Britt T. McKinney
Senior Vice President & Chief Nuclear Officer

PPL Susquehanna, LLC
769 Salem Boulevard
Berwick, PA 18603
Tel. 570.542.3149 Fax 570.542.1504
btmckinney@pplweb.com

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U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Station OP1-17
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SUSQUEHANNA STEAM ELECTRIC STATION ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT PLA-6054

Docket Nos. 50-387 and 50-388

The Susquehanna SES Annual Radiological Environmental Operating Report is hereby submitted for the calendar year 2005 in accordance with Technical Specification Section 5.6.2.

If you have any questions, please contact Mr. Rocco R. Sgarro, Manager, Nuclear Regulatory Affairs at (610) 774-7552.

Sincerely,

Britt T. McKinney

Attachments

copy: Mr. A. J. Blamey, NRC Sr. Resident Inspector
Mr. S. J. Collins, NRC Region I, Regional Administrator
Mr. J. T. Furia, NRC Region I, Senior Health Physicist
Mr. R. V. Guzman, NRC Project Manager
Mr. R. Janati, DEP/BRP
Mr. R. Maiers, DEP/BRP
Ms. T. Lewis, DEP/BRP
Mr. D. J. Allard, DEP/BRP
Mr. W. Wendland, ANI
Mr. S. Mainieri, INPO

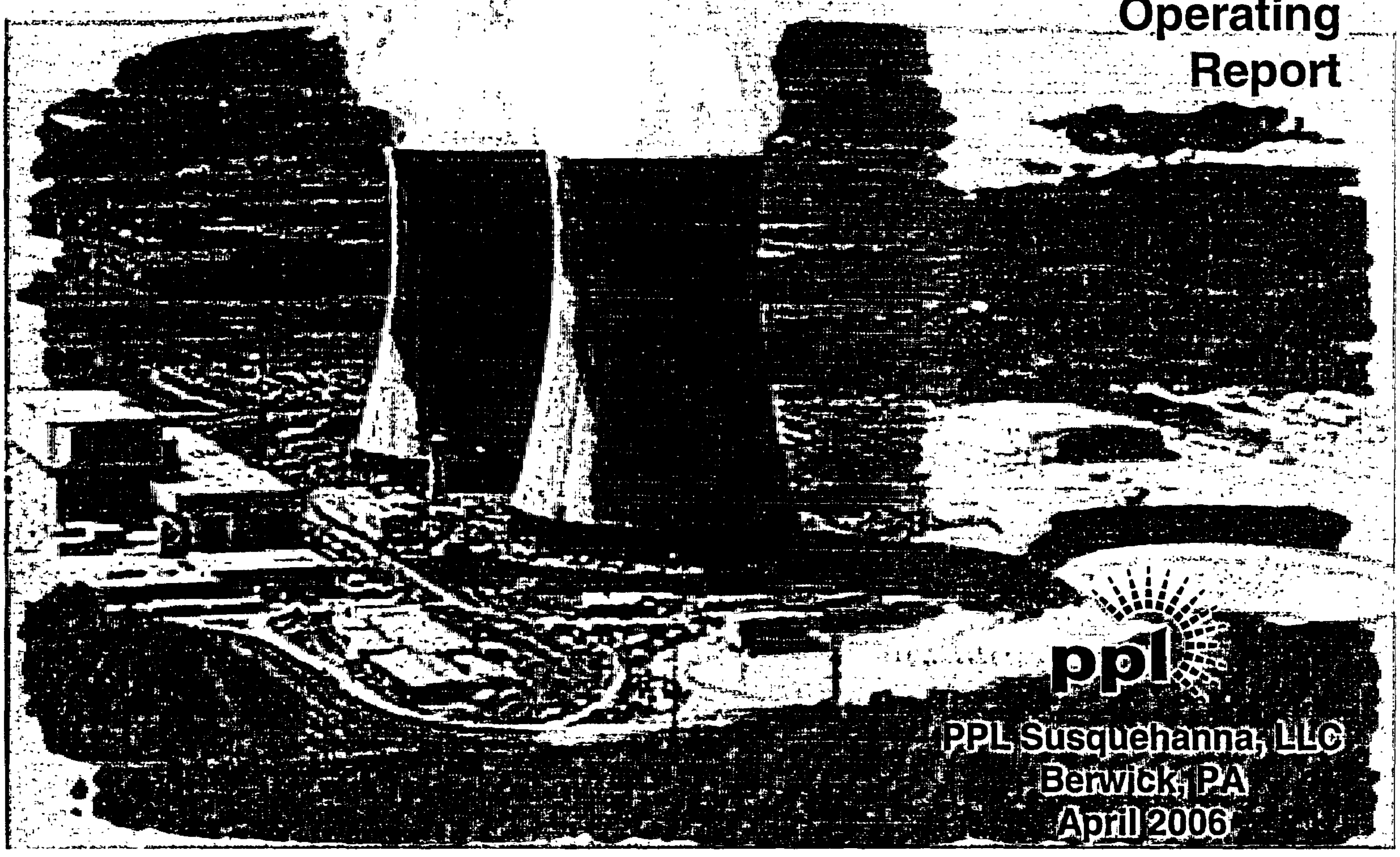
IE25

Susquehanna Steam Electric Station

Units 1 & 2

2005 ANNUAL REPORT

Annual Radiological Environmental Operating Report



PPL Susquehanna, LLC
Berwick, PA
April 2006

SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 and 2

Annual Radiological
Environmental Operating Report

2005

Prepared by:

H. L. Riley, Health Physicist

Reviewed by:

R. E. Doebler, Chemistry Support Supervisor

Approved by:

B. E. Rhoads, Manager – Plant Chemistry

PPL Susquehanna, LLC
769 Salem Boulevard
Berwick, Pennsylvania 18603

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SUMMARY AND CONCLUSIONS

Radiological Dose Impact

This report on the Radiological Environmental Monitoring Program covers the year 2005.

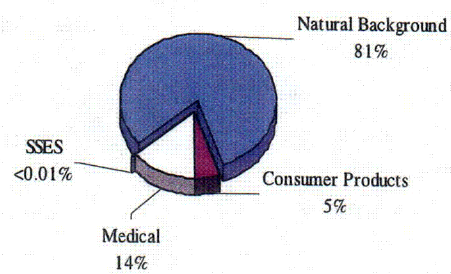
During that period, 1245 analyses were performed on 884 samples at 31 sampling locations. Additionally, 228 TLD direct radiation measurements were performed at 58 locations around the site.

In assessing all the data gathered and comparing with SSES pre-operational data, it was concluded that the operation of SSES had no adverse radiological impact on the health and safety of the public or the environment.

The total whole body dose from both ingested radionuclides and direct radiation from SSES Operations is negligible compared to the public's exposure from natural background radiation, medical irradiation, and radiation from consumer products of more than 300 millirem/year.

The following graph compares public dose from SSES operation to that from other sources of radioactivity and radiation.

COMPARISON OF PERCENT OF AVERAGE ANNUAL PUBLIC DOSE FROM OTHER SOURCES WITH THAT FROM THE SSES



Sources for the values provided, with the exception of Susquehanna, are the following from NCRP Report #93 (1987): Tables 2.4 (Natural Background), 5.1 (Consumer Products), and 7.4 (Medical).

C01

Ambient Gamma Radiation

Environmental direct radiation measurements were performed quarterly on and around the SSES site using thermoluminescent dosimeters (TLDs).

The maximum direct radiation dose from SSES operation to a member of the public was approximately 0.0281 mrem for all of 2005. This dose represents approximately 0.11% of the 25-mrem whole-body SSES Technical Requirements (TRO 3.11.3) limit for all SSES sources of radioactivity and radiation.

Aquatic Environment

Surface water samples were analyzed for concentrations of tritium, iodine-131, and gamma emitting nuclides. Drinking water samples were analyzed for concentrations of gross beta, tritium and gamma emitting nuclides. Gross beta activities detected in drinking water were consistent with those reported in previous years.

Iodine-131 activity was detected in 14 of 36 surface water samples. Evidence indicates that it is there only as the result of the discharge of medical waste to the Susquehanna or Lackawanna Rivers through sewage treatment plants upstream of the SSES. Iodine-131 was not reported to have been discharged with water released from the SSES to the Susquehanna River during 2005.

Tritium activity attributable to SSES operation was detected in the aquatic pathway to man. The maximum dose from the ingestion of tritium was estimated at the nearest downriver municipal water supplier via the drinking water pathway and near the outfall of the SSES discharge to the Susquehanna River via the fish pathway. The maximum whole body and organ doses due to tritium identified via REMP samples is approximately 0.0016 mrem/year. This dose is less than one-tenth of one percent of the dose guidelines stated in 10 CFR 50, Appendix I.

Fish samples were analyzed for concentrations of gamma emitting nuclides. Concentrations of naturally occurring K-40 were consistent with those detected in previous years. No fission or activation products were detected in fish.

Sediment samples were analyzed for concentrations of gamma emitting nuclides. Cesium-137 was observed in sediment and attributed to non-SSES sources (residual fallout from atmospheric weapons testing). Concentrations of naturally occurring K-40, radium-226, and actinium-thorium-228 were found consistent with those detected in previous years.

Atmospheric Environment

Air particulate samples were analyzed for concentrations of gross beta and gamma emitting nuclides. Cosmogenic Be-7 was detected at levels consistent with those detected in previous years.

Air iodine samples were analyzed for concentrations of iodine-131. All results were less than the MDC.

Terrestrial Environment

Soil samples were analyzed for concentrations of gamma emitting nuclides. Cesium-137 was observed in soil and attributed to non-SSES sources (residual fallout from atmospheric weapons testing). Concentrations of naturally occurring K-40 were consistent with those detected in previous years. Concentrations of naturally occurring actinium-thorium-228 were consistent with those of previous years.

Cow milk samples were analyzed for concentrations of iodine-131 as well as other gamma emitting nuclides. All iodine results were less than the MDC. Concentrations of naturally occurring K-40 were consistent with those detected in previous years. No fission or activation products were detected.

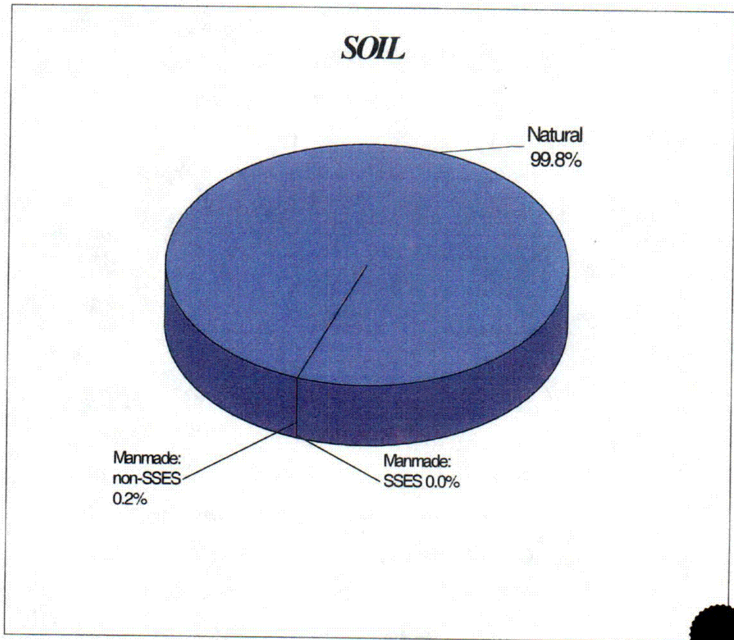
Potatoes and pumpkins which were irrigated with Susquehanna River water downstream of the SSES were sampled. These food products were sampled during the harvest season and analyzed for concentrations of gamma emitting nuclides. Concentrations of naturally occurring K-40 were found consistent with those in previous years.
No fission or activation products were detected.

Ground Water

Ground water samples were analyzed for concentrations of tritium and gamma emitting nuclides. No tritium was measured above analysis MDC in 2005. No fission or activation products were detected.

TERRESTRIAL PATHWAY

PERCENT TOTAL GAMMA ACTIVITY



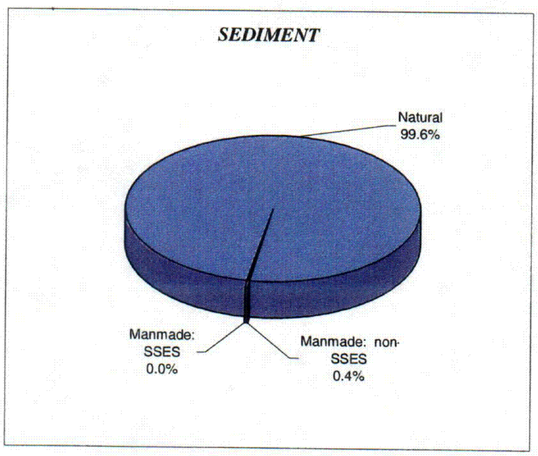
Relative Radionuclide Activity Levels in Selected Media

Some media monitored in the environment are significant for the numbers of gamma-emitting radionuclides routinely measured at levels exceeding analysis MDCs. Sediment in the aquatic pathway and soil in the terrestrial pathway are two such media.

The following graphs show the relative activity contributions for the types of gamma-emitting radionuclides reported at levels above the analysis MDCs in sediment and soil at indicator locations during 2005.

AQUATIC PATHWAY

PERCENT TOTAL GAMMA ACTIVITY



Naturally occurring radionuclides accounts for over 99.6 % of the gamma-emitting activity in both sediment and soil in 2005 . Man-made radionuclides of SSES origin accounted for 0.0% of the gamma-emitting activity in sediment and soil during 2005. Man-made radionuclides of non-SSES origin account for the rest of the gamma-emitting activity in sediment and soil during 2005.

C02

Radionuclides Contributing to Dose from SSES Operation

Of the three man-made radionuclides reported in the environment by the SSES REMP (i.e. H-3, I-131 and Cs-137), tritium is the only radionuclide attributable to SSES operation.

The whole body and organ dose to members of the public attributable to tritium identified in REMP blowdown samples was 0.0016 mrem.

Tritium was included in the dose calculation because it was identified in the REMP samples of water being discharged to the river. The concentration of tritium in the water and the volume of water discharged were used to determine the amount of tritium released. The presumed exposure pathways to the public from this radionuclide were drinking water taken from the Susquehanna River at Danville, PA, and eating fish caught near the SSES discharge to the river. This assumption is based on the fact that tritium does not emit gamma radiation and the beta radiation emitted by tritium is not sufficiently penetrating to reach an individual on the shore.

INTRODUCTION

Radiological Environmental Monitoring Program (REMP)

The SSES is located on approximately an 1500-acre tract along the Susquehanna River, five miles northeast of Berwick in Salem Township, Luzerne County, Pennsylvania. The area around the site is primarily rural, consisting predominately of forest and agricultural lands. (More specific information on the demography, hydrology, meteorology, and land use characteristics of the area in the vicinity of the SSES can be found in the Environmental Report (Reference 1), the Final Safety Analysis Report (Reference 2), and the Final Environmental Statement (Reference 3) for the SSES.)

The SSES implements the REMP in accordance with Technical Specifications, Technical Requirements Manual and the Offsite Dose Calculation Manual, which are based on the design objectives in 10CFR Part 50 Appendix I, Sections IV.B.2, IV.B.3, and IV.C.

The REMP supplements the results of the radioactive effluent-monitoring program by verifying that the measurable concentrations of radioactive materials and levels of radiation in the environment are not higher than expected on the basis of the effluent measurements and modeling of the environment in the vicinity of the SSES.

Key objectives of the SSES REMP are as follows:

- Document compliance with SSES REMP Technical Requirements radiological environmental surveillances
- Verify proper implementation of SSES radiological effluent controls
- Identify, measure, and evaluate trends of radionuclide concentrations in environmental pathways near SSES
- Assess impact of SSES Effluents on the environment and the public

PPL has maintained a Radiological Environmental Monitoring Program (REMP) in the vicinity of the Susquehanna Steam Electric Station Units 1 and 2 since April, 1972, prior to construction of both units and ten years prior to the initial operation of Unit 1 in September, 1982. The purpose of the preoperational REMP (April, 1972 to September, 1982) was to establish a baseline for radioactivity in the local environment that could be compared with the radioactivity levels observed in various environmental media throughout the operational lifetime of the SSES. This comparison facilitates assessments of the radiological impact of the SSES operation.

Potential Exposure Pathways

The three pathways through which radioactive material may reach the public from nuclear power plants are the atmospheric, terrestrial, and aquatic pathways. (Figure 1 depicts these pathways for the intake of radioactive materials.)

Mechanisms by which people may be exposed to radioactivity and radiation in the environment vary with the pathway. Three mechanisms by which a member of the public has the potential to be exposed to radioactivity or radiation from nuclear power plants such as the SSES are as follows:

- inhalation (breathing)
- ingestion (eating and drinking), and
- whole body irradiation directly from a plant or from immersion in the radioactive effluents.

REMP Scope

The scope of the SSES REMP was developed based on the NRC's Radiological Assessment Branch Technical Position on radiological environmental monitoring, as described in Revision 1, November 1979 (Reference 4). However, the REMP conducted by PPL for the SSES exceeds some of the monitoring suggested by the NRC's branch technical position, in terms of the number of monitoring locations, the frequency of certain monitoring, the types of analyses required for the samples, and the achievable analysis sensitivities.

During the operational period of the SSES, two different categories of monitoring locations, called control and indicator locations, were established to further assist in assessing the impact of station operation. Control locations are located at sites where it is considered unlikely that radiation or radioactive material from normal station operation would be detected. Indicator locations are sited where it is expected that radiation and radioactive material that might originate from the station would be most readily detectable.

Control locations for the atmospheric and terrestrial pathways are more than 10 miles from the station. Preferably, the controls also are in directions from the station less likely to be exposed to wind blowing from the station than are the indicator locations. Control locations for the aquatic pathway, the Susquehanna River, are upstream of the station's discharge to the river.

Indicator locations are selected primarily on the basis of proximity to the station, although factors such as meteorology, topography, and sampling practicality also are considered. Indicator locations for the atmospheric and terrestrial pathways are typically less than 10 miles from the station. Most often, they are within 5 miles of the station. Indicator locations in the Susquehanna River are downstream of the station's discharge. Monitoring results from indicator locations are compared with results from control locations. These comparisons are made to discern any differences in the levels and/or types of radioactive material and/or radiation that might exist between indicators and controls and that could be attributable to the station.

In 2005 , the SSES REMP collected 884 samples at 31 locations and performed 1,245 analyses. In addition, the REMP monitors ambient radiation levels using thermoluminescent dosimeters (TLDs) at 58 indicator and control locations, resulting in 228 radiation level measurements in 2005. The media monitored and analyses performed are summarized in the table below. Figures 2 through 7 display the REMP TLDs and sampling locations in the vicinity of the SSES. Appendix C provides directions, distances, and a brief description of each of the locations in Figures 2 through 7.

REMP Monitoring Sensitivity

Detection of radiation and radioactive material from the SSES in the environment is complicated by the presence of naturally occurring radiation and radioactive materials from both terrestrial and cosmic sources. Man-made radiation and radioactive material from non-SSES sources, such as nuclear fallout from previous nuclear weapons tests and medical wastes, also can make identification of SSES radiation and radioactive material difficult. Together, this radiation and radioactive material present background levels from which an attempt is made to distinguish relatively small contributions from the SSES. This effort is further complicated by the natural variations that typically occur from both monitoring location to location and with time at the same locations.

The naturally occurring radionuclides potassium-40, beryllium-7, actinium-228, thorium-228, and tritium are routinely observed in certain environmental media. Potassium-40 has been observed in all monitored media and is routinely seen at readily detectable levels in such media as milk, fish, fruits and vegetables. Seasonal variations in beryllium-7 in air samples are regularly observed. Man-made radionuclides, such as cesium-137 left over from nuclear weapons testing are often observed as well. In addition, the radionuclide tritium, produced by both cosmic radiation interactions in the upper atmosphere as well as man-made (nuclear weapons), is another radionuclide typically observed.

SSES REMP	
Type of Monitoring	**Media Monitored**
Gross Beta Activity	Drinking Water and Air Particulates
Gamma-Emitting Radionuclide Activities	All Media
Tritium Activity	All Waters
Iodine-131 Activity	Surface Water, Air & Milk
Gamma Radiation Exposure (by TLD)	Ambient Radiation Levels

Radioactivity levels in environmental media are usually so low that their measurements, even with state-of-the-art measurement methods, typically have significant degrees of uncertainty associated with them (Reference 5). As a result, expressions are often used when referring to these measurements that convey information about the levels being measured relative to the measurement sensitivities. Terms such as "minimum detectable concentration" (MDC) are used for this purpose. The MDC is an "a priori" estimate of the capability for detecting an activity concentration by a given measurement system, procedure, and type of sample. Counting statistics of the appropriate instrument background are used to compute the MDC for each specific analysis. The formulas used to calculate MDCs may be found in procedures referenced in Appendix A.

The methods of measurement for sample radioactivity levels used by PPL's contracted REMP radioanalytical laboratories are capable of meeting the analysis sensitivity requirements found in the SSES Technical Requirements.

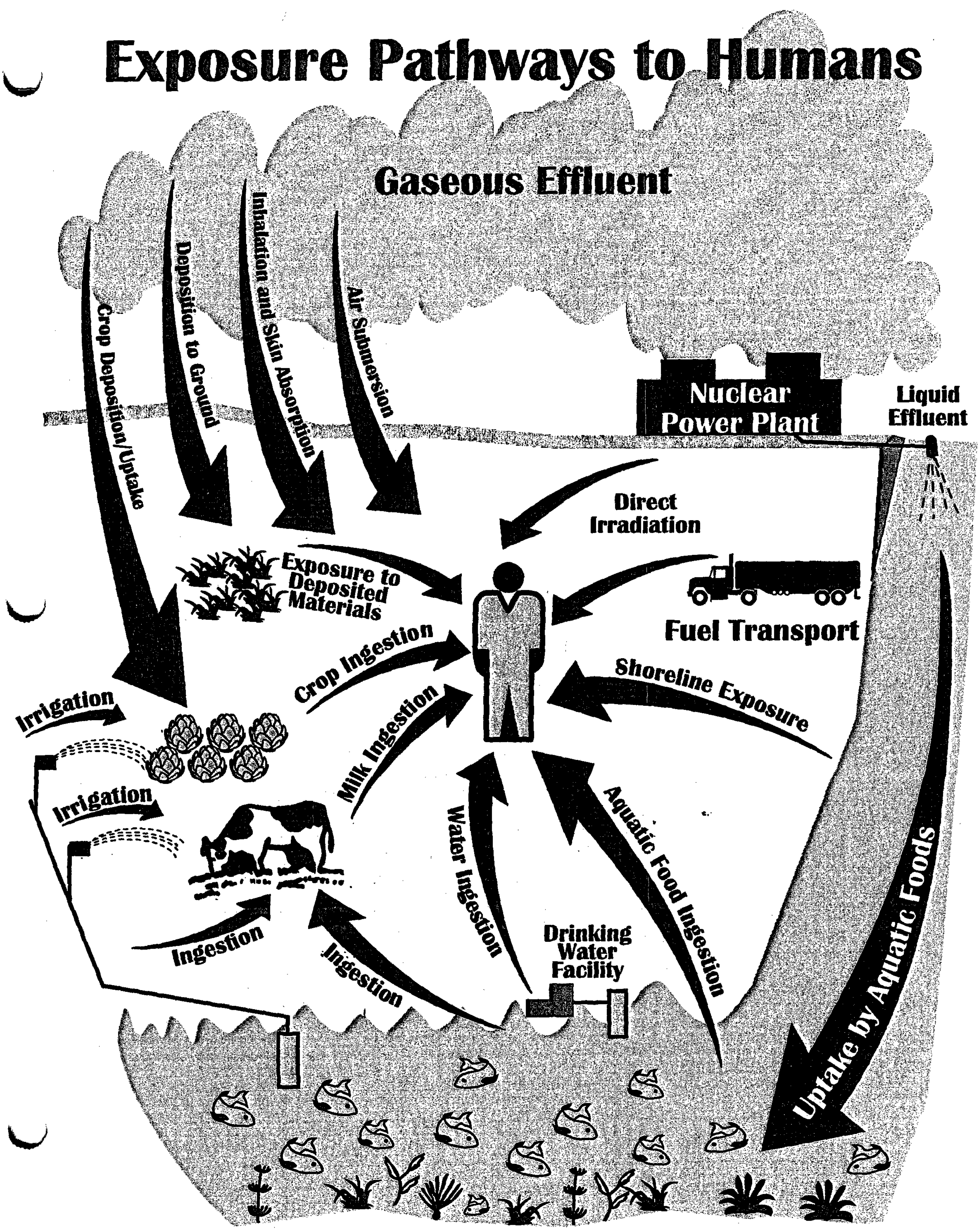
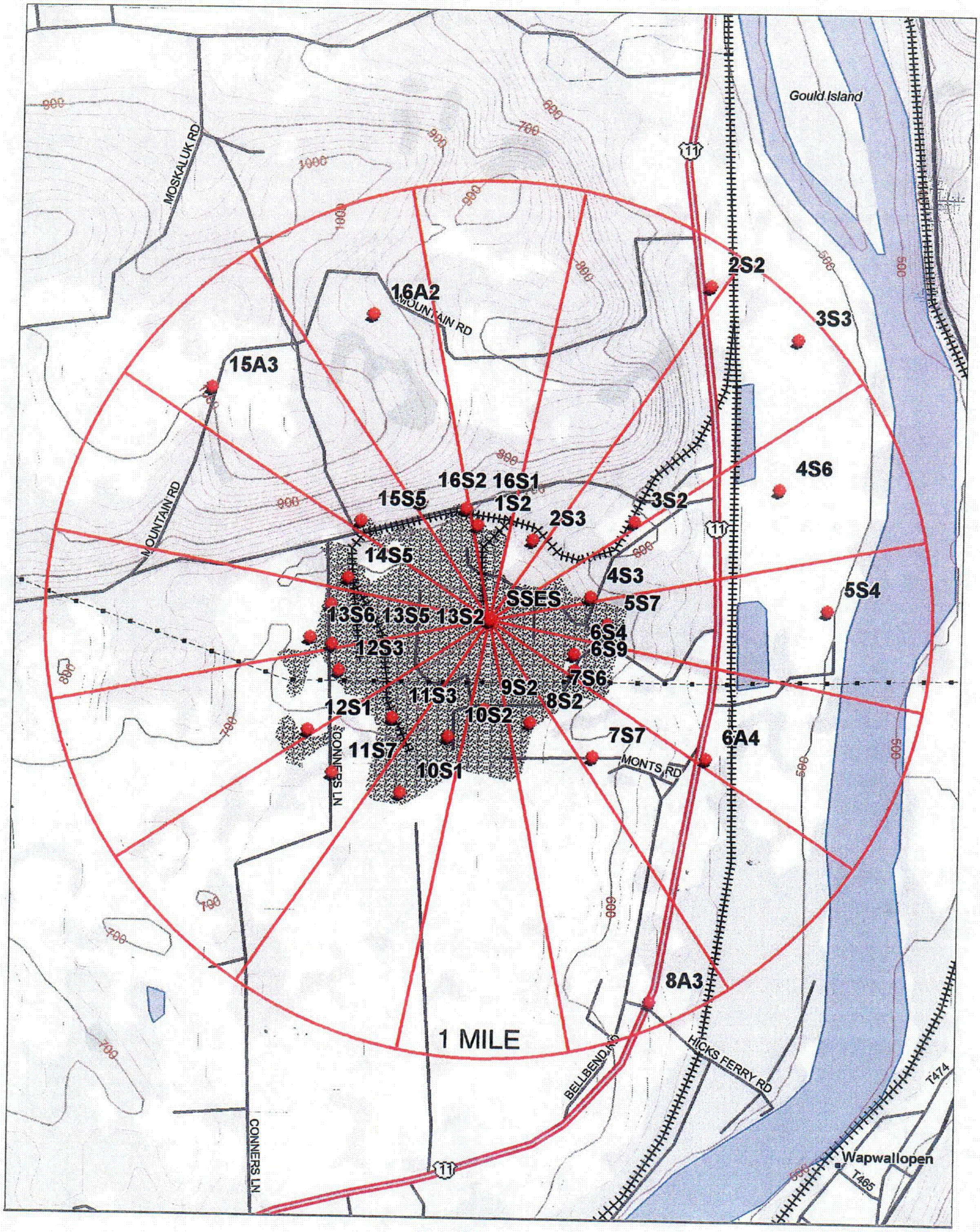

Exposure Pathways to Humans
Gaseous Effluent
Crop Deposition/Uptake
Deposition to Ground
Inhalation and Skin Absorption
Air Submersion
Nuclear
Power Plant
Liquid
Effluent
Direct
Irradiation
Exposure to
Deposited
Materials
Fuel Transport
Crop Ingestion
Milk Ingestion
Shoreline Exposure
Irrigation
Irrigation
Water Ingestion
Aquatic Food Ingestion
Uptake by Aquatic Foods
Ingestion
Ingestion
Drinking
Water
Facility

