ASI-23				37.8	< 7.4	< 7.4	< 7.4	< 7.4	< 7.4	< 7.4		
ASI-24				64.9	46.6	14.2	< 7.4	< 7.4	< 7.4	< 7.4		
ASI-25					< 7.4	< 7.4	14.9					
ASI-26				< 7.4	< 7.4	< 7.4	< 7.4	< 7.4	< 7.4	< 7.4		
ASI-27		60.1		< 7.4	< 7.4							
ASI-28		80.4		< 7.4	< 7.4							
ASI-29		< 7.4		140.5	< 7.4							
ASI-30		69.6		< 7.4	< 7.4							
ASI-31		68.9		< 7.4	< 7.4							
ASI-32		100		< 7.4	< 7.4							

TABLE 2B -- ON-PROPERTY SOIL SAMPLING DATA -- ISOTOPIC RADIOLOGICAL RESULTS

Soil Sample Location	Depth (in.)	Datachem ID #	FERMCO ID #	Ra-226 (pCi/g)		Ra-228 (pCi/g)		Th-230 (pCi/g)		Th-232 (pCi/g)		U-234 (pCi/g)		U-235/U-236 (pCi/g)		U-238 (pCi/g)		Total U (Datachem) (pCi/g)		Total U (FERMCO) (pCi/g)		Total U (FERMCO) (pCi/g)
				157	179	1.6	2.7	1.5	71.3	2.7	69.9	132.0	89.2	247	167.0							
ASI-1	0-2	103501	103503	1.57	1.79	1.6	2.7	1.5	71.3	2.7	69.9	132.0	89.2	247	167.0	247	167.0	247	167.0	247	167.0	167.0
ASI-1	2-4	103504	103506	1.64	1.77	1.9	8.6	1.7	75.2	3.1	75.8	119.0	80.4	245	165.6	245	165.6	245	165.6	245	165.6	165.6
ASI-1	4-6	103507	103509	1.55	1.58	0.8	1.5	0.9	35.9	1.9	34.6	57.4	38.8	73	49.3	73	49.3	73	49.3	73	49.3	49.3
ASI-1	6-12	103510	103512	1.49	1.32	1.3	1.3	1.5	1.6	0.1	1.7	6.5	4.4	<11	<7.4	<11	<7.4	<11	<7.4	<11	<7.4	<7.4
ASI-1	12-18	103513	103515	1.68	1.48	1.3	1.5	1.0	1.1	<0.01	1.5	2.7	1.8	<11	<7.4	<11	<7.4	<11	<7.4	<11	<7.4	<7.4
ASI-2	0-2	103517	103516	1.52	1.64	1.0	1.9	1.2	60.4	2.6	62.1	115.0	77.7	225	152.1	225	152.1	225	152.1	225	152.1	152.1
ASI-2	2-4	103518	103519	1.45	1.69	0.8	1.6	1.0	50.1	2.4	49.4	100.0	67.6	202	136.6	202	136.6	202	136.6	202	136.6	136.6
ASI-2	4-6	103520	103521	1.43	1.38	1.3	1.6	1.4	19.3	1.3	18.3	37.9	25.6	78	52.7	78	52.7	78	52.7	78	52.7	52.7
ASI-2	6-12	103522	103523	1.38	1.31	0.8	1.6	1.0	1.5	0.2	2.3	28.8	19.5	<11	<7.4	<11	<7.4	<11	<7.4	<11	<7.4	<7.4
ASI-2	12-18	103524	103525	1.24	1.27	0.7	1.6	0.7	35.9	2.0	36.7	83.5	56.4	118	79.8	118	79.8	118	79.8	118	79.8	79.8
ASI-3	0-2	103532	103535	1.85	1.63	0.7	1.5	0.6	27.4	1.1	28.1	65.6	44.3	85	57.5	85	57.5	85	57.5	85	57.5	57.5
ASI-3	2-4	103536	103538	1.72	1.64	0.4	1.5	1.1	21.9	1.4	25.0	49.4	33.4	84	56.8	84	56.8	84	56.8	84	56.8	56.8
ASI-3	4-6	103539	103541	1.55	1.37	0.3	0.9	0.5	17.4	0.9	18.4	38.7	26.2	28	18.9	28	18.9	28	18.9	28	18.9	18.9
ASI-3	6-12	103542	103544	1.51	1.30	0.5	1.0	0.8	12.8	0.8	12.7	25.2	17.0	34	23.0	34	23.0	34	23.0	34	23.0	23.0
ASI-3	12-18	103545	103547	1.43	1.32	1.2	1.7	1.3	13.4	0.7	14.1	16.6	11.2	46	31.1	46	31.1	46	31.1	46	31.1	31.1
ASI-4	0-2	103548	103549	1.43	1.32	1.2	1.7	1.3	9.1	0.3	9.4	17.5	11.8	30	20.3	30	20.3	30	20.3	30	20.3	20.3
ASI-4	2-4	103550	103551	1.43	1.23	0.9	1.5	1.0	5.7	0.2	5.6	7.8	5.3	18	12.2	18	12.2	18	12.2	18	12.2	12.2
ASI-4	4-6	103552	103553	1.55	1.17	0.9	1.5	1.1	2.1	0.1	2.4	4.1	2.8	<11	<7.4	<11	<7.4	<11	<7.4	<11	<7.4	<7.4
ASI-4	6-12	103554	103555	1.57	1.34	1.1	1.1	1.5	2.1	0.1	2.4	4.2	2.8	<11	<7.4	<11	<7.4	<11	<7.4	<11	<7.4	<7.4
ASI-4	12-18	103556	103557	1.54	1.38	1.2	1.5	1.3	2.3	0.1	2.4	4.2	2.8	<11	<7.4	<11	<7.4	<11	<7.4	<11	<7.4	<7.4
ASI-5	0-2	103558	103559	1.57	1.66	1.3	3.4	1.7	74.0	5.0	82.5	158.0	106.8	244	164.9	244	164.9	244	164.9	244	164.9	164.9
ASI-5	2-4	103560	103561	1.69	1.70	1.0	2.8	1.4	73.5	4.3	76.4	147.6	99.8	226	152.8	226	152.8	226	152.8	226	152.8	152.8
ASI-5	4-6	103562	103563	1.50	1.49	1.8	3.0	1.8	67.2	3.6	67.6	135.6	91.7	171	115.6	171	115.6	171	115.6	171	115.6	115.6
ASI-5	6-12	103564	103565	1.49	1.31	1.3	1.3	1.0	9.7	0.5	9.8	22.5	15.2	34	23.0	34	23.0	34	23.0	34	23.0	23.0
ASI-5	12-18	103566	103567	1.37	1.30	0.8	1.5	1.1	2.5	0.1	2.4	3.8	2.6	<11	<7.4	<11	<7.4	<11	<7.4	<11	<7.4	<7.4
ASI-6	0-2	103569	103570	0.96	0.84	1.2	1.7	1.4	80.7	3.8	78.7	182.0	123.0	235	158.9	235	158.9	235	158.9	235	158.9	158.9
ASI-6	2-4	103571	103572	0.84	0.84	1.2	1.7	1.4	53.4	2.2	54.5	129.0	87.2	164	110.9	164	110.9	164	110.9	164	110.9	110.9
ASI-6	4-6	103573	103574	0.91	0.97	1.1	1.5	1.1	23.4	0.9	24.0	47.1	31.8	61	41.2	61	41.2	61	41.2	61	41.2	41.2
ASI-6	6-12	103575	103576	0.81	0.81	1.2	1.5	1.2	3.4	0.1	3.1	6.5	4.4	20	13.5	20	13.5	20	13.5	20	13.5	13.5
ASI-6	12-18	103577	103578	0.81	1.10	1.0	1.4	1.0	1.3	<0.01	<0.01	3.6	2.4	<11	<7.4	<11	<7.4	<11	<7.4	<11	<7.4	<7.4
ASI-7	0-2	103579	103580	0.85	1.32	1.4	2.4	1.6	50.0	1.9	49.1	102.0	69.0	144	97.3	144	97.3	144	97.3	144	97.3	97.3
ASI-7	2-4	103581	103582	0.92	1.38	1.3	2.6	1.4	45.9	2.9	46.7	97.6	66.0	137	92.6	137	92.6	137	92.6	137	92.6	92.6
ASI-7	4-6	103584	103584	0.88	1.34	1.3	2.6	1.4	37.6	2.0	38.1	74.4	50.3	90	60.8	90	60.8	90	60.8	90	60.8	60.8
ASI-7	6-12	103583	103586	0.95	1.08	1.3	1.7	1.5	6.2	0.2	5.6	14.0	9.5	20	13.5	20	13.5	20	13.5	20	13.5	13.5
ASI-7	12-18	103587	103588	0.80	1.03	1.2	1.8	1.8	2.4	0.2	2.5	5.3	3.6	14	9.5	14	9.5	14	9.5	14	9.5	9.5
ASI-8	0-2	103677	103679	1.39	1.39	1.2	4.5	1.2	92.0	5.1	93.9	247.0	167.0	307	207.5	307	207.5	307	207.5	307	207.5	207.5
ASI-8	2-4	103680	103682	1.65	1.33	3.1	4.5	1.1	70.4	3.6	70.2	194.0	131.1	210	142.0	210	142.0	210	142.0	210	142.0	142.0
ASI-8	4-6	103683	103685	1.82	1.29	3.5	4.1	1.2	40.1	2.6	41.7	120.0	81.1	45	30.4	45	30.4	45	30.4	45	30.4	30.4
ASI-8	6-12	103686	103688	1.14	0.96	2.4	2.2	1.3	17.4	0.9	17.3	50.1	33.9	<11	<7.4	<11	<7.4	<11	<7.4	<11	<7.4	<7.4
ASI-8	12-18	103689	103691	1.10	1.11	3.4	1.3	1.3	2.4	0.1	2.3	5.9	4.0	<11	<7.4	<11	<7.4	<11	<7.4	<11	<7.4	<7.4
ASI-8	18-24	103692	103694	1.17	1.13	3.3	1.7	1.0	1.1	0.1	1.2	2.7	1.8	255	172.4	255	172.4	255	172.4	255	172.4	172.4
ASI-9	0-2	103715	103718	1.24	1.52	2.8	2.6	1.1	77.8	4.5	76.6	226.4	153.0	227	153.5	227	153.5	227	153.5	227	153.5	153.5
ASI-9	2-4	103717	103718	1.32	1.63	2.7	2.5	1.5	64.6	4.5	64.8	211.6	143.0	169	114.2	169	114.2	169	114.2	169	114.2	114.2
ASI-9	4-6	103719	103720	1.20	1.42	2.1	2.4	1.3	63.1	3.9	62.0	192.0	129.8	178	120.3	178	120.3	178	120.3	178	120.3	120.3
ASI-9	6-12	103721	103722	1.23	1.19	3.3	1.9	1.3	11.4	0.6	11.6	34.4	23.3	50	33.8	50	33.8	50	33.8	50	33.8	33.8
ASI-9	12-18	103723	103724	1.33	1.17	3.0	1.2	1.0	3.5	0.1	3.2	8.6	5.8	<11	<7.4	<11	<7.4	<11	<7.4	<11	<7.4	<7.4
ASI-9	18-24	103725	103726	1.28	1.10	3.9	1.9	1.1	2.8	0.2	2.5	6.5	4.4	<11	<7.4	<11	<7.4	<11	<7.4	<11	<7.4	<7.4
ASI-10	0-2	103701	103702	2.05	1.54	2.6	4.2	1.1	44.5	3.2	46.6	142.0	96.0	168	113.6	168	113.6	168	113.6	168	113.6	113.6
ASI-10	2-4	103703	103704	1.89	1.41	3.1	4.7	1.5	41.6	2.5	41.7	109.2	73.8	114	77.1	114	77.1	114	77.1	114	77.1	77.1
ASI-10	4-6	103705	103706	1.77	1.18	1.9	2.3	1.0	19.8	1.0	20.3	49.3	33.3	54	36.5	54	36.5	54	36.5	54	36.5	36.5
ASI-10	6-12	103707	103708	1.69	1.00	2.9	2.5	1.0	10.3	0.5	10.5	27.8	18.8	24	16.2	24	16.2	24	16.2	24	16.2	16.2
ASI-10	12-18	103709	103710	4.39	0.77	3.4	6.6	0.6	7.8	0.4	7.0	18.1	12.2	14	9.5	14	9.5	14	9.5	14	9.5	9.5