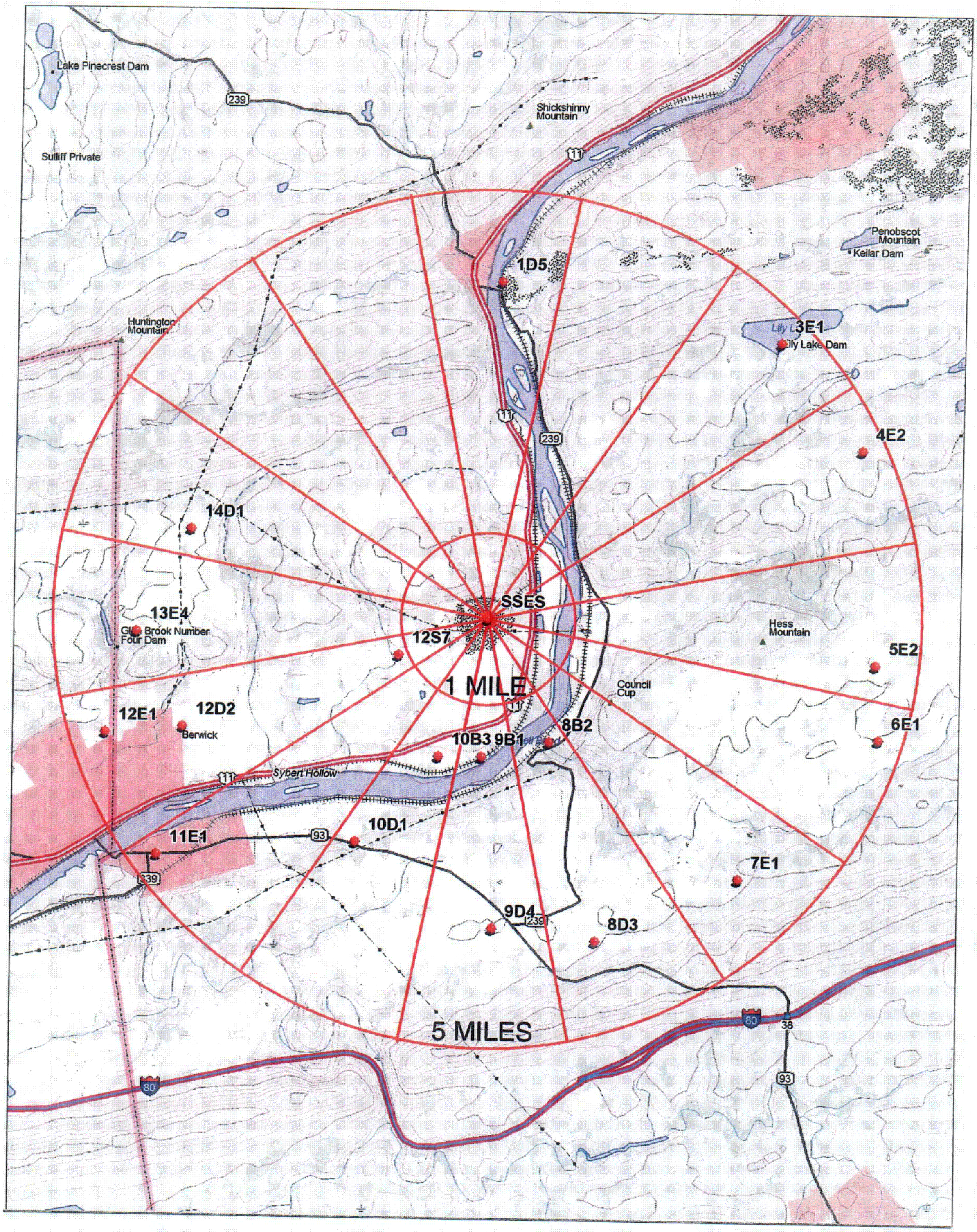
Figure 1

FIGURE 2
2005 TLD MONITORING LOCATIONS
WITHIN ONE MILE



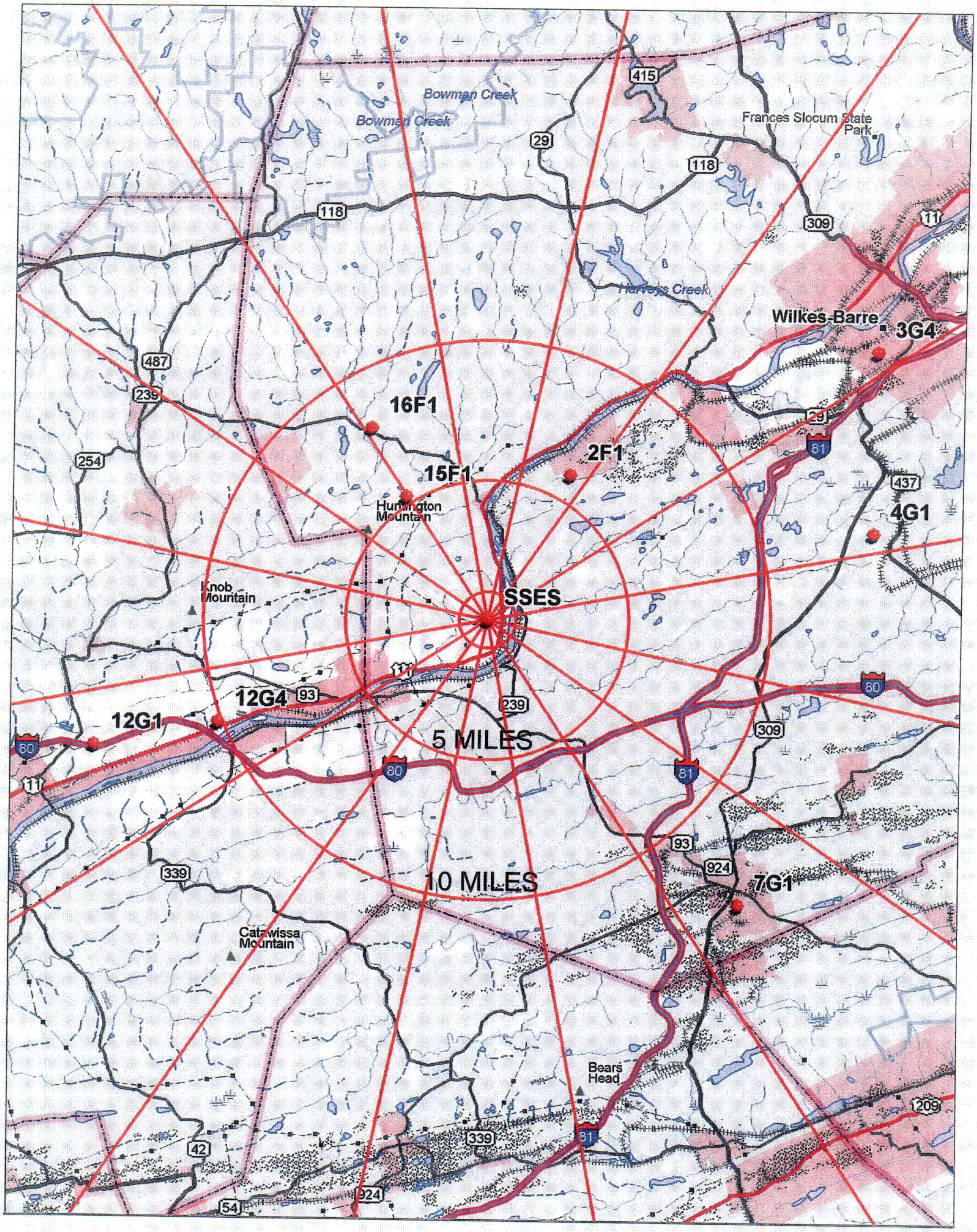
C03

FIGURE 3
2005 TLD MONITORING LOCATIONS
FROM ONE TO FIVE MILES



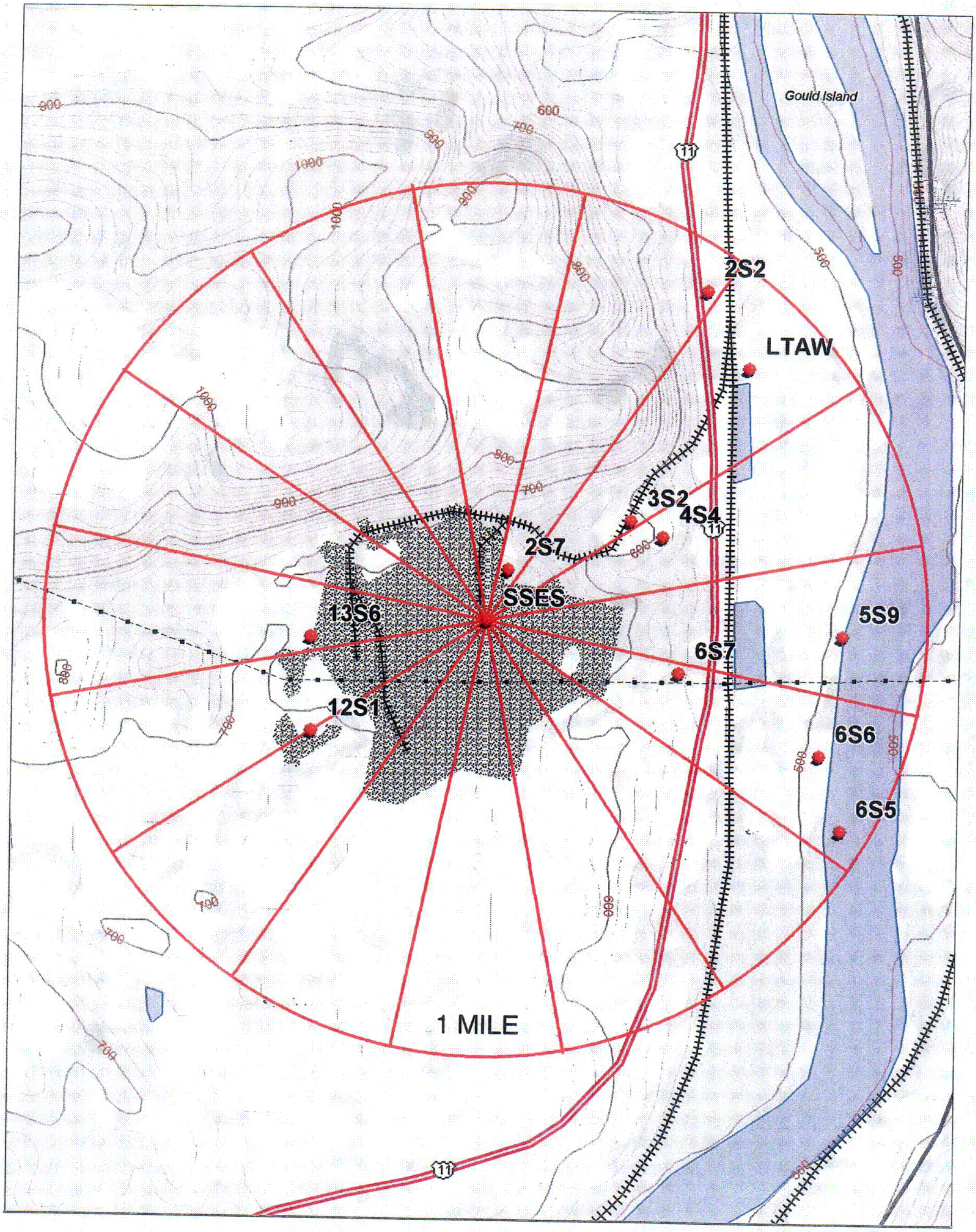
C04

FIGURE 4
2005 TLD MONITORING LOCATIONS
GREATER THAN FIVE MILES



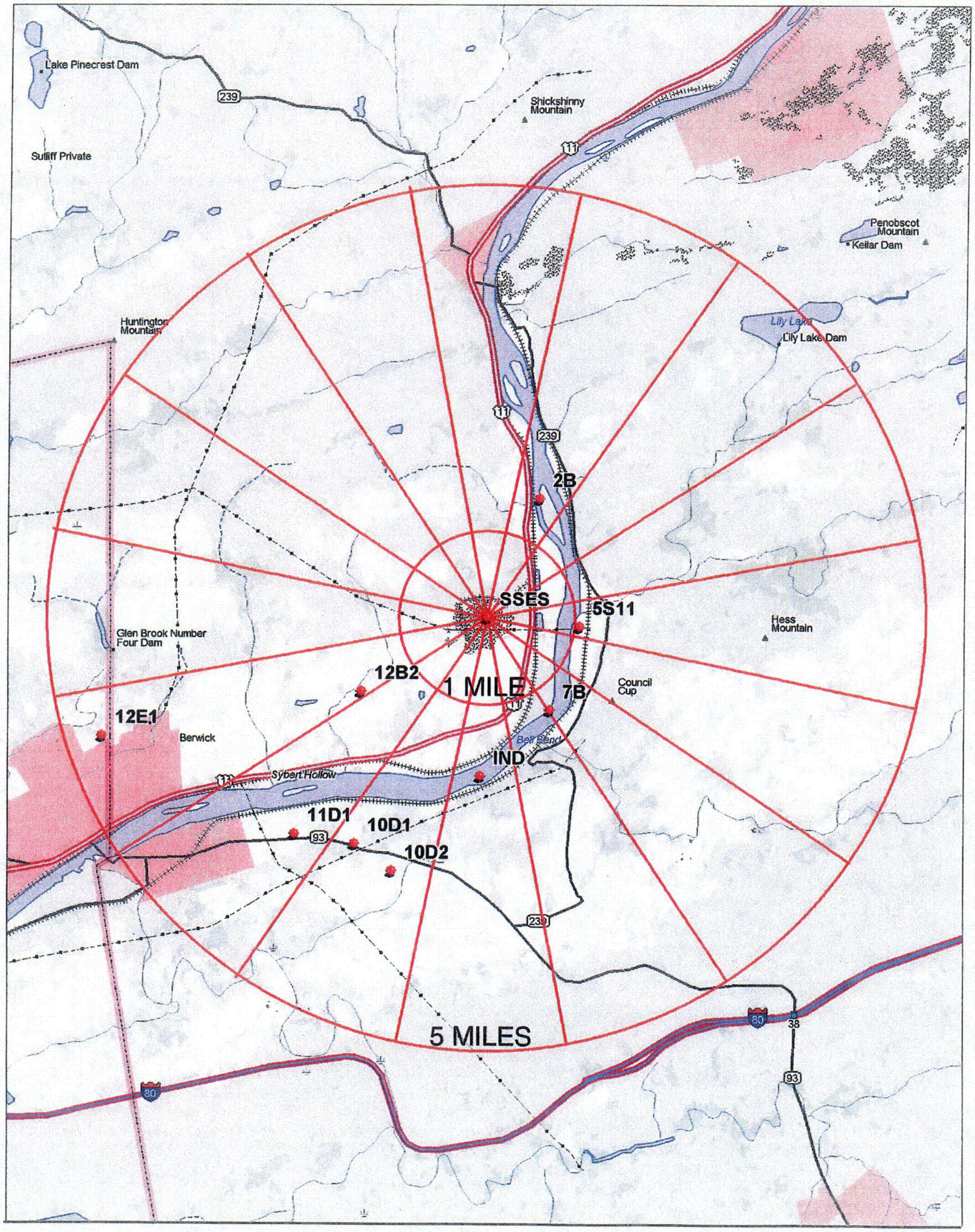
C05

FIGURE 5
2005 ENVIRONMENTAL SAMPLING LOCATIONS WITHIN ONE MILE



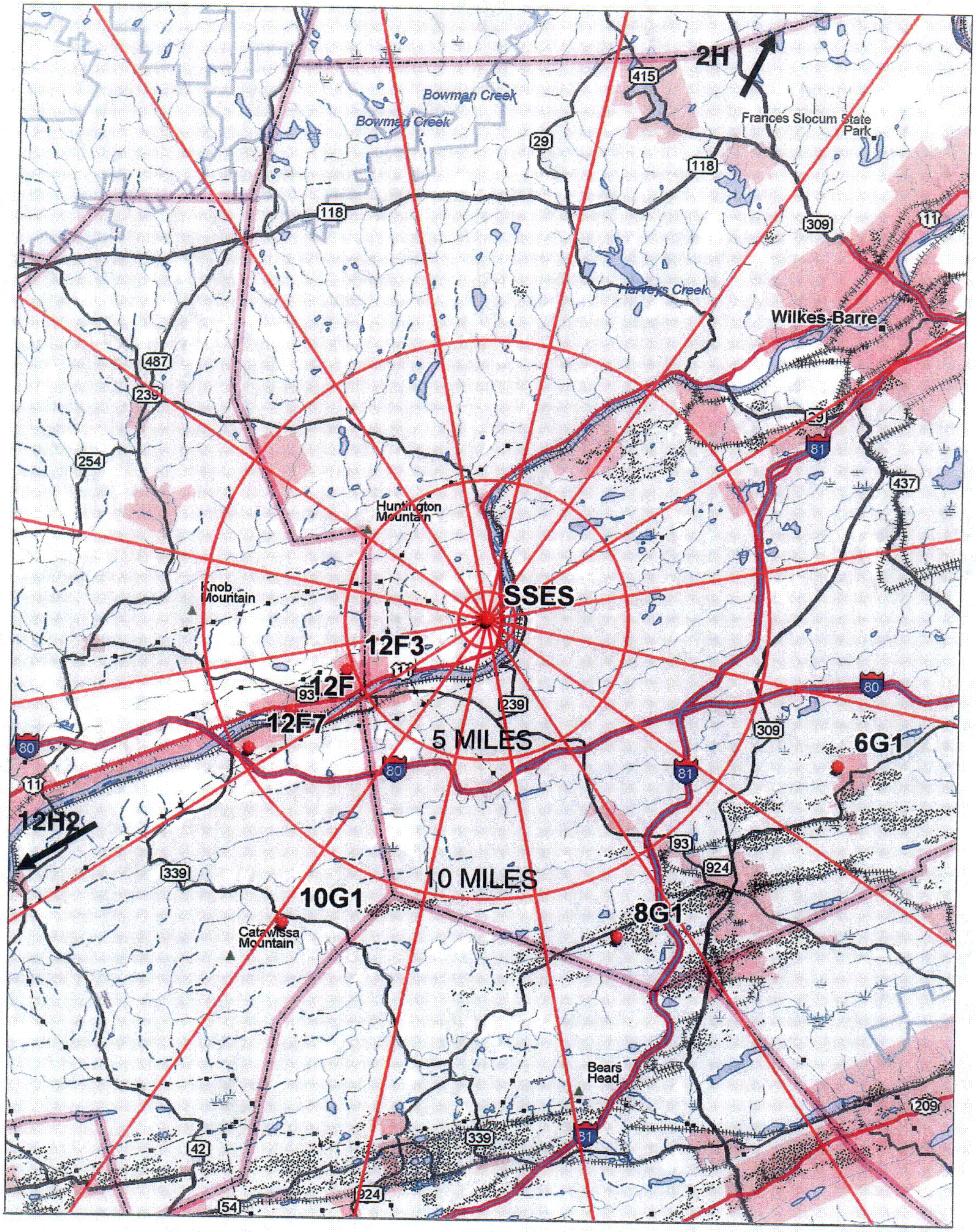
C06

FIGURE 6
2005 ENVIRONMENTAL SAMPLING LOCATIONS FROM ONE TO FIVE MILES



C07

FIGURE 7
2005 ENVIRONMENTAL SAMPLING LOCATIONS GREATER THAN FIVE MILES



C08

AMBIENT RADIATION MONITORING

INTRODUCTION

The primary method for the SSES REMP measurement of ambient radiation levels is the use of thermoluminescent dosimeters (TLDs). The TLDs are crystals (calcium sulfate) capable of detecting and measuring low levels of radiation by absorbing a portion of the radiation's energy that is incident upon them and storing the captured energy until the TLDs are processed (read). Processing involves heating the TLDs to release their stored energy in the form of light and measuring the intensity of the light that they emit. The intensity of the emitted light is proportional to the amount of radiation to which they were exposed. Calibration of the TLD processors permits a reliable relationship to be established between the light emitted and the amount of radiation dose received by the TLDs. The result permits accurate measurements of the ambient radiation in the environment.

Environmental TLDs are continually exposed to natural radiation from the ground (terrestrial radiation) and from the sky (cosmic) radiation. In addition, they also may be exposed to man-made radiation. Most of the environmental TLD's natural radiation exposure comes from sources in the ground. These terrestrial sources vary naturally with time due to changes in soil moisture, snow cover, etc. The natural-radiation picture is complicated because the factors affecting radiation reaching the TLDs from the ground vary differently with time from one location to another due to locational differences in such factors as soil characteristics (amounts of organic matter, particle size, etc.), drainage opportunities, and exposure to sunlight. Environmental TLDs can also be affected by direct radiation (shine) from the SSES turbine buildings during operation, radwaste transfer and storage, and radioactive gaseous effluents from the SSES.

Unfortunately, TLDs do not have any inherent ability to indicate the source of the radiation to which they are exposed. The placement of numerous TLDs in the environment can facilitate decision-making about the possible radiation sources to which TLDs are exposed. However, a method for evaluating TLD data is still required. The SSES REMP relies on a statistically based approach to simultaneously compare indicator TLD data with control TLD data and operational TLD data with preoperational TLD data. This approach permits the flagging of environmental TLD doses that might have been produced by both man-made sources of radiation, as well as natural radiation sources. It also provides a means for attributing a portion of the total TLD dose to SSES operation if appropriate.

Interpretation of environmental TLD results is described in PPL Nuclear Engineering Study, EC-ENVR-1012 (Revision 0, January 1995).

Scope

Direct radiation measurements were made using Panasonic 710A readers and Panasonic UD-814 (calcium sulfate) thermoluminescent dosimeters (TLD). During 2005, the SSES REMP had 48 indicator, and 10 special interest TLD locations. Refer to Table C1 and C2 for TLD measurement locations. The TLD locations are placed on and around the SSES site as follows:

A site boundary ring (i.e. an inner ring) with at least 1 TLD in each of the 16 meteorological sectors, in the general area of the site boundary. Currently there are 31 locations. They are: (1S2, 2S2, 2S3, 3S2, 3S3, 4S3, 4S6, 5S4, 5S7, 6S4, 6S9, 7S6, 7S7, 8S2, 8A3, 9S2, 9B1, 10S1,10S2, 11S3, 11S7, 12S1, 12S3, 12S7, 13S2, 13S5, 13S6, 14S5, 15S5, 16S1 and 16S2) near and within the site perimeter representing fence post doses from a SSES release.

An outer distance ring with at least 1 TLD in each of the 16 meteorological sectors, in the 3 to 9 mile range from the site. Currently there are 17 locations. They are: (1D5, 2F1, 3E1, 4E2, 5E2, 6E1, 7E1, 8D3, 9D4, 10D1, 11E1, 12D2, 12E1, 13E4, 14D1, 15F1 and 16F1). These TLD's are designed to measure possible exposures to close-in population.

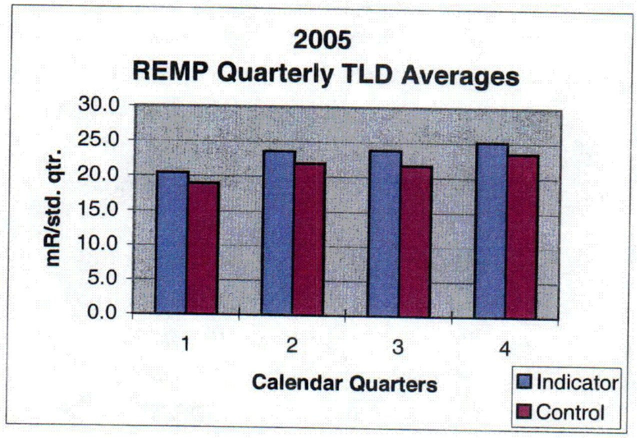
The balance of TLD locations represents the special interest areas such as population centers, schools, residences and control locations. Currently there are ten special interest locations. They are 6A4, 8B2, 10B3, 15A3, 16A2, 3G4, 4G1, 7G1, 12G1 and 12G4.

The specific locations were determined according to the criteria presented in the NRC Branch Technical Position on Radiological Monitoring (Revision 1, November 1979).

Monitoring Results

TLDs

The TLDs were exchanged quarterly and processed by the SSES Health Physics Dosimetry Group. Average quarterly ambient gamma radiation levels measured by environmental TLDs is shown in the bar graph below.



The average environmental results for all indicator and control TLD were 23.2 +/- 8.2 and 21.5 +/- 3.1 (mR/std.qtr.), respectively.

Indicator environmental TLD results for 2005 were examined quarterly on an individual location basis and compared with both current control location results and preoperational data. Very small SSES exposure contributions were identified during 2005 at eleven onsite locations as follows: 1S2, 6S4, 6S9, 7S6, 8S2, 9S2, 10S2, 11S3, 12S3, 13S2, and 13S5.

C09

The highest, estimated, gamma radiation dose of 2.81E-02 mrem for 2005 was at location 9S2. It is assumed that the occupancy time for a member of the public is no more than one hour each calendar quarter at location 9S2. This dose is approximately 0.11% of the 25 mrem whole-body SSES Technical Requirements (TRO 3.11.3) limit for all SSES sources of radioactivity and radiation.

Refer to the following for results of TLD measurements for 2005:

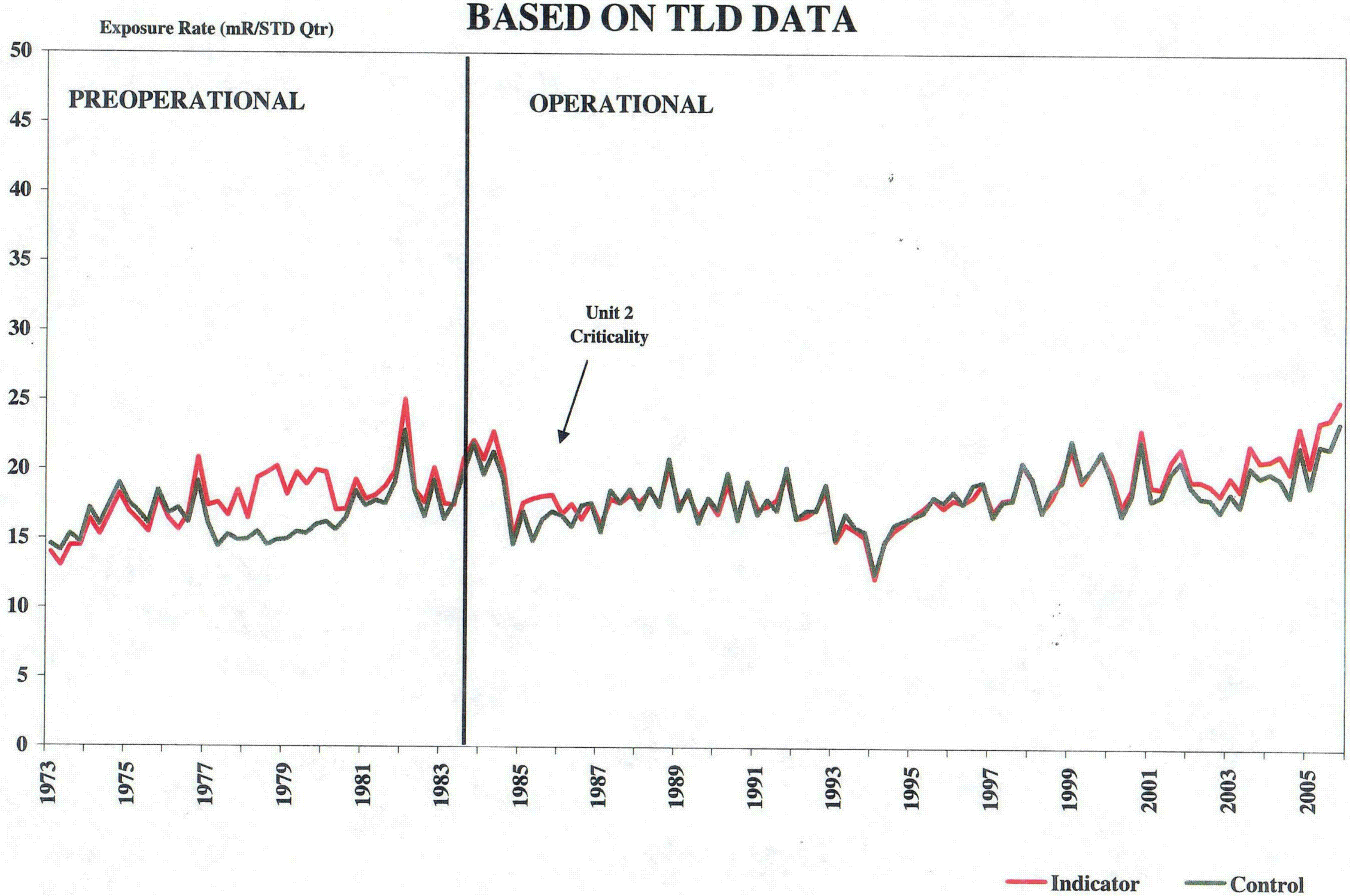
- Figure 8, trends quarterly TLD results for both preoperational and operational periods

- Appendix G, Table G Summary of Data Table, page G-3 shows the averages for TLD indicator and control locations for the entire year.

- Appendix H, Table H1, page H-3 shows a comparison of the 2005 mean indicator and control TLD results with the means for the preoperational and operational periods at the SSES.

- Appendix I, Table I-1, page I-3 through I-7 shows TLD results for all locations for each quarter of 2005.

FIGURE 8 - AMBIENT RADIATION LEVELS BASED ON TLD DATA



C10

AQUATIC PATHWAY MONITORING

INTRODUCTION

In 2005 the SSES REMP monitored the following media in the aquatic pathway: surface water, drinking water, fish, sediment, fruits and vegetables. Some of the media (e.g., drinking water and fish) provide information that can be especially useful to the estimation of possible dose to the public from potentially ingested radioactivity, if detected. Other media, such as sediment, can be useful for trending radioactivity levels in the aquatic pathway, primarily because of their tendency to assimilate certain materials that might enter the surface water to which they are exposed. The results from monitoring all of these media provide a picture of the aquatic pathway that is clearer than that which could be obtained if one or more were not included in the REMP.

SSES Technical Requirements only require that fruit and vegetables be sampled at locations irrigated by Susquehanna River water from points downstream of the SSES discharge to the River. The land use census (Reference 11) conducted in 2005 looked at farms within 10 miles downstream of the SSES. The Lupini Farm in Mifflinville (12F7) irrigated potatoes in July 2005, and the Zehner Farm (11D1-field east of Nescopeck) irrigated pumpkins in July and August 2005, using Susquehanna River water. Chapin Farm irrigated potatoes (5S11-PPL Susquehanna Project East Side Parcel 25) using Susquehanna River water above the intake. Samples were collected from Chapin fields (control) and Lupini and Zehner fields (indicator) as the crops matured. No other fields within 10 miles downriver of Susquehanna SES were irrigated in 2005.

The aquatic pathway in the vicinity of the SSES is the Susquehanna River. Monitoring of all of the aquatic media, except drinking water, is conducted both downstream and upstream of the location from which occasional SSES low-level radioactive discharges enter the river. The upstream monitoring locations serve as controls to provide data for comparison with downstream monitoring results. The potential exists for radioactive material that might be present in SSES airborne releases to enter the Susquehanna River upstream of the plant through either direct deposition (e.g., settling or washout) or by way of runoff from deposition on land adjacent to the river. However, direct deposition and runoff are considered to be insignificant as means of entry for SSES radioactivity into the Susquehanna River when compared to liquid discharges under normal conditions.

Lake Took-a-While (LTAW), which is located in PPL's Riverlands Recreation Area adjacent to the Susquehanna River, is also considered to be part of the aquatic pathway for monitoring purposes. Although it is not in a position to receive water discharged to the river from the SSES, it can receive storm runoff from the SSES. Storm runoff from the SSES site should not normally contain any measurable radioactivity from the plant. However, the SSES REMP, consistent with other aspects of aquatic monitoring and the REMP, in general, goes beyond its requirements by monitoring LTAW.

Scope

Surface Water

Surface water was routinely sampled from the Susquehanna River at one indicator location (6S5/Outfall Area) and one control location (6S6/River Water Intake Line) during 2005. Sampling also took place at the following additional indicator locations: the SSES discharge line to the river (2S7/6S7) and Lake Took-A-While (LTAW).

Drinking Water

Drinking water samples were collected at location 12H2, the Danville Municipal Water Authority's treatment facility on the Susquehanna River, in 2005. Treated water is collected from the end of the processing flowpath, representing finished water that is suitable for drinking. This is the nearest point downstream of the SSES discharge to the River at which drinking water is obtained. No drinking water control location is sampled. For all intents and purposes, control surface water sampling location (6S6) would be suitable for comparison.

Fish

Fish were sampled from the Susquehanna River in the spring and fall of 2005, at one indicator location, IND, downstream of the SSES liquid discharge to the River and one control location, 2H, sufficiently upstream to essentially preclude the likelihood that fish caught there would spend any time below the SSES discharge. In addition, fish were also sampled in the fall from PPL's Lake Took-a-While, location LTAW. This location is not downstream of the SSES discharge. It is sampled because of its potential for receiving runoff from the SSES. LTAW is considered an indicator location.

Sediment

Sediment sampling was performed in the spring and fall at indicator locations 7B and 12F and control location 2B on the Susquehanna River.

Fruits and Vegetables

Fruits and vegetables were sampled at indicator locations 11D1 and 12F7 and control location 5S11. These locations were irrigated with Susquehanna River water in 2005. The edible portions are kept for analysis.

Sampling

Surface Water

Weekly water samples were collected at indicator location 6S5 for both biweekly and monthly compositing. Location 6S5 was considered a backup for locations 2S7 and 6S7 in the event that water could not be obtained from the automatic samplers at these locations. Routine samples for 6S5 were collected from a boat, unless river conditions prohibited boating. When this occurs, samples are collected from an alternate shoreline site located below the Susquehanna SES discharge diffuser. The shoreline samples are collected at the Wetlands Cottage area, approximately 100-150 yards down river from the 6S5 site.

Indicator locations 2S7 and 6S7, the SSES Cooling Tower Blowdown Discharge (CTBD) line, and control location 6S6, the SSES River Water Intake structure, were time - proportionally sampled using automatic continuous samplers. The samplers were typically set to obtain 30-60 ml aliquots every 20-25 minutes. Weekly, the water obtained by these samplers was retrieved for both biweekly and monthly compositing.

The other surface water monitoring location, LTAW, was grab sampled once each quarter.

Drinking Water

Treated water was time-proportionally sampled by an automatic sampler. The sampler was typically set to obtain three 12-ml aliquots every twenty minutes. Weekly, the water obtained by this sampler was retrieved for monthly compositing.

Fish

Fish were obtained by electrofishing. Electrofishing stuns the fish and allows them to float to the surface so that those of the desired species and sufficient size can be sampled. Sampled fish include recreationally important species, such as smallmouth bass, and also channel catfish and shorthead redhorse. The fish are filleted and the edible portions are kept for analysis.

Sediment

Shoreline sediment was collected to depths of four feet of water.

Fruits and Vegetables

Potatoes and pumpkins which were irrigated with river water downstream from SSES, were sampled during the harvest season.

Sample Preservation and Analysis

Surface and Drinking Water

Surface water samples were analyzed monthly for gamma-emitting radionuclides and tritium activities. One biweekly surface composite sample was analyzed for I-131 activity each month. Drinking water samples were analyzed monthly for beta, gamma-emitting radionuclides, and tritium activities.

Sediment and Fish

Fish are frozen until shipment. All samples are analyzed by gamma spectroscopy for the activities of any gamma emitting radionuclides that may be present.

Monitoring Results

Surface Water

Refer to the following for results of surface water analyses for 2005:

- Appendix G, Table G page G-3 and G-4, shows a summary of the 2005 surface water data.
- Appendix H, Tables H 3 and H 4, shows comparisons of iodine-131 and tritium monitoring results against past years data.
- Appendix I, Tables I-2 and I-3, shows specific results of tritium,

gamma spectroscopic and iodine-131 analyses of surface water samples.

The Nuclear Regulatory Commission (NRC) requires that averages of the activity levels for indicator environmental monitoring locations and for control environmental monitoring locations of surface water, as well as other monitored media, be reported annually. Data from the following three surface water monitoring locations were averaged together as indicators for reporting purposes: one location (6S5) on the Susquehanna River downstream of the SSES, Lake-Took-a While (LTAW) adjacent to the river, and the SSES cooling tower blowdown discharge (CTBD) line to the river (2S7/6S7).

Technically, the CTBD line is not part of the environment. The CTBD line is a below ground pipe to which the public has no access, contrary to the other environmental monitoring locations on the Susquehanna River to which the public does have access. However, currently there is no automatic composite sampling of an indicator location on the Susquehanna River, so the CTBD line from the SSES is included as an indicator monitoring location in the radiological environmental monitoring program.

Most of the water entering the Susquehanna River through the SSES CTBD line is simply water that was taken from the river upstream of the SSES, used for cooling purposes without being radioactively contaminated by SSES operation, and returned to the river. Batch discharges of relatively small volumes of slightly radioactively contaminated water are made to the river through the SSES CTBD at times throughout each year. The water is released from tanks of radioactively contaminated water on site to the CTBD and mixes with the noncontaminated water already present in the CTBD. Flow rates from the tanks containing radioactively contaminated water being discharged to the CTBD vary based on the radioactivity level of the batch release. In addition, the minimum flow rate for the returning water in the CTBD is maintained at a flow rate of 5,000 gpm or higher. These requirements are in place to ensure adequate dilution of radioactively contaminated water by the returning noncontaminated water in the CTBD prior to entering the river.

At the point that CTBD water enters the river, additional, rapid dilution of the discharged water by the river is promoted by releasing it through a diffuser. The diffuser is a large pipe with numerous holes in it that is positioned near the bottom of the river. CTBD discharges exit the diffuser through the many holes, enhancing the mixing of the discharge and river waters. The concentrations of contaminants are reduced significantly as the discharged water mixes with the much larger flow of river water. The mean flow rate of the Susquehanna River in 2005 was approximately 7,980,000 gpm. The CTBD average flow during 2005 was 8,248 gpm. Based on the average river flow and the average CTBD flow during 2005, liquid discharges from the SSES blowdown line were diluted by approximately a factor of 1,000 after entering the river.

The amount of radioactively contaminated water being discharged is small. Nevertheless, sensitive analyses of the water samples can often detect the low levels of certain types of radioactivity in the CTBD water following dilution. Though the levels of radioactivity measured in the CTBD water are generally quite low, they tend to be higher than those in the river downstream of the SSES. Most radionuclides discharged from the SSES CTBD are at such low levels in the downstream river water that, even with the sensitive analyses performed, they cannot be detected.

When the radioactivity levels from the CTBD samples throughout the year are averaged with those obtained from actual downstream monitoring locations, the result is an overall indicator location average that is too high to be representative of the actual average radioactivity levels of the downstream river water. As the following discussions are reviewed, consideration should be given to this inflation of average radioactivity levels from the inclusion of CTBD (location 2S7/6S7) results in the indicator data that is averaged.

Surface Water Iodine-131

Bi-weekly (once per month) samples from surface water locations were analyzed for concentrations of iodine-131 activity (Table I-3 and Table G). The 2005 indicator values range from -0.33 to 4.0 pCi/l compared to -0.3 to 1.39 for 2004. Comparison of the 2005 mean iodine-131 activity of 1.0 pCi/l for all indicator locations to the average of the annual control mean of 0.36 pCi/l for pre-operational years suggests activity detected slightly above the preoperational control.

Throughout the course of a year, iodine-131 is typically measured at levels in excess of analysis MDCs in some samples obtained from control surface water monitoring locations on the Susquehanna River upstream of the SSES as well as indicator locations downstream of the SSES. As determined by measurements of samples obtained by the SSES REMP, the mean iodine-131 activity level from the CTBD for all of 2005 was 1.37 pCi/l compared to the control mean of 0.66 pCi/l for 2005. The 2005 mean iodine-131 activity of 0.64 pCi/l at the indicator 6S5 (Outfall Area) was slightly lower than the mean iodine-131 activity of 0.66 pCi/l at the control 6S6 (River Water Intake) location.

Iodine-131 from the discharge of medical wastes into the Susquehanna River upstream of the SSES is drawn into the SSES cooling tower basins through the SSES River Water Intake Structure. It is reasonable to assume that concentration of the already existing iodine-131 in the cooling tower basins occurs as it does for other substances found in the river. For example, the SSES routinely assumes concentration factors in the basin for calcium of four to five times the concentrations in the river water entering the basins, based on past measurements. This concentrating effect occurs because of the evaporation of the water in the basins, leaving behind most dissolved and suspended materials in the unevaporated water remaining in the basins. If a concentration factor of four for iodine-

131 were to be applied to the 2005 mean iodine-131 activity level for the control samples from the Susquehanna River, a mean concentration of 2.64 pCi/liter for iodine-131 in the basin water and the water being discharged from the basins would be expected. The actual 2005 mean of 1.37 pCi/l for the CTBD mean is about half the expected mean.