TABLE 2B -- ON-PROPERTY SOIL SAMPLING DATA -- ISOTOPIC RADIOLOGICAL RESULTS

Sample Location	Depth (in.)	Datachem ID #	FERMCO ID #	Ra-226 (pCi/g)	Ra-228 (pCi/g)	Th-228 (pCi/g)	Th-230 (pCi/g)	Th-232 (pCi/g)	U-234 (pCi/g)	U-235/U-236 (pCi/g)	U-238 (pCi/g)	Total U (Datachem) (µg/g)	Total U (Datachem) (pCi/g)	Total U (FERMCO) (pCi/g)	Total U (FERMCO) (pCi/g)
ASI-11	2-4	103772	103773	1.81	1.58	1.7	3.0	1.5	39.4	1.8	38.8	124.8	84.4	138	93.3
ASI-11	4-6	103774	103775	1.49	1.27	1.1	2.3	1.1	28.4	1.5	27.3	73.2	49.5	80	54.1
ASI-11	6-12	103776	103777	1.31	1.13	1.3	1.4	1.3	9.5	0.7	9.3	33.8	22.8	28	18.9
ASI-11	12-18	103778	103779	1.31	1.13	1.1	1.2	1.3	2.1	0.1	2.3	6.4	4.3	<11	<7.4
ASI-11	18-24	103780	103781	1.38	1.21	1.3	1.4	1.0	1.6	0.1	1.8	5.0	3.4	<11	<7.4
ASI-12	0-2	103754	103755	1.50	1.44	1.2	2.1	1.1	46.7	2.6	47.3	148.4	100.3	160	108.2
ASI-12	2-4	103756	103757	1.45	1.28	1.4	2.4	1.2	43.1	2.4	43.4	142.8	96.5	77	52.1
ASI-12	4-6	103758	103759	1.22	1.16	1.0	1.4	1.1	24.9	1.0	24.6	66.0	44.6	<11	<7.4
ASI-12	6-12	103760	103761	1.07	1.06	1.1	1.1	0.9	3.5	0.1	3.3	9.8	6.6	135	91.3
ASI-12	12-18	103762	103763	1.21	1.07	1.1	1.2	1.1	1.2	0.0	1.2	3.6	2.4	<11	<7.4
ASI-12	18-24	103764	103765	1.29	1.24	1.0	0.9	0.9	1.2	0.0	1.1	3.2	2.2	<11	<7.4
ASI-13	0-2	103730	103732	2.53	1.28	1.0	4.3	1.5	29.6	1.6	29.9	72.3	48.9	84	56.8
ASI-13	2-4	103733	103735	2.78	1.38	1.2	4.3	1.2	27.0	1.1	25.3	61.5	41.6	75	50.7
ASI-13	4-6	103736	103738	2.68	1.07	0.9	4.0	0.8	18.8	1.2	19.5	40.9	27.6	48	32.4
ASI-13	6-12	103739	103741	2.49	1.04	0.8	2.8	0.8	9.5	0.5	9.4	26.9	18.2	17	11.5
ASI-13	12-18	103742	103744	1.02	0.79	0.7	1.1	0.7	3.8	0.2	3.7	9.2	6.2	<11	<7.4
ASI-13	18-24	103745	103747	0.86	0.74	0.6	1.0	0.6	1.0	0.1	1.2	3.9	2.7	<11	<7.4
ASI-14	0-2	103637	103638	12.50	1.08	2.1	33.2	1.2	31.0	1.3	31.5	74.7	50.5	100	67.6
ASI-14	2-4	103639	103640	13.40	1.13	2.2	25.6	0.7	26.0	1.0	26.0	66.0	44.6	86	58.1
ASI-14	4-6	103641	103642	15.40	1.09	2.5	28.9	1.4	19.9	0.8	22.0	48.9	33.1	62	41.9
ASI-14	6-12	103643	103644	3.84	0.92	3.7	6.9	1.1	9.7	0.5	10.9	24.8	16.8	23	15.5
ASI-14	12-18	103645	103646	1.37	0.97	2.8	1.4	0.7	3.8	0.1	4.3	10.0	6.8	<11	<7.4
ASI-14	18-24	103647	103648	1.22	1.11	3.3	1.8	0.7	1.6	0.0	1.6	3.8	2.6	<11	<7.4
ASI-15	0-2	103786	103787	16.60	1.15	1.4	31.9	1.0	29.0	1.6	28.8	100.0	67.6	112	75.7
ASI-15	2-4	103788	103789	17.80	1.23	1.6	30.2	1.2	29.6	1.7	29.4	102.0	69.0	104	70.3
ASI-15	4-6	103790	103791	11.20	0.89	1.4	26.0	1.2	18.1	0.9	17.0	51.7	34.9	56	37.9
ASI-15	6-12	103792	103793	4.06	1.14	1.2	5.2	1.2	8.1	0.3	8.2	24.1	16.3	21	14.2
ASI-15	12-18	103794	103795	1.26	1.10	1.1	1.9	0.9	3.1	0.1	2.8	11.5	7.8	<11	<7.4
ASI-15	18-24	103796	103797	1.47	1.33	1.2	1.5	1.4	1.7	0.0	1.8	5.0	3.4	<11	<7.4
ASI-16	0-2	103802	103804	5.43	1.24	1.1	17.1	1.4	30.9	1.7	30.2	94.6	63.9	98	66.2
ASI-16	2-4	103805	103807	6.29	1.23	1.0	12.8	1.1	34.0	2.1	35.8	87.6	59.2	104	70.3
ASI-16	4-6	103808	103810	9.31	1.17	1.2	16.4	1.3	31.3	1.9	33.3	99.5	67.3	101	68.3
ASI-16	6-12	103811	103813	12.40	0.91	1.0	19.7	0.8	15.7	0.7	15.7	47.2	31.9	42	28.4
ASI-16	12-18	103814	103816	3.10	0.98	1.0	4.0	0.7	8.6	0.6	9.3	27.0	18.3	18	12.2
ASI-16	18-24	103817	103819	1.65	1.16	1.4	2.8	1.3	3.3	0.2	3.8	11.4	7.7	<11	<7.4
ASI-17	0-2	103604	103605	15.70	1.04	2.8	47.0	1.0	36.6	1.6	36.8	93.8	63.4	110	74.4
ASI-17	2-4	103606	103607	15.60	1.00	3.0	46.7	1.0	37.0	1.7	34.1	99.7	67.4	109	73.7
ASI-17	4-6	103608	103609	14.50	1.21	3.2	8.2	0.8	24.0	1.1	24.1	74.6	50.4	14	9.5
ASI-17	6-12	103610	103611	4.10	1.09	2.3	6.8	1.1	7.8	0.5	8.4	32.2	21.8	84	56.8
ASI-17	12-18	103612	103613	1.16	1.02	2.6	1.2	1.2	1.3	0.0	1.5	22.5	15.2	<11	<7.4
ASI-17	18-24	103614	103615	1.32	1.18	2.6	3.3	0.8	26.0	1.4	28.9	27.3	18.5	<11	<7.4
ASI-18	0-2	103620	103621	1.59	0.82	2.2	3.4	1.1	19.2	0.9	20.5	80.2	54.2	76	51.4
ASI-18	2-4	103622	103623	1.83	0.97	2.5	2.9	1.0	19.1	1.1	21.0	71.3	48.2	63	42.6
ASI-18	4-6	103624	103625	1.71	0.86	2.3	2.7	0.7	19.8	1.3	20.3	78.7	53.2	63	42.6
ASI-18	6-12	103626	103627	1.51	1.10	2.1	1.6	0.8	8.0	0.4	8.5	50.8	34.3	19	12.8
ASI-18	12-18	103628	103629	1.10	1.00	2.4	1.5	1.0	1.6	0.1	2.0	49.5	33.5	<11	<7.4
ASI-18	18-24	103630	103631	1.36	1.39	2.8	1.8	1.0	1.0	0.0	0.9	40.4	27.3	<11	<7.4
ASI-19	0-2	103654	103656	1.26	1.02	2.4	2.1	1.2	5.4	0.3	5.7	15.3	10.3	<11	<7.4
ASI-19	2-4	103657	103659	1.39	1.15	2.5	1.7	1.1	4.6	0.2	4.5	14.0	9.5	<11	<7.4
ASI-19	4-6	103660	103662	0.88	0.83	2.8	1.4	0.8	5.2	0.4	5.9	18.2	12.3	<11	<7.4
ASI-19	6-12	103663	103665	0.99	1.02	2.4	1.1	1.2	3.3	0.2	3.6	9.8	6.6	<11	<7.4
ASI-19	12-18	103666	103668	1.10	1.00	2.6	1.1	1.0	3.0	0.2	3.0	11.0	7.7	<11	<7.4