Because iodine-131 is radioactive, unlike the calcium that has been measured, iodine-131 is removed from the water while it is in the basins through the radioactive decay process. Thus, it might be expected that the net concentration factor for iodine-131 would be somewhat less than that for calcium, considering this additional removal process. The extent to which the iodine-131 concentration factor is less than that for calcium would depend on the mean residence time for the water in the basins compared to iodine-131's radioactive half-life - the greater the ratio of the mean residence time to the half-life, the smaller the concentration factor. A mean residence time for water in the basins is expected to be about two days. This is only about one-fourth of the approximately eight-day half-life of iodine-131. Thus, radioactive decay would not be expected to reduce the concentration factor for iodine-131 by a large amount. Therefore, the difference between the 2005 mean iodine-131 activity of about 1.37 pCi/l in the CTBD and the 2005 mean iodine-131 activity for the control location of 0.66 pCi/l is most probably the result of concentration in the basins. Additional support for this assumption is that iodine-131 was not reported in water discharged from the SSES to the Susquehanna River during 2005.

Surface Water Tritium

Monthly samples from all surface water locations were analyzed for concentrations of tritium activity (Table I-2 and Table G). Tritium was detected in the indicator location above MDC. The 2005 indicator values ranged from -354 to 11,000 pCi/l compared to -71.5 to 18,400 for 2004. Comparison of the 2005 mean tritium activity of 2,054 pCi/l for all indicator locations to the average of the annual preoperational control mean of 171 pCi/l indicates a contribution of tritium activity from the SSES.

Refer to Figure 10 which trends tritium activity levels separately for surface water indicator and control locations from 1972 through 2005.

The much higher levels of tritium observed in the CTBD line (location 2S7/6S7), when averaged with the low levels from the downstream location 6S5 sample analysis results distort the real environmental picture. The mean tritium activity level from indicator location 6S5 for 2005 was 90.0 pCi/liter, which is greater than the mean tritium activity of -65.0 pCi/l for the control location and is within the range of prior operational and preoperational periods.

Tritium activity levels reported for 2S7/6S7 are from the discharge line prior to dilution in the river. The highest quarterly average tritium activity reported at 2S7/6S7 during 2005 was approximately 6,695 pCi/liter for the second quarter. This is well below the

NRC non-routine reporting levels for quarterly average activity levels of 20,000 pCi/liter when a drinking water pathway exists or 30,000 pCi/liter when no drinking water pathway exists.

The tritium activity reported in the CTBD line from location 2S7/6S7 is attributable to the SSES. Refer to the "Dose from the Aquatic Pathway" discussion at the end of this section for additional information on the projected dose to the population from tritium and other radionuclides in the aquatic pathway attributable to the SSES.

No gamma-emitting radionuclides were detected in surface water samples above MDC, with the exception of iodine-131.

Drinking Water

Drinking water was monitored during 2005 at the Danville Water Company's facility 26 miles WSW of the SSES on the Susquehanna River at location 12H2.

There are no known drinking water supplies in Pennsylvania on the Susquehanna River upstream of the SSES and therefore no drinking water control monitoring locations. Danville drinking water analysis results may be compared to the results for surface water control monitoring locations.

Refer to the following for results of surface water analyses for 2005:

- Figure 11 trends gross beta activity levels for drinking water location 12H2 from 1977 through 2005.
- Appendix G, Table G page G-5 and G-6, shows a summary of the 2005 drinking water data.
- Appendix H, Table H 6 and H 7, shows comparisons of gross beta and tritium activity in drinking water for 2005 against past years' data.
- Appendix I, Table I-4 shows specific results of gross beta, tritium and gamma spectroscopic analyses of drinking water

Drinking Water Gross Beta

Monthly samples from the 12H2 drinking water location were analyzed for concentrations of gross beta activity (Table I-4). Beta activity was detected in the 12H2 location above MDC for 2005. The 2005 values ranged from 1.45 to 3.37 pCi/l compared to 0.735 to 3.09 for 2004.

Gross beta activity has been monitored in drinking water since 1977. Gross beta activity is typically measured at levels exceeding the MDCs in drinking water samples. The 2005 mean gross beta activity of 2.5 pCi/l is above the mean gross beta activity of 1.9 for 2004 but is within the range of the preoperational (1977-81) values of 2.2 to 3.2 pC/l.

Drinking Water Tritium

Monthly samples from the 12H2 drinking water location were analyzed for concentrations of tritium activity (Table I-4). Tritium activity was detected above MDC in 2 out of 12 drinking water samples in 2005. The 2005 values ranged from -141 to 203 pCi/l compared to -17.5 to 195 for 2004.

The 2005 mean tritium activity of 51.6 pCi/l for drinking water was lower than the mean tritium activity of 74.1 pCi/l for 2004 and is less than the preoperational (1977-81) values of 101 to 194 pCi/l. The 2005 mean tritium activity level for drinking water is greater than the 2005 mean tritium activity level of -65.0 pCi/l for the surface water control location.

Drinking Water Gamma Spectroscopic

No gamma-emitting radionuclides were detected in drinking water samples above the MDC.

Fish

Refer to the following for results of fish analyses for 2005:

- Table G page G-7 shows a summary of the 2005 fish data.
- Table H 8 page H-4 shows comparisons of potassium-40 monitoring results against past years' data.
- Table I-5 page I-13 shows specific results of gamma spectroscopic analyses of fish.

Fish Gamma Spectroscopic

Semi-annual samples from the indicator (IND) and control (2H) fish locations were analyzed for concentrations of gamma activity (Table I-5).

Three species of fish were sampled at each of one indicator location and one control location on the Susquehanna River in the spring 2005 and again in fall 2005. The species included the following: smallmouth bass, channel catfish and shorthead redhorse. In addition, one largemouth bass was sampled from PPL's LTAW in October 2005. A total of 13 fish were collected and analyzed.

The only gamma-emitting radionuclide reported in excess of analysis MDCs in fish during 2005 was naturally occurring potassium-40. The 2005 indicator values ranged from 2,600 to 4,320 pCi/kg compared to 2,920 to 4,120 for 2004. The 2005 indicator and control means for the activity levels of potassium-40 in fish were 3,290 pCi/kg and 3,010 pCi/kg, respectively. Naturally occurring potassium-40 in fish is not attributable to the liquid discharges from the SSES to the Susquehanna River.

Sediment

Refer to the following for results of sediment analyses for 2005:

- Appendix G, Table G pages G-8 and G-9, shows a summary of the 2005 sediment data.

- Appendix H, Tables H 9, 10, 11 and 12, shows comparisons of potassium-40, radium-226, thorium-228, and cesium-137 monitoring results against past years' data.

- Appendix I, Table I-6 shows specific results of gamma spectroscopic analyses of sediment samples.

Sediment Gamma Spectroscopic

Semi-annual samples from all sediment locations were analyzed for concentrations of gamma activity (Table I-6). Naturally occurring potassium-40, radium-226, Ac-228, and thorium-228 were measured at activity levels above MDCs in all shoreline sediment samples in 2005. The naturally occurring radionuclides in sediment are not attributable to the liquid discharges from the SSES to the Susquehanna River.

Cesium-137 was measured at activity levels exceeding analysis MDCs in 4 of 6 shoreline sediment sample analyses in 2005. The 2005 indicator and control means for cesium-137 activity levels in sediment were 59 pCi/kg and 94 pCi/kg respectively. The cesium-137 in sediment is attributed to residual fallout from past atmospheric nuclear weapons tests.

Fruits and Vegetables

Refer to the following for results of fruits and vegetables for SSES:

- Appendix G, Table G page G-15, shows a summary of the 2005 fruits and vegetables.
- Appendix I, Table I-12 page I-24, shows specific gamma spectroscopic analysis of fruit/vegetable samples.

Fruit /Vegetable Gamma Spectroscopic

Potato and pumpkin samples were collected from the 12F7 and 11D1 locations and analyzed for concentrations of gamma emitting nuclide activity (Table I-12). Potatoes were also collected from 5S11 location using Susquehanna River water from above the intake. Potassium-40 was the only gamma-emitting radionuclide measured in fruits and vegetables at an activity level above MDC during 2005. The average potassium-40 concentration for the indicator samples was 3550 pCi/kg while the control was 4540 pCi/kg.

Potassium-40 in fruits and vegetables is not attributable to SSES operation because it is a naturally occurring radionuclide.

Dose from the Aquatic Pathway

Tritium was the only radionuclide identified in 2005 by the SSES REMP in the aquatic pathway that was attributable to SSES operation and also included in the pathway to man.

The total tritium activity released from the SSES for the year was estimated based on REMP monitoring results for use in projecting maximum doses to the public.

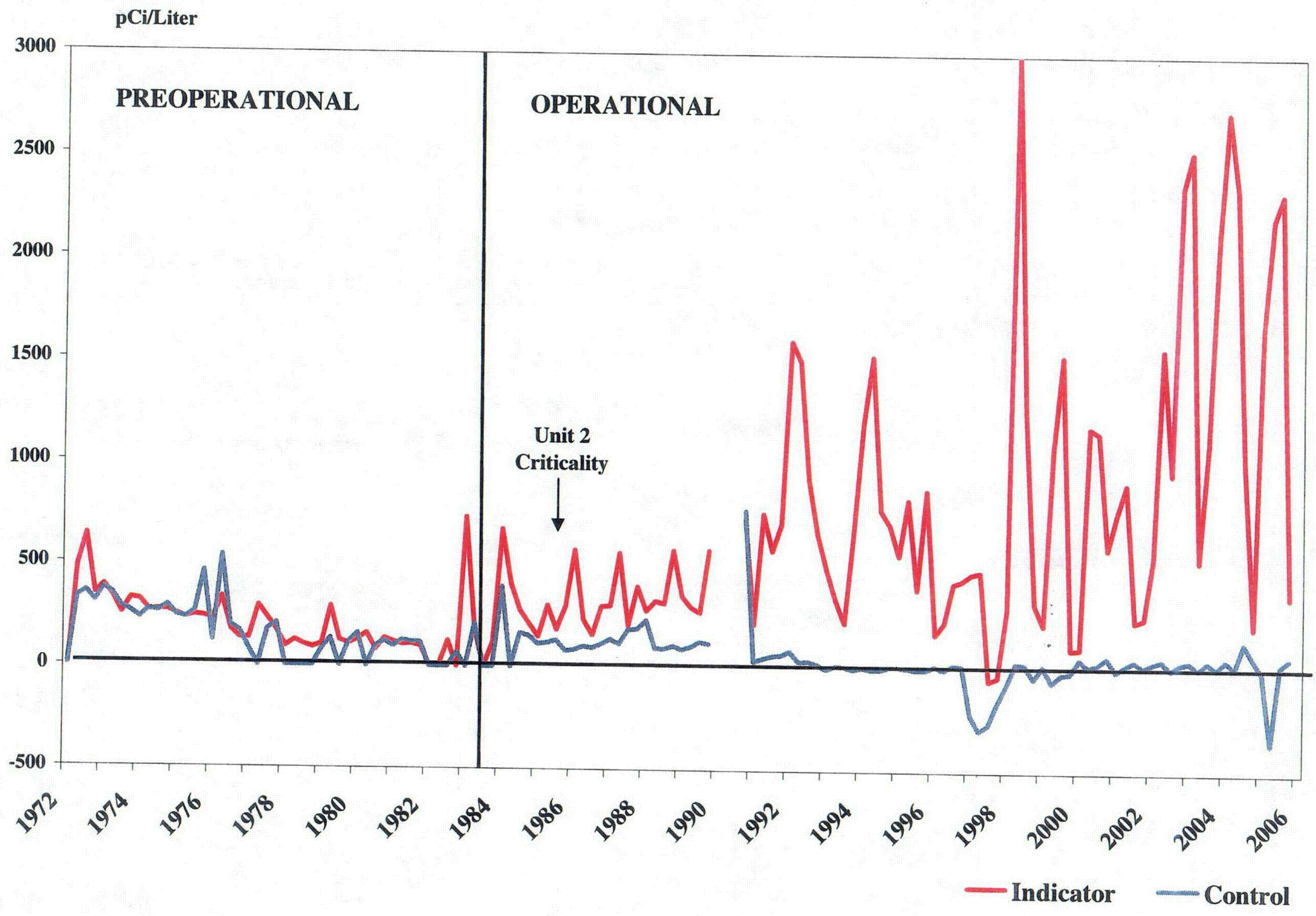
The annual mean activity level of tritium in the CTBD line (monitoring location 2S7\6S7) for 2005 was 4,613 pCi/l. The annual mean activity of tritium for control location 6S6 was -65 pCi/l. For the purpose of performing the dose calculation, tritium was assumed to be present continuously in the CTBD line throughout 2005 at a level equivalent to the annual mean activity of 4,613 pCi/l. The annual mean flow rate for the CTBD line was 8,248 gpm. Using the proper unit conversions and multiplying 8,248 gpm times 4,613 pCi/l yields a value of 75.7 curies for the estimate of tritium released from SSES during 2005. This estimate is 1.7 curies more than the 74.0

curies of tritium determined by effluent monitoring that was released to the river by the SSES in 2005.

Given the total tritium activity released, the maximum whole-body and organ doses to hypothetical exposed individuals in four age groups (adult, teenager, child, and infant) were determined according to the methodology of the Offsite Dose Calculation manual using the RETDAS computer program. This is in accordance with SSES Technical Requirement 3.11.4.1.3.

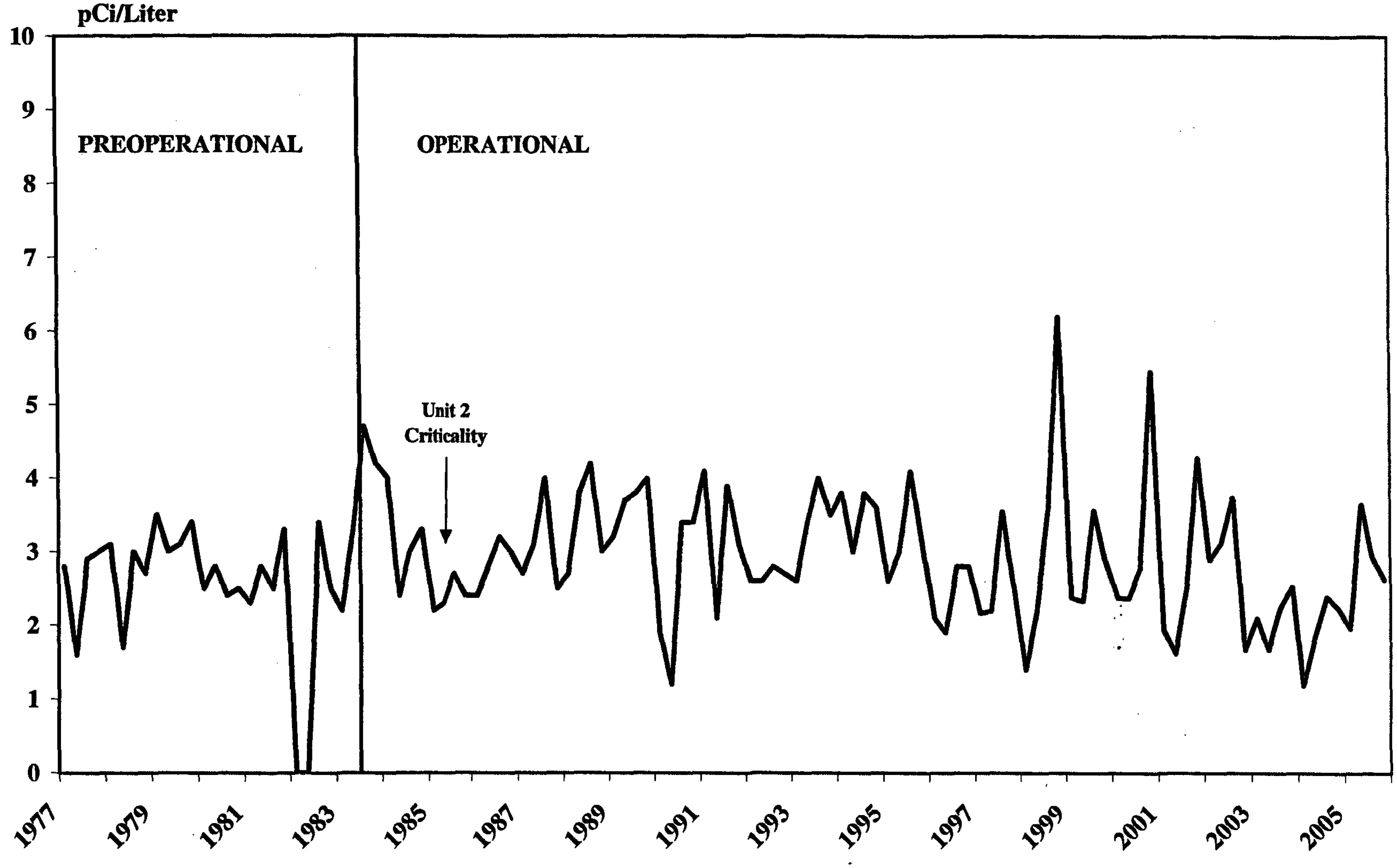
The maximum dose obtained from the ingestion of tritium was estimated at the nearest downriver municipal water supplier via the drinking water pathway and near the outfall of the SSES discharge to the Susquehanna River via the fish pathway. The maximum whole body and organ doses (child) were each calculated as 0.0016 mrem.

FIGURE 10 - TRITIUM ACTIVITY IN SURFACE WATER



C11

FIGURE 11 - GROSS BETA ACTIVITY IN DRINKING WATER



ATMOSPHERIC PATHWAY MONITORING

INTRODUCTION

Atmospheric monitoring by the SSES REMP involves the sampling and analysis of air. Because the air is the first medium that SSES vent releases enter in the pathway to man, it is fundamental that it be monitored. Mechanisms do exist for the transport of airborne contaminants to other media and their concentration in them. For example, airborne contaminants may move to the terrestrial environment and concentrate in milk. Concentrations of radionuclides can make the sampling and analysis of media like milk more sensitive approaches for the detection of radionuclides, such as iodine-131, in the pathway to man than the monitoring of air directly. (PPL also samples milk; refer to the Terrestrial Pathway Monitoring section of this report.) Nevertheless, the sensitivity of air monitoring can be optimized by the proper selection of sampling techniques and the choice of the proper types of analyses for the collected samples.

Scope

Air samples were collected on particulate filters and charcoal cartridges at indicator locations 3S2, 12S1, 13S6 and 12E1, and control locations 6G1 and 8G1.

Sampling and Analysis

Air

The SSES REMP monitored the air at four indicator locations and two control locations during 2005. The SSES Technical Requirements require monitoring at only a total of five sites. Monitoring is required at three locations at the SSES site boundary in different sectors with the greatest predicted sensitivities for the detection of SSES releases (3S2, 12S1, 13S6). Monitoring must be performed at the community in the vicinity of the SSES with the greatest predicted sensitivity (12E1). A control location that is expected to be unaffected by any routine SSES releases must be monitored (6G1, 8G1).

Airborne particulates were collected on glass fiber filters using low volume (typically 2.0 to 2.5 cfm sampling rates) air samplers that run continuously. Air iodine samples were collected on charcoal cartridges, placed downstream of the particulate filters.

Particulate filters and charcoal cartridges were exchanged weekly at the air monitoring sites. Sampling times were recorded on elapsed-time meters. Air sample volumes for particulate filters and charcoal cartridges were measured with dry-gas meters.

Air filters were analyzed weekly for gross beta activity, then composited quarterly and analyzed for the activities of gamma-emitting radionuclides. The charcoal cartridges were analyzed weekly for iodine-131.

Monitoring Results

Air Particulates

Refer to the following for results of air particulate analyses for 2005:

- Figure 12 trends gross beta activities separately for air particulate indicator and control locations from 1974 through 2005.
- Appendix G, Table G pages G-10 and G-11, shows a summary of the 2005 air particulate data.
- Appendix H, Tables H 13 and 14 page H-5, shows comparisons of gross beta and Beryllium-7 monitoring results against past years' data.
- Appendix I, Table I-8 pages I-16 and I-17, shows specific sample results of gross beta analyses for air particulate filters.

Air Particulate Gross Beta

Weekly samples from all air particulate filter locations were analyzed for concentrations of gross beta activity (Table I-8). Gross beta activity was observed at all locations above MDC for 2005. The 2005 indicator values ranged from 3.83E-3 to 27E-3 pCi/m^3, compared to 3.51E-3 to 36.6E-3 pCi/m^3 for 2004. The 2005 mean gross beta activity of 14.2E-3 pCi/m^{3}for all indicator location compared to the average of the annual preoperational control mean of 62E-3 pCi/m^3 indicates activity detected below the preoperational control. In addition, a comparison of the 2005 indicator mean of 14.2E-3 pCi/m^3 with the 2005 control locations mean of 13E-3 pCi/m^3 indicates no appreciable effects from the operation of SSES.

Gross beta activity is normally measured at levels in excess of the analysis MDCs on the fiber filters. The highest gross beta activity levels that have been measured during the operational period of the SSES were obtained in 1986 following the Chernobyl accident in the former Soviet Union.

Note that prior to SSES operation, before 1982, the unusually high gross beta activities were generally attributable to fallout from atmospheric nuclear weapons tests. Typical gross beta activities measured on air particulate filters are the result of naturally occurring radionuclides associated with dust particles suspended in the sampled air. They are thus terrestrial in origin.

The SSES Technical Requirements Manual requires radionuclide analysis if any weekly gross beta result was greater than ten times the yearly mean of control sample results. This condition did not occur during 2005.

Air Particulate Gamma Spectroscopic

Quarterly gamma spectroscopic measurements of composited filters often show the naturally occurring radionuclide beryllium-7. Occasionally, other naturally occurring radionuclides, potassium-40 and radium-226, are also observed. Beryllium-7 is cosmogenic in origin, being produced by the interaction of cosmic radiation with the earth's atmosphere. The other two gamma-emitting radionuclides originate from soil and rock.

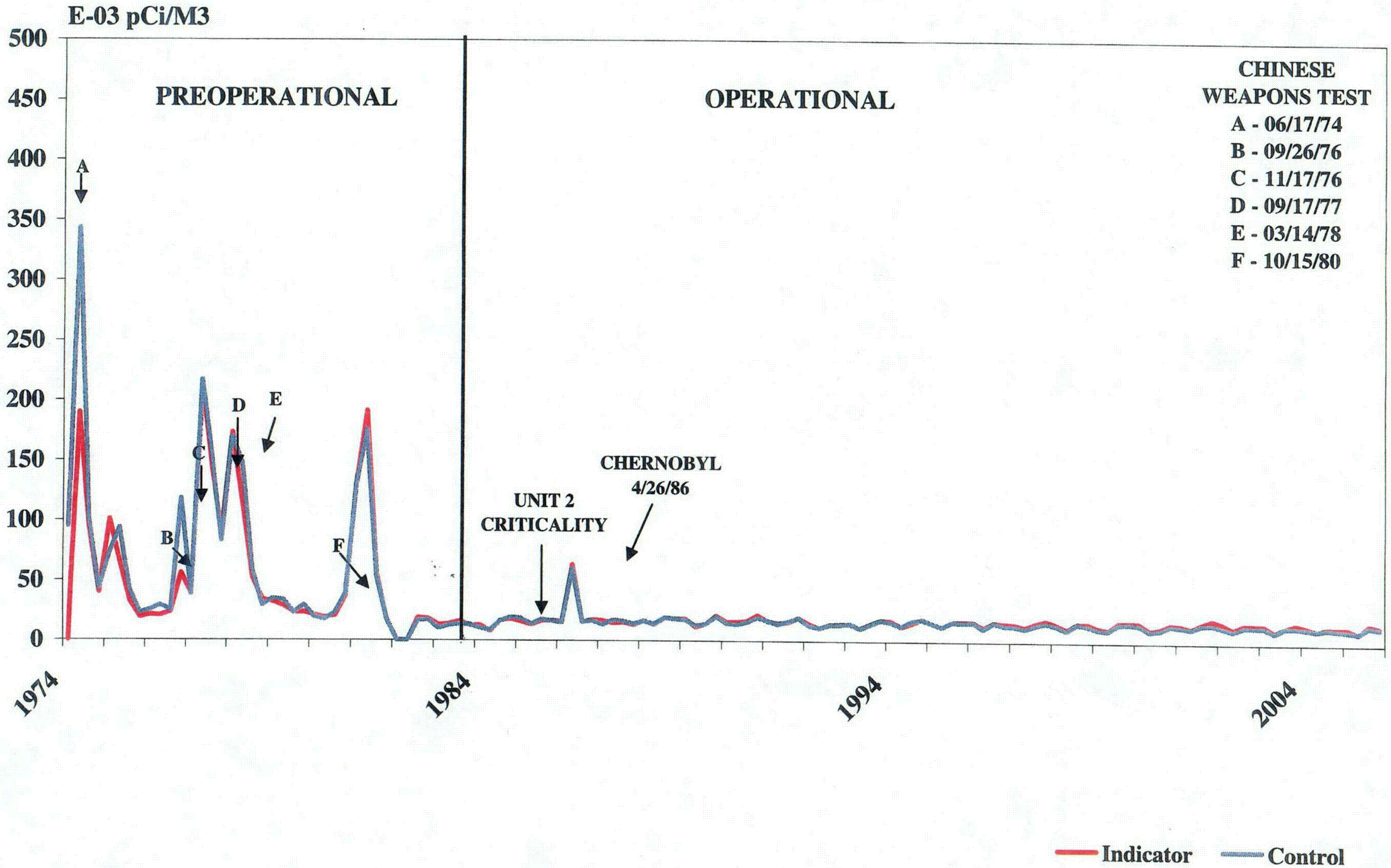
Beryllium-7 was measured above analysis MDCs for all quarterly composite samples in 2005. The 2005 indicator and control means for beryllium-7 activity were both 106 pCi/m^3. Beryllium-7 activity levels for each 2005 calendar quarter at each monitoring location are presented in Table I-9 of Appendix I. Comparisons of 2005 beryllium-7 analysis results with previous years may be found in Table H 14 of Appendix H.

No other gamma-emitting radionuclides were reported for air in 2005. Beryllium-7 is not attributable to SSES operation.

Air Iodine

Iodine-131 has been detected infrequently from 1976, when it was first monitored, through 2005. Since operation of the SSES began in 1982, iodine-131 has only been positively detected in air samples in 1986 due to the Chernobyl accident. No iodine-131 was reported for the 2005 air monitoring results.

FIGURE 12 - GROSS BETA ACTIVITY IN AIR PARTICULATES



C12

TERRESTRIAL PATHWAY MONITORING

INTRODUCTION

Soil and milk were monitored in the Terrestrial Pathway in 2005.

Soil can be a great accumulator of man-made radionuclides that enter it. The extent of the accumulation in the soil depends of course on the amount of the radionuclides reaching it, but it also depends on the chemical nature of those radionuclides and the particular characteristics of the soil. For example, the element cesium, and, therefore, cesium-137 can be bound very tightly to clay in soils. The amount of clay in soil can vary greatly from one location to another. In clay soils, cesium-137 may move very slowly and also may be taken up very slowly in plants as they absorb soil moisture.

Any medium, such as soil, that tends to accumulate radioactive materials can also provide more sensitivity for radionuclide detection in the environment than those media that don't. Such a medium facilitates the early identification of radionuclides in the environment, as well as awareness of changes that subsequently may occur in the environmental levels of the identified radionuclides.

The SSES REMP samples soil near two of the six REMP air-sampling stations. The purpose for soil sampling near the air sampling sites is to make it easier to correlate air sampling results with soil sampling results if any SSES related radioactive material were found in either medium. Sampling is performed at different depths near the surface to help provide information on how recently certain radioactive materials may have entered the soil. Sampling at more than one depth also may help ensure the detection of materials that move relatively quickly through the soil. Such quick-moving materials may have already passed through the topmost layer of soil at the time of sampling.

Milk was sampled at four locations in 2005. SSES Technical Requirements require that the SSES REMP sample milk at the three most sensitive monitoring locations near the SSES and one control location distant from the SSES.

No requirement exists for the SSES REMP to monitor soil. All monitoring of the terrestrial pathway that is conducted by the SSES REMP in addition to milk (and broad leaf vegetation in certain cases when milk sampling not performed) is voluntary and reflects PPL's willingness to exceed regulatory requirements to ensure that the public and the environment are protected.

Scope

Soil

Soil was sampled in September 2005 in accordance with its scheduled annual sampling frequency, at the following two REMP air sampling locations: 12S1 (indicator) and 8G1 (control).

Several soil plugs were taken at selected spots at each monitoring location. The plugs were separated into "top" (0-2 inches) and "bottom" (2-6 inches) segments. Each set of top and bottom segments was composited to yield 2 soil samples from each location for analysis. Since there are two monitoring locations, a total of 4 soil samples were analyzed in 2005.

Milk

Milk was sampled at least monthly at the following four locations in 2005: 10D1, 10D2, 12B2 and 10G1.

Milk was sampled bi-weekly from April through October when cows were more likely to be on pasture and monthly at other times. Locations 10D1, 10D2, and 12B2 are believed to be the most sensitive indicator sites available for the detection of radionuclides released from the SSES. Location 10G1 is the control location. Since there are four monitoring locations, a total of 84 cow milk samples were collected in 2005.

Sample Preservation and Analysis

All media in the terrestrial pathway are analyzed for the activities of gamma-emitting radionuclides using gamma spectroscopy. The other analysis that is routinely performed is the radiochemical analysis for iodine-131 in milk.

Monitoring Results

Refer to the following for results of the terrestrial pathway analyses for 2005:

- Figure 13 trends iodine-131 activities separately for milk indicator and control locations from 1977 through 2005.

- Appendix G, Table G pages G-12 through G-14, shows a summary of the 2005 terrestrial monitoring results for milk and soil.

- Appendix H, Tables H 15 through 19 pages H-6 and H-7, shows comparisons of terrestrial pathway monitoring results against past years' data.

- Appendix I, Tables I-10 and I-11 pages I-19 through I-23, shows results of specific sample analyses for terrestrial pathway media.

The only man-made radionuclides normally expected at levels in excess of analysis MDCs in the terrestrial pathway are strontium-90 and cesium-137. Both of these radionuclides are present in the environment as a residual from previous atmospheric nuclear weapons testing. Strontium-90 analyses are not now routinely performed for any media samples in the terrestrial pathway. Strontium-90 activity would be expected to be found in milk. SSES Technical Requirements do not require that milk be analyzed for strontium-90. Strontium-90 analyses may be performed at any time if the results of other milk analyses would show detectable levels of fission product activity, such as I-131, which might suggest the SSES as the source.

Cesium-137 normally has been measured in excess of analysis MDCs in most soil samples.

Certain naturally occurring radionuclides are also routinely found above analysis MDCs in terrestrial pathway media. Potassium-40, a primordial and very long-lived radionuclide, which is terrestrial in origin, is observed in all terrestrial pathway media. Other naturally occurring radionuclides often observed in soil are thorium-228 and radium-226.

Soil

Annual samples from the 12S1 and 8G1 soil locations were analyzed for concentrations of gamma emitting nuclides (Table I-11). The following gamma-emitting radionuclides are routinely measured in soil at levels exceeding analysis MDCs: naturally occurring potassium-40, thorium-228 and man-made cesium-137. The 2005 analysis results were similar to those for previous years. No other gamma-emitting radionuclides were reported at levels above analysis MDCs.

The 2005 means for indicator and control location potassium-40 activity were 12.6 pCi/g and 8.48 pCi/g, respectively. This is not the result of SSES operation because the potassium-40 is naturally occurring.

The 2005 means for indicator and control location thorium-228 activity were 0.92 pCi/g and 0.72 pCi/g, respectively. Thorium-228 in soil is not the result of SSES operation because it is naturally occurring.

The 2005 means for indicator and control location cesium-137 activity were 0.03 pCi/g and 0.08 pCi/g, respectively. The 2005 indicator values ranged from 0.024 to 0.034 pCi/g, compared to -0.015 to 0.076 pCi/g for 2004. Cesium-137 in soil, although man-made, is not from the operation of the SSES. It is residual fallout from previous atmospheric nuclear weapons testing.

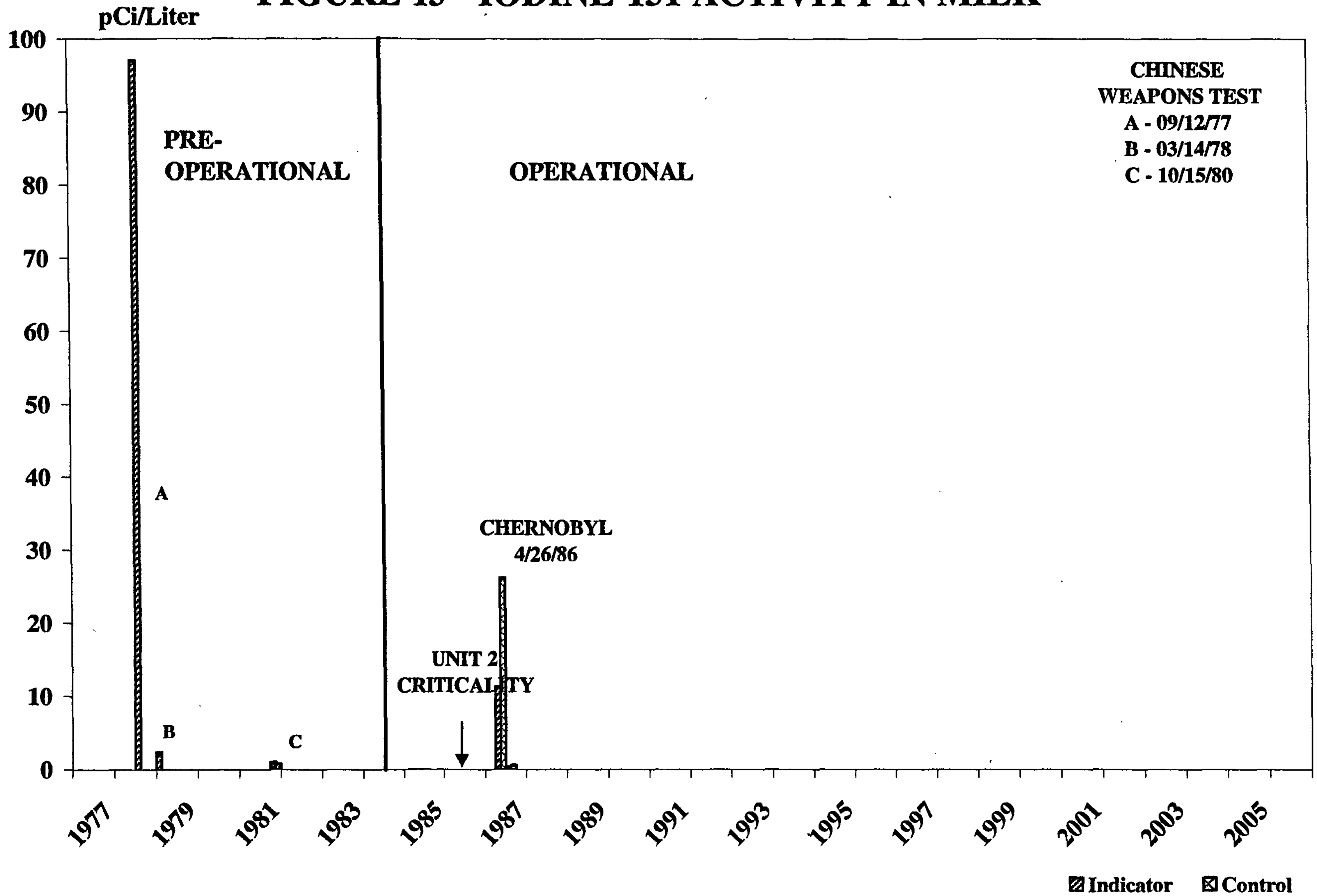
Milk

Semi-monthly or monthly samples from all milk locations were analyzed for concentrations of iodine-131 and other gamma-emitting nuclide activity (Table I-10). No detectable iodine-131 activity above MDC was observed at any location for 2005. The 2005 indicator values ranged from -0.176 to 0.26 pCi/l, compared to -0.9 to 0.54 pCi/l for 2004. Iodine-131 has been chemically separated in milk samples and counted routinely since 1977. Refer to Figure 13 which trends iodine-131 activity in milk for indicator and control locations from 1977 through 2005.

The preoperational years 1976, 1978, and 1980 were exceptional years in the sense that iodine-131 activity was observed in excess of MDCs due to fallout from atmospheric nuclear weapons testing. Iodine-131 activity was also measured at levels exceeding MDCs in milk samples in 1986 in the vicinity of the SSES as a result of the Chernobyl incident.

With the exception of the naturally occurring potassium-40, no gamma-emitting radionuclides were measured in excess of analysis MDCs in 2005. The 2005 means for indicator and control location potassium-40 activity were 1,337 pCi/liter and 1,429 pCi/liter, respectively. The potassium-40 activity in milk is not attributable to SSES operation because it is naturally occurring.

FIGURE 13 - IODINE-131 ACTIVITY IN MILK



GROUND WATER MONITORING

INTRODUCTION

Normal operation of the SSES does not involve the release of radioactive material to ground water directly, or indirectly through the ground. As a result, there are no effluent monitoring data to compare with REMP ground water monitoring results. Ground water could conceivably become contaminated by leakage or spills from the plant or by the washout or deposition of radioactive material that might be airborne. If deposited on the ground, precipitation/soil moisture could aid in the movement of radioactive materials through the ground to water that could conceivably be pumped for drinking purposes. No use of ground water for irrigation near the SSES has been identified.

Primary release paths for recent groundwater contamination events at other nuclear facilities have been: 1) spent fuel pool leakage; 2) leaks from liquid radwaste discharge lines and; 3) leaks from cooling tower blowdown lines. The physical location of the spent fuel pools at Susquehanna and the fuel pool leakage collection system make it highly unlikely that the fuel pools would be a radiological contamination source for groundwater. Leaks from the liquid radwaste discharge line or the cooling tower blowdown line could impact ground water, but to date, there has been no indication of any radiological impacts on groundwater due to station operations.

Scope

Ground water in the SSES vicinity was sampled quarterly at 2 indicator locations (2S2 and 4S4) and one control location (12F3) during 2005.

With the exception of location 4S4, untreated ground water was sampled. Untreated means that the water has not undergone any processing such as filtration, chlorination, or softening. At location 4S4, the SSES Learning Center, well water actually is obtained from on-site and piped to the Learning Center after treatment. This treatment would not affect tritium analysis. This sampling is performed as a check to ensure that water has not been radioactively contaminated. Sampling is performed at the Learning Center to facilitate the sample collection process.

Sample Preservation & Analysis

Ground water samples were analyzed for gamma-emitting radionuclide and tritium activities. Gamma spectrometric analyses of ground water began in 1979 and tritium analyses in 1972, both prior to SSES operation.

Monitoring Results

Tritium activity levels in ground water have typically been observed to be lower than in surface water. A noticeable decline occurred between 1992 and 1993. Fewer measurements were above the analysis sensitivities after 1993.

Gamma-emitting radionuclides in excess of MDCs have been found in only a few samples in all the years that these analyses have been performed. The naturally occurring radionuclides potassium-40 and thorium-228 have been measured above their MDCs occasionally in ground water. Potassium-40 was reported in 1979, 1981, 1985, 1991, 1992, 1993, and 1997. Thorium-228 was found in 1985 and 1986. The man-made radionuclide cesium-137 has been detected only occasionally since 1979. Its presence has always been attributed to residual fallout from previous atmospheric nuclear weapons tests.

Results for the 2005 specific ground water sample analyses may be found in Table I-7 of Appendix I. A summary of the 2005 ground water monitoring data may be located in Appendix G, pages G-9 and G-10. Comparisons of 2005 monitoring results for tritium with those of past years may be found in Table H 20 of Appendix H.

In 2005, no tritium was found in ground water samples above analysis MDC. The 2005 maximum tritium activity levels for indicator and control monitoring locations were 55 and 51 pCi/l, respectively. Both the 2005 indicator and control mean tritium activity levels are lower than their corresponding range for preoperational years.

The only REMP monitored pathway where tritium has been identified as a result of station operations is in the surface water pathway (Susquehanna River) downstream of the site, There have been no indications of any increases in ground water tritium concentrations above normal background levels (based on pre-operational data) since inception of the REMP at PPL Susquehanna.

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9. PPL, "Susquehanna Steam Electric Station, 2004 Annual Radiological Environmental Operating Report," April 2005.

10. PPL, "Susquehanna Steam Electric Station, Radioactive Effluent Release Report," Data Period: January – December 2005, April 2005.

11. Ecology III, "Susquehanna Steam Electric Station, 2005 Land Use Census," November 2005.

12. PPL, "Engineering Study, EC-ENVR-1012 (Revision 0, January 1995)," Interpretation of Environmental TLD Results.

APPENDIX A

2005 REMP SAMPLE COLLECTION, ANALYSIS TYPE, ANALYTICAL METHODS, PROGRAM CHANGES AND EXCEPTIONS

REMP Sample Collection, Analyses and Methods

An independent consulting group, Ecology III, working at Susquehanna's Environmental Laboratory, located approximately ¾ miles east of the SSES, collects and prepares the samples (except for TLD's which are handled by HP). Samples are brought to the laboratory, stored, and shipped to two outside independent analytical laboratories. The following table summarizes the REMP sample collection/analyses performed by independent laboratories for 2005. Note that TBE represents Teledyne Brown Engineering, E-LAB represents Framatome ANP and E-III represents Ecology III, Inc.

TABLE A1
(Page 1 of 3)

SOURCE OF REMP DATA FOR MONITORING YEAR 2005				
Sample Medium	**Analysis**	**Analysis Frequency**	**Collection Procedure Number**	**Analytical Procedure Number**
Ambient Radiation	TLD	Quarterly	SSES, HP-TP-205	SSES,HP-TP-159 & 190
Air	Gross Beta	Weekly	E-III, Appendix 2	TBE-2008 Gross Alpha and/or Beta Activity in Various Matrices
Air	I-131	Weekly	E-III, Appendix 2	TBE-2012 Radioiodine in Various Matrices
Air	Gamma	Quarterly	E-III, Appendix 2	TBE-2007 Gamma Emitting Radioisotope Analysis
Drinking Water	Gross Beta	Monthly	E-III, Appendix 5	TBE-2008 Gross Alpha and/or Beta Activity in Various Matrices
All Waters	Tritium	Monthly (LTAW and Groundwater Quarterly	E-III, Appendix 3, 4, 5, 6, 7 & 8	TBE-2010 Tritium and Carbon-14 Analysis by Liquid Scintillation
Surface & Drinking Water	Gamma	Monthly (LTAW Quarterly)	E-III, Appendix 3, 4, 5, 6, & 7	E-LAB-305 Preparation of Environmental and Bioassay Media for Analysis of Gamma Ray Emitters

TABLE A1
(Page 2 of 3)

Sample Medium	Analysis	Analysis Frequency	Collection Procedure Number	Analytical Procedure Number
Ground Water	Gamma	Quarterly	E-III, Appendix 8	E-LAB-305 Preparation of Environmental and Bioassay Media for Analysis of Gamma Ray Emitters
Surface & Drinking Water (except LTAW)	I-131	Monthly	E-III, Appendix 4, 5, 6, and 7	E-LAB-340 Determination of Iodine-131 in Environmental Media Using Anion Exchange Chromatography
Milk	Gamma	Monthly/ Semi-Monthly	E-III, Appendix 9	E-LAB-305 Preparation of Environmental and Bioassay Media for Analysis of Gamma Ray Emitters
Milk	I-131	Monthly/ Semi-Monthly	E-III, Appendix 9	E-LAB-340 Determination of Iodine-131 in Environmental Media Using Anion Exchange Chromatography
Fish	Gamma	Semi-Annually (Spring/Fall)	E-III, Appendix 11	TBE-2007 gamma Emitting Radioisotope Analysis
Sediment	Gamma	Semi-Annually (Spring/Fall)	E-III, Appendix 12	TBE-2007 gamma Emitting Radioisotope Analysis
Fruits & Vegetables	Gamma	In Season (when irrigated)	E-III, Appendix 13	TBE-2007 gamma Emitting Radioisotope Analysis

TABLE A1
(Page 3 of 3)

Sample Medium	Analysis	Analysis Frequency	Collection Procedure Number	Analytical Procedure Number
Soil	Gamma	Annually	E-III, Appendix 14	E-LAB-305 Preparation of Environmental and Bioassay Media for Analysis of Gamma Ray Emitters

PROGRAM CHANGES:

Direct Radiation Monitoring

There were no changes to the environmental TLD monitoring program in 2005.

Air Monitoring

There were no changes to the air monitoring program for 2005.

Surface Water and Drinking Water Monitoring

Gross beta analysis for surface water locations was discontinued for 2005. Appendix H, Table H2 Surface Water Gross Beta Activities, was deleted. Also Figure 9 Gross Beta Activity in Surface Water was deleted. At the LTAW location the gamma and tritium analyses were changed from monthly to quarterly. Gross alpha and iodine-131 analyses for drinking water location 12H2 were discontinued for 2005. Appendix H, Table H-5 Drinking Water Gross Alpha Activities, was deleted.

Milk Monitoring

There were no changes to the milk-monitoring program for 2005.

Ground Water Monitoring

At locations 12F3, 2S2, and 4S4 gamma and tritium analyses were changed from monthly to quarterly for 2005.

Fruits & Vegetables

5S11 location was added to the fruits and vegetable monitoring program as a control location based on 2005 Land Use Census survey. Fruits and vegetables reported under Aquatic Pathway in 2005. Previously reported under Terrestrial Pathway.

Soil Monitoring

Soil samples were collected at two locations 8G1 and 12S1 in 2005. Sample locations 3S2 and 13S6 were discontinued in 2005.

Sediment Monitoring

At location LTAW, gamma analysis was discontinued for 2005.

Fish Monitoring

There were no changes to the fish monitoring program for 2005.

Quality Assessment Program

The Quality Assessment Program of DOE's Environmental Measurements Laboratory (EML) Tables J-4 and J-9 were discontinued in March 2004.

PROGRAM EXCEPTIONS

The following are sampling and analysis exceptions for 2005.

TABLE A2
(Page 1 of 3)

Sample Type	Date	Location	Explanation
Direct Radiation	1st Q-2005	5E2	TLD # 1000226 unable to process due to water damage. Data from back-up TLD # 1000336 at same location used as valid data.
	1st Q-2005	7E1	TLDs # 1000340 and 1000686 unable to process due to water damage. Data not available.
	3rd Q-2005	16A2	TLDs # 1000698 and 1000687 unable to process due to water damage. Data not available.
	3rd Q-2005	8A3	TLDs # 1000464 and 1000406 unable to process due to water damage. Data not available.
	3rd Q-2005	12E1	TLD # 1000221 unable to process due to water damage. Data from back-up TLD # 1000071 at same location used as valid data.
	3rd Q-2005	2F1	TLDs # 1000761 and 1000987 unable to process due to water damage. Data not available.
	3rd Q-2005	5E2	TLD # 1000902 unable to process due to water damage. Data from back-up TLD # 1000826 at same location used as valid data.
	3rd Q-2005	6E1	TLD # 1000394 unable to process due to water damage. Data from back-up TLD # 1000633 at same location used as valid data.

Table A2
(Page 2 of 3)

Sample Type	Date	Location	Explanation
Direct Radiation	3rd Q-2005	10D1	TLD # 1000998 unable to process due to water damage. Data from back-up TLD # 1000909 at same location used as valid data.
	3rd Q-2005	16A2	TLD # 1000116 unable to process due to water damage. Data from back-up TLD # 1000523 at same location used as valid data.
Surface Water	January	6S6	Unable to collect a sample from 1/11/05 to 1/18/05 and 1/18/05 to 1/25/05 due to debris blockage of auto composite sampler. Grab samples taken at 5S9 (alternate for 6S6) on 1/17/05 and 1/25/05 to represent Week 3 and Week 4 of January 2005 composite.
	May	2S7	Due to power outage from 0520 to 1023 on 5/25/05, time proportional sampling from auto composite sampler was not available for approximately 5 hours. Valid sample obtained.
	July - September	2S7	The quarterly average I-131 activity concentration was elevated for the 3rd quarter in 2005. This quarterly average corresponds to 151.5% of the NRC Reporting Level. This elevated level did not satisfy condition B of TRM/TRO 3.11.4.1 requirements because the observed iodine-131 activity was not the result of SSES plant operations. Reasons for not attributing iodine-131 to plant effluents are discussed on page A-9.

TABLE A2
(Page 3 of 3)

Sample Type	Date	Location	Explanation
Air (Particulate & Iodine)	January	8G1	Due to power outage, continuous sampling interrupted for approximately 6 hours due to ice storm during 1/4/05 to 1/12/05. Valid sample obtained.
	March	3S2,13S6	Due to air sampler malfunction, air sample collected was not in ideal sample volume range from 3/9/05 to 3/16/05. Valid sample obtained.
	March	8G1	Due to electrical problems, air sample collected was not in ideal sample volume range from 3/23/05 to 3/30/05. Valid sample obtained.
	May	12E1	Due to air sampler malfunction, air sample collected was not in ideal volume range from 5/25/05 to 6/1/05. Valid sample obtained.
	July	3S2, 13S6 and 8G1	Power outage on 7/13/05, due to storm interrupted continuous sampling for approximately 1 hour. Valid sample obtained.
	August	3S2, 13S6 and 8G1	Due to power outage on 8/24/05, continuous sampling was interrupted for approximately 1 hour. Valid sample obtained.
	September	3S2	Timer Box failure due to electrical problem during 8/31/05 to 9/7/05. Sampler station remained operable. Valid sample obtained.
	October	12E1	Due to sampler malfunction, air sample collection was not in ideal sample volume range from 10/05/05 to 10/12/05. Valid sample obtained.
	December	8G1	Due to power outage between 12/14/05 and 12/21/05, continuous sampling was interrupted for approximately 2 hours. Valid sample obtained.

ELEVATED I-131 Levels in 2S7 Sample Location

A concentration of 3.03 pCi/l was calculated as the quarterly average I-131 activity concentration in the CTBD line for the third quarter 2005 based on analysis results using the appropriate weighting factors. Elevated I-131 levels observed at 2S7 sample location exceeded the reporting level of 2 pCi/l per TRM Table 3.11.4.1-2; however, the observed iodine-131 was not the result of Susquehanna plant effluents for the following reasons:

- The "Monthly Gaseous and Liquid Radiological Effluent Report" listed no iodine-131 as having been released in liquid effluent for July, August, and September 2005 based on the results of sampling and analyses of the liquid contents of tanks prior to discharge.

- SSES Units 1 and 2 have not observed any indication of fuel failure during this period. Unit 1 and 2 Reactor Coolant System iodine-131 activities have been very low (1 to 2E-6 µCi/ml). Unit 1 and 2 Offgas Xe-138/Xe-133 ratio trends have indicated no fuel defects.

- Of the 78 REMP air samples analyzed for iodine-131 during the third quarter 2005 in the vicinity of the Susquehanna SES, all were below the lower limit of detection. It is reasonable to conclude that atmospheric releases from Susquehanna SES can not explain the iodine-131 levels seen in the Susquehanna River.

Apparent Cause

Varying levels of iodine-131 in medical waste discharged upriver from municipal waste facilities and varying river levels cause fluctuations in iodine-131 activity concentrations in the river with time. The coincidence of larger iodine-131 releases upstream with lower river levels can result in significantly higher iodine-131 concentrations. During June through October (warmer months), river flow generally tends to be below the average for the year. This increases the chance of observing higher activity concentrations at this time of year. The CTBD, location 2S7, I-131 activity of 3.03 pCi/l for the third quarter of 2005 can be explained by the concentrating effect of the cooling towers on the I-131 activity (1.53 pCi/l) found in river water upstream of the SSES (control location 6S6) which is used for makeup to the cooling tower. Based on the average makeup and blowdown flow rates for the third quarter, and using methodology in EC-ENVR-1037, the I-131 activity in the upstream river water should be concentrated by a factor of 3.36. Thus, the calculated concentration of I-131 in the CTBD due to concentration of upstream activity would be 5.1 pCi/l. The fact that the actual concentration of I-131 reported (3.03 pCi/l) was less than the calculated value supports the conclusion that the I-131 found in CTBD samples in third quarter of 2005 is not due to the operation of SSES.

In 2005 the SSES REMP overall performance was as follows:

Sample Collection and Analysis

884 of 889 samples were collected for 99.4% sample collection recovery.

1245 of 1255 analyses were performed on 884 samples for 99.2% analysis data recovery.

	# of Samples Collected	# of Analyses
Primary	845 of 850	1011 of 1021
Replicate	39 of 39	50 of 50
Split/Duplicate	--	184 of 184
Total	884 of 889	1245 of 1255

TLD Direct Radiation Measurements

228 of 232 TLD measurements were analyzed for 98.3 % data recovery.

Equipment Operability Trending

Table A1 below depicts trending of REMP continuous air and automatic water composite sampling equipment operability on a year by year basis. Each discrepancy was reviewed to understand the causes of the program exception. It should be noted that deviations from continuous sampling are permitted for routine maintenance or equipment malfunctions for periods not to exceed 4 hours. Occasional equipment power outages/breakdowns were unavoidable.

Table A1
(Page 1 of 1)

Sampling Medium	Sample Location	Description	Percent (%) Operability 2004	2005
Air Particulate & Charcoal	3S2	SSES Backup Met. Tower	100	99.5
	12S1	West Building	100	100
	13S6	Former Laydown Area, West of Confers Lane	100	99.9
	12E1	Berwick Hospital	100	98.1
	6G1	Freeland Substation	100	100
	8G1	PPL Sys. Facilities Cntr, Humbolt Industrial Park	100	98.6
Drinking Water	12H2	Danville Water Company	100	100
Surface Water	2S7	Cooling Tower Blowdown Discharge Line	98	99.9
	6S6	River Water Intake Line	98	95.3
	6S7	Cooling Tower Blowdown line (STP, alternate for 2S7)	100	81.9

APPENDIX B

2005 REMP MONITORING SCHEDULE (SAMPLING AND ANALYSIS)

TABLE B1
(Page 1 of 2)

Annual Analytical Schedule for the PPL Susquehanna Steam Electric Station Radiological Environmental Monitoring Program – 2005

Media	No. of Locations	Sample Freq.(a)	Analyses Required	Analysis Freq. (a)
Airborne Particulates	6	W QC	Gross Beta (b) Gamma Spectrometry	W Q
Airborne Iodine	6	W	I-131	W
Sediment	3	SA	Gamma Spectrometry	SA
Fish	2 1	SA A	Gamma Spectrometry (on edible portion)	SA A
Surface Water (c)	5	W for MC W for BWC	Gamma Spectrometry Tritium I-131	M, Q LTAW M, Q LTAW M
Ground Water (Well)	3	Q	Gamma Spectrometry Tritium	Q Q
Drinking Water (d)	1	W for MC	Gross Beta Gamma Spectrometry Tritium	M M M
Cow Milk	4(e)	M, SM(e)	I-131 Gamma Spectrometry	M, SM M, SM
Food Products (f) (Potatoes and Pumpkins)	3	A	Gamma Spectrometry	A
Soil	2	A	Gamma Spectrometry	A
Direct Radiation	58	Q	TLD	Q

(a) W = weekly, BWC = bi-weekly composite (once per month), M = monthly, SM = semi-monthly, Q = quarterly, QC = quarterly composite , SA = semi-annually, A = annually, MC = monthly composite.

(b) If the gross beta activity were greater than 10 times the yearly mean of the control sample, gamma analysis would be performed on the individual filter. Gross beta analysis was performed 24 hours or more following filter change to allow for radon and thorium daughter decay.

(c) Locations 6S6, 6S7, and 2S7 are automatic composite samplers and time-proportional sampling was performed at these locations the entire year. Samples are collected weekly for bi-weekly composite and monthly composite samples. Location 6S5 is a sample from the Susquehanna River location downriver of the SSES discharge diffuser. Station 6S5 was grab sampled weekly. An alternate shoreline site located below the SSES discharge diffuser is used when river conditions prohibit boating. The shoreline samples are collected at the Wetlands Cottage area, approximately 100-150 yards downriver from the 6S5 site. LTAW was grab sampled quarterly. The Environmental Lab Boat Ramp (5S9) is an alternate for Riverwater Intake (6S6).

(d) Water from location 12H2 was retrieved weekly. Composite samples of the weekly collections at this location were made monthly (MC) for analysis. Sampling at 12H2 was performed using an automatic composite sampler (ACS) that was operated in the time-proportional mode.

(e) Locations 10D1, 10D2, 10G1, and 12B2 were sampled semi-monthly from April through October when cows are on pasture, monthly otherwise.

(f) Location 12F7, (Lupini Farm-Mifflinville), irrigated potatoes in July 2005 and location 11D1, (Zehner Farm), irrigated pumpkins in July and August 2005 using Susquehanna River water down river from the SSES. Location 5S11, (PPL Susquehanna Project East-Side-Parcel 25), irrigated potato fields using Susquehanna River water upstream of the discharge diffuser. No other fields were identified using river water below the SSES in 2005.

APPENDIX C

2005
REMP MONITORING LOCATION DESCRIPTIONS

TABLE C 1
(Page 1 of 5)

TLD Locations for the SSES Radiological Environmental Monitoring Program – 2005

Less Than One Mile from the SSES - See Figure 2

Location Code[a]	Distance[a] (miles)	Direction	Description
1S2	0.2	N	Perimeter Fence
2S2	0.9	NNE	Energy Information Center
2S3	0.2	NNE	Perimeter Fence
3S2	0.5	NE	SSES Backup Met Tower
3S3	0.9	NE	Riverlands Garden (Abandoned)
4S3	0.2	ENE	Post, West of SSES APF
4S6	0.7	ENE	Riverlands
5S4	0.8	E	West of Environmental Laboratory
5S7	0.3	E	Perimeter Fence
6S4	0.2	ESE	Perimeter Fence (north)
6S9	0.2	ESE	Perimeter Fence (south)
7S6	0.2	SE	Perimeter Fence
7S7	0.4	SE	End of Kline's Road
8S2	0.2	SSE	Perimeter Fence
9S2	0.2	S	Security Fence
10S1	0.4	SSW	Post - south of switching station
10S2	0.2	SSW	Security Fence
11S3	0.3	SW	Security Fence
11S7	0.4	SW	SSES Access Road Gate #50
12S1	0.4	WSW	SSES West Building

TABLE C 1
(Page 2 of 5)

TLD Locations for the SSES
Radiological Environmental Monitoring Program – 2005

Less Than One Mile from the SSES - See Figure 2

Location Code[a]	Distance[a] (miles)	Direction	Description
12S3	0.4	WSW	Perimeter Fence
13S2	0.4	W	Perimeter Fence
13S5	0.4	W	Perimeter Fence
13S6	0.4	W	Former Laydown Area - west of Confer's Lane
14S5	0.5	WNW	Beach Grove Road/Confer's Lane
15S5	0.4	NW	Perimeter Fence
16S1	0.3	NNW	Perimeter Fence (east)
16S2	0.3	NNW	Perimeter Fence (west)
6A4*	0.6	ESE	Restaurant (U.S. Route 11)
8A3	0.9	SSE	PPL Wetlands Sign (U. S. Route 11)
15A3*	0.9	NW	Hosler Residence
16A2*	0.8	NNW	Benkinney Residence

TABLE C 1
(Page 3 of 5)

TLD Locations for the SSES
Radiological Environmental Monitoring Program – 2005

From One to Five Miles from the SSES - See Figure 3

Location Code[a]	Distance[a] (miles)	Direction	Description
12S7	1.1	WSW	Kisner Residence
8B2*	1.4	SSE	Lawall Residence
9B1	1.3	S	Transmission Line - east of Route 11
10B3*	1.7	SSW	Castek Inc.
1D5	4.0	N	Shickshinny/Mocanaqua Sewage Treatment Plt.
8D3	4.0	SSE	Mowry Residence
9D4	3.6	S	Country Folk Store
10D1	3.0	SSW	R. & C. Ryman Farm
12D2	3.7	WSW	Dagostin Residence
14D1	3.6	WNW	Moore's Hill/Mingle Inn Roads Intersection
3E1	4.7	NE	Webb Residence - Lilly Lake
4E2	4.7	ENE	Ruckles Hill/Pond Hill Roads Intersection
5E2	4.5	E	Bloss Farm
6E1	4.7	ESE	St. James Church
7E1	4.2	SE	Harwood Transmission Line Pole #2
11E1	4.7	SW	Thomas Residence
12E1	4.7	WSW	Berwick Hospital
13E4	4.1	W	Kessler Farm

TABLE C 1
(Page 4 of 5)

TLD Locations for the SSES Radiological Environmental Monitoring Program – 2005

Greater than Five Miles from the SSES - See Figure 4

Location Code[a]	Distance[a] (miles)	Direction	Description
2F1	5.9	NNE	St. Adalberts Cemetery
15F1	5.4	NW	Zawatski Farm
16F1	7.8	NNW	Hidlay Residence
3G4**	17	NE	Wilkes Barre Service Center
4G1**	14	ENE	Mountaintop - Crestwood Industrial Park
7G1**	14	SE	Hazleton PP&L Complex
12G1**	15	WSW	PPL Service Center, Bloomsburg
12G4**	10	WSW	Naus Residence

TABLE C 1
(Page 5 of 5)

TLD Locations for the SSES Radiological Environmental Monitoring Program – 2005

a) All distances from the SSES to monitoring locations are measured from the standby gas treatment vent at 44200/N34117 (Pa. Grid System). The location codes are based on both distance and direction from the SSES. The letters in the location codes indicate if the monitoring locations are on site (within the site boundary) or, if they are not on site, the approximate distances of the locations from the SSES as described below:

S - on site	E - 4-5 miles
A - <1 mile	F - 5-10 miles
B - 1-2 miles	G - 10-20 miles
C - 2-3 miles	H - >20 miles
D - 3-4 miles	*- Special interest areas (other than controls)
	** - Control TLDs

The numbers preceding the letters in the location codes provide the directions of the monitoring locations from the SSES by indicating the sectors in which they are located. A total of 16 sectors (numbered 1 through 16) equally divide an imaginary circle on a map of the SSES and its vicinity, with the SSES at the center of the circle. The middle of sector 1 is directed due north (N). Moving clockwise from sector 1, the sector immediately adjacent to sector 1 is sector 2, the middle of which is directed due north, northeast (NNE). Continuing to move clockwise, the sector numbers increase to 16, which is the north, northwest sector.

The numbers following the letters in the location codes are used to differentiate sampling locations found in the same sectors at approximately the same distances from the SSES.

TABLE C 2
(Page 1 of 4)

Sampling Locations for the SSES Radiological Environmental Monitoring Program – 2005

Less Than One Mile from the SSES - See Figure 5

Location Code[a]	Distance[a] (miles)	Direction	Description
		SURFACE WATER	
2S7	0.1	NNE	Cooling Tower Blowdown Line
5S9	0.8	E	Environmental Lab Boat Ramp (alternate for 6S6)
6S5	0.9	ESE	Outfall Area
6S6*	0.8	ESE	River Water Intake Line
6S7	0.4	ESE	Cooling Tower Blowdown Line (alternate for 2S7)
LTAW	0.7	NE	Lake Took-A-While (on site)
		FISH	
LTAW	0.7	NE - ESE	Lake Took-A-While (on site)
		AIR	
12S1	0.4	WSW	SSES West Building
13S6	0.4	W	Former Laydown Area, West of Confers Lane
3S2	0.5	NE	Back-up Meteorological Tower
		SOIL	
12S1	0.4	WSW	SSES West Building

TABLE C 2
(Page 2 of 4)

Sampling Locations for the SSES Radiological Environmental Monitoring Program – 2005

Less Than One Mile from the SSES - See Figure 5

Location Code[a]	Distance[a] (miles)	Direction	Description
			GROUND WATER
2S2	0.9	NNE	SSES Energy Information Center
4S4	0.5	ENE	SSES Learning Center
From One to Five Miles From the SSES - See Figure 6			
			FISH[b]
IND	0.9 - 1.4	ESE	At or Below the SSES Discharge Diffuser
			SEDIMENT[c]
2B*	1.6	NNE	Gould Island
7B	1.2	SE	Bell Bend
			AIR
12E1	4.7	WSW	Berwick Hospital
			MILK
10D1	3.0	SSW	R. & C. Ryman Farm
10D2	3.1	SSW	Raymond Ryman Farm
12B2	1.7	WSW	Berger Farm
			FRUITS/VEGETABLES
5S11*	1.1	E	PPL Susquehanna Project East Side-Parcel 25
11D1	3.3	SW	Zehner Farm

TABLE C 2
(Page 3 of 4)

Sampling Locations for the SSES Radiological Environmental Monitoring Program – 2005

Greater than Five Miles from the SSES - See Figure 7

Location Code[a]	Distance[a] (miles)	Direction	Description
		DRINKING WATER	
12H2	26	WSW	Danville Water Co. (treated)
		FISH	
2H*	30	NNE	Near Falls, Pa.
		SEDIMENT[c]	
12F	6.9	WSW	Old Berwick Test Track
		AIR	
6G1*	13.5	ESE	Freeland Substation
8G1*	12	SSE	PPL SFC - Humbolt Industrial Park
		SOIL	
8G1*	12	SSE	PPL SFC - Humbolt Industrial Park
		MILK	
10G1*	14	SSW	Davis Farm
		FRUITS/VEGETABLES	
12F7	8.3	WSW	Lupini Farm-Mifflinville
		GROUND WATER	
12F3*	5.2	WSW	Berwick Water Company

TABLE C 2
(Page 4 of 4)

Sampling Locations for the SSES Radiological Environmental Monitoring Program – 2005

a) All distances from the SSES to monitoring locations are measured from the standby gas treatment vent at 44200/N34117 (Pa. Grid System). The location codes are based on both distance and direction from the SSES. The letters in the location codes indicate if the monitoring locations are on site (within the site boundary) or, if they are not on site, the approximate distances of the locations from the SSES as described below:

S - on site	E - 4-5 miles
A - <1 mile	F - 5-10 miles
B - 1-2 miles	G - 10-20 miles
C - 2-3 miles	H - >20 miles
D - 3-4 miles	* - Control locations

The numbers preceding the letters in the location codes provide the directions of the monitoring locations from the SSES by indicating the sectors in which they are located. A total of 16 sectors (numbered 1 through 16) equally divide an imaginary circle on a map of the SSES and its vicinity, with the SSES at the center of the circle. The middle of sector 1 is directed due north (N). Moving clockwise from sector 1, the sector immediately adjacent to sector 1 is sector 2, the middle of which is directed due north, northeast (NNE). Continuing to move clockwise, the sector numbers increase to 16, which is the north, northwest sector.

The numbers following the letters in the location codes are used to differentiate sampling locations found in the same sectors at approximately the same distances from the SSES.

b) No actual location is indicated since fish are sampled from the Susquehanna River at or below the SSES discharge diffuser.

c) No permanent locations exist; samples are taken based on availability. Consequently, it is not necessary to assign a number following the letter in the location code.

APPENDIX D

2005
LAND USE CENSUS RESULTS

2005 LAND USE CENSUS RESULTS

A Land Use Survey, conducted during the 2005 growing season around the SSES, was performed by Ecology III, Inc. to comply with the Offsite Dose Calculation Manual. The purpose of the survey was to document the nearest milk animal, residence, and garden greater than 50 m^2 (approx. 500 ft^2) producing broad leaf vegetation within a distance of 8 km (approx. 5 miles) in each of the 16 meteorological sectors surrounding the SSES.

SUMMARY OF CHANGES FROM 2004 TO 2005

Residence Census:
The residence census was conducted from 1 August through 13 September 2005. Distances of the nearest residences from the Susquehanna SES in the 16 different sectors ranged from 0.5 (J.Futoma, sector 7) to 2.1 miles (R. Barberi, sector 4), with an average of approximately 1.0 miles.

Changes from the 2004 census included: G. John (Sector 16) @ 0.6 mile replaced W. Metzler (moved).

Garden Census:
The garden census was conducted on 1 August through 13 September 2005. Distances of the nearest gardens from the Susquehanna SES in the 16 different sectors ranged from 0.6 miles (T. Scholl, sector 7) to 4.0 miles (P. Culver, sector 16), with an average of 1.9 miles.

Changes from the 2004 census included: A. Kadir (Sector 9) @ 1.2 mile replaced M. Cope (no garden this year), and R. Broody (Sector 11) @ 1.9 mile replaced H. Schultz (no garden this year).

Dairy Animal Census:
Ten dairy animal sites were identified in the census conducted on 25 and 26 July 2005 (9 were within 5 mile radius and one was the control at 14 miles). The numbers of sites were the same as in 2004. Cows were present at all sites; no dairy goats were found. It is noted that after completion of the census, C. and K. Drasher (10D3) discontinued milking and sold their dairy animals. This reduces the number of active dairies in the 5-mile radius to eight.

Irrigation
Unusual amounts of rainfall affected the sizes of gardens and amount of irrigation in 2005. Irrigated fruits and vegetables were monitored at the Lupini Farm (12F7 – Mifflinville field) irrigated potatoes in July 2005, and the Zehner Farm (11D1 – field east of Nescopeck) irrigated pumpkins in July and August 2005, using Susquehanna River water downriver from the Susquehanna SES. The Chapin Farm (5S11 – PPL

Susquehanna Project East Side Parcel 25) irrigated potato fields using Susquehanna River water above the intake. As a result of this survey, 5S11 location was added to the SSES REMP. Overall results of the survey are summarized below:

TABLE D1
(Page 1 of 1)

Nearest residence, garden, and dairy animal in each of the 16 meteorological sectors within a 5-mile radius of the Susquehanna Steam Electric Station, 2005 .