TABLE 2C ON --PROPERTY SOIL SAMPLING DATA HSL RESULTS

Volatile Organic Results, ug/kg

Soil Sample Location	Depth (in.)	HSL ID #/ Dioxin ID #	(RQLs)**	Acetone	Toluene	Methylene Chloride
ASI-1	0-2	103501/103502	50	10	10	10
ASI-1	2-4	103504/103505	--	--	--	--
ASI-1	4-6	103507/103508	--	--	2 J	--
ASI-1	6-12	103510/103511	--	2 J	2 J	--
ASI-1	12-18	103513/103514	--	--	--	--
ASI-3	0-2	103532/103534	--	--	--	--
ASI-3	2-4	103536/103537	--	--	--	--
ASI-3	4-6	103539/103540	--	--	--	--
ASI-3	6-12	103542/103543	--	--	--	--
ASI-3	12-18	103545/103546	--	--	--	--
ASI-8	0-2	103677/103678	--	--	--	--
ASI-8	2-4	103680/103681	17 B/18 B	--	--	2 J
ASI-8	4-6	103683/103684	--	U/7 J	--	--
ASI-8	6-12	103686/103687	11 BJ	--	--	--
ASI-8	12-18	103689/103690	15 B	--	--	--
ASI-8	18-24	103692/103693	11 BJ/12 BJ	--	--	U/2 BJ
ASI-13	0-2	103730/103731	--	2 J/U	1 J/U	1 J/U
ASI-13	2-4	103733/103734	11 BJ/U	--	--	--
ASI-13	4-6	103736/103737	--	--	1 J/2 J	U/3 J
ASI-13	6-12	103739/103740	10 BJ/8 BJ	U/3 J	--	--
ASI-13	12-18	103742/103743	11 BJ	--	--	--
ASI-13	18-24	103745/103746	14 B/13 B	--	--	U/2 J
ASI-16	0-2	103802/103803	--	--	--	--
ASI-16	2-4	103805/103806	U/5 BJ	--	--	--
ASI-16	4-6	103808/103809	8 BJ	--	--	--
ASI-16	6-12	103811/103812	--	--	--	--
ASI-16	12-18	103814/103815	7 BJ	--	--	--
ASI-16	18-24	103817/103818	6 BJ	--	--	--
ASI-19	0-2	103654/103655	6 BJ	--	--	--
ASI-19	2-4	103657/103658	5 BJ	--	--	--
ASI-19	4-6	103660/103661	--	3 J	--	--
ASI-19	6-12	103663/103664	--	--	--	--
ASI-19	12-18	103666/103667	5 BJ	--	--	--
ASI-19	18-24	103669/103670	--	--	--	--

The full HSL list was analyzed, only analytes for which at least one sample had a result above the detection limit is listed.

All Dioxin Results were below the laboratory's detection limit.

-- = Results were below the laboratory's detection limit.

** Required Quantitation Limits per SCQ, Table 2-4.

ORGANIC DATA QUALIFIERS:

B = The analyte was also found in the associated blank.

J = Result is an estimated value.

U = Result is below laboratory's detection limit.

TABLE 2C -- ON-PROPERTY SOIL SAMPLING DATA -- HSL RESULTS

Semi-volatile Organic Results, ug/kg

Soil Sample Location	Butylbenzyl-phthalate (RQLs)**	Benzo(a) Anthracene	Chrysene	bis(2-Ethylhexyl) Phthalate	Benzo(b) Fluoranthene	Benzo(k) Fluoranthene	Benzo(a) Pyrene	Indeno(1,2,3-cd) Pyrene	Dibenz(a,h) Anthracene	Benzo(g,h,i) Perylene
ASI-1	330	330	330	330	330	330	330	330	330	330
ASI-1		29 J	44 J		34 J		27 J			
ASI-1										
ASI-1										
ASI-1										
ASI-3		68 J	85 J		81 J	77 J	83 J	88 J		140 J
ASI-3		24 J	34 J		37 J	31 J	31 J	27 J		48 J
ASI-3	U/26 J	56 J/67 J	55 J/66J		51 J/67 J	59 J/61 J	48 J/52 J	69 J/69 J		94 J/140 J
ASI-3										
ASI-8		78 J	120 J		110 J	91 J	68 J			
ASI-8		61 J	87 J	39 BJ	140 J	150 J	110 J			
ASI-8		590	590		1800	1300	940	1500	400 J	1100
ASI-8										
ASI-8										
ASI-13										
ASI-13										
ASI-13										
ASI-13										
ASI-13										
ASI-13										
ASI-16			49 J	280 BJ						
ASI-16		52 J	54 J		44 J	64 J	47 J			
ASI-16		57 J	66 J		55 J	56 J				
ASI-16										
ASI-16										
ASI-19			45 J	24 BJ						
ASI-19				54 BJ						
ASI-19										
ASI-19										
ASI-19										
ASI-19										
ASI-19										
ASI-19										

The full HSL list was analyzed, only analytes for which at least one sample had a result above the detection limit is listed.

All Dioxin Results were below the laboratory's detection limit.

* = Results were below the laboratory's detection limit.
 ** Required Quantitation Limits per SCQ, Table 2-4.

ORGANIC DATA QUALIFIERS:

B = The analyte was also found in the associated blank.
 J = Result is an estimated value.