SECTOR	DIRECTION	NEAREST RESIDENCE	NEAREST GARDEN	NEAREST DAIRY ANIMAL
1	N	1.3 mi	3.2 mi	>5.0 mi
2	NNE	1.0 mi	2.3 mi [i]	>5.0 mi
3	NE	0.9 mi	2.7 mi	>5.0 mi
4	ENE	2.1 mi	2.4 mi [a,d,f,j,l]	>5.0 mi
5	E	1.4 mi	1.8 mi [a,c]	4.5 mi. [g]
6	ESE	0.5 mi	2.5 mi	2.7 mi
7	SE	0.5 mi	0.6 mi	>5.0 mi
8	SSE	0.6 mi	1.6 mi	>5.0 mi
9	S	1.0 mi	1.2 mi	>5.0 mi
10	SSW	0.9 mi	1.2 mi	3.0 mi [a,b,c,d,e,g]
11	SW	1.5 mi	1.9 mi	>5.0 mi
12	WSW	1.3 mi	1.3 mi	1.7 mi [i,g]
13	W	1.2 mi	1.2 mi	5.0 mi
14	WNW	0.8 mi	1.3 mi	>5.0 mi
15	NW	0.8 mi [a,c]	1.8 mi [m]	>5.0 mi
16	NNW	0.6 mi	4.0 mi	4.2 mi

[a] Chickens raised for consumption at this location.
[b] Ducks raised for consumption at this location.
[c] Eggs consumed from chickens at this location.
[d] Geese raised for consumption at this location.
[e] Pigs raised for consumption at this location.
[f] Turkeys raised for consumption at this location.
[g] Fruits/vegetables raised for consumption at this location.
[h] Rabbits raised for consumption at this location.*
[i] Beef cattle raised for consumption at this location.
[j] Goats raised for consumption at this location.*
[k] Pheasants raised for consumption at this location.*
[l] Sheep raised for consumption at this location.
[m] Guinea hen raised for consumption at this location.

*No locations were identified as raising rabbits, dairy goats, and pheasants during 2005.

APPENDIX E

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APPENDIX F

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APPENDIX G

2005 SSES REMP SUMMARY OF DATA

The averages for indicator and control locations reported in the Summary of Data Table, which summarizes the entire year's results for the SSES REMP, were calculated using all measured values, when available, whether or not they were reported in Appendix I tables. Values below the MDCs, even zeroes and negatives, were part of the averaging process for these analysis results. When no measured results are available in these cases, "LLD" is reported.

Preferably, the averages reported in the Summary of Data table for sample media that are normally collected continuously are determined using only results from continuously collected samples. Occasionally, grab samples are taken for these media when equipment malfunctions or other anomalies preclude or otherwise perturb routine continuous sampling. These grab samples are taken to minimize the time periods when no sampling is being performed, or, in some instances, when continuous sampling is considered to be nonrepresentative.

Because grab samples are snapshots of the media over brief periods, it is preferable not to average the analysis results of these samples with those for continuously collected composite samples. However, when equipment malfunctions are protracted, relatively large periods of time could be entirely unrepresented by averages if the results from grab sample analyses are not considered.

Allowing analysis results for grab samples to be weighted equally with those representing relatively large periods of time would tend to bias the resulting averages unjustifiably towards the conditions at the times that the grabs are obtained. Averages obtained in this way might less accurately reflect the conditions for the combined period of continuous sampling and grab sampling than if only the results from continuous sampling were used. On the other hand, using weighting factors for the analysis results of grab samples derived from the actual time it takes to collect those samples would lead to the grab sample analysis results having a negligible effect on the overall average and not justifying the effort involved.

Grab samples collected in lieu of normal continuous sampling are typically obtained at regular intervals corresponding to the intervals (weekly) at which the continuously collected samples would usually be retrieved for eventual compositing. For example, grab samples are collected once a week but may be composited monthly in place of continuously collected samples that would normally be retrieved weekly and composited monthly. Since each grab sample is used to represent an entire week, albeit imperfect, it is reasonable to weight the analysis results the same. Thus, the results of one weekly grab are given approximately one-fourth the weight of the results for a monthly composite sample collected continuously for each of the four weeks in a month. Similarly, the analysis results of a composite of four weekly grab samples would carry the same weight as the analysis results for a composite of four weeks of continuously collected sample.

SUMMARY OF DATA FOR SSES

OPERATIONAL RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM - 2005

NAME OF FACILITY: SUSQUEHANNA STEAM ELECTRIC STATION

LOCATION OF FACILITY: LUZERNE COUNTY, PENNSYLVANIA

Reporting Period: December 28, 2004 to January 19, 2006

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED (1)		LOWER LIMIT OF DETECTION (LLD) (2)	ALL INDICATOR LOCATIONS MEAN (3) RANGE	LOCATION WITH HIGHEST MEAN NAME DISTANCE AND DIRECTION	LOCATION WITH HIGHEST MEAN MEAN (3) RANGE	CONTROL LOCATION MEAN (3) RANGE	NUMBER OF NONROUTINE REPORTED MEASUREMENTS(4)
Ambient Radiation (mR/std. qtr.)	TLD	232		2.32E+01 (208 / 212) (1.61E+01 - 4.63E+01)	9S2 0.2 mi S	4.16E+01 (4 / 4) (3.50E+01 - 4.63E+01)	2.15E+01 (20 / 20) (1.71E+01 - 2.50E+01)	0
Surface Water (pCi/l)	Gross Beta	0	4					0
	Tritium	41	2000	2.05E+03 (28 / 28) (-3.54E+02 - 1.10E+04)	2S7 0.1 mi NNE	4.61E+03 (12 / 12) (-1.08E+02 - 1.10E+04)	-6.52E+01 (13 / 13) (-5.63E+02 - 8.86E+01)	0
	Iodine-131	37	1	1.00E+00 (24 / 24) (-3.30E-01 - 4.00E+00)	2S7 0.1 mi NNE	1.37E+00 (12 / 12) (-3.30E-01 - 4.00E+00)	6.57E-01 (13 / 13) (-1.10E-01 - 1.70E+00)	0
	Gamma Spec K-40	41		3.69E-01 (28 / 28) (-5.20E+01 - 3.10E+01)	6S6 0.8 mi ESE	1.68E+01 (13 / 13) (-2.70E+01 - 4.70E+01)	1.68E+01 (13 / 13) (-2.70E+01 - 4.70E+01)	0
	Mn-54	41	15	-3.65E-01 (28 / 28) (-3.90E+00 - 1.60E+00)	LTAW on site NE-ESE	1.50E-01 (4 / 4) (-1.90E+00 - 1.60E+00)	-4.60E-01 (13 / 13) (-4.40E+00 - 3.00E+00)	0
	Co-58	41	15	-4.91E-01 (28 / 28) (-3.90E+00 - 2.10E+00)	6S6 0.8 mi ESE	-3.40E-01 (13 / 13) (-3.90E+00 - 1.70E+00)	-3.40E-01 (13 / 13) (-3.90E+00 - 1.70E+00)	0
	Fe-59	41	30	-7.07E-01 (28 / 28) (-5.80E+00 - 1.10E+01)	LTAW on site NE-ESE	8.25E-01 (4 / 4) (-2.70E+00 - 3.80E+00)	7.60E-01 (13 / 13) (-5.00E+00 - 9.30E+00)	0
	Co-60	41	15	-1.08E-01 (28 / 28) (-2.10E+00 - 6.10E+00)	6S5 0.9 mi ESE	1.67E-01 (12 / 12) (-2.10E+00 - 6.10E+00)	-5.77E-02 (13 / 13) (-1.60E+00 - 2.60E+00)	0
	Zn-65	41	30	-2.03E+00 (28 / 28) (-1.50E+01 - 3.10E+00)	6S6 0.8 mi ESE	-5.58E-01 (13 / 13) (-7.00E+00 - 1.20E+01)	-5.58E-01 (13 / 13) (-7.00E+00 - 1.20E+01)	0

TABLE G
SUMMARY OF DATA FOR SSES
OPERATIONAL RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM - 2005
NAME OF FACILITY: SUSQUEHANNA STEAM ELECTRIC STATION
LOCATION OF FACILITY: LUZERNE COUNTY, PENNSYLVANIA

Reporting Period: December 28, 2004 to January 19, 2006

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED (1)		LOWER LIMIT OF DETECTION (LLD) (2)	ALL INDICATOR LOCATIONS MEAN (3) RANGE	LOCATION WITH HIGHEST MEAN NAME DISTANCE AND DIRECTION		LOCATION WITH HIGHEST MEAN MEAN (3) RANGE	CONTROL LOCATION MEAN (3) RANGE	NUMBER OF NONROUTINE REPORTED MEASUREMENTS(4)
Surface Water (cont.) (pCi/l)	Zr-95	41	30	1.29E-01 (28 / 28) (-3.60E+00 - 4.10E+00)	LTAW on site	NE-ESE	2.20E+00 (4 / 4) (1.00E+00 - 4.00E+00)	-1.41E-01 (13 / 13) (-2.50E+00 - 1.00E+00)	0
	Nb-95	41	15	-1.53E-01 (28 / 28) (-3.40E+00 - 2.80E+00)	LTAW on site	NE-ESE	1.23E+00 (4 / 4) (-2.00E-01 - 2.80E+00)	-2.48E-01 (13 / 13) (-2.10E+00 - 1.50E+00)	0
	Cs-134	41	15	2.16E-01 (28 / 28) (-1.80E+00 - 3.20E+00)	LTAW on site	NE-ESE	3.75E-01 (4 / 4) (-1.30E+00 - 1.90E+00)	-3.61E-01 (13 / 13) (-4.40E+00 - 1.60E+00)	0
	Cs-137	41	18	6.04E-03 (28 / 28) (-4.30E+00 - 1.50E+00)	6S5 0.9 mi	ESE	1.33E-01 (12 / 12) (-4.30E+00 - 1.40E+00)	-4.31E-02 (13 / 13) (-2.60E+00 - 3.10E+00)	0
	Ba-140	41	60	-3.54E-01 (28 / 28) (-3.70E+00 - 3.90E+00)	6S6 0.8 mi	ESE	1.06E-01 (13 / 13) (-3.60E+00 - 5.10E+00)	1.06E-01 (13 / 13) (-3.60E+00 - 5.10E+00)	0
	La-140	41	15	-4.08E-01 (28 / 28) (-4.30E+00 - 4.50E+00)	6S6 0.8 mi	ESE	1.20E-01 (13 / 13) (-4.10E+00 - 5.80E+00)	1.20E-01 (13 / 13) (-4.10E+00 - 5.80E+00)	0

TABLE G
SUMMARY OF DATA FOR SSES
OPERATIONAL RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM - 2005
NAME OF FACILITY: SUSQUEHANNA STEAM ELECTRIC STATION
LOCATION OF FACILITY: LUZERNE COUNTY, PENNSYLVANIA

Reporting Period: December 28, 2004 to January 19, 2006

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED (1)		LOWER LIMIT OF DETECTION (LLD) (2)	ALL INDICATOR LOCATIONS MEAN (3) RANGE	LOCATION WITH HIGHEST MEAN NAME DISTANCE AND DIRECTION	LOCATION WITH HIGHEST MEAN MEAN (3) RANGE	CONTROL LOCATION MEAN (3) RANGE	NUMBER OF NONROUTINE REPORTED MEASUREMENTS(4)
Potable Water (pCi/l)	Gross Alpha	0			12H2 26 mi WSW		Only indicator stations sampled for this medium.	0
	Gross Beta	12	4	2.54E+00 (12 / 12) (1.45E+00 - 3.37E+00)	12H2 26 mi WSW	2.54E+00 (12 / 12) (1.45E+00 - 3.37E+00)		0
	Iodine-131	0	1		12H2 26 mi WSW			0
	Tritium	12	2000	5.16E+01 (12 / 12) (-1.41E+02 - 2.03E+02)	12H2 26 mi WSW	5.16E+01 (12 / 12) (-1.41E+02 - 2.03E+02)		0
	Gamma Spec							
	K-40	12		-3.60E+00 (12 / 12) (-4.60E+01 - 2.40E+01)	12H2 26 mi WSW	-3.60E+00 (12 / 12) (-4.60E+01 - 2.40E+01)		0
	Mn-54	12	15	-5.76E-01 (12 / 12) (-2.50E+00 - 1.30E+00)	12H2 26 mi WSW	-5.76E-01 (12 / 12) (-2.50E+00 - 1.30E+00)		0
	Co-58	12	15	3.27E-01 (12 / 12) (-2.00E+00 - 2.10E+00)	12H2 26 mi WSW	3.27E-01 (12 / 12) (-2.00E+00 - 2.10E+00)		0
	Fe-59	12	30	2.37E+00 (12 / 12) (-2.50E+00 - 9.20E+00)	12H2 26 mi WSW	2.37E+00 (12 / 12) (-2.50E+00 - 9.20E+00)		0
	Co-60	12	15	1.09E+00 (12 / 12) (-1.40E+00 - 4.20E+00)	12H2 26 mi WSW	1.09E+00 (12 / 12) (-1.40E+00 - 4.20E+00)		0
	Zn-65	12	30	-1.63E+00 (12 / 12) (-5.90E+00 - 6.00E+00)	12H2 26 mi WSW	-1.63E+00 (12 / 12) (-5.90E+00 - 6.00E+00)		0
	Zr-95	12	30	1.04E+00 (12 / 12) (-3.40E+00 - 4.30E+00)	12H2 26 mi WSW	1.04E+00 (12 / 12) (-3.40E+00 - 4.30E+00)		0

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED (1)		LOWER LIMIT OF DETECTION (LLD) (2)	ALL INDICATOR LOCATIONS MEAN (3) RANGE	LOCATION WITH HIGHEST MEAN NAME DISTANCE AND DIRECTION	LOCATION WITH HIGHEST MEAN MEAN (3) RANGE	CONTROL LOCATION MEAN (3) RANGE	NUMBER OF NONROUTINE REPORTED MEASUREMENTS(4)
Potable Water (cont) (pCi/l)	Nb-95	12	15	-2.21E-01 (12 / 12) (-5.00E+00 - 2.40E+00)	12H2 26 mi WSW	-2.21E-01 (12 / 12) (-5.00E+00 - 2.40E+00)	Only indicator stations sampled for this medium.	0
	Cs-134	12	15	1.24E-01 (12 / 12) (-1.70E+00 - 1.60E+00)	12H2 26 mi WSW	1.24E-01 (12 / 12) (-1.70E+00 - 1.60E+00)		0
	Cs-137	12	18	-1.76E-01 (12 / 12) (-2.00E+00 - 1.60E+00)	12H2 26 mi WSW	-1.76E-01 (12 / 12) (-2.00E+00 - 1.60E+00)		0
	Ba-140	12	60	7.04E-01 (12 / 12) (-4.20E+00 - 3.60E+00)	12H2 26 mi WSW	7.04E-01 (12 / 12) (-4.20E+00 - 3.60E+00)		0
	La-140	12	15	7.89E-01 (12 / 12) (-4.90E+00 - 4.10E+00)	12H2 26 mi WSW	7.89E-01 (12 / 12) (-4.90E+00 - 4.10E+00)		0

TABLE G
SUMMARY OF DATA FOR SSES
OPERATIONAL RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM - 2005
NAME OF FACILITY: SUSQUEHANNA STEAM ELECTRIC STATION
LOCATION OF FACILITY: LUZERNE COUNTY, PENNSYLVANIA

Reporting Period: December 28, 2004 to January 19, 2006

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED (1)		LOWER LIMIT OF DETECTION (LLD) (2)	ALL INDICATOR LOCATIONS MEAN (3) RANGE	LOCATION WITH HIGHEST MEAN NAME DISTANCE AND DIRECTION	LOCATION WITH HIGHEST MEAN MEAN (3) RANGE	CONTROL LOCATION MEAN (3) RANGE	NUMBER OF NONROUTINE REPORTED MEASUREMENTS(4)
Fish	Gamma Spec							
(pCi/kg wet)	K-40	13		3.29E+03 (7 / 7) (2.60E+03 - 4.32E+03)	LTAW on site NE-ESE	3.72E+03 (1 / 1) (3.72E+03 - 3.72E+03)	3.01E+03 (6 / 6) (2.33E+03 - 3.52E+03)	0
	Mn-54	13	130	4.59E+00 (7 / 7) (-6.34E+00 - 2.66E+01)	IND 0.9-1.4 mi ESE	5.66E+00 (6 / 6) (-6.34E+00 - 2.66E+01)	4.17E-01 (6 / 6) (-8.15E+00 - 7.31E+00)	0
	Co-58	13	130	-1.32E+00 (7 / 7) (-1.68E+01 - 9.42E+00)	LTAW on site NE-ESE	9.86E-01 (1 / 1) (9.86E-01 - 9.86E-01)	-4.31E+00 (6 / 6) (-1.06E+01 - 6.18E+00)	0
	Fe-59	13	260	-2.34E+01 (7 / 7) (-6.54E+01 - 3.56E+01)	LTAW on site NE-ESE	3.56E+01 (1 / 1) (3.56E+01 - 3.56E+01)	-1.17E+01 (6 / 6) (-4.42E+01 - 2.24E+01)	0
	Co-60	13	130	-2.77E+00 (7 / 7) (-1.66E+01 - 1.13E+01)	LTAW on site NE-ESE	1.09E+01 (1 / 1) (1.09E+01 - 1.09E+01)	-6.16E+00 (6 / 6) (-2.08E+01 - 6.11E+00)	0
	Zn-65	13	260	-2.69E+01 (7 / 7) (-6.77E+01 - 4.37E+00)	LTAW on site NE-ESE	-2.22E+01 (1 / 1) (-2.22E+01 - -2.22E+01)	-2.66E+01 (6 / 6) (-8.92E+01 - 4.53E+01)	0
	Zr-95	13		3.96E+00 (7 / 7) (-2.26E+01 - 2.66E+01)	2H 30 mi NNE	7.65E+00 (6 / 6) (-2.60E+01 - 4.90E+01)	7.65E+00 (6 / 6) (-2.60E+01 - 4.90E+01)	0
	Nb-95	13		-4.75E+00 (7 / 7) (-1.14E+01 - 6.37E+00)	2H 30 mi NNE	1.30E+00 (6 / 6) (-1.93E+01 - 1.60E+01)	1.30E+00 (6 / 6) (-1.93E+01 - 1.60E+01)	0
	Cs-134	13	130	-9.02E+00 (7 / 7) (-4.59E+01 - 1.40E+01)	2H 30 mi NNE	9.80E+00 (6 / 6) (-1.41E+00 - 2.26E+01)	9.80E+00 (6 / 6) (-1.41E+00 - 2.26E+01)	0
	Cs-137	13	150	6.50E+00 (7 / 7) (-1.03E+01 - 2.18E+01)	IND 0.9-1.4 mi ESE	6.94E+00 (6 / 6) (-1.03E+01 - 2.18E+01)	-2.84E+00 (6 / 6) (-1.70E+01 - 8.11E+00)	0
	Ba-140	13		1.49E+01 (7 / 7) (-1.00E+02 - 1.05E+02)	LTAW on site NE-ESE	4.05E+01 (1 / 1) (4.05E+01 - 4.05E+01)	3.70E+01 (6 / 6) (-7.36E+01 - 8.48E+01)	0
	La-140	13		2.21E-01 (7 / 7) (-3.28E+01 - 2.10E+01)	IND 0.9-1.4 mi ESE	5.72E+00 (6 / 6) (-1.59E+01 - 2.10E+01)	-5.96E+00 (6 / 6) (-1.59E+01 - 1.88E+00)	0

TABLE G
SUMMARY OF DATA FOR SSES
OPERATIONAL RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM - 2005
NAME OF FACILITY: SUSQUEHANNA STEAM ELECTRIC STATION
LOCATION OF FACILITY: LUZERNE COUNTY, PENNSYLVANIA

Reporting Period: December 28, 2004 to January 19, 2006

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED (1)		LOWER LIMIT OF DETECTION (LLD) (2)	ALL INDICATOR LOCATIONS MEAN (3) RANGE	LOCATION WITH HIGHEST MEAN NAME DISTANCE AND DIRECTION	LOCATION WITH HIGHEST MEAN MEAN (3) RANGE	CONTROL LOCATION MEAN (3) RANGE	NUMBER OF NONROUTINE REPORTED MEASUREMENTS(4)
Sediment	Gamma Spec							
(pCi/kg dry)	Be-7	6		1.03E+02 (4 / 4)	12F	1.83E+02 (2 / 2)	9.24E+00 (2 / 2)	0
				(1.89E+01 - 2.90E+02)	6.9 mi WSW	(7.63E+01 - 2.90E+02)	(-3.72E+01 - 5.57E+01)	
	K-40	6		1.08E+04 (4 / 4)	2B	1.35E+04 (2 / 2)	1.35E+04 (2 / 2)	0
				(7.64E+03 - 1.27E+04)	1.6 mi NNE	(1.20E+04 - 1.49E+04)	(1.20E+04 - 1.49E+04)	
	Mn-54	6		-1.34E+01 (4 / 4)	2B	1.98E+01 (2 / 2)	1.98E+01 (2 / 2)	0
				(-3.49E+01 - 2.38E+01)	1.6 mi NNE	(1.70E+01 - 2.26E+01)	(1.70E+01 - 2.26E+01)	
	Co-58	6		-1.40E+01 (4 / 4)	7B	-1.12E+01 (2 / 2)	-1.74E+01 (2 / 2)	0
				(-4.11E+01 - 7.29E+00)	1.2 mi SE	(-1.27E+01 - -9.65E+00)	(-3.32E+01 - -1.60E+00)	
	Fe-59	6		4.08E+01 (4 / 4)	2B	4.82E+01 (2 / 2)	4.82E+01 (2 / 2)	0
				(-5.50E+01 - 1.29E+02)	1.6 mi NNE	(4.78E+01 - 4.86E+01)	(4.78E+01 - 4.86E+01)	
	Co-60	6		-4.33E+00 (4 / 4)	12F	-3.59E+00 (2 / 2)	-7.46E+00 (2 / 2)	0
				(-8.31E+00 - 1.12E+00)	6.9 mi WSW	(-8.31E+00 - 1.12E+00)	(-9.49E+00 - -5.43E+00)	
	Zn-65	6		-4.17E+00 (4 / 4)	2B	2.05E+01 (2 / 2)	2.05E+01 (2 / 2)	0
				(-2.58E+01 - 9.11E+00)	1.6 mi NNE	(-4.24E-01 - 4.13E+01)	(-4.24E-01 - 4.13E+01)	
	Zr-95	6		2.39E+01 (4 / 4)	7B	2.56E+01 (2 / 2)	-9.64E+00 (2 / 2)	0
				(-1.16E+01 - 6.28E+01)	1.2 mi SE	(-1.16E+01 - 6.28E+01)	(-1.46E+01 - -4.65E+00)	
	Nb-95	6		1.47E+01 (4 / 4)	2B	5.12E+01 (2 / 2)	5.12E+01 (2 / 2)	0
				(-4.44E+01 - 8.20E+01)	1.6 mi NNE	(3.05E+01 - 7.20E+01)	(3.05E+01 - 7.20E+01)	
	Cs-134	6	150	-7.51E+00 (4 / 4)	7B	-1.93E+00 (2 / 2)	-4.41E+00 (2 / 2)	0
				(-1.71E+01 - 1.27E+01)	1.2 mi SE	(-1.65E+01 - 1.27E+01)	(-5.22E+00 - -3.60E+00)	
	Cs-137	6	180	5.91E+01 (4 / 4)	7B	1.18E+02 (2 / 2)	9.37E+01 (2 / 2)	0
				(-3.58E+00 - 1.32E+02)	1.2 mi SE	(1.05E+02 - 1.32E+02)	(6.46E+01 - 1.23E+02)	
	Ba-140	6		5.38E+01 (4 / 4)	7B	9.33E+01 (2 / 2)	-5.04E+01 (2 / 2)	0
				(-2.98E+01 - 1.76E+02)	1.2 mi SE	(1.12E+01 - 1.76E+02)	(-6.81E+01 - -3.27E+01)	

TABLE G
SUMMARY OF DATA FOR SSES
OPERATIONAL RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM - 2005
NAME OF FACILITY: SUSQUEHANNA STEAM ELECTRIC STATION
LOCATION OF FACILITY: LUZERNE COUNTY, PENNSYLVANIA

Reporting Period: December 28, 2004 to January 19, 2006

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED (1)		LOWER LIMIT OF DETECTION (LLD) (2)	ALL INDICATOR LOCATIONS MEAN (3) RANGE		LOCATION WITH HIGHEST MEAN NAME DISTANCE AND DIRECTION			LOCATION WITH HIGHEST MEAN MEAN (3) RANGE		CONTROL LOCATION MEAN (3) RANGE		NUMBER OF NONROUTINE REPORTED MEASUREMENTS(4)
Sediment (cont)	La-140	6		-2.40E+01	(4 / 4)	7B			-1.05E+01	(2 / 2)	-2.37E+01	(2 / 2)	0
(pCi/kg dry)				(-5.16E+01	- 1.76E+01)	1.2	mi	SE	(-3.86E+01	- 1.76E+01)	(-3.34E+01	- -1.41E+01)	
	Ra-226	6		2.15E+03	(4 / 4)	7B			2.21E+03	(2 / 2)	1.99E+03	(2 / 2)	0
				(1.55E+03	- 2.86E+03)	1.2	mi	SE	(1.55E+03	- 2.86E+03)	(1.74E+03	- 2.25E+03)	
	Th-228	6		1.71E+03	(4 / 4)	2B			1.98E+03	(2 / 2)	1.98E+03	(2 / 2)	0
				(1.12E+03	- 2.33E+03)	1.6	mi	NNE	(1.11E+03	- 2.85E+03)	(1.11E+03	- 2.85E+03)	
Ground Water	Gamma Spec												
(pCi/l)	K-40	12		-1.56E+01	(8 / 8)	12F3			4.25E+00	(4 / 4)	4.25E+00	(4 / 4)	0
				(-5.30E+01	- 1.00E+01)	5.2	mi	WSW	(-3.70E+01	- 4.80E+01)	(-3.70E+01	- 4.80E+01)	
	Mn-54	12	15	-4.48E-01	(8 / 8)	4S4			-3.25E-01	(4 / 4)	-1.00E+00	(4 / 4)	0
				(-1.80E+00	- 1.20E+00)	0.5	mi	ENE	(-1.10E+00	- 1.20E+00)	(-2.00E+00	- -1.00E-01)	
	Co-58	12	15	-4.44E-01	(8 / 8)	4S4			1.13E+00	(4 / 4)	-1.75E-01	(4 / 4)	0
				(-5.20E+00	- 2.70E+00)	0.5	mi	ENE	(-5.00E-01	- 2.70E+00)	(-1.30E+00	- 1.20E+00)	
	Fe-59	12	30	1.63E-01	(8 / 8)	12F3			1.80E+00	(4 / 4)	1.80E+00	(4 / 4)	0
				(-5.50E+00	- 5.40E+00)	5.2	mi	WSW	(-5.30E+00	- 6.50E+00)	(-5.30E+00	- 6.50E+00)	
	Co-60	12	15	3.10E-01	(8 / 8)	4S4			5.25E-01	(4 / 4)	7.50E-02	(4 / 4)	0
				(-1.30E+00	- 2.00E+00)	0.5	mi	ENE	(-6.00E-01	- 2.00E+00)	(-3.90E+00	- 3.10E+00)	
	Zn-65	12	30	6.50E-01	(8 / 8)	12F3			1.28E+00	(4 / 4)	1.28E+00	(4 / 4)	0
				(-6.40E+00	- 1.20E+01)	5.2	mi	WSW	(-1.90E+00	- 6.00E+00)	(-3.90E+00	- 6.00E+00)	
	Zr-95	12	30	-9.88E-01	(8 / 8)	2S2			4.25E-01	(4 / 4)	-1.65E+00	(4 / 4)	0
				(-5.80E+00	- 3.40E+00)	0.9	mi	NNE	(-4.00E-01	- 2.10E+00)	(-6.70E+00	- 2.50E+00)	
	Nb-95	12	15	3.38E-01	(8 / 8)	2S2			6.75E-01	(4 / 4)	4.50E-01	(4 / 4)	0
				(-1.00E+00	- 1.70E+00)	0.9	mi	NNE	(2.00E-01	- 1.70E+00)	(-1.90E+00	- 4.20E+00)	
	Cs-134	12	15	1.30E-01	(8 / 8)	2S2			4.10E-01	(4 / 4)	-4.00E-01	(4 / 4)	0
				(-2.40E+00	- 2.10E+00)	0.9	mi	NNE	(-2.00E+00	- 2.10E+00)	(-2.70E+00	- 2.20E+00)	

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Reporting Period: December 28, 2004 to January 19, 2006

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED (1)		LOWER LIMIT OF DETECTION (LLD) (2)	ALL INDICATOR LOCATIONS MEAN (3) RANGE	LOCATION WITH HIGHEST MEAN NAME DISTANCE AND DIRECTION	LOCATION WITH HIGHEST MEAN MEAN (3) RANGE	CONTROL LOCATION MEAN (3) RANGE	NUMBER OF NONROUTINE REPORTED MEASUREMENTS(4)
Ground Water (cont) (pCi/l)	Cs-137	12	18	7.64E-01 (8 / 8) (-1.90E+00 - 3.70E+00)	2S2 0.9 mi NNE	1.00E+00 (4 / 4) (-3.00E-01 - 2.50E+00)	-7.50E-02 (4 / 4) (-2.20E+00 - 2.20E+00)	0
	Ba-140	12	60	-1.25E+00 (8 / 8) (-4.70E+00 - 1.10E+00)	2S2 0.9 mi NNE	-3.75E-01 (4 / 4) (-3.50E+00 - 1.10E+00)	-2.15E+00 (4 / 4) (-7.70E+00 - 2.00E-01)	0
	La-140	12	15	-1.44E+00 (8 / 8) (-5.40E+00 - 1.30E+00)	2S2 0.9 mi NNE	-4.25E-01 (4 / 4) (-4.00E+00 - 1.30E+00)	-2.45E+00 (4 / 4) (-8.80E+00 - 2.00E-01)	0
	H-3	12	2000	-7.07E+01 (8 / 8) (-6.64E+02 - 5.50E+01)	4S4 0.5 mi ENE	-3.23E+00 (4 / 4) (-5.91E+01 - 5.50E+01)	-8.38E+01 (4 / 4) (-4.17E+02 - 5.06E+01)	0
Air Particulates (E-03 pCi/m3)	Gross Beta	312	10	1.42E+01 (208 / 208) (3.83E+00 - 2.70E+01)	12E1 4.7 mi WSW	1.44E+01 (52 / 52) (3.83E+00 - 2.70E+01)	1.30E+01 (104 / 104) (3.25E+00 - 2.80E+01)	0
Air Iodine (E-03 pCi/m3)	I-131	312	70	-3.87E-01 (208 / 208) (-1.24E+01 - 1.03E+01)	12E1 4.7 mi WSW	-2.00E-02 (52 / 52) (-1.24E+01 - 1.03E+01)	-8.39E-02 (104 / 104) (-1.22E+01 - 1.02E+01)	0
Air Particulates Quarterly Composite (E-03 pCi/m3)	Gamma Spec Be-7	24		1.06E+02 (16 / 16) (7.55E+01 - 1.43E+02)	12E1 4.7 mi WSW	1.13E+02 (4 / 4) (9.60E+01 - 1.43E+02)	1.06E+02 (8 / 8) (7.36E+01 - 1.38E+02)	0
	K-40	24		1.04E+00 (16 / 16) (-4.12E+00 - 1.19E+01)	3S2 0.5 mi NE	7.70E+00 (4 / 4) (1.78E+00 - 1.19E+01)	3.46E+00 (8 / 8) (-5.96E+00 - 1.98E+01)	0
	Mn-54	24		7.61E-02 (16 / 16) (-2.93E-01 - 3.95E-01)	3S2 0.5 mi NE	1.96E-01 (4 / 4) (-8.91E-02 - 3.95E-01)	-4.29E-02 (8 / 8) (-4.54E-01 - 1.26E-01)	0

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Reporting Period: **December 28, 2004** **to** **January 19, 2006**

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED (1)		LOWER LIMIT OF DETECTION (LLD) (2)	ALL INDICATOR LOCATIONS MEAN (3) RANGE	LOCATION WITH HIGHEST MEAN NAME DISTANCE AND DIRECTION	LOCATION WITH HIGHEST MEAN MEAN (3) RANGE	CONTROL LOCATION MEAN (3) RANGE	NUMBER OF NONROUTINE REPORTED MEASUREMENTS(4)
Air Particulates (cont)								
Quarterly Composite (E-03 pCi/m3)	Co-58	24		-1.26E-01 (16 / 16) (-7.74E-01 - 3.70E-01)	8G1 12 mi SSE	1.60E-01 (4 / 4) (1.62E-02 - 2.92E-01)	1.08E-01 (8 / 8) (-3.43E-01 - 3.75E-01)	0
	Fe-59	24		4.06E-01 (16 / 16) (-2.71E+00 - 3.31E+00)	12E1 4.7 mi WSW	8.85E-01 (4 / 4) (1.18E-01 - 1)	2.52E-01 (8 / 8) (-2.25E+00 - 3.16E+00)	0
	Co-60	24		1.63E-02 (16 / 16) (-4.08E-01 - 4.42E-01)	8G1 12 mi SSE	3.11E-01 (4 / 4) (9.74E-02 - 6.72E-01)	7.64E-02 (8 / 8) (-3.19E-01 - 6.72E-01)	0
	Zn-65	24		-3.26E-01 (16 / 16) (-1.81E+00 - 9.40E-01)	8G1 12 mi SSE	5.42E-01 (4 / 4) (-5.61E-01 - 1.54E+00)	4.47E-01 (8 / 8) (-5.61E-01 - 1.64E+00)	0
	Zr-95	24		-9.19E-03 (16 / 16) (-1.53E+00 - 2.01E+00)	3S2 0.5 mi NE	3.95E-01 (4 / 4) (-7.14E-01 - 1.77E+00)	-5.74E-02 (8 / 8) (-1.02E+00 - 1.90E+00)	0
	Nb-95	24		9.89E-02 (16 / 16) (-4.44E-01 - 7.18E-01)	8G1 12 mi SSE	3.91E-01 (4 / 4) (-2.25E-02 - 8.43E-01)	2.41E-01 (8 / 8) (-2.25E-02 - 8.43E-01)	0
	Cs-134	24	50	9.89E-02 (16 / 16) (-3.94E-01 - 5.86E-01)	3S2 0.5 mi NE	1.04E-01 (4 / 4) (-1.27E-01 - 3.43E-01)	-5.83E-02 (8 / 8) (-5.02E-01 - 8.45E-01)	0
	Cs-137	24	60	7.93E-02 (16 / 16) (-1.74E-01 - 5.87E-01)	3S2 0.5 mi NE	2.35E-01 (4 / 4) (5.20E-02 - 5.87E-01)	2.05E-02 (8 / 8) (-2.89E-01 - 2.42E-01)	0
	Ba-140	24		-3.03E+00 (16 / 16) (-5.60E+01 - 4.74E+01)	12E1 4.7 mi WSW	1.16E+01 (4 / 4) (-1.52E+01 - 4.74E+01)	-2.10E+01 (8 / 8) (-6.02E+01 - 3.09E+01)	0
	La-140	24		5.48E-03 (16 / 16) (-1.48E+01 - 1.36E+01)	8G1 12 mi SSE	7.14E+00 (4 / 4) (-7.29E+00 - 2.74E+01)	2.24E+00 (8 / 8) (-7.29E+00 - 2.74E+01)	0

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NAME OF FACILITY: SUSQUEHANNA STEAM ELECTRIC STATION
LOCATION OF FACILITY: LUZERNE COUNTY, PENNSYLVANIA

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MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED (1)		LOWER LIMIT OF DETECTION (LLD) (2)	ALL INDICATOR LOCATIONS MEAN (3) RANGE	LOCATION WITH HIGHEST MEAN NAME DISTANCE AND DIRECTION	LOCATION WITH HIGHEST MEAN MEAN (3) RANGE	CONTROL LOCATION MEAN (3) RANGE	NUMBER OF NONROUTINE REPORTED MEASUREMENTS(4)
Milk (pCi/l)	I-131	84	1	1.84E-02 (63 / 63) (-1.76E-01 - 2.60E-01)	10D1 3 mi SSW	3.43E-02 (21 / 21) (-1.00E-01 - 2.60E-01)	1.14E-03 (21 / 21) (-7.70E-02 - 2.60E-01)	0
	Gamma Spec							
	K-40	84		1.34E+03 (63 / 63) (1.12E+03 - 1.55E+03)	10G1 14 mi SSW	1.43E+03 (21 / 21) (1.30E+03 - 1.54E+03)	1.43E+03 (21 / 21) (1.30E+03 - 1.54E+03)	0
	Mn-54	84		-9.68E-02 (63 / 63) (-4.20E+00 - 2.80E+00)	10D2 3.1 mi SSW	4.00E-01 (21 / 21) (-3.80E+00 - 2.80E+00)	-6.57E-01 (21 / 21) (-6.20E+00 - 3.40E+00)	0
	Co-58	84		-1.97E-01 (63 / 63) (-5.20E+00 - 3.10E+00)	10D1 3 mi SSW	2.81E-01 (21 / 21) (-2.90E+00 - 3.10E+00)	-1.90E-02 (21 / 21) (-5.40E+00 - 3.10E+00)	0
	Fe-59	84		-4.81E-01 (63 / 63) (-1.10E+01 - 1.10E+01)	10D1 3 mi SSW	1.26E+00 (21 / 21) (-1.00E+01 - 1.10E+01)	6.67E-02 (21 / 21) (-9.00E+00 - 9.00E+00)	0
	Co-60	84		-1.57E-01 (63 / 63) (-5.50E+00 - 4.40E+00)	10G1 14 mi SSW	5.90E-01 (21 / 21) (-2.60E+00 - 5.90E+00)	5.90E-01 (21 / 21) (-2.60E+00 - 5.90E+00)	0
	Zn-65	84		-2.31E+00 (63 / 63) (-1.12E+01 - 1.10E+01)	12B2 1.7 mi WSW	-2.03E+00 (21 / 21) (-1.04E+01 - 4.00E+00)	-3.27E+00 (21 / 21) (-8.80E+00 - 3.80E+00)	0
	Zr-95	84		-2.13E-01 (63 / 63) (-9.30E+00 - 6.80E+00)	12B2 1.7 mi WSW	1.38E+00 (21 / 21) (-2.00E+00 - 6.80E+00)	-7.81E-01 (21 / 21) (-5.30E+00 - 4.60E+00)	0
	Nb-95	84		5.24E-02 (63 / 63) (-5.00E+00 - 4.00E+00)	10D1 3 mi SSW	3.33E-01 (21 / 21) (-1.90E+00 - 3.00E+00)	2.14E-01 (21 / 21) (-2.90E+00 - 3.00E+00)	0
	Cs-134	84	15	3.86E-01 (63 / 63) (-5.20E+00 - 5.40E+00)	12B2 1.7 mi WSW	7.29E-01 (21 / 21) (-2.60E+00 - 5.40E+00)	-5.71E-02 (21 / 21) (-3.40E+00 - 3.10E+00)	0
	Cs-137	84	18	1.03E-01 (63 / 63) (-5.50E+00 - 5.10E+00)	10D1 3 mi SSW	3.81E-01 (21 / 21) (-2.20E+00 - 4.60E+00)	2.76E-01 (21 / 21) (-2.70E+00 - 4.50E+00)	0
	Ba-140	84	60	-1.68E-01 (63 / 63) (-6.50E+00 - 7.90E+00)	10G1 14 mi SSW	-2.86E-02 (21 / 21) (-4.10E+00 - 4.40E+00)	-2.86E-02 (21 / 21) (-4.10E+00 - 4.40E+00)	0
	La-140	84	15	-2.06E-01 (63 / 63) (-7.40E+00 - 9.10E+00)	10G1 14 mi SSW	-2.38E-02 (21 / 21) (-4.70E+00 - 5.10E+00)	-2.38E-02 (21 / 21) (-4.70E+00 - 5.10E+00)	0

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Soil	Gamma Spec										
(pCi/kg dry)	K-40	4		1.26E+04	(2 / 2)	12S1	1.26E+04	(2 / 2)	8.48E+03	(2 / 2)	0
				(1.14E+04	- 1.38E+04)	0.4 mi WSW	(1.14E+04	- 1.38E+04)	(6.52E+03	- 1.04E+04)	
	Mn-54	4		3.50E+00	(2 / 2)	8G1	8.50E+00	(2 / 2)	8.50E+00	(2 / 2)	0
				(-3.00E+00	- 1.00E+01)	12 mi SSE	(-3.00E+00	- 2.00E+01)	(-3.00E+00	- 2.00E+01)	
	Co-58	4		-9.00E+00	(2 / 2)	12S1	-9.00E+00	(2 / 2)	-2.00E+01	(2 / 2)	0
				(-9.00E+00	- -9.00E+00)	0.4 mi WSW	(-9.00E+00	- -9.00E+00)	(-2.30E+01	- -1.70E+01)	
	Fe-59	4		-5.50E+00	(2 / 2)	12S1	-5.50E+00	(2 / 2)	-3.15E+01	(2 / 2)	0
				(-2.50E+01	- 1.40E+01)	0.4 mi WSW	(-2.50E+01	- 1.40E+01)	(-4.00E+01	- -2.30E+01)	
	Co-60	4		9.50E+00	(2 / 2)	12S1	9.50E+00	(2 / 2)	-7.00E+00	(2 / 2)	0
				(2.00E+00	- 1.70E+01)	0.4 mi WSW	(2.00E+00	- 1.70E+01)	(-8.00E+00	- -6.00E+00)	
	Zn-65	4		0.00E+00	(2 / 2)	8G1	3.50E+00	(2 / 2)	3.50E+00	(2 / 2)	0
				(-1.00E+01	- 1.00E+01)	12 mi SSE	(-3.00E+00	- 1.00E+01)	(-3.00E+00	- 1.00E+01)	
	Zr-95	4		6.50E+00	(2 / 2)	12S1	6.50E+00	(2 / 2)	-1.00E+00	(2 / 2)	0
				(-1.30E+01	- 2.60E+01)	0.4 mi WSW	(-1.30E+01	- 2.60E+01)	(-5.00E+00	- 3.00E+00)	
	Nb-95	4		-6.50E+00	(2 / 2)	12S1	-6.50E+00	(2 / 2)	-2.50E+01	(2 / 2)	0
				(-7.00E+00	- -6.00E+00)	0.4 mi WSW	(-7.00E+00	- -6.00E+00)	(-5.00E+01	- 0.00E+00)	
	Cs-134	4		-1.15E+01	(2 / 2)	8G1	8.50E+00	(2 / 2)	8.50E+00	(2 / 2)	0
				(-1.30E+01	- -1.00E+01)	12 mi SSE	(7.00E+00	- 1.00E+01)	(7.00E+00	- 1.00E+01)	
	Cs-137	4		2.90E+01	(2 / 2)	8G1	7.80E+01	(2 / 2)	7.80E+01	(2 / 2)	0
				(2.40E+01	- 3.40E+01)	12 mi SSE	(4.90E+01	- 1.07E+02)	(4.90E+01	- 1.07E+02)	
	Ba-140	4		-2.50E+01	(2 / 2)	8G1	2.50E+01	(2 / 2)	2.50E+01	(2 / 2)	0
				(-8.00E+01	- 3.00E+01)	12 mi SSE	(-1.00E+01	- 6.00E+01)	(-1.00E+01	- 6.00E+01)	
	La-140	4		1.40E+01	(2 / 2)	12S1	1.40E+01	(2 / 2)	-1.00E+00	(2 / 2)	0
				(-2.00E+01	- 4.80E+01)	0.4 mi WSW	(-2.00E+01	- 4.80E+01)	(-1.70E+01	- 1.50E+01)	

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED (1)		LOWER LIMIT OF DETECTION (LLD) (2)	ALL INDICATOR LOCATIONS MEAN (3) RANGE	LOCATION WITH HIGHEST MEAN NAME DISTANCE AND DIRECTION	LOCATION WITH HIGHEST MEAN MEAN (3) RANGE	CONTROL LOCATION MEAN (3) RANGE	NUMBER OF NONROUTINE REPORTED MEASUREMENTS(4)
Soil (cont) (pCi/kg dry)	Ra-226	0						0
	Th-228	4		9.25E+02 (2 / 2)	12S1	9.25E+02 (2 / 2)	7.19E+02 (2 / 2)	0
				(9.00E+02 - 9.50E+02)	0.4 mi WSW	(9.00E+02 - 9.50E+02)	(5.65E+02 - 8.73E+02)	
Food/Garden Crops (pCi/kg wet)	Gamma Spec							
	Be-7	3		7.98E+00 (2 / 2)	12F7	6.30E+01 (1 1)	3.18E+01 (1 / 1)	0
				(-4.71E+01 - 6.30E+01)	8.3 mi WSW	(6.30E+01 - 6.30E+01)	(3.18E+01 - 3.18E+01)	
	K-40	3		3.55E+03 (2 / 2)	5S11	4.54E+03 (1 / 1)	4.54E+03 (1 / 1)	0
				(3.51E+03 - 3.59E+03)	1.1 mi E	(4.54E+03 - 4.54E+03)	(4.54E+03 - 4.54E+03)	
	Mn-54	3		6.04E-01 (2 / 2)	11D1	3.45E+00 (1 / 1)	-2.08E+00 (1 / 1)	0
				(-2.24E+00 - 3.45E+00)	3.3 mi SW	(3.45E+00 - 3.45E+00)	(-2.08E+00 - -2.08E+00)	
	Co-58	3		1.73E+00 (2 / 2)	12F7	5.84E+00 (1 / 1)	-7.87E+00 (1 / 1)	0
				(-2.37E+00 - 5.84E+00)	8.3 mi WSW	(5.84E+00 - 5.84E+00)	(-7.87E+00 - -7.87E+00)	
	Fe-59	3		-5.64E+00 (2 / 2)	11D1	7.93E+00 (1 / 1)	-5.39E-01 (1 / 1)	0
				(-1.92E+01 - 7.93E+00)	3.3 mi SW	(7.93E+00 - 7.93E+00)	(-5.39E-01 - -5.39E-01)	
	Co-60	3		4.08E+00 (2 / 2)	12F7	7.95E+00 (1 / 1)	-2.40E+00 (1 / 1)	0
				(2.04E-01 - 7.95E+00)	8.3 mi WSW	(7.95E+00 - 7.95E+00)	(-2.40E+00 - -2.40E+00)	
	Zn-65	3		1.70E+01 (2 / 2)	12F7	1.82E+01 (1 / 1)	5.77E+00 (1 / 1)	0
				(1.58E+01 - 1.82E+01)	8.3 mi WSW	(1.82E+01 - 1.82E+01)	(5.77E+00 - 5.77E+00)	
	Zr-95	3		7.20E-01 (2 / 2)	12F7	7.56E+00 (1 / 1)	2.12E+00 (1 / 1)	0
				(-6.12E+00 - 7.56E+00)	8.3 mi WSW	(7.56E+00 - 7.56E+00)	(2.12E+00 - 2.12E+00)	
	Nb-95	3		9.48E+00 (2 / 2)	11D1	1.43E+01 (1 / 1)	7.21E+00 (1 / 1)	0
				(4.69E+00 - 1.43E+01)	3.3 mi SW	(1.43E+01 - 1.43E+01)	(7.21E+00 - 7.21E+00)	
	I-131	3		9.95E-01 (2 / 2)	12F7	7.10E+00 (1 / 1)	-7.27E+00 (1 / 1)	0
				(-5.11E+00 - 7.10E+00)	8.3 mi WSW	(7.10E+00 - 7.10E+00)	(-7.27E+00 - -7.27E+00)	

TABLE G
SUMMARY OF DATA FOR SSES
OPERATIONAL RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM - 2005
NAME OF FACILITY: SUSQUEHANNA STEAM ELECTRIC STATION
LOCATION OF FACILITY: LUZERNE COUNTY, PENNSYLVANIA

Reporting Period: December 28, 2004 to January 19, 2006

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED (1)		LOWER LIMIT OF DETECTION (LLD) (2)	ALL INDICATOR LOCATIONS MEAN (3) RANGE		LOCATION WITH HIGHEST MEAN NAME DISTANCE AND DIRECTION			LOCATION WITH HIGHEST MEAN MEAN (3) RANGE		CONTROL LOCATION MEAN (3) RANGE		NUMBER OF NONROUTINE REPORTED MEASUREMENTS(4)
Food/Garden Crops (cont)													
(pCi/kg wet)	Cs-134	3		6.89E+00	(2 / 2)	11D1			1.10E+01	(1 / 1)	-7.59E-01	(1 / 1)	0
				(2.82E+00	- 1.10E+01)	3.3	mi	SW	(1.10E+01	- 1.10E+01)	(-7.59E-01	- -7.59E-01)	
	Cs-137	3		4.07E+00	(2 / 2)	12F7			1.63E+01	(1 / 1)	-5.13E+00	(1 / 1)	0
				(-8.17E+00	- 1.63E+01)	8.3	mi	WSW	(1.63E+01	- 1.63E+01)	(-5.13E+00	- -5.13E+00)	
	Ba-140	3		2.34E+01	(2 / 2)	12F7			4.45E+01	(1 / 1)	1.67E+00	(1 / 1)	0
				(2.25E+00	- 4.45E+01)	8.3	mi	WSW	(4.45E+01	- 4.45E+01)	(1.67E+00	- 1.67E+00)	
	La-140	3		-1.28E+00	(2 / 2)	12F7			4.82E+00	(1 / 1)	3.26E+00	(1 / 1)	0
				(-7.39E+00	- 4.82E+00)	8.3	mi	WSW	(4.82E+00	- 4.82E+00)	(3.26E+00	- 3.26E+00)	

1. The total number of analyses does not include duplicates, splits, or repeated analyses.
2. The Technical Requirement LLD's are shown when applicable.
3. The mean and range are based on all available measured results including those below MDCS. The ratio indicated in parentheses is the total number of results used to calculate the mean to the total number of samples.
4. USNRC Reporting Levels are specified in the Technical Requirements (i.e.; when Reporting Levels in Technical Requirements are exceeded).

APPENDIX H

COMPARISON OF INDICATOR AND CONTROL 2005 REMP ANNUAL MEANS FOR SELECTED MEDIA ANALYSIS RESULTS WITH MEANS FROM PREOPERATIONAL AND PRIOR OPERATIONAL PERIODS

The data presented in the following tables were included if specific analysis results routinely exceeded the applicable MDCs in 2005 and/or routinely may have done so in previous years. The comparisons may be useful for observing any step changes that may occur in the environment over a long period. However, the importance attached to these comparisons should be tempered by the understanding that changes in methods of analysis, typical MDCs achieved by the analyses, and averaging methods over the years may tend to blur the picture in some cases.

AMBIENT RADIATION MONITORING

TABLE H 1

AMBIENT RADIATION LEVELS AS MEASURED BY TLDS (mR/STD QTR)						
Location	Indicator			Control		
Period	Pre-Op	Operational		Pre-Op	Operational	
	1978-81	1982-04	2005	1978-81	1982-04	2005
Range	18.5-19.2	14.7-20.8	--	15.0-17.9	14.8-20.8	--
Mean	18.9	18.4	23.2	16.3	18.1	21.5

AQUATIC PATHWAY MONITORING

TABLE H 3

SURFACE WATER IODINE-131 ACTIVITIES (pCi/l)						
Location	Indicator			Control		
Period	Pre-Op	Operational		Pre-Op	Operational	
	1979-81	1982-04	2005	1979-81	1982-04	2005
Range	0.24-0.37	0.06-0.90	--	0.29-0.43	0.03-1.0	--
Mean	0.29	0.35	1.00	0.36	0.32	0.66

TABLE H 4

SURFACE WATER TRITIUM ACTIVITIES (pCi/l)						
Location	Indicator			Control		
Period	Pre-Op	Operational		Pre-Op	Operational	
	1978-81	1982-04*	2005	1978-81	1982-04*	2005
Range	101-122	126-1576	--	119-319	-239 - +212	--
Mean	109	664	2050	171	52	-65.2

*1990 results were not averaged with 1982-01 data because the validity of the 1990 values is questionable in some instances. Laboratory analysis error is suspected. See the 1990 Annual Report.

TABLE H 6

DRINKING WATER GROSS BETA ACTIVITIES (pCi/l)			
Period	Preoperational	Operational	
	1977 - 81	1982 - 04	2005
Range	2.2 - 3.2	1.9 - 5.4	--
Mean	2.7	3.1	2.5

TABLE H 7

DRINKING WATER TRITIUM ACTIVITIES (pCi/l)			
Period	Preoperational	Operational	
	1977 – 81	1982 - 04	2005
Range	101 – 194	-247 - +220	--
Mean	132	63	52

TABLE H 8

FISH POTASSIUM-40 ACTIVITIES (pCi/g wet)						
Location	Indicator			Control		
Period	Pre-Op	Operational		Pre-Op	Operational	
	1977-81	1982-04	2005	1977-81	1982-04	2005
Range	2.7 - 3.5	3.1 - 5.3	--	2.8 - 3.6	3.1 - 4.2	--
Mean	3.2	3.7	3.3	3.2	3.5	3.0

TABLE H 9

SEDIMENT POTASSIUM-40 ACTIVITIES (pCi/g dry)						
Location	Indicator			Control		
Period	Pre-Op	Operational		Pre-Op	Operational	
	1978-81	1982-04	2005	1978-81	1982-04	2005
Range	8.6-10.4	7.4-13.6	--	7.5-11.0	6.2-14.8	--
Mean	9.3	10.9	10.8	7.7	10.8	13.5

TABLE H 10

SEDIMENT RADIUM-226 ACTIVITIES (pCi/g dry)						
Location	Indicator			Control		
Period	Pre-Op	Operational		Pre-Op	Operational	
	1978-81	1982-04	2005	1978-81	1982-04	2005
Range	0.5-0.7	0.5-2.4	--	0.6-1.9	0.4-2.9	--
Mean	0.6	1.6	2.1	0.7	1.6	2.0

TABLE H 11

SEDIMENT THORIUM-228 ACTIVITIES (pCi/g dry)				
Location	Indicator		Control	
Period	1984 – 04*	2005	1984 - 04*	2005
Range	0.9 – 3.2	--	0.8 – 3.1	--
Mean	1.3	1.7	1.3	2.0

*Th-232 was reported instead of Th-228 in 1990.

TABLE H 12

SEDIMENT CESIUM-137 ACTIVITIES (pCi/g dry)						
Location	Indicator			Control		
Period	Pre-Op	Operational		Pre-Op	Operational	
	1978-81	1982-04	2005	1978-81	1982-04	2005
Range	0.08-0.15	0.02-0.17	--	0.08-0.21	0.06-0.21	--
Mean	0.10	0.08	0.06	0.11	0.10	0.09

ATMOSPHERIC PATHWAY MONITORING

TABLE H 13

AIR PARTICULATE GROSS BETA ACTIVITIES (E-3 pCi/m^3)						
Location	Indicator			Control		
Period	Pre-Op	Operational		Pre-Op	Operational	
	1978-81	1982-04	2005	1978-81	1982-04	2005
Range	24 - 97	13 – 28.8	--	24 - 102	12 – 27.7	--
Mean	61	16.2	14	62	15.4	13

TABLE H 14

AIR PARTICULATE BERYLLIUM-7 ACTIVITIES (E-3 pCi/m^3)						
Location	Indicator			Control		
Period	Pre-Op	Operational		Pre-Op	Operational	
	1978-81	1982-04*	2005	1978-81	1982-04*	2005
Range	69 - 81	50 - 137	--	59 - 85	49 - 126	--
Mean	76	95	106	72	88	106

*1990 results were not averaged with 1982-01 data because the validity of the 1990 values is questionable in some instances. Laboratory analysis error is suspected. See the 1990 Annual Report.

TERRESTRIAL PATHWAY MONITORING

TABLE H 15

SOIL POTASSIUM-40 ACTIVITIES (pCi/g dry)						
Location	**Indicator**			**Control**		
Period	**Pre-Op**	**Operational**		**Pre-Op**	**Operational**	
	1979&81	**1984-04**	**2005**	**1979&81**	**1984-04**	**2005**
Range	9.2 - 9.7	9.4-15.3	--	9.1-11.0	7.4-14.1	--
Mean	9.5	12.0	12.6	10.1	10.4	8.5

TABLE H 16

SOIL RADIUM-226 ACTIVITIES (pCi/g dry)						
Location	**Indicator**			**Control**		
Period	**Pre-Op**	**Operational**		**Pre-Op**	**Operational**	
	1979&81	**1984-04***	**2005***	**1979&81**	**1984-04***	**2005***
Range	0.8 - 1.3	0.8 - 2.5	--	0.8 - 1.2	1.0 - 2.2	--
Mean	1.1	1.6	ND	1.0	1.7	ND

* Radium-226 was not detected (ND) in 2002, 2003, 2004, or 2005.

TABLE H 17

SOIL THORIUM-228 ACTIVITIES (pCi/g dry)						
Location	**Indicator**			**Control**		
Period	**Pre-Op**	**Operational**		**Pre-Op**	**Operational**	
	1979&81	**1984-04**	**2005**	**1979&81**	**1984-04**	**2005**
Range	0.9 - 1.3	0.8 – 2.0	--	--	0.7 – 2.4	--
Mean	1.1	0.9	0.9	1.0	1.0	0.7

TABLE H 18

SOIL CESIUM-137 ACTIVITIES (pCi/g dry)						
Location	**Indicator**			**Control**		
Period	**Pre-Op**	**Operational**		**Pre-Op**	**Operational**	
	1979&81	**1982-04**	**2005**	**1979&81**	**1982-04**	**2005**
Range	0.5 - 0.7	0.02 - 0.45	--	0.2 - 1.2	0.07 - 1.2	--
Mean	0.6	0.20	0.03	0.7	0.36	0.08

TABLE H 19

MILK POTASSIUM-40 ACTIVITIES (pCi/l)						
Location	Indicator			Control		
Period	Pre-Op	Operational		Pre-Op	Operational	
	1978-81	1985-04	2005	1978-81	1985-04	2005
Range	1222-1500	1241-1422	--	1273-1500	1247-1472	--
Mean	1325	1340	1337	1390	1340	1429

TABLE H 20

GROUND WATER TRITIUM ACTIVITIES (pCi/l)						
Location	Indicator			Control		
Period	Pre-Op	Operational		Pre-Op	Operational	
	1980-81	1982-04	2005	1980-81	1982-04	2005
Range	94-109	-206 - +180	--	117 - 119	-206 - +260	--
Mean	101	58.6	-71	118	63.1	-84

APPENDIX I

SPECIFIC ANALYSIS RESULTS TABULATED BY MEDIA AND SAMPLING PERIOD

Results of analyses are generally reported in the following tables to two significant figures. Random uncertainties of counting are reported to the same decimal place as the result.

Calculated values for analysis results are reported with the random uncertainty of counting at two standard deviations (2S), determined by considering both the sample and background count rates. The uncertainty of an activity is influenced by the volume or mass of the sample, the background count rate, the count times, the method used to round off the value obtained to reflect its degree of significance, and other factors. The uncertainties of activities determined by gamma spectrometric analyses are also influenced by the relative concentrations of the radionuclides in the sample, the energies and intensities of the gammas emitted by those radionuclides, and the assumptions used in selecting the radionuclides to be quantitatively determined.

Results reported as less than (<) in these tables are below the minimum detectable concentrations (MDCs). The MDC is an estimate of the detection capabilities of the overall measurement method, taking into account not only the counting system, but also the characteristics of the sample being counted. When the MDC is used as the level to decide whether or not to enter a measured value into a table, there is a 50% chance that the value will be entered when the actual sample activity is equivalent to the MDC. There is only a five percent chance that a value representing a fluctuation in background activity will be entered as sample activity in such an instance.

Measured values for the activities of specific radionuclides, such as the man-made gamma-emitting radionuclides iodine-131 and cesium-137, only appear in the following tables for each specific medium when the levels that are measured exceed the MDC values for those measurements and those radionuclides are actually identified as present in the samples. Measured values for the analyses that are not radionuclide specific, such as gross alpha and beta analyses, also are presented in the tables for specific media only when the levels that are measured actually exceed the MDCs.

TABLE I-1
ENVIRONMENTAL THERMOLUMINESCENT DOSIMETRY RESULTS
SUSQUEHANNA STEAM ELECTRIC STATION - 2005
Results (1) are in mR/std. qtr (2) ± 2S (3)

Location	First Quarter 01/25/05 to 04/21/05	Second Quarter 04/20/05 to 07/14/05	Third Quarter 07/13/05 to 10/27/05	Fourth Quarter 10/26/05 to 01/19/06
ONSITE				
1S2	23.0 ± 1.7	26.8 ± 2.6	27.1 ± 1.9	27.2 ± 0.6
2S2	19.4 ± 1.3	21.6 ± 0.2	22.2 ± 1.0	23.3 ± 1.5
2S3	22.0 ± 1.5	25.0 ± 1.7	25.3 ± 0.9	26.5 ± 1.1
3S2	17.5 ± 1.3	20.4 ± 2.2	19.7 ± 1.6	22.4 ± 1.3
3S3	17.5 ± 0.9	19.8 ± 1.3	19.7 ± 0.7	21.6 ± 1.7
3S4	(8)	(8)	(8)	(8)
4S3	22.8 ± 1.5	26.0 ± 2.6	25.9 ± 1.6	27.2 ± 0.4
4S6	18.0 ± 1.4	21.8 ± 4.1	21.3 ± 1.4	22.7 ± 1.3
5S4	16.5 ± 0.9	18.8 ± 2.2	19.3 ± 1.0	20.9 ± 0.4
5S7	18.0 ± 1.3	19.8 ± 1.7	19.9 ± 1.4	21.6 ± 0.6
6S4	25.6 ± 1.5	27.7 ± 2.6	29.6 ± 1.2	30.8 ± 2.1
6S9	24.5 ± 0.9	27.5 ± 1.7	28.2 ± 3.1	30.1 ± 1.3
7S6	24.7 ± 2.1	29.4 ± 1.7	31.5 ± 1.7	32.7 ± 1.1
7S7	17.5 ± 1.1	20.7 ± 0.4	20.2 ± 0.9	21.8 ± 1.9
8S2	22.9 ± 0.6	26.0 ± 2.6	27.6 ± 1.9	27.8 ± 1.3
9S2	35.0 ± 4.1	41.1 ± 3.3	43.9 ± 3.3	46.3 ± 4.1
10S1	16.9 ± 1.5	19.4 ± 2.0	19.9 ± 1.0	21.6 ± 1.1
10S2	27.7 ± 1.9	32.7 ± 3.9	32.9 ± 1.9	33.9 ± 1.9
10S3	(8)	(8)	(8)	(8)
11S3	25.9 ± 3.0	28.9 ± 2.4	29.5 ± 1.4	31.9 ± 1.9
11S7	19.1 ± 1.3	23.4 ± 1.5	21.6 ± 1.0	23.4 ± 1.7

TABLE

ENVIRONMENTAL THERMOLUMINESCENT DOSIMETRY RESULTS

SUSQUEHANNA STEAM ELECTRIC STATION - 2005

Results (1) are in mR/std. qtr (2) ± 2S (3)

Location	First Quarter 01/25/05 to 04/21/05	Second Quarter 04/20/05 to 07/14/05	Third Quarter 07/13/05 to 10/27/05	Fourth Quarter 10/26/05 to 01/19/06
12S1	19.4 ± 1.3	22.3 ± 1.3	21.7 ± 1.7	23.7 ± 1.3
12S3	24.5 ± 2.6	28.0 ± 2.0	27.2 ± 2.1	29.0 ± 2.1
12S4	(8)	(8)	(8)	(8)
12S5	(8)	(8)	(8)	(8)
12S6	(8)	(8)	(8)	(8)
12S7	16.9 ± 1.3	20.0 ± 0.9	19.6 ± 2.3	20.7 ± 1.9
13S2	24.7 ± 2.4	27.8 ± 2.2	28.2 ± 2.4	29.3 ± 1.3
13S4	(8)	(8)	(8)	(8)
13S5	26.2 ± 1.7	28.2 ± 3.3	28.3 ± 1.4	29.8 ± 2.6
13S6	22.3 ± 1.9	25.3 ± 2.0	24.7 ± 1.0	27.2 ± 2.6
14S5	21.6 ± 1.3	25.4 ± 2.0	25.0 ± 1.0	26.2 ± 1.3
14S6	(8)	(8)	(8)	(8)
15S5	19.4 ± 0.4	22.9 ± 1.1	23.1 ± 2.1	22.9 ± 1.7
16S1	21.8 ± 1.1	25.3 ± 2.2	25.6 ± 1.7	27.4 ± 1.7
16S2	22.4 ± 0.9	26.2 ± 2.8	25.6 ± 1.7	28.0 ± 1.7

See the comments at the end of this table.

TABLE I-1
ENVIRONMENTAL THERMOLUMINESCENT DOSIMETRY RESULTS
SUSQUEHANNA STEAM ELECTRIC STATION - 2005
Results (1) are in mR/std. qtr (2) ± 2S (3)

Location	First Quarter 01/25/05 to 04/21/05	Second Quarter 04/20/05 to 07/14/05	Third Quarter 07/13/05 to 10/27/05	Fourth Quarter 10/26/05 to 01/19/06
0-1 MILE OFFSITE				
6A4	20.6 ± 1.9	23.2 ± 2.4	23.1 ± 1.0	24.6 ± 2.1
8A3	17.7 ± 2.4	19.8 ± 1.7	(5)	22.2 ± 2.4
15A3	18.4 ± 1.3	23.4 ± 1.3	20.9 ± 1.4	21.7 ± 1.9
16A2	16.6 ± 0.4	19.3 ± 1.1	(5)	21.6 ± 1.3
1-2 MILES OFFSITE				
1B1	(8)	(8)	(8)	(8)
2B3	(8)	(8)	(8)	(8)
2B4	(8)	(8)	(8)	(8)
5B3	(8)	(8)	(8)	(8)
7B2	(8)	(8)	(8)	(8)
8B2	17.5 ± 1.1	21.1 ± 1.7	20.3 ± 1.9	22.3 ± 0.9
9B1	17.0 ± 1.3	19.2 ± 0.9	19.5 ± 1.4	20.6 ± 1.1
10B2	(8)	(8)	(8)	(8)
10B3	17.7 ± 0.9	19.8 ± 0.4	19.7 ± 1.2	22.0 ± 2.4
10B4	(8)	(8)	(8)	(8)
12B4	(8)	(8)	(8)	(8)
13B1	(8)	(8)	(8)	(8)
14B3	(8)	(8)	(8)	(8)
15B1	(8)	(8)	(8)	(8)
16B2	(8)	(8)	(8)	(8)
2-3 MILES OFFSITE				
11C2	(8)	(8)	(8)	(8)

See the comments at the end of this table.

TABLE

ENVIRONMENTAL THERMOLUMINESCENT DOSIMETRY RESULTS
SUSQUEHANNA STEAM ELECTRIC STATION - 2005
Results (1) are in mR/std. qtr (2) ± 2S (3)

Location	First Quarter 01/25/05 to 04/21/05	Second Quarter 04/20/05 to 07/14/05	Third Quarter 07/13/05 to 10/27/05	Fourth Quarter 10/26/05 to 01/19/06
3-4 MILES OFFSITE				
1D5	19.6 ± 1.7	23.1 ± 2.4	22.7 ± 0.9	24.3 ± 3.1
6D1	(8)	(8)	(8)	(8)
8D3	18.3 ± 1.7	22.4 ± 2.0	22.5 ± 2.1	23.5 ± 1.8
9D4	18.8 ± 0.9	22.7 ± 0.4	22.2 ± 2.1	23.1 ± 1.8
10D1	18.3 ± 1.1	22.1 ± 1.3	21.9 ± 3.0	23.2 ± 2.0
12D2	19.2 ± 0.6	23.4 ± 2.0	23.6 ± 2.3	23.9 ± 2.1
14D1	19.1 ± 1.7	22.2 ± 2.2	22.7 ± 1.4	23.3 ± 2.1
4-5 MILES OFFSITE				
3E1	16.1 ± 0.4	19.4 ± 2.2	18.9 ± 1.6	21.1 ± 0.9
4E2	19.1 ± 1.7	22.1 ± 2.0	22.2 ± 1.0	23.6 ± 2.6
5E2	18.3 ± 1.1	21.9 ± 1.7	22.2 ± 1.9	23.3 ± 1.1
6E1	20.6 ± 1.7	24.4 ± 2.0	24.4 ± 3.1	24.1 ± 1.5
7E1	(5)	21.8 ± 1.3	21.3 ± 1.6	23.5 ± 2.4
11E1	16.3 ± 1.5	19.9 ± 2.4	18.8 ± 0.7	20.8 ± 1.5
12E1	17.9 ± 0.9	20.6 ± 1.3	20.8 ± 1.2	21.9 ± 2.6
13E4	20.0 ± 0.6	23.7 ± 1.5	23.4 ± 1.2	25.1 ± 0.6
5-10 MILES OFFSITE				
2F1	17.6 ± 1.5	21.9 ± 1.7	(5)	22.4 ± 0.4
8F2	(8)	(8)	(8)	(8)
12F2	(8)	(8)	(8)	(8)
15F1	18.9 ± 0.9	23.1 ± 2.0	22.7 ± 1.6	23.8 ± 1.7
16F1	21.0 ± 1.3	23.9 ± 1.5	23.6 ± 1.9	24.8 ± 2.4

See the comments at the end of this table.