TABLE 2C - ON-PROPERTY SOIL SAMPLING DATA - HSL RESULTS

Inorganic Results, mg/kg

Soil Sample Location	Aluminum (UTL)**	Antimony	Arsenic	Barium	Beryllium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese
ASI-1	13724	7.7	10.2	161.6	0.6	5791	17.8	17.8	16.4	25979	25.6	3334	2516
ASI-1	11200 *	--	4.6	85.4	0.73 B	3650	16.2 *	7.2 B	17.7	16300	33.3	2210	593
ASI-1	10300 *	--	6.2	83.2	0.91 B	3410	15.8 *	7.9 B	15.6	16000	37.4	2130	560
ASI-1	10200 *	--	5.4	78.9	0.69 B	2340	14.5 *	7.6 B	11.2	17100	21.3	1860	629
ASI-1	18000 *	--	9.5	126	1.2	2920	23.3 *	15.3	19	31800	16.7	3260	791
ASI-1	21600 *	--	14	150	1.5	3560	25.9 *	18.6	24.1	36900	22.6	3980	1290
ASI-3	14800 *	--	6.6	114	0.95 B	4980	19.9 *	8.9 B	17.6	24000	24.9	3410	721
ASI-3	14500 *	--	8	206	1.1 B	4710	19.0 *	21.3	19.9	27600	22.3	3450	2170
ASI-3	14800 *	--	8	148	1.3 B	4380	19.0 *	16.9	19.7	30000	40 +	3290	1610
ASI-3	20200 *	--	8.7	152	1.3	4370	25.3 *	14.2	24.9	34000	15.5	4070	1230
ASI-3	16100 *	--	12.5	124	1.1 B	5110	22.7 *	9.2 B	23.2	31800	19.3	4150	551
ASI-8	10900 *	--	4.8 N*	81.5	--	5430 *	16.0 *	6.9 B	20.9	21500	87.7 S*	2820 *	369 N
ASI-8	15400 *	21.5 N	6.1 N*	116	0.80 B	6230 *	22.6 *	9.3 B	21.6	22600	101 S*	3980 *	558 N
ASI-8	15400 *	--	6.8 N*	118	0.69 B	10300 *	23.5 *	13.1	23.8	25800	137 S*	5450 *	1060 N
ASI-8	13600 *	--	6.1 N*	87.2	0.66 B	3220 *	17.7 *	9.3 B	11	19900	22.0 *	2510 *	701 N
ASI-8	22500 *	--	13.2 N*	108	0.86 B	3540 *	26.9 *	12.5	23.8	34700	18.3 *	3780 *	432 N
ASI-8	27000 *	--	12.1 N*	137	1.1 B	3480 *	31.1 *	12.3 B	22.9	34300	14.7 *	4690 *	570 N
ASI-13	14900 *	--	5.5 N*	101	0.72 B	16900 *	20.0 *	8.0 B	17.5	20800	40.9 *	7240 *	558 N
ASI-13	18100 *	--	6.3 N*	106	1.1 B	19700 *	24.0 *	9.4 B	17.9	22200	46.6 *	8620 *	576 N
ASI-13	17200 *	19.3 N	6.6 N*	130	0.64 B	26400 *	21.0 *	11.7 B	18.4	24700	570 *	10100 *	913 N
ASI-13	14900 *	--	5.5 N*	97.2	0.63 B	74500 *	17.4 *	15.8	16	22200	17.4 S*	21300 *	1090 N
ASI-13	18400 *	--	6.1 N*	97.1	0.63 B	73900 *	21.9 *	9.6 B	18.5	25500	9.9 *	21200 *	530 N
ASI-13	14300 *	--	5.5 N*	83.1	--	136000 *	16.8 *	9.0 B	15.2	19800	11.6 S*	28300 *	726 N
ASI-16	17400	--	6.1	176	0.76 B	7780	22.7	12.0 B	31.9	24700	38.9 *	4000	1880 E
ASI-16	18800	--	7	166	0.71 B	7130	23.6	12.7 B	26.7	24200	45.4 *	4070	2010 E
ASI-16	18100	--	5.7	154	0.89 B	8580	23.3	13.7	25.2	24400	37.0 *	5110	1750 *
ASI-16	13200	--	5.1	94.9	0.68 B	21700	17.7	11.2 B	19.5	18600	26.2 S*	9240	840 E
ASI-16	14700	--	6.4	113	0.60 B	10700	19.3	10.2 B	18.6	19300	31.4 +	4860	871 E
ASI-16	23000	--	9.1	150	1.0 B	5780	27.6	13.9	25.6	32400	21.4 S*	4600	904 E
ASI-19	12900 *	--	13.7 N*	79.2	0.52 B	30800 *	15.9 *	8.9 B	17.9	21100	15.5 *	14000 *	435 N
ASI-19	17000 *	--	28.4 N*	78.7	0.65 B	14200 *	20.5 *	9.8 B	18.9	25900	16.4 *	7150 *	343 N
ASI-19	13900 *	--	6.1 N*	75.8	--	42800 *	17.8 *	7.7 B	15	21200	12.3 *	12100 *	419 N
ASI-19	13400 *	--	6.1 N*	106	0.65 B	22200 *	16.0 *	10.0 B	10.7	18700	20.9 S*	6720 *	1030 N
ASI-19	25700 *	--	8.7 N*	172	1.3	4630 *	29.6 *	12.5	21.3	31300	17.0 *	4580 *	685 N
ASI-19	22400 *	--	8.8 N*	167	1.1 B	7680 *	25.7 *	12.5	19.7	28700	14.8 *	5760 *	885 N

The full HSL list was analyzed, only analytes for which at least one sample had a result above the detection limit is listed.

-- = Results were below the laboratory's detection limit.

** Upper 95% Tolerance Limit, Background Study report: FEMP-05BG-2, March 19, 1993.

INORGANIC DATA QUALIFIERS:

S = The result was reported by the Method of Standard Additions.

B = Reported value was less than the Contract Required Detection Limit (CRQL), but greater than the Instrument Detection Limit (IDL).

* = Duplicate analysis not within control limits.

N = Spiked sample results were not within control limits.

E = Result is an estimated value due to the presence of interference.

W = Post-digestion spike is not out of control limits, but sample absorbance is less than 50% of spike absorbance.