TABLE I-1
ENVIRONMENTAL THERMOLUMINESCENT DOSIMETRY RESULTS
SUSQUEHANNA STEAM ELECTRIC STATION - 2005
Results (1) are in mR/std. qtr (2) ± 2S (3)

Location	First Quarter 01/25/05 to 04/21/05	Second Quarter 04/20/05 to 07/14/05	Third Quarter 07/13/05 to 10/27/05	Fourth Quarter 10/26/05 to 01/19/06
10-20 MILES				
3G4	20.3 ± 0.9	22.9 ± 1.3	22.1 ± 1.0	24.4 ± 2.6
4G1	19.8 ± 2.4	23.6 ± 1.1	23.0 ± 0.7	25.0 ± 0.7
6G1	(8)	(8)	(8)	(8)
7G1	17.7 ± 1.1	21.3 ± 1.1	20.8 ± 1.6	22.3 ± 1.3
7G2	(8)	(8)	(8)	(8)
8G1	(8)	(8)	(8)	(8)
12G1	17.1 ± 0.4	19.2 ± 1.3	19.1 ± 1.6	21.5 ± 0.9
12G4	19.8 ± 1.1	22.5 ± 1.3	23.3 ± 2.6	24.3 ± 0.7

See the comments at the end of this table.

Location				
Indicator Average (6)	20.4 ± 10.7	23.6 ± 14.5	23.8 ± 12.1	25.1 ± 12.7
Control Average (6)	18.9 ± 3.0	21.9 ± 2.8	21.7 ± 3.7	23.5 ± 3.2

COMMENTS

(1) Individual monitor location results are normally the average of the elemental doses of six calcium sulfate elements from the two TLDs assigned to each monitoring location.

(2) A standard (std.) quarter (qtr.) is considered to be 91.25 days. Results obtained for monitoring periods of other durations are normalized by multiplying them by 91.25/x, where x is the actual duration in days of the period.

(3) Uncertainties for individual monitoring location results are two standard deviations of the elemental doses of six calcium elements from the two TLDs assigned to each monitoring location, representing the variability between the elemental doses of each of the six TLD elements.

(4) TLDs were not in the field at this monitoring location during this quarter. Refer to Appendix A of this report for an explanation of program changes to the REMP (not applicable for 2005 data).

(5) No measurement could be made because the TLDs were lost, stolen or damaged. Refer to Appendix A for explanation of analysis exceptions.

(6) Uncertainties associated with quarterly indicator and control averages are two standard deviations, representing the variability between the results of the individual monitoring locations.

(7) Data were invalidated for this period because of an unacceptably high coefficient of variation among element readings (not applicable for 2005 data).

(8) Extra TLD location, not required by TRM/ODCM (i.e. do not provide additional benefit) and were deleted from the monitoring program in 2nd quarter of 2004.

TABLE I-2

TRITIUM AND GAMMA SPECTROSCOPIC ANALYSES OF SURFACE WATER

SUSQUEHANNA STEAM ELECTRIC STATION - 2005

Results in pCi/liter ± 2S

LOCATION	COLLECTION DATE		TRITIUM	OTHER ACTIVITY	COMMENTS
6S6 *	12/28/04	01/11/05	<140		*Refer to Appendix A for exceptions
5S9	01/17/05	01/25/05	<143		5S9 was grab sample
2S7	12/28/04	01/25/05	211 ± 107		
6S5	01/04/05	01/25/05	<138		
6S6	01/28/05	02/28/05	<137		
2S7	01/25/05	02/28/05	5540 ± 180		
6S5	02/01/05	02/28/05	< 137		
6S6	02/28/05	03/29/05	<102		
2S7	02/28/05	03/29/05	7440 ± 150		
6S5	03/08/05	03/29/05	<101		
LTAW	03/14/05		496 ± 89		
6S6	03/29/05	04/26/05	<143		
2S7	03/29/05	04/26/05	6870 ± 161		
6S5	04/05/05	04/26/05	<140		
6S6	04/26/05	05/31/05	<148		
2S7 *	04/26/05	05/31/05	3110 ± 117		*Refer to Appendix A for exceptions
6S5	05/03/05	05/31/05	<137		
6S6	05/31/05	06/28/05	<116		
2S7	05/31/05	06/28/05	11,000 ± 239		
6S5	06/07/05	06/28/05	<111		
LTAW	06/13/05		<132		

TABLE I-2
TRITIUM AND GAMMA SPECTROSCOPIC ANALYSES OF SURFACE WATER
SUSQUEHANNA STEAM ELECTRIC STATION - 2005
Results in pCi/liter ± 2S

LOCATION	COLLECTION DATE		TRITIUM	OTHER ACTIVITY	COMMENTS
6S6	06/28/05	07/06/05	<132		
2S7	06/28/05	07/26/05	10,900 ± 200		
6S5	07/05/05	07/26/05	<131		
6S6	07/26/05	08/23/05	<130		
2S7	07/26/05	08/23/05	9770 ± 207		
6S5	08/02/05	08/23/05	1320 ± 111		
6S6	08/23/05	09/27/05	<134		
2S7	08/23/05	09/27/05	<138		
6S5	08/30/05	09/27/05	<136		
LTAW	08/15/05		<136		
6S6	09/27/05	11/01/05	<126		
2S7	09/27/05	11/01/05	904 ± 96.1		
6S5	10/04/05	11/01/05	<127		
6S6	11/01/05	11/29/05	<128		
2S7	11/01/05	11/29/05	1870 ± 115		
6S5	11/08/05	11/29/05	<127		
LTAW	11/14/05		186 ± 82		
6S6	11/29/05	12/27/05	<128		
2S7	11/29/05	12/27/05	<132		
6S5	12/06/05	12/27/05	<107		

TABLE I-3

IODINE-131 ANALYSES OF SURFACE WATER

SUSQUEHANNA STEAM ELECTRIC STATION - 2005

Results in pCi/liter ± 2S

LOCATION	COLLECTION DATE	I-131	COMMENTS
6S6	01/04/05 - 01/11/05	<0.87	
2S7	01/04/05 - 01/18/05	<0.97	
6S5	01/11/05 - 01/18/05	<0.91	
6S6	02/01/05 - 02/15/05	<0.68	
2S7	02/01/05 - 02/15/05	1.78 ± 0.64	
6S5	02/08/05 - 02/15/05	<0.29	
6S6	02/28/05 - 03/15/05	<0.96	
2S7	02/28/05 - 03/15/05	1.36 ± 0.74	
6S5	03/08/05 - 03/15/05	<0.62	
6S6	04/05/05 - 04/19/05	<0.59	
2S7	04/05/05 - 04/19/05	0.54 ± 0.39	
6S5	04/12/05 - 04/19/05	<0.40	
6S6	05/03/05 - 05/17/05	<0.77	
2S7	05/03/05 - 05/17/05	<0.91	
6S5	05/10/05 - 05/17/05	<0.59	
6S6	06/07/05 - 06/21/05	<0.72	
2S7	06/07/05 - 06/21/05	1.68 ± 0.95	
6S5	06/14/05 - 06/21/05	<0.52	
6S6	07/05/05 - 07/19/05	1.35 ± 0.95	
2S7	07/05/05 - 07/19/05	1.9 ± 1.2	
6S5	07/12/04 - 07/19/05	1.41 ± 0.88	

TABLE I-3
IODINE-131 ANALYSES OF SURFACE WATER
SUSQUEHANNA STEAM ELECTRIC STATION - 2005
Results in pCi/liter ± 2S

LOCATION	COLLECTION DATE	I-131	COMMENTS
6S6	08/02/05 - 08/16/05	1.70 ± 0.84	
2S7	08/02/05 - 08/16/05	3.20 ± 1.3	
6S5	08/09/05 - 08/16/05	1.91 ± 0.86	
6S6	09/06/05 - 09/20/05	1.54 ± 0.65	
2S7	09/06/05 - 09/20/05	4.0 ± 1.1	
6S5	09/13/05 - 09/20/05	2.03 ± 0.64	
6S6	10/04/05 - 10/18/05	<0.42	
2S7	10/04/05 - 10/18/05	<0.52	
6S5	10/11/05 - 10/18/05	<0.34	
6S6	11/01/05 - 11/15/05	<0.85	
2S7	11/01/05 - 11/15/05	<0.93	
6S5	11/08/05 - 11/15/05	<0.74	
6S6	12/06/05 - 12/20/05	<0.77	
2S7	12/06/05 - 12/20/05	0.87 ± 0.53	
6S5	12/13/05 - 12/20/05	<0.53	

TABLE I-4

GROSS BETA, TRITIUM, GAMMA* SPECTROSCOPIC ANALYSES OF DRINKING WATER

SUSQUEHANNA STEAM ELECTRIC STATION - 2005

Results in pCi/liter ± 2S

LOCATION	COLLECTION DATE	GR-BETA	TRITIUM	OTHER ACTIVITY	COMMENTS
12H2	12/28/04 - 01/25/05	2.56 ± 1.26	<141		
12H2	01/25/05 - 02/28/05	1.90 ± 1.25	<137		
12H2	02/28/05 - 03/29/05	<2.04	<101		
12H2	03/29/05 - 04/26/05	2.43 ± 1.31	147 ± 84		
12H2	04/26/05 - 05/31/05	2.57 ± 1.51	<137		
12H2	05/31/05 - 06/28/05	2.98 ± 1.75	203 ± 73		
12H2	06/28/05 - 07/26/05	2.52 ± 1.53	<135		
12H2	07/26/05 - 08/23/05	3.30 ± 1.67	<134		
12H2	08/23/05 - 09/27/05	2.94 ± 1.56	<134		
12H2	09/27/05 - 11/01/05	3.37 ± 1.43	<123		
12H2	11/01/05 - 11/29/05	2.09 ± 1.21	<126		
12H2	11/29/05 - 12/27/05	2.21 ± 1.35	<104		

TABLE I-5
GAMMA SPECTROSCOPIC ANALYSES OF FISH
SUSQUEHANNA STEAM ELECTRIC STATION - 2005
Results in pCi/kg (wet) ± 2S

LOCATION	SAMPLE TYPE	COLLECTION DATE	K-40	COMMENTS
IND	Smallmouth Bass	04/29/05 - 4/29/05	3120 ± 688	
IND	Shorthead Redhorse	04/29/05 - 4/29/05	4320 ± 829	
IND	Channel Catfish	05/02/05 - 05/03/05	2600 ± 842	
2H	Smallmouth Bass	05/05/05 - 05/05/05	2980 ± 758	
2H	Shorthead Redhorse	05/05/05 - 05/05/05	2580 ± 855	
2H	Channel Catfish	05/05/05 - 05/06/05	2330 ± 543	
IND	Smallmouth Bass	10/13/05 - 10/13/05	3210 ± 826	
IND	Shorthead Redhorse	10/13/05 - 10/13/05	2740 ± 861	
IND	Channel Catfish	10/12/05 - 10/13/05	3370 ± 644	
2H	Smallmouth Bass	11/03/05 - 11/03/05	3380 ± 732	
2H	Shorthead Redhorse	11/03/05 - 11/03/05	3520 ± 686	
2H	Channel Catfish	11/03/05 - 11/04/05	3280 ± 741	
LTAW	Largemouth Bass	11/26/05 - 11/26/05	3720 ± 738	

TABLE I-6
GAMMA* SPECTROSCOPIC ANALYSES OF SHORELINE SEDIMENT
SUSQUEHANNA STEAM ELECTRIC STATION - 2005
Results in pCi/kg (dry) ± 2S

LOCATION	COLLECTION DATE	K-40	Cs-137	Ra-226	Th-228	OTHER ACTIVITY	
2B	4/22/2005	14,900 ± 1570	123 ± 61.4	2250 ± 1210	2850 ± 1140	Ac-228	1510 ± 270
7B	4/22/2005	12,500 ± 1520	105 ± 59.3	2860 ± 1370	2330 ± 1230	Ac-228	1120 ± 298
12F	4/22/2005	7640 ± 1140	<43.5	1680 ± 1040	2170 ± 1070	Ac-228	701 ± 194
2B	10/20/2005	12,000 ± 1220	64.6 ± 41.9	1740 ± 1030	1110 ± 84.1	Ac-228	996 ± 238
7B	10/20/2005	10,300 ± 1510	132 ± 74	1550 ± 981	1200 ± 110	Ac-228	849 ± 308
12F	10/20/2005	12,700 ± 1100	<51.2	2490 ± 1180	1120 ± 90.4	Ac-228	1200 ± 233

TABLE I-7

TRITIUM AND GAMMA* SPECTROSCOPIC ANALYSES OF GROUND WATER

SUSQUEHANNA STEAM ELECTRIC STATION - 2005

Results in pCi/liter ± 2S

LOCATION	COLLECTION DATE	TRITIUM*	OTHER ACTIVITY*
12F3	3/14/2005	<102	
2S2	3/14/2005	<101	
4S4 Treated	3/14/2005	<94	
12F3	6/13/2005	<131	
2S2	6/13/2005	<129	
4S4	6/13/2005	<119	
12F3	8/15/2005	<131	
2S2	8/15/2005	<132	
4S4 Treated	8/15/2005	<131	
12F3	11/14/2005	<126	
2S2	11/14/2005	<124	
4S4 Treated	11/14/2005	<122	

*Tritium or other activities were all less than MDC in 2005.

TABLE I-8

GROSS BETA ANALYSES OF AIR PARTICULATE FILTERS

SUSQUEHANNA STEAM ELECTRIC STATION - 2005

Results in E-03 pCi/Cu. M. ± 2S

COLLECTION MONTH	DATE	6G1	8G1	3S2	12E1	12S1	13S6	COMMENTS
JAN	12/28/04 - 1/4/05	19.3 ± 2.5	19.1 ± 2.5	24.4 ± 2.9	24.8 ± 2.8	26.6 ± 3.0	21.3 ± 2.7	
	1/4/05 - 1/12/05	9.27 ± 1.7	6.8* ± 1.6	8.55 ± 1.7	7.95 ± 1.7	8.41 ± 1.7	8.0 ± 1.7	*Refer to Appendix A for exceptions
	1/12/05 - 1/19/05	15.4 ± 2.2	13.4 ± 2.1	14.4 ± 2.2	15.1 ± 2.2	18.2 ± 2.4	14.8 ± 2.2	
	1/19/05 - 1/26/05	15.1 ± 2.2	12.4 ± 2.1	15.9 ± 2.4	16.7 ± 2.4	16.8 ± 2.4	14.4 ± 2.3	
FEB	1/26/05 - 2/2/05	12.2 ± 2.1	11.2 ± 2.0	14.8 ± 2.3	14.2 ± 2.3	12.5 ± 2.2	14.6 ± 2.2	
	2/2/05 - 2/9/05	15.9 ± 2.4	15.2 ± 2.3	19.5 ± 2.6	23.5 ± 2.8	21.4 ± 2.7	22.9 ± 2.7	
	2/9/05 - 2/16/05	11.5 ± 2.1	12.6 ± 2.1	13.2 ± 2.3	13.0 ± 2.2	14.7 ± 2.3	13.8 ± 2.2	
	2/16/05 - 2/23/05	11.6 ± 2.0	10.0 ± 1.9	13.3 ± 2.2	10.9 ± 2.0	11.8 ± 2.1	12.0 ± 2.1	
MAR	2/23/05 - 3/2/05	10.5 ± 2.0	12.0 ± 2.1	12.0 ± 2.1	11.3 ± 2.0	13.2 ± 2.2	11.4 ± 2.0	
	3/2/05 - 3/9/05	9.83 ± 2.0	12.3 ± 2.2	11.7 ± 2.2	11.8 ± 2.1	11.7 ± 2.2	11.9 ± 2.1	
	3/9/05 - 3/16/05	9.91 ± 2.0	10.7 ± 2.0	12.1* ± 2.7	10.9 ± 2.0	10.5 ± 2.0	13.4* ± 3.9	*Refer to Appendix A for exceptions
	3/16/05 - 3/23/05	10.2 ± 1.9	8.89 ± 1.9	12.0 ± 2.1	12.3 ± 2.1	12.0 ± 2.1	9.40 ± 2.3	
	3/23/05 - 3/30/05	7.43 ± 1.9	5.52* ± 4.9	9.10 ± 2.0	4.74 ± 1.7	6.09 ± 1.8	6.41 ± 1.8	*Refer to Appendix A for exceptions
APR	3/30/05 - 4/6/05	6.20 ± 1.9	6.87 ± 1.9	6.20 ± 1.9	7.44 ± 1.9	5.48 ± 1.9	5.79 ± 1.8	
	4/6/05 - 4/13/05	11.7 ± 2.1	12.4 ± 2.1	13.7 ± 2.2	13.7 ± 2.2	12.0 ± 2.1	14.2 ± 2.2	
	4/13/05 - 4/20/05	12.7 ± 2.4	12.8 ± 2.3	14.2 ± 2.5	14.9 ± 2.5	13.7 ± 2.5	13.0 ± 2.3	
	4/20/05 - 4/27/05	7.67 ± 1.8	7.43 ± 1.8	9.38 ± 1.9	7.33 ± 1.7	10.0 ± 2.0	7.53 ± 1.8	Power off at 13S6 for approx. 1 hr. during week
MAY	4/27/05 - 5/4/05	9.16 ± 2.0	8.03 ± 1.8	7.72 ± 1.9	7.43 ± 1.8	11.1 ± 2.1	8.04 ± 1.9	
	5/4/05 - 5/11/05	10.9 ± 2.2	11.1 ± 2.1	11.0 ± 2.2	11.9 ± 2.3	9.07 ± 2.1	9.81 ± 2.1	
	5/11/05 - 5/18/05	10.4 ± 2.0	11.4 ± 2.0	10.5 ± 2.0	11.3 ± 2.0	11.6 ± 2.1	10.8 ± 2.0	
	5/18/05 - 5/25/05	3.65 ± 1.7	3.25 ± 1.6	4.82 ± 1.8	3.95 ± 1.8	5.57 ± 1.9	6.68 ± 1.9	
JUN	5/25/05 - 6/1/05	8.14 ± 2.0	8.87 ± 2.0	5.22 ± 1.8	3.84* ± 2.5	8.43 ± 2.1	4.80 ± 1.8	*Refer to Appendix A for exceptions
	6/1/05 - 6/8/05	11.2 ± 2.3	9.89 ± 2.0	10.2 ± 2.1	9.70 ± 2.2	9.25 ± 2.5	7.53 ± 2.0	
	6/8/05 - 6/15/05	14.5 ± 2.3	12.2 ± 2.0	15.1 ± 2.3	15.7 ± 2.4	14.7 ± 2.3	15.5 ± 2.3	
	6/15/05 - 6/22/05	5.30 ± 2.0	4.18 ± 1.8	5.76 ± 2.0	8.37 ± 2.2	4.82 ± 1.9	4.35 ± 1.9	
	6/22/05 - 6/29/05	18.4 ± 2.5	19.1 ± 2.4	19.0 ± 2.5	18.6 ± 2.5	17.8 ± 2.4	18.2 ± 2.4	

TABLE I-8
GROSS BETA ANALYSES OF AIR PARTICULATE FILTERS
SUSQUEHANNA STEAM ELECTRIC STATION - 2005
Results in E-03 pCi/Cu. M. ± 2S

COLLECTION MONTH	DATE	6G1	8G1	3S2	12E1	12S1	13S6	COMMENTS
JUL	6/29/05 - 7/6/05	11.7 ± 2.3	9.99 ± 2.0	15.3 ± 2.4	11.7 ± 2.3	10.7 ± 2.1	11.7 ± 2.2	
	7/6/05 - 7/13/05	14.1 ± 2.4	12.8* ± 2.2	14.6* ± 2.4	13.4 ± 2.4	14.4 ± 2.4	14.6* ± 2.4	*Refer to Appendix A for exceptions
	7/13/05 - 7/20/05	11.9 ± 2.1	12.4 ± 2.0	14.9 ± 2.3	15.7 ± 2.4	12.6 ± 2.2	15.1 ± 2.3	
	7/20/05 - 7/27/05	15.4 ± 2.3	18.6 ± 2.4	17.9 ± 2.4	15.8 ± 2.4	18.3 ± 2.5	18.4 ± 2.5	
AUG	7/27/05 - 8/3/05	20.2 ± 2.7	18.5 ± 2.7	18.9 ± 2.5	18.6 ± 2.6	16.7 ± 2.5	15.7 ± 2.4	
	8/3/05 - 8/10/05	28.0 ± 3.0	24.0 ± 2.8	25.0 ± 2.8	24.8 ± 2.8	24.6 ± 2.8	23.4 ± 2.8	
	8/10/05 - 8/17/05	25.9 ± 3.0	24.3 ± 3.0	24.1 ± 2.8	27 ± 3.0	22.1 ± 2.7	25.9 ± 3.0	
	8/17/05 - 8/24/05	15.3 ± 2.4	16.1* ± 2.5	16.3* ± 2.5	12.3 ± 2.2	16.2 ± 2.4	14.7* ± 2.4	*Refer to Appendix A for exceptions
	8/24/05 - 8/31/05	12.6 ± 2.3	11* ± 2.3	12.8* ± 2.2	12.4 ± 2.3	11.6 ± 2.2	10.5* ± 2.2	*Refer to Appendix A for exceptions
SEP	8/31/05 - 9/7/05	10.4 ± 2.1	11.6 ± 2.2	11.8* ± 2.2	10.7 ± 2.1	13.1 ± 2.2	12.8 ± 2.3	*Refer to Appendix A for exceptions
	9/7/05 - 9/14/05	21.9 ± 2.8	22.8 ± 2.8	26.5 ± 2.9	24.4 ± 2.9	20.7 ± 2.6	23.6 ± 2.8	
	9/14/05 - 9/21/05	15.3 ± 2.4	16.0 ± 2.4	16.8 ± 2.4	16.9 ± 2.4	17.5 ± 2.4	17.2 ± 2.5	
	9/21/05 - 9/28/05	17.3 ± 2.5	16.0 ± 2.5	17.8 ± 2.5	20.7 ± 2.7	18.2 ± 2.5	20.5 ± 2.7	
OCT	9/28/05 - 10/5/05	15.5 ± 2.3	18.7 ± 2.5	20.5 ± 2.5	20.2 ± 2.7	17.3 ± 2.3	18.1 ± 2.5	
	10/5/05 - 10/12/05	6.22 ± 1.7	6.76 ± 1.7	6.06 ± 1.6	18.8* ± 5.0	7.43 ± 1.8	8.81 ± 2.0	*Refer to Appendix A for exceptions
	10/12/05 - 10/19/05	7.82 ± 1.8	9.84 ± 2.0	8.42 ± 2.0	8.10 ± 2.0	8.88 ± 1.9	8.12 ± 1.9	
	10/19/05 - 10/26/05	5.08 ± 1.7	3.41 ± 1.6	5.31 ± 1.8	3.83 ± 1.6	6.03 ± 1.8	4.08 ± 1.6	
NOV	10/26/05 - 11/02/05	15.3 ± 2.3	14.7 ± 2.3	14.4 ± 2.3	15.6 ± 2.4	14.5 ± 2.3	16.1 ± 2.4	
	11/2/05 - 11/9/05	25.0 ± 2.7	24.0 ± 2.7	21.4 ± 2.6	22.3 ± 2.6	21.8 ± 2.6	22.1 ± 2.6	
	11/9/05 - 11/16/05	14.4 ± 2.2	11.9 ± 2.1	15.2 ± 2.4	15.4 ± 2.4	14.6 ± 2.4	15.4 ± 2.4	
	11/16/05 - 11/23/05	10.7 ± 2.0	14.6 ± 2.2	16.5 ± 2.5	17.0 ± 2.4	14.9 ± 2.3	15.8 ± 2.3	
	11/23/05 - 11/30/05	9.44 ± 2.0	12.7 ± 2.2	12.0 ± 2.2	10.4 ± 2.1	11.6 ± 2.2	10.8 ± 2.1	
DEC	11/30/05 - 12/7/05	11.2 ± 2.1	11.5 ± 2.6	12.5 ± 2.2	14.1 ± 2.3	13.4 ± 2.3	12.6 ± 2.2	
	12/7/05 - 12/14/05	19.0 ± 2.7	19.6 ± 2.7	24.3 ± 2.9	24.1 ± 2.5	25.1 ± 2.9	23.3 ± 2.7	
	12/14/05 - 12/21/05	13.3 ± 2.4	15.8* ± 2.5	16.5 ± 2.6	16.7 ± 2.4	15.7 ± 2.5	19.1 ± 2.5	*Refer to Appendix A for exceptions
	12/21/05 - 12/28/05	20.4 ± 2.8	17.3 ± 2.6	26.1 ± 3.1	25.9 ± 2.9	24.1 ± 2.9	23.9 ± 2.8	

TABLE I-9

GAMMA* SPECTROSCOPIC ANALYSES OF COMPOSITED AIR PARTICULATE FILTERS

SUSQUEHANNA STEAM ELECTRIC STATION - 2005

Results in E-03 pCi/Cu. M. ± 2S

LOCATION	COLLECTION DATE	Be-7	K-40	OTHER ACTIVITY
6G1	12/28/04 - 3/30/05	89.1 ± 13	<3.33	
8G1	12/28/04 - 3/30/05	94.4 ± 14.8	<11.5	
3S2	12/28/04 - 3/30/05	104 ± 15.3	11.9 ± 6.9	
12E1	12/28/04 - 3/30/05	105 ± 12.3	<7.04	
12S1	12/28/04 - 3/30/05	108 ± 12.8	<5.66	
13S6	12/28/04 - 3/30/05	90.4 ± 11.7	<8.58	
6G1	3/30/05 - 6/29/05	128 ± 16.0	<10.6	
8G1	3/30/05 - 6/29/05	85.7 ± 16.5	<12.4	
3S2	3/30/05 - 6/29/05	112 ± 13.7	<4.82	
12E1	3/30/05 - 6/29/05	108 ± 12.2	<10.8	
12S1	3/30/05 - 6/29/05	99.8 ± 12.3	<9.61	
13S6	3/30/05 - 6/29/05	95.5 ± 14.8	<5.24	
6G1	6/29/05 - 9/28/05	132 ± 23.5	<20.7	
8G1	6/29/05 - 9/28/05	138 ± 24.2	19.8 ± 12.8	
3S2	6/29/05 - 9/28/05	140 ± 23.7	<18.7	
12E1	6/29/05 - 9/28/05	143 ± 19.4	<13.6	
12S1	6/29/05 - 9/28/05	113 ± 19.5	<5.80	
13S6	6/29/05 - 9/28/05	122 ± 28.2	<15.4	
6G1	9/28/05 - 12/28/05	73.6 ± 13.7	<11.6	
8G1	9/28/05 - 12/28/05	106 ± 16.9	<10.3	
3S2	9/28/05 - 12/28/05	91.8 ± 16.4	<8.91	
12E1	9/28/05 - 12/28/05	96.0 ± 15.9	<11.8	
12S1	9/28/05 - 12/28/05	75.5 ± 16.7	<15.3	
13S6	9/28/05 - 12/28/05	96.7 ± 16.9	<11.0	

TABLE I-10
IODINE-131, AND GAMMA* SPECTROSCOPIC ANALYSES OF MILK
SUSQUEHANNA STEAM ELECTRIC STATION - 2005
Results in pCi/liter ± 2S

LOCATION	COLLECTION DATE	K-40	OTHER ACTIVITY	COMMENTS
10G1	01/10/05	1520 ± 110		
10D1	01/10/05	1510 ± 140		
10D2	01/10/05	1340 ± 150		
12B2	01/10/05	1250 ± 150		
10G1	02/08/05	1540 ± 170		
10D1	02/08/05	1460 ± 140		
10D2	02/08/05	1310 ± 150		
12B2	02/08/05	1480 ± 160		
10G1	03/08/05	1390 ± 130		
10D1	03/08/05	1410 ± 150		
10D2	03/08/05	1300 ± 170		
12B2	03/08/05	1410 ± 110		
10G1	04/05/05	1480 ± 120		
10D1	04/05/05	1440 ± 160		
10D2	04/05/05	1320 ± 180		
12B2	04/05/05	1370 ± 170		
10G1	04/18/05	1320 ± 160		
10D1	04/18/05	1310 ± 130		
10D2	04/18/05	1270 ± 150		
12B2	04/18/05	1330 ± 150		
10G1	05/02/05	1460 ± 130		
10D1	05/02/05	1420 ± 150		
10D2	05/02/05	1290 ± 170		
12B2	05/02/05	1300 ± 150		
10G1	05/16/05	1522 ± 88		

TABLE I-10
IODINE-131, AND GAMMA* SPECTROSCOPIC ANALYSES OF MILK
SUSQUEHANNA STEAM ELECTRIC STATION - 2005
Results in pCi/liter ± 2S

LOCATION	COLLECTION DATE	K-40	OTHER ACTIVITY	COMMENTS
10D1	05/16/05	1330 ± 130		
10D2	05/16/05	1320 ± 130		
12B2	05/16/05	1350 ± 130		
10G1	05/31/05	1430 ± 170		
10D1	05/31/05	1500 ± 150		
10D2	05/31/05	1350 ± 160		
12B2	05/31/05	1250 ± 140		
10G1	06/13/05	1450 ± 110		
10D1	06/13/05	1320 ± 100		
10D2	06/13/05	1270 ± 120		
12B2	06/13/05	1340 ± 81		
10G1	06/27/05	1470 ± 110		
10D1	06/27/05	1320 ± 150		
10D2	06/27/05	1320 ± 170		
12B2	06/27/05	1310 ± 100		
10G1	07/11/05	1420 ± 110		
10D1	07/11/05	1307 ± 68		
10D2	07/11/05	1328 ± 83		
12B2	07/11/05	1380 ± 110		

TABLE I-10
IODINE-131, AND GAMMA* SPECTROSCOPIC ANALYSES OF MILK
SUSQUEHANNA STEAM ELECTRIC STATION - 2005
Results in pCi/liter ± 2S

LOCATION	COLLECTION DATE	K-40	OTHER ACTIVITY	COMMENTS
10G1	07/25/05	1510 ± 150		
10D1	07/25/05	1440 ± 140		
10D2	07/25/05	1260 ± 130		
12B2	07/25/05	1358 ± 97		
10G1	08/08/05	1420 ± 95		
10D1	08/08/05	1530 ± 150		
10D2	08/08/05	1330 ± 130		
12B2	08/08/05	1290 ± 140		
10G1	08/22/05	1437 ± 98		
10D1	08/22/05	1412 ± 72		
10D2	08/22/05	1303 ± 81		
12B2	08/22/05	1311 ± 81		
10G1	09/06/05	1400 ± 180		
10D1	09/06/05	1450 ± 150		
10D2	09/06/05	1480 ± 150		
12B2	09/06/05	1450 ± 150		
10G1	09/19/05	1460 ± 170		
10D1	09/19/05	1290 ± 140		
10D2	09/19/05	1180 ± 150		
12B2	09/19/05	1260 ± 160		

TABLE I-10

IODINE-131, AND GAMMA* SPECTROSCOPIC ANALYSES OF MILK

SUSQUEHANNA STEAM ELECTRIC STATION - 2005

Results in pCi/liter ± 2S

LOCATION	COLLECTION DATE	K-40	OTHER ACTIVITY	COMMENTS
10G1	10/03/05	1400 ± 140		
10D1	10/03/05	1320 ± 130		
10D2	10/03/05	1150 ± 120		
12B2	10/03/05	1220 ± 150		
10G1	10/17/05	1360 ± 150		
10D1	10/17/05	1480 ± 130		
10D2	10/17/05	1170 ± 150		
12B2	10/17/05	1120 ± 170		
10G1	10/31/05	1330 ± 120		
10D1	10/31/05	1440 ± 150		
10D2	10/31/05	1260 ± 100		
12B2	10/31/05	1270 ± 120		
10G1	11/14/05	1300 ± 160		
10D1	11/14/05	1550 ± 140		
10D2	11/14/05	1280 ± 120		
12B2	11/14/05	1240 ± 160		
10G1	12/12/05	1400 ± 110		
10D1	12/12/05	1270 ± 120		
10D2	12/12/05	1260 ± 120		
12B2	12/12/05	1320 ± 120		

TABLE I-11
GAMMA* SPECTROSCOPIC ANALYSES OF SOIL
SUSQUEHANNA STEAM ELECTRIC STATION - 2005
Results in pCi/kg (dry) ± 2S

LOCATION	COLLECTION DATE	K-40	Cs-137	Th-228
8G1 TOP	9/7/2005	10,430 ± 760	107 ± 37	873 ± 97
8G1 BOT	9/7/2005	6520 ± 530	49 ± 23	565 ± 70
12S1 TOP	9/7/2005	11,420 ± 970	<55	950 ± 120
12S1 BOT	9/7/2005	13,800 ± 1100	<55	900 ± 120

TABLE I-12
GAMMA* SPECTROSCOPIC ANALYSES OF FOOD PRODUCTS (FRUITS AND VEGETABLES)
SUSQUEHANNA STEAM ELECTRIC STATION - 2005

Results in pCi/kg (wet) ± 2S

LOCATION	SAMPLE TYPE	COLLECTION DATE	K-40	OTHER ACTIVITY
12F7	Potato	08/22/05	3510 ± 522	
5S11	Potato	08/22/05	4540 ± 587	
11D1	Pumpkin	09/27/05	3590 ± 410	

TABLE I-13

TYPICAL MINIMUM DETECTABLE CONCENTRATIONS OF NUCLIDES SEARCHED FOR BUT NOT FOUND BY GAMMA SPECTROMETRY IN THE VICINITY OF SUSQUEHANNA STEAM ELECTRIC STATION, 2005

Nuclide	Fish (pCi/kg wet)	Sediment (pCi/kg dry)	Surface Water (pCi/l)	Ground Water (pCi/l)	Potable Water (pCi/l)
Mn-54	33	30.8	4.73	4.3	5.14
Co-58	33	43.6	4.96	4.7	5.14
Fe-59	82	132	13.2	11	13.4
Co-60	36	40.6	5.15	6.2	5.51
Zn-65	89	121	12.1	12	11.7
Zr-95	63	80.1	8.66	8.5	8.85
Nb-95	N/A	48.1	5.89	6.1	5.88
Ru-103	N/A	N/A	5.37	5.7	5.51
I-131	102	109	12.5	8.6	10.9
Cs-134	32	44.4	4.93	6.2	5.14
Cs-137	33	55.7	4.65	4.2	4.94
Ba-140	79	314	9.96	11	9.53
La-140	92	110	11.5	12	10.8
Ce-141	43	N/A	8.14	8.2	8.34

Nuclide	Air Particulate (E-3 pCi/m3)	Milk (pCi/l)	Fruit/Veg. (pCi/kg wet)	Soil (pCi/kg dry)	Air Iodine (E-3 pCi/m3)
Mn-54	1.25	6.2	5.33	38	
Co-58	1.90	6.3	5.87	43	
Fe-59	5.73	19.4	14.3	97	
Co-60	1.37	7.6	5.33	41	
Zn-65	2.77	16.5	13.0	181	
Zr-95	3.47	11.1	9.23	79	
Nb-95	3.80	6.9	7.60	66	
Ru-103	2.40	6.5	5.77	45	
I-131	76	10.8	30.3	139	5.3
Cs-134	1.20	6.6	5.93	58	
Cs-137	1.03	6.1	4.63	49	
Ba-140	27.3	10.0	14.7	300	
La-140	31.7	11.5	17.3	151	
Ce-141	4.07	8.9	11.0	77	

APPENDIX J

PERFORMANCE SUMMARY FOR THE RADIOANALYSES OF SPIKED ENVIRONMENTAL SAMPLE MEDIA – 2005

FRAMATOME ANP ENV. LABORATORY AND TELEDYNE BROWN ENGINEERING

The data in the tables that follow show how well Framatome ANP Environmental Laboratory and Teledyne Brown Engineering Environmental Services (TBE) performed in the analysis of radioactively spiked media. Tables J-1 through J-5 provide the performance results for Framatome ANP. Tables J-6 through J-10 provide the performance results for TBE. In addition to the Analytics' spikes analyzed as part of PPL's REMP Laboratory Spike Program (Tables J-3 and J-8), Framatome ANP and TBE analyzed spikes procured independently from Analytics as part of their respective Quality Control Spike Programs (Tables J-2 and J-7), as well as spikes prepared as part of the following programs:

1. The Proficiency Testing Program of Environmental Resource Associates (Tables J-1 and J-6)

2. The Quality Assessment Program of DOE's Environmental Measurements Laboratory (EML) (Tables J-4 and J-9) was discontinued in March 2004.