TABLE 3 - ADDITIONAL OFF - PROPERTY SOIL SAMPLING DATA

Soil Location	Sample Location	Depth (in.)	Datchem ID #	FERMCO ID #	Ra-226 (pCi/g)		Th-232 (pCi/g)		U-234 (pCi/g)		U-235/U-236 (pCi/g)		U-238 (pCi/g)		Total U (Datachem) (ug/g)		Total U (Datachem) (pCi/g)		Total U (FERMCO) (ug/g)		Total U (FERMCO) (pCi/g)	
					1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
C-1	104001	0-2	104002	104002	0.95	1.26	1.2	1.4	1.2	1.6	0.2	0.2	20.6	48.5	32.8	70	47.3					
C-1	104001	2-4	104004	104004	0.79	1.17	1.2	2.0	1.3	16.7	0.9	0.9	22.2	30.8	20.8	68	46.0					
C-1	104005	4-6	104006	104006	0.88	1.20	1.2	2.2	1.0	17.2	0.9	0.9	21.7	63.3	42.8	70	47.3					
C-2	104007	0-2	104008	104008	0.86	1.07	1.4	2.2	1.3	24.1	1.6	1.6	36.6	87.2	58.9	118	79.8					
C-2	104009	2-4	104010	104010	0.93	1.31	1.1	2.4	1.2	26.0	1.5	1.5	37.5	96.8	65.4	110	74.4					
C-2	104011	4-6	104012	104012	0.90	1.21	1.2	2.2	0.9	21.9	2.2	1.4	35.4	80.8	54.6	104	70.3					
C-3	104013	0-2	104014	104014	0.88	1.12	0.9	1.3	0.8	11.3	0.7	0.7	12.0	27.2	18.4	38	25.7					
C-3	104015	2-4	104016	104016	0.84	1.09	1.1	1.9	1.2	15.3	0.8	0.8	17.0	27.7	18.7	40	27.0					
C-3	104017	4-6	104018	104018	0.89	1.18	1.2	1.4	1.2	11.8	0.7	0.7	12.9	26.2	17.7	42	28.4					
C-4	104019	0-2	104020	104020	0.87	1.41	0.6	1.2	0.6	44.6	2.6	2.6	44.9	76.3	51.6	145	98.0					
C-4	104021	2-4	104022	104022	1.01	1.23	0.7	1.5	0.9	29.4	1.4	1.4	29.2	56.1	37.9	111	75.0					
C-4	104023	4-6	104024	104024	0.88	1.14	1.0	1.7	1.8	13.3	0.7	0.7	14.2	28.5	19.3	37	25.0					
C-5	104025	0-2	104026	104026	1.13	1.44	1.0	1.8	1.2	31.2	1.9	1.9	31.3	58.1	39.3	100	67.6					
C-5	104027	2-4	104028	104028	0.96	1.17	0.8	1.5	0.5	30.2	1.5	1.5	28.4	47	31.8	67	45.3					
C-5	104029	4-6	104030	104030	1.08	1.37	0.9	1.0	0.7	6.5	0.8	0.8	16.0	28.3	19.1	51	34.5					
C-6	104031	0-2	104032	104032	1.17	1.4	1.4	2.0	1.2	6.3	0.7	0.7	6.6	8.55	5.8	22	14.9					
C-6	104033	2-4	104034	104034	1.01	1.26	1.3	1.8	1.2	6.6	0.4	0.4	6.1	14.2	9.6	24	16.2					
C-6	104035	4-6	104036	104036	0.97	1.09	1.0	1.6	1.2	6.2	0.3	0.3	7.0	12	8.1	25	16.9					
C-7	104037	0-2	104038	104038	1.19	1.23	2.1	2.6	2.7	7.5	0.4	0.4	8.0	15.8	10.7	26	17.6					
C-7	104039	2-4	104040	104040	1.06	1.12	1.0	1.6	1.3	9.3	0.3	0.3	9.4	14.4	9.7	30	20.3					
C-7	104041	4-6	104042	104042	1.39	1.22	1.4	1.8	1.4	3.9	0.2	0.2	4.7	8.07	5.5	20	13.5					
C-8	104043	0-2	104044	104044	1.18	1.27	0.8	1.3	0.8	5.7	0.3	0.3	6.0	15.6	10.5	24	16.2					
C-8	104045	2-4	104046	104046	1.27	1.20	0.4	0.8	0.5	5.9	0.3	0.3	6.0	14.5	9.8	32	21.6					
C-8	104047	4-6	104048	104048	1.20	1.22	0.4	0.6	0.4	11.4	0.4	0.4	11.6	25.5	17.2	37	25.0					
C-9	104049	0-2	104050	104050	1.26	1.49	1.7	2.2	1.2	24.5	1.3	1.3	24.3	62.3	42.1	84	56.8					
C-9	104051	2-4	104052	104052	1.20	1.26	1.1	1.7	1.0	21.6	1.1	1.1	22.2	49.6	33.5	80	54.1					
C-9	104053	4-6	104054	104054	1.31	1.36	1.4	1.3	1.6	11.0	0.7	0.7	10.8	26.8	18.1	40	27.0					
C-10	104055	0-2	104056	104056	1.10	1.38	1.3	2.9	0.9	27.9	1.5	1.5	28.2	71.3	48.2	100	67.6					
C-10	104057	2-4	104058	104058	1.46	1.51	1.3	2.3	2.3	29.0	1.7	1.7	30.0	53.1	35.9	39	26.4					
C-10	104059	4-6	104060	104060	1.19	1.23	0.7	1.8	1.2	10.4	0.5	0.5	11.4	23.9	16.2	91	61.5					
D-1	104101	0-2	104102	104102	2.83	1.14	0.9	4.1	0.9	15.8	1.0	1.0	16.2	41	27.7	49	33.1					
D-1	104103	2-4	104104	104104	2.70	1.09	0.7	3.8	1.1	12.2	0.7	0.7	12.2	33.4	22.6	35	23.7					
D-1	104105	4-6	104106	104106	2.08	0.97	1.1	3.2	1.2	9.3	0.4	0.4	10.0	25	16.9	28	18.9					
D-2	104107	0-2	104108	104108	13.80	1.14	1.1	24.0	0.8	25.2	1.3	1.3	25.6	69.6	47.0	89	60.3					
D-2	104109	2-4	104110	104110	11.90	1.13	1.7	14.0	0.9	26.6	1.6	1.6	27.9	64.2	43.1	64	43.3					
D-2	104111	4-6	104112	104112	15.30	1.11	0.9	20.0	0.8	21.9	1.0	1.0	22.9	65.4	44.2	84	56.8					
D-3	104113	0-2	104114	104114	4.55	0.89	1.1	7.4	1.2	14.1	0.7	0.7	14.8	20.6	13.9	50	33.8					
D-3	104115	2-4	104116	104116	4.74	0.95	0.9	6.7	0.9	9.5	0.4	0.4	10.0	30	20.3	36	24.3					
D-3	104117	4-6	104118	104118	4.37	0.99	1.1	6.7	0.9	9.1	0.4	0.4	10.1	28.1	19.0	32	21.6					
D-4	104119	0-2	104120	104120	1.33	1.25	0.9	1.4	1.2	7.6	0.5	0.5	7.5	20.4	13.3	22	14.9					
D-4	104121	2-4	104122	104122	1.15	1.11	1.1	1.1	1.1	7.6	0.4	0.4	7.5	19.1	12.9	20	13.5					
D-4	104123	4-6	104124	104124	1.29	1.25	1.1	0.9	1.3	7.2	0.4	0.4	7.0	20.3	13.7	20	13.5					
D-5	104125	0-2	104126	104126	1.13	1.07	0.8	1.6	1.3	7.6	0.5	0.5	7.9	18.4	12.4	22	14.9					
D-5	104127	2-4	104128	104128	1.29	1.12	2.8	1.3	1.3	8.5	0.5	0.5	8.8	38.8	26.2	21	14.2					
D-5	104129	4-6	104130	104130	1.13	1.11	2.5	1.9	0.8	7.7	0.2	0.2	7.4	27.4	18.5	17	11.5					
D-6	104131	0-2	104132	104132	1.24	1.23	2.6	1.3	0.9	12.4	0.7	0.7	12.6	33.4	22.6	31	21.0					
D-6	104133	2-4	104134	104134	1.20	1.19	2.9	1.3	1.4	13.0	0.7	0.7	13.0	38.1	25.8	35	23.7					
D-6	104135	4-6	104136	104136	1.32	1.17	2.8	1.5	1.0	13.8	0.6	0.6	13.9	40.2	27.2	45	30.4					
D-7	104137	0-2	104138	104138	1.19	1.20	3.2	1.8	1.1	7.7	0.4	0.4	8.6	30.2	20.4	12	8.1					
D-7	104139	2-4	104140	104140	1.38	1.21	3.4	1.6	1.2	7.1	0.4	0.4	7.7	30.8	20.8	7.4	7.4					
D-7	104141	4-6	104142	104142	1.19	1.05	2.5	1.6	1.2	6.2	0.4	0.4	7.3	23.5	15.9	<11	<7.4					
D-8	104143	0-2	104144	104144	1.51	1.24	2.9	1.9	1.2	9.4	0.4	0.4	11.2	29.9	20.2	19	12.8					
D-8	104145	2-4	104146	104146	1.36	1.26	3.3	2.4	0.7	10.3	0.6	0.6	11.2	33.5	22.6	23	15.5					
D-8	104147	4-6	104148	104148	1.52	1.36	2.7	1.9	1.1	12.6	0.6	0.6	12.7	20.1	13.6	11	7.4					
D-9	104149	0-2	104150	104150	1.35	1.16	2.2	1.5	1.0	9.1	0.4	0.4	8.2	20.1	14.7	11	7.4					
D-9	104151	2-4	104152	104152	1.29	1.28	2.6	1.6	1.2	7.2	0.4	0.4	7.0	14.7	14.7	14	9.5					
D-9	104153	4-6	104154	104154	1.51	1.28	3.0	1.7	1.3	9.3	0.5	0.5	8.3	19.8	13.4	14	9.5					
D-10	104155	0-2	104156	104156	1.28	1.1	2.9	1.9	1.1	6.8	0.3	0.3	6.9	46.8	31.6	<11	<7.4					
D-10	104157	2-4	104158	104158	1.44	1.26	2.9	1.9	1.1	6.8	0.3	0.3	6.9	46.8	31.6	<11	<7.4					

Additional Off-Property Walkover Surveying and Intrusive Sampling Strategy

Additional walkover (screening) surveying and follow-up intrusive soil sampling will be performed for the off-property contaminated areas north and east of the Sewage Treatment Plant. The purpose of this additional sampling is to identify the extent of radiological contamination above the action level beyond the areas already identified as contaminated. These additional surveys and samples are a result of radiological characterization previously performed in this area.

Walkover Surveying

A preliminary transect survey will be conducted at areas of known and/or suspected contamination. Individual transects will be separated by a distance of 100 feet. Since the incinerator at the sewage treatment plant has been identified as the source of contamination, transects will proceed in northward and eastward directions, in areas which are downwind (prevailing winds) from the incinerator (see Figure 2). Transects will not be conducted in the western-most grove of trees located just off-property, since radiological contamination has been confirmed in this area and also because of the difficulty of traversing the area due to dense understory vegetation. The transects are used to determine the extent of contamination north and east of the incinerator off-property.

A sampling grid consisting of squares 25 feet by 25 feet will be superimposed on the area delineated by transect surveying (see Figure 3). This grid will correspond to the ones used for previous walkover surveying in adjacent areas. After the grid is established, walkover surveying will be performed at each grid line intersection, using the shielded SPA-3 detector. The walkover survey grid will establish the horizontal extent of radiological contamination off-property between the transects.

Two minute readings, from 5 inches above-grade, will be taken at 50 foot intervals along the transect, using a shielded SPA-3 detector. It is important to note that the SPA-3 readings must be taken in an area that is free of standing water and that has been cleared of existing vegetation. Each transect will be extended until two consecutive readings, each correlating

to less than 35 pCi/g, are recorded. The location of the second consecutive reading less than 35 pCi/g will also mark the greatest extent of the sampling grid which follows.

As discussed above, additional walkover surveying will not be conducted within the off-property tree grove. Two locations within the grove and two locations outside of the grove will be randomly chosen as soil sample points (see Figure 2 for proposed locations). These samples will be submitted for TCLP analysis, to detect any regulatory levels of hazardous waste constituents for the purpose of waste disposition.

Intrusive Sampling

Intrusive soil sampling will be used to confirm radiological contamination levels at the second (consecutive) below-action-level reading (terminus). These samples will be analyzed for the radiological specified in Table 2 of the WPA2. Additionally, samples from two randomly selected locations within the western-most tree grove and from two other off-property locations shall be analyzed for TCLP constituents (see Figure 2 for proposed locations). The sampling methodology is outlined in Section 3 of the WPA2.

Intrusive sampling will be performed as follows:

Using a stainless steel hand auger, the top 6" of soil will be extracted and deposited into a stainless steel pan. A homogenous sample from the pan will then be containerized for submission to the lab for analysis. This process will be repeated, with a clean auger and pan each time, for the 6" to 12" layer, the 12" to 18" layer, the 18" to 24" layer, the 24" to 36" layer, and the 36" to 48" layer, except that the last two layers will be archived for possible future analysis, depending on results from overlying layers.

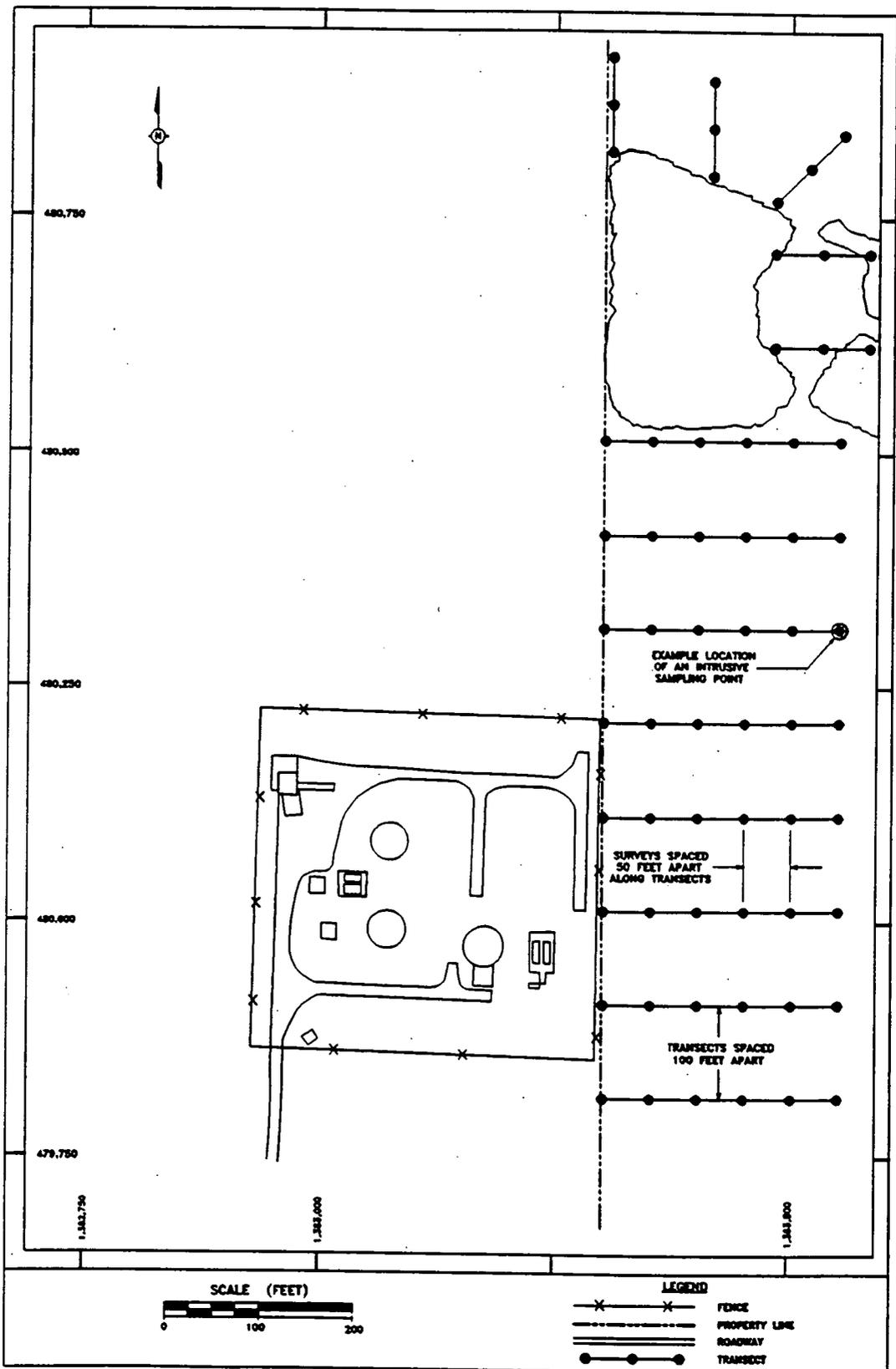


FIGURE 1, TRANSECT SURVEY LOCATIONS TO DETERMINE AREAL EXTENT (EXTENT OF RADIOLOGICAL CONTAMINATION NORTH AND EAST OF STP)

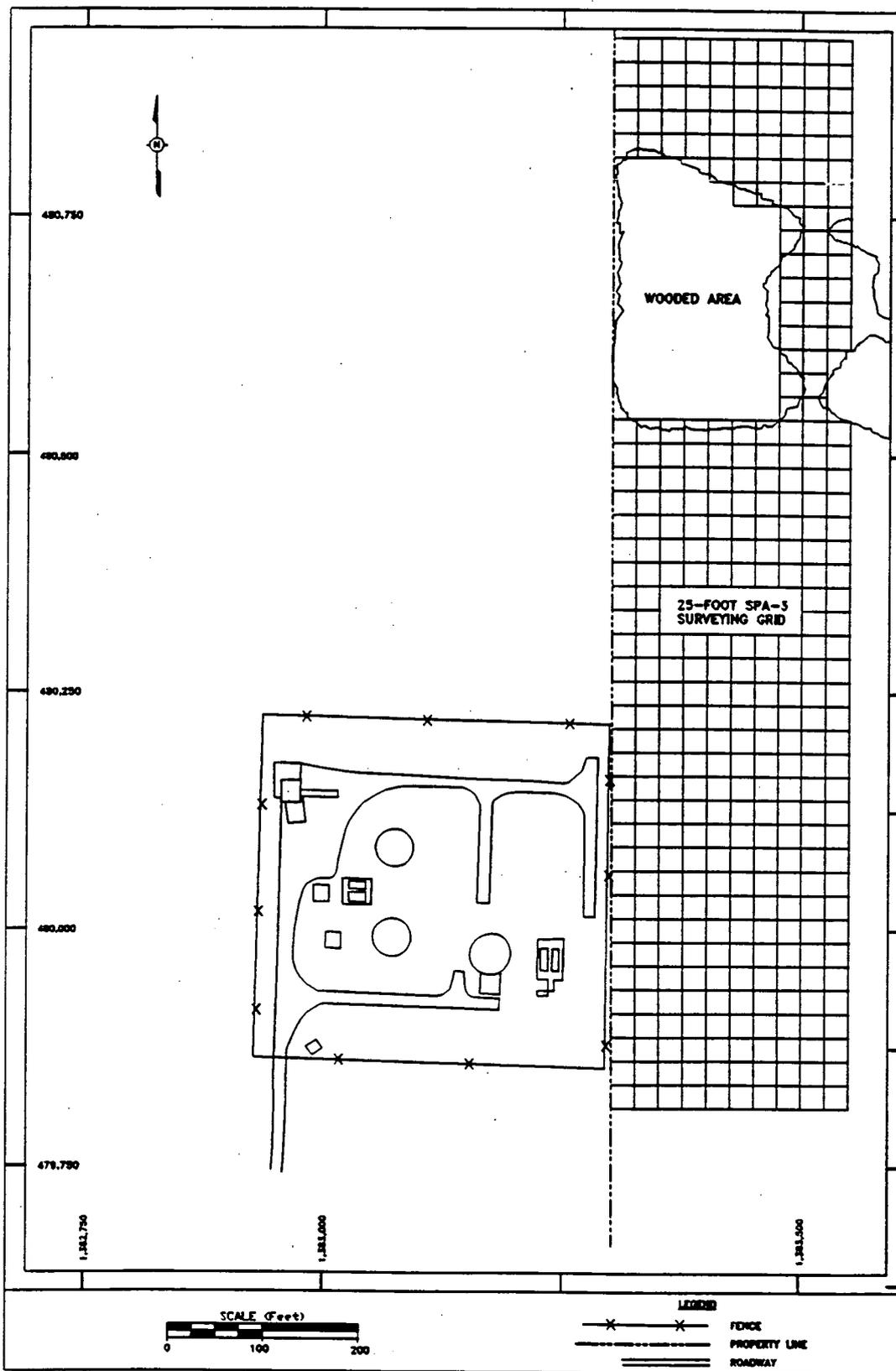


FIGURE 2, OFF-PROPERTY RADIOLOGICAL SURVEY GRID