3. The Mixed Analyte Performance Evaluation Program (MAPEP) of the DOE (Tables J-5 and J-10)

It should be noted that program #1 above only provides spiked water for analyses. No other media are included in the spikes provided by this program. The following characteristics are important for the spiked environmental media:

1. When practical, the level of activity in, at least, some of the spiked environmental media should be within the range between required analysis sensitivities for the SSES REMP and the Reporting Levels, if applicable, of the NRC.

2. The spikes should be preserved in a manner as similar as possible to the way that actual samples of those media are prepared.

3. The variety of radionuclides with which environmental media are spiked should be as extensive as practical, including as many as of the activation and fission products that could be detected in the vicinity of the SSES as reasonable.

The spiked environmental media prepared by Analytics according to the requirements of PPL's REMP Laboratory Spike Program are intended to incorporate characteristics #1, #2, and #3 to the greatest degree that is practical.

The criteria for the acceptability of the analyses results for the spikes prepared as part of the PPL REMP Laboratory Spike Program (Tables J-3 & J-8) have been established by PPL. They are based on criteria that were originally developed by the NRC. The NRC bases these criteria on an empirical relationship that combines prior experience and accuracy needs. As the resolution of the measurement process improves (relative measurement uncertainty becomes smaller), the criteria for determining acceptability become tighter. Conversely, as the resolution of the process becomes poorer (relative measurement uncertainty becomes bigger), the criteria are widened.

The criteria for acceptability of DOE (MAPEP) program – Tables J-5 and J-10 are based on control limits based on percentiles of historic data distributions.

Note that comment numbers at the extreme right side of the tables denote unacceptable results in Tables J-1 through J-10. Discussions relevant to these comment numbers follow the presentations of the data, as applicable.

TABLE J-1
ENVIRONMENTAL RESOURCE ASSOCIATES (ERA)
PROFICIENCY TESTING PROGRAM - 2005
FRAMATOME ANP ENVIRONMENTAL SERVICES LABORATORY
(Page 1 of 2)

Month/Year	Identification No.	Medium	Units	Nuclide	ERA Known Result (a)	Framatome Results (a)	Framatome/ERA Ratio	ERA Control Limits (b)	Evaluation
May-05	Rad-61	Water	pCi/l	Gross Alpha	37	38.9	1.05	21.0-53.0	Acceptable
			pCi/l	Gross Beta	34.2	37.8	1.11	25.5-42.9	Acceptable
			pCi/l	Tritium	24400	24100	0.99	20200-28600	Acceptable
			pCi/l	Ba-133	88.4	88.9	1.01	73.1-104	Acceptable
			pCi/l	Cs-134	78.6	76.9	0.98	69.9-87.3	Acceptable
			pCi/l	Cs-137	194	204	1.05	177-211	Acceptable
			pCi/l	Co-60	37	38.4	1.04	28.3-45.7	Acceptable
			pCi/l	Zn-65	118	121	1.03	97.6-138	Acceptable
			pCi/l	I-131	15.5	15.1	0.97	10.3-20.7	Acceptable
November-05	Rad-63	Water	pCi/l	Gross Alpha	23.3	23.3	1.00	13.2-33.4	Acceptable
			pCi/l	Gross Beta	39.1	36.6	0.94	30.4-47.8	Acceptable
			pCi/l	Tritium	12200	12200	1.00	10100-14300	Acceptable
			pCi/l	Ba-133	31.2	27.5	0.88	22.5-39.9	Acceptable
			pCi/l	Cs-134	33.9	33.5	0.99	25.2-42.6	Acceptable
			pCi/l	Cs-137	28.3	26.5	0.94	19.6-37.0	Acceptable
			pCi/l	Co-60	84.1	82.5	0.98	75.4-92.8	Acceptable
			pCi/l	Zn-65	105	102	0.97	86.8-123	Acceptable
			pCi/l	I-131	17.4	17.1	0.98	12.2-22.6	Acceptable

(a) Results are the average of three measurements, reported in units of pCi/l.
(b) Per guidelines of the EPA'S National Standards for Water Proficiency Testing Criteria Document, December 1998.

TABLE J-1
ENVIRONMENTAL RESOURCE ASSOCIATES (ERA)
PROFICIENCY TESTING PROGRAM - 2005
FRAMATOME ANP ENVIRONMENTAL SERVICES LABORATORY
(Page 2 of 2)

COMMENTS

None

TABLE J-2
ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM - 2005
FRAMATOME ANP QUALITY CONTROL SPIKE PROGRAM
FRAMATOME ANP ENVIRONMENTAL LABORATORY
(Page 1 of 6)

Quarter/Year	Identification No.	Medium	Units	Nuclide	Analytics Calculated Results	Framatome Results	Framatome / Analytics Ratio
1st/2005	E4463-162	Milk	pCi/l	*I-131LL	92.3	91.2	0.99
	E4463-162	Milk	pCi/l	I-131	92.3	95.9	1.04
	E4463-162	Milk	pCi/l	Ce-141	229	229	1.00
	E4463-162	Milk	pCi/l	Cr-51	334	334	1.00
	E4463-162	Milk	pCi/l	Cs-134	139	137	0.99
	E4463-162	Milk	pCi/l	Cs-137	130	133	1.02
	E4463-162	Milk	pCi/l	Co-58	115	118	1.03
	E4463-162	Milk	pCi/l	Mn-54	160	166	1.04
	E4463-162	Milk	pCi/l	Fe-59	111	117	1.05
	E4463-162	Milk	pCi/l	Zn-65	198	203	1.03
	E4463-162	Milk	pCi/l	Co-60	144	145	1.01
1st/2005	E4464-162	Milk	pCi/l	Sr-89	107	93.8	0.88
1st/2005	E4464-162	Milk	pCi/l	Sr-90	17.9	16.1	0.90
1st/2005	E4459-162	Water	pCi/l	Gr. Alpha	40.8	39.9	0.98
	E4459-162	Water	pCi/l	Gr. Beta	292	279	0.96
1st/2005	E4460-162	Water	pCi/l	*I-131LL	65.9	66.2	1.00
	E4460-162	Water	pCi/l	I-131	65.9	69.3	1.05
	E4460-162	Water	pCi/l	Ce-141	221	219	0.99
	E4460-162	Water	pCi/l	Cr-51	322	346	1.07
	E4460-162	Water	pCi/l	Cs-134	134	130	0.97
	E4460-162	Water	pCi/l	Cs-137	125	127	1.02
	E4460-162	Water	pCi/l	Co-58	111	108	0.97
	E4460-162	Water	pCi/l	Mn-54	154	160	1.04
	E4460-162	Water	pCi/l	Fe-59	107	114	1.07
	E4460-162	Water	pCi/l	Zn-65	191	192	1.01
	E4460-162	Water	pCi/l	Co-60	139	138	0.99
1st/2005	E4461-162	Water	pCi/l	Sr-89	103	94.6	0.92
	E4461-162	Water	pCi/l	Sr-90	17.2	15.6	0.91

*I-131 LL = radiochemical separation analysis

TABLE J-2
ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM - 2005
FRAMATOME ANP QUALITY CONTROL SPIKE PROGRAM
FRAMATOME ANP ENVIRONMENTAL LABORATORY
(Page 2 of 6)

Quarter/Year	Identification No.	Medium	Units	Nuclide	Analytics Calculated Results	Framatome Results	Framatome / Analytics Ratio
1st/05	E4462-162	AP Filter	pCi	Gr. Alpha	21.9	20.8	0.95
	E4462-162	AP Filter	pCi	Gr. Beta	157	162	1.03
2nd/05	E4599-162	Water	pCi/l	H-3	9100	9060	1.00
2nd/05	E4600-162	AP Filter	pCi	Gr. Alpha	30.9	31.9	1.03
	E4600-162	AP Filter	pCi	Gr. Beta	127	125	0.98
2nd/05	E4603-162	Milk	pCi/l	*I-131LL	86.9	85.7	0.99
	E4603-162	Milk	pCi/l	I-131	86.9	86.8	1.00
	E4603-162	Milk	pCi/l	Ce-141	92.4	96.3	1.04
	E4603-162	Milk	pCi/l	Cr-51	303	295	0.97
	E4603-162	Milk	pCi/l	Cs-134	95	87.7	0.92
	E4603-162	Milk	pCi/l	Cs-137	189	186	0.98
	E4603-162	Milk	pCi/l	Co-58	5.30	5.83	1.10
	E4603-162	Milk	pCi/l	Mn-54	125	124	0.99
	E4603-162	Milk	pCi/l	Fe-59	63.9	67	1.05
	E4603-162	Milk	pCi/l	Zn-65	155	149	0.96
	E4603-162	Milk	pCi/l	Co-60	145	138	0.95
2nd/05	E4602-162	AP Filter	pCi	Sr-89	97.5	90.5	0.93
	E4602-162	AP Filter	pCi	Sr-90	12.6	13.0	1.03

*I-131 LL = radiochemical separation analysis

TABLE J-2
ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM - 2005
FRAMATOME ANP QUALITY CONTROL SPIKE PROGRAM
FRAMATOME ANP ENVIRONMENTAL LABORATORY
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Quarter/Year	Identification No.	Medium	Units	Nuclide	Analytics Calculated Results	Framatome Results	Framatome / Analytics Ratio
2nd/05	E4601-162	AP Filter	pCi	Ce-141	58.9	59.3	1.01
	E4601-162	AP Filter	pCi	Cr-51	193	207	1.07
	E4601-162	AP Filter	pCi	Cs-134	60.6	59.1	0.98
	E4601-162	AP Filter	pCi	Cs-137	120	131	1.09
	E4601-162	AP Filter	pCi	Co-58	3.4	3.55	1.04
	E4601-162	AP Filter	pCi	Mn-54	79.7	88.6	1.11
	E4601-162	AP Filter	pCi	Fe-59	40.7	40.1	0.99
	E4601-162	AP Filter	pCi	Zn-65	98.8	112	1.13
	E4601-162	AP Filter	pCi	Co-60	92.3	89.4	0.97
3rd/05	E4690-162	Milk	pCi/l	*I-131LL	94.3	99.0	1.05
	E4690-162	Milk	pCi/l	I-131	94.3	90.0	0.95
	E4690-162	Milk	pCi/l	Ce-141	233	228.5	0.98
	E4690-162	Milk	pCi/l	Cr-51	338	306.3	0.91
	E4690-162	Milk	pCi/l	Cs-134	122	118.3	0.97
	E4690-162	Milk	pCi/l	Cs-137	195	196.5	1.01
	E4690-162	Milk	pCi/l	Co-58	63.4	64.0	1.01
	E4690-162	Milk	pCi/l	Mn-54	92.0	94.7	1.03
	E4690-162	Milk	pCi/l	Fe-59	61.0	63.3	1.04
	E4690-162	Milk	pCi/l	Zn-65	123	121.7	0.99
	E4690-162	Milk	pCi/l	Co-60	167	165.2	0.99
3rd/05	E4691-162	Milk	pCi/l	Sr-89	146	139.6	0.96
	E4691-162	Milk	pCi/l	Sr-90	11.5	10.8	0.94
3rd/05	E4686-162	Water	pCi/l	Gr. Alpha	41.6	42.3	1.02
	E4686-162	Water	pCi/l	Gr. Beta	123	128.5	1.04

*I-131 LL = radiochemical separation analysis

TABLE J-2
ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM - 2005
FRAMATOME ANP QUALITY CONTROL SPIKE PROGRAM
FRAMATOME ANP ENVIRONMENTAL LABORATORY
(Page 4 of 6)

Quarter/Year	Identification No.	Medium	Units	Nuclide	Analytics Calculated Results	Framatome Results	Framatome / Analytics Ratio
3rd/05	E4687-162	Water	pCi/l	*I-131LL	78.2	78.3	1.00
	E4687-162	Water	pCi/l	I-131	78.2	77.2	0.99
	E4687-162	Water	pCi/l	Ce-141	282	276.4	0.98
	E4687-162	Water	pCi/l	Cr-51	408	353.7	0.87
	E4687-162	Water	pCi/l	Cs-134	148	137.3	0.93
	E4687-162	Water	pCi/l	Cs-137	235	231.1	0.98
	E4687-162	Water	pCi/l	Co-58	77.0	72.5	0.94
	E4687-162	Water	pCi/l	Mn-54	111	113.2	1.02
	E4687-162	Water	pCi/l	Fe-59	74.0	74.7	1.01
	E4687-162	Water	pCi/l	Zn-65	149	152.3	1.02
	E4687-162	Water	pCi/l	Co-60	202	192.1	0.95
3rd/05	E4688-162	Charcoal	pCi	I-131	62.7	61.0	0.97
3rd/05	E4689-162	AP Filter	pCi	Gr. Alpha	38.0	39.3	1.03
	E4689-162	AP Filter	pCi	Gr. Beta	112	120.8	1.08
4th/05	E4841-162	Milk	pCi/l	*I-131LL	74.6	72.4	0.97
	E4841-162	Milk	pCi/l	I-131	74.6	74.1	0.99
	E4841-162	Milk	pCi/l	Ce-141	224	217	0.97
	E4841-162	Milk	pCi/l	Cr-51	193	190	0.98
	E4841-162	Milk	pCi/l	Cs-134	87.3	86.4	0.99
	E4841-162	Milk	pCi/l	Cs-137	189	187	0.99
	E4841-162	Milk	pCi/l	Co-58	77.5	78.7	1.02
	E4841-162	Milk	pCi/l	Mn-54	152	153	1.01
	E4841-162	Milk	pCi/l	Fe-59	82.4	87.8	1.07
	E4841-162	Milk	pCi/l	Zn-65	154	148	0.96
	E4841-162	Milk	pCi/l	Co-60	111	106	0.95
4th/05	E4879-162	Charcoal	pCi	I-131	72.0	68.4	0.95

*I-131 LL = radiochemical separation analysis

TABLE J-2
ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM - 2005
FRAMATOME ANP QUALITY CONTROL SPIKE PROGRAM
FRAMATOME ANP ENVIRONMENTAL LABORATORY
(Page 5 of 6)

Quarter/Year	Identification No.	Medium	Units	Nuclide	Analytics Calculated Results	Framatome Results	Framatome / Analytics Ratio
4th/05	E4836-162	Water	pCi/l	H-3	13200	13700	1.04
4th/05	E4840-162	AP Filter	pCi	Sr-89	121	103	0.85
	E4840-162	AP Filter	pCi	Sr-90	9.70	9.05	0.93
4th/05	E4838-162	AP Filter	pCi	Gr.Alpha	25.0	22.3	0.89
	E4838-162	AP Filter	pCi	Gr. Beta	136	146	1.07
4th/05	E4839-162	AP Filter	pCi	Ce-141	131	122	0.93
	E4839-162	AP Filter	pCi	Cr-51	113	113	1.00
	E4839-162	AP Filter	pCi	Cs-134	51.0	48	0.94
	E4839-162	AP Filter	pCi	Cs-137	111	111	1.00
	E4839-162	AP Filter	pCi	Co-58	45.2	44.2	0.98
	E4839-162	AP Filter	pCi	Mn-54	88.9	93.5	1.05
	E4839-162	AP Filter	pCi	Fe-59	48.1	44.6	0.93
	E4839-162	AP Filter	pCi	Zn-65	89.9	95.8	1.07
	E4839-162	AP Filter	pCi	Co-60	64.6	59.1	0.91
4th/05	E4837-162	Water	pCi/l	Sr-89	91.4	80.3	0.88
	E4837-162	Water	pCi/l	Sr-90	9.70	9.05	0.93

*I-131 LL = radiochemical separation analysis

COMMENTS

None

TABLE J-3
PPL REMP LABORATORY SPIKE PROGRAM
ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM - 2005
FRAMATOME ANP ENVIRONMENTAL LABORATORY
(Page 1 of 4)

Month/Year	Identification No.	Medium	Units	Nuclide	Analytics Calculated Results (a)	Framatome Results (a)	Framatome/Analytics Ratio
March-05	E4506-186	Sediment	pCi/kg	Ce-141	258 ± 9	265 ± 12	1.03
			pCi/kg	Cr-51	375 ± 13	367 ± 37	0.98
			pCi/kg	Cs-134	156 ± 5	159 ± 5	1.02
			pCi/kg	Cs-137	249 ± 8	282 ± 6	1.13
			pCi/kg	Co-58	129 ± 4	137 ± 5	1.06
			pCi/kg	Mn-54	179 ± 6	189 ± 9	1.06
			pCi/kg	Fe-59	125 ± 4	143 ± 6	1.14
			pCi/kg	Zn-65	222 ± 7	239 ± 9	1.08
			pCi/kg	Co-60	161 ± 5	164 ± 4	1.02
March-05	E4510-186	Milk	pCi/l	I-131	91 ± 3	91 ± 4	1.00
			pCi/l	Ce-141	400 ± 13	389 ± 9	0.97
			pCi/l	Cr-51	575 ± 19	521 ± 43	0.91
			pCi/l	Cs-134	239 ± 8	225 ± 8	0.94
			pCi/l	Cs-137	223 ± 7	220 ± 8	0.99
			pCi/l	Co-58	199 ± 7	185 ± 7	0.93
			pCi/l	Mn-54	275 ± 9	273 ± 8	0.99
			pCi/l	Fe-59	191 ± 6	190 ± 10	0.99
			pCi/l	Zn-65	341 ± 11	328 ± 15	0.96
			pCi/l	Co-60	248 ± 8	234 ± 6	0.94
September-05	E4752-186	AP Filter	pCi	Ce-141	182 ± 6	164 ± 5	0.90
			pCi	Cr-51	263 ± 9	214 ± 37	0.81
			pCi	Cs-134	95 ± 3	86 ± 2	0.91
			pCi	Cs-137	152 ± 5	152 ± 3	1.00
			pCi	Co-58	49 ± 2	49 ± 3	0.99
			pCi	Mn-54	72 ± 3	72 ± 2	1.00
			pCi	Fe-59	48 ± 2	46 ± 4	0.95
			pCi	Zn-65	96 ± 3	101 ± 5	1.05
			pCi	Co-60	130 ± 5	116 ± 2	0.89

(a) Counting error is two standard deviations.

TABLE J-3
PPL REMP LABORATORY SPIKE PROGRAM
ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM - 2005
FRAMATOME ANP ENVIRONMENTAL LABORATORY
(Page 2 of 4)

Month/Year	Identification No.	Medium	Units	Nuclide	Analytics Calculated Results (a)	Framatome Results (a)	Framatome/Analytics Ratio
September-05	E4753-186	AP Filter	pCi	Ce-141	172 ± 6	154 ± 5	0.90
			pCi	Cr-51	249 ± 9	227 ± 37	0.91
			pCi	Cs-134	90 ± 3	81 ± 2	0.90
			pCi	Cs-137	144 ± 5	143 ± 3	0.99
			pCi	Co-58	47 ± 2	44 ± 2	0.94
			pCi	Mn-54	68 ± 2	70 ± 2	1.03
			pCi	Fe-59	45 ± 2	38 ± 4	0.85
			pCi	Zn-65	91 ± 3	93 ± 4	1.02
			pCi	Co-60	123 ± 4	108 ± 2	0.88
September-05	E4754-186	AP Filter	pCi	Ce-141	181 ± 6	170 ± 5	0.94
			pCi	Cr-51	263 ± 9	282 ± 4	1.07
			pCi	Cs-134	95 ± 3	89 ± 2	0.93
			pCi	Cs-137	151 ± 5	161 ± 3	1.07
			pCi	Co-58	49 ± 2	50 ± 3	1.02
			pCi	Mn-54	72 ± 3	79 ± 2	1.10
			pCi	Fe-59	47 ± 2	45 ± 4	0.96
			pCi	Zn-65	96 ± 3	106 ± 5	1.10
			pCi	Co-60	130 ± 5	119 ± 2	0.92
Mar-05	E4507-186	Charcoal	pCi	I-131	62 ± 2	68 ± 4	1.10
Mar-05	E4508-186	Charcoal	pCi	I-131	73 ± 2	81 ± 5	1.11
Mar-05	E4509-186	Charcoal	pCi	I-131	82 ± 3	86 ± 5	1.05
June-05	E4653-186	Charcoal Filter	pCi	I-131	104 ± 3	108 ± 4	1.04
June-05	E4654-186	Charcoal Filter	pCi	I-131	81 ± 3	82 ± 5	1.01

(a) Counting error is two standard deviations.

TABLE J-3
PPL REMP LABORATORY SPIKE PROGRAM
ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM - 2005
FRAMATOME ANP ENVIRONMENTAL LABORATORY
(Page 3 of 4)

Month/Year	Identification No.	Medium	Units	Nuclide	Analytics Calculated Results (a)	Framatome Results (a)	Framatome/Analytics Ratio
June-05	E4655-186	Charcoal Filter	pCi	I-131	92 ± 3	100 ± 6	1.09
September-05	E4751-186	Milk	pCi/l	I-131	94 ± 3	93 ± 4	0.99
			pCi/l	Ce-141	489 ± 16	475 ± 10	0.97
			pCi/l	Cr-51	708 ± 24	695 ± 50	0.98
			pCi/l	Cs-134	256 ± 9	245 ± 8	0.96
			pCi/l	Cs-137	408 ± 14	416 ± 10	1.02
			pCi/l	Co-58	133 ± 4	124 ± 6	0.93
			pCi/l	Mn-54	193 ± 6	204 ± 8	1.06
			pCi/l	Fe-59	128 ± 4	139 ± 9	1.09
			pCi/l	Zn-65	259 ± 9	268 ± 14	1.03
			pCi/l	Co-60	351 ± 12	337 ± 7	0.96
September-05	E4755-186	Charcoal Filter	pCi	I-131	63 ± 2	75 ± 1	1.19
September-05	E4756-186	Charcoal Filter	pCi	I-131	59 ± 2	60 ± 1	1.02
September-05	E4757-186	Charcoal Filter	pCi	I-131	69 ± 2	93 ± 1	1.35
December-05	E4859-186	Milk	pCi/l	I-131	70 ± 4	65 ± 5	0.93
			pCi/l	Ce-141	416 ± 21	404 ± 11	0.97
			pCi/l	Cr-51	359 ± 18	347 ± 48	0.97
			pCi/l	Cs-134	162 ± 8	157 ± 7	0.97
			pCi/l	Cs-137	352 ± 18	350 ± 10	0.99
			pCi/l	Co-58	144 ± 7	141 ± 7	0.98
			pCi/l	Mn-54	283 ± 19	283 ± 10	1.00
			pCi/l	Fe-59	153 ± 8	150 ± 11	0.98
			pCi/l	Zn-65	286 ± 14	270 ± 17	0.94
			pCi/l	Co-60	206 ± 10	198 ± 7	0.96

(a) Counting error is two standard deviations.

TABLE J-3
PPL REMP LABORATORY SPIKE PROGRAM
ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM - 2005
FRAMATOME ANP ENVIRONMENTAL LABORATORY
(Page 4 of 4)

COMMENTS

None

TABLE J-4
DOE - ENVIRONMENTAL MEASUREMENTS LABORATORY (EML)
QUALITY ASSESSMENT PROGRAM (QAP)
FRAMATOME ANP ENVIRONMENTAL LABORATORY
(Page 1 of 1)

Month/Year	Identification No.	Medium	Units	Nuclide	EML Known Results	Framatome Results	Framatome/EML Ratio

*EML has notified the industry that March 2004 was the final set of samples to be issued.

TABLE J-5
DOE - MAPEP - 05-14
MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM
FRAMATOME ANP ENVIRONMENTAL LABORATORY
(Page 1 of 2)

Month/Year	Identification No.	Medium	Units	Nuclide	MAPEP Known Results	Framatome Results	Framatome/MAPEP Ratio	Evaluation
July-05	05-Rd-F14	Filter	Bq	Am-241	0.158	0.1359	0.86	Agreement
		Filter	Bq	Cs-134	3.85	3.828	0.99	Agreement
		Filter	Bq	Cs-137	3.23	3.396	1.05	Agreement
		Filter	Bq	Co-57	6.2	6.506	1.05	Agreement
		Filter	Bq	Co-60	2.85	2.924	1.03	Agreement
		Filter	Bq	Mn-54	4.37	4.55	1.04	Agreement
		Filter	Bq	Pu-238	0.0969	0.1059	1.09	Agreement
		Filter	Bq	Pu-239/240	0.0898	0.096	1.07	Agreement
		Filter	Bq	Sr-90	2.25	2.037	0.91	Agreement
		Filter	Bq	Zn-65	4.33	4.81	1.11	Agreement
July-05	05-MaS14	Soil	Bq/kg	Cs-134	568	594	1.05	Agreement
		Soil	Bq/kg	Cs-137	439	468	1.07	Agreement
		Soil	Bq/kg	Co-57	524	546	1.04	Agreement
		Soil	Bq/kg	Co-60	287	300	1.05	Agreement
		Soil	Bq/kg	Mn-54	439	475	1.08	Agreement
		Soil	Bq/kg	K-40	604	650	1.08	Agreement
		Soil	Bq/kg	Sr-90	757	663	0.88	Agreement
		Soil	Bq/kg	Zn-65	823	881	1.07	Agreement
July-05	05-RdV14	Vegetation	Bq	Am-241	0.23	0.251	1.09	Agreement
		Vegetation	Bq	Pu-238	False Postive Test	0.00111+/- 0.00054	N/A	Agreement*
		Vegetation	Bq	Pu-239/240	0.164	0.1675	1.02	Agreement
		Vegetation	Bq	Sr-90	2.42	2.28	0.94	Agreement

*MAPEP-05-14 Pu-238 vegetation was a "False Positive Test" sample. Framatome observed a non-positive results (i.e., did not have a false positive), thus the test is in agreement.

TABLE J-5
DOE - MAPEP - 05-14
MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM
FRAMATOME ANP ENVIRONMENTAL LABORATORY
(Page 2 of 2)

Month/Year	Identification No.	Medium	Units	Nuclide	MAPEP Known Results	Framatome Results	Framatome/MAPEP Ratio	Evaluation
July-05	05-MaW14	Water	Bq/l	Am-241	2.23	1.849	0.83	Agreement
		Water	Bq/l	Cs-134	167	160.7	0.96	Agreement
		Water	Bq/l	Cs-137	333	306	0.92	Agreement
		Water	Bq/l	Co-57	272	257	0.94	Agreement
		Water	Bq/l	Co-60	261	248	0.95	Agreement
		Water	Bq/l	H-3	527	571	1.08	Agreement
		Water	Bq/l	Fe-55	196	208	1.06	Agreement
		Water	Bq/l	Mn-54	418	392	0.94	Agreement
		Water	Bq/l	Ni-63	100	93.5	0.94	Agreement
		Water	Bq/l	Pu-238	1.91	1.659	0.87	Agreement
		Water	Bq/l	Pu-239/240	2.75	2.305	0.84	Agreement
		Water	Bq/l	Tc-99	66.5	60.8	0.91	Agreement
		Water	Bq/l	Zn-65	330	326	0.99	Agreement

TABLE J-6
ENVIRONMENTAL RESOURCE ASSOCIATES (ERA)
PROFICIENCY TESTING PROGRAM - 2005
TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES (TBE)
(Page 1 of 2)

Month/Year	Identification No.	Medium	Units	Nuclide	ERA Known Result (a)	TBE Results (a)	TBE/ERA Ratio	ERA Control Limits (b)	Evaluation (c)
May 2005	Rad 61	Water	pCi/l	Sr-89	41.3	37.5	0.91	32.6 - 50.0	A
			pCi/l	Sr-90	5.92	5.37	0.91	0.00 - 14.6	A
			pCi/l	Ba-133	88.4	88.6	1.00	73.1 - 104	A
			pCil	Cs-134	78.6	70.5	0.90	69.9 - 87.3	A
			pCi/l	Cs-137	201	201	1.00	184 - 218	A
			pCi/l	Co-60	37.0	37.5	1.01	28.3 - 45.7	A
			pCi/l	Zn-65	118	122	1.03	97.6 - 138	A
			pCi/l	Gr-Alpha	37.0	35.5	0.96	21.0 - 53.0	A
			pCi/l	Gr-Beta	34.2	35.6	1.04	25.5 - 42.9	A
			pCi/l	H-3	24400	24600	1.01	20200 - 28600	A
	Rad 61	Water	pCi/l	I-131	15.5	13.6	0.88	10.3 - 20.7	A
November 2005	Rad 63	Water	pCi/l	Sr-89	19.0	18.0	0.95	10.3 - 27.7	A
			pCi/l	Sr-90	16.0	16.6	1.04	7.37 - 24.7	A
			pCi/l	Ba-133	31.2	31.7	1.02	22.5 - 39.9	A
			pCi/l	Cs-134	33.9	30.8	0.91	25.2 - 42.6	A
			pCi/l	Cs-137	28.3	26.8	0.95	19.6 - 37.0	A
			pCi/l	Co-60	84.1	83.9	1.00	75.4 - 92.8	A
			pCi/l	Zn-65	105	109	1.04	86.8 - 123	A
			pCi/l	Gr-Alpha	23.3	19.5	0.84	13.2 - 33.4	A
			pCi/l	Gr-Beta	39.1	34.0	0.87	30.4 - 47.8	A
			pCi/l	H-3	12200	12400	1.02	10100 - 14300	A
	Rad 63		pCi/l	I-131	17.4	17.8	1.02	12.2 - 22.6	A

(a) Results are the average of three measurements, reported in units of pCi/l.
(b) Per guidelines of the EPA'S National Standards for Water Proficiency Testing Criteria Document, December 1998.
(c) ERA evaluation: A=acceptable. Reported result falls within the Warning Limits. NA=not acceptable. Reported result falls outside of the Control Limits. CE=check for Error. W=acceptable with warning. Reported result falls within the Control Limits and outside of the Warning Limit.

TABLE J-6
ENVIRONMENTAL RESOURCE ASSOCIATES (ERA)
PROFICIENCY TESTING PROGRAM - 2005
TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES (TBE)
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COMMENTS

None

TABLE J-7
ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM - 2005
TELEDYNE QUALITY CONTROL SPIKE PROGRAM
TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES
(Page 1 of 5)

Month/Year	Identification No.	Medium	Units	Nuclide	Analytics Calculated Results	TBE Results	TBE/Analytics Ratio	Evaluation (1)
March 2005	E4522-396	Milk	pCi/l	Sr-89	107	96.9	0.91	A
			pCi/l	Sr-90	17.9	16.9	0.94	A
March, 2005	E4523-396	Milk	pCi/l	I-131	92.3	82.7	0.90	A
			pCi/l	Ce-141	229	217	0.95	A
			pCi/l	Cr-51	334	314	0.94	A
			pCi/l	Cs-134	139	123	0.88	A
			pCi/l	Cs-137	130	125	0.96	A
			pCi/l	Co-58	115	110	0.96	A
			pCi/l	Mn-54	160	158	0.99	A
			pCi/l	Fe-59	111	118	1.06	A
			pCi/l	Zn-65	198	191	0.96	A
			pCi/l	Co-60	144	140	0.97	A
March, 2005	E4524-396	Charcoal	pCi	I-131	60.7	67.4	1.11	A
March, 2005	E4525-396	AP	pCi	Ce-141	172	150	0.87	A
			pCi	Cr-51	250	278	1.11	A
			pCi	Cs-134	104	105	1.01	A
			pCi	Cs-137	97.1	95.6	0.98	A
			pCi	Co-58	86.3	84.4	0.98	A
			pCi	Mn-54	120	112	0.93	A
			pCi	Fe-59	83.2	92.8	1.12	A
			pCi	Zn-65	148	162	1.09	A
			pCi	Co-60	108	102	0.94	A

TABLE J-7
ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM - 2005
TELEDYNE QUALITY CONTROL SPIKE PROGRAM
TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES
(Page 2 of 5)

Month/Year	Identification No.	Medium	Units	Nuclide	Analytics Calculated Results	TBE Results	TBE/Analytics Ratio	Evaluation (1)
June 2005	E4630-396	Milk	pCi/l	Sr-89	88.1	89.4	1.01	A
				Sr-90	11.4	11.6	1.02	A
June, 2005	E4631-396	Milk	pCi/l	I-131	86.9	82.3	0.95	A
			pCi/l	Ce-141	92.4	91.6	0.99	A
			pCi/l	Cr-51	303	278	0.92	A
			pCi/l	Cs-134	95.0	81.1	0.85	A
			pCi/l	Cs-137	189	180	0.95	A
			pCi/l	Mn-54	125	124	0.99	A
			pCi/l	Fe-59	63.9	61.1	0.96	A
			pCi/l	Zn-65	155	156	1.01	A
			pCi/l	Co-60	145	136	0.94	A
June, 2005	E4633-396	AP	pCi	Ce-141	64.2	79.2	1.23	W
			pCi	Cr-51	210	263	1.25	W
			pCi	Cs-134	66.1	69.7	1.05	A
			pCi	Cs-137	131	135	1.03	A
			pCi	Mn-54	87.0	94.9	1.09	A
			pCi	Fe-59	44.4	48	1.09	A
			pCi	Zn-65	108	120	1.11	A
			pCi	Co-60	101	104	1.03	A
June, 2005	E4632-396	Charcoal	pCi	I-131	92.5	88.9	0.96	A

TABLE J-7
ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM - 2005
TELEDYNE QUALITY CONTROL SPIKE PROGRAM
TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES
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Month/Year	Identification No.	Medium	Units	Nuclide	Analytics Calculated Results	TBE Results	TBE/Analytics Ratio	Evaluation (1)
September 2005	E4766-396	Milk	pCi/l	Sr-89	146.0	135.0	0.92	A
			pCi/l	Sr-90	11.5	9.7	0.84	A
September, 2005	E4767-396	Milk	pCi/l	I-131	94.3	87.5	0.93	A
			pCi/l	Ce-141	233	203	0.87	A
			pCi/l	Cr-51	338	279	0.83	A
			pCi/l	Cs-134	122.0	102	0.84	A
			pCi/l	Cs-137	195	178	0.91	A
			pCi/l	Co-58	63.4	55.3	0.87	A
			pCi/l	Mn-54	92.0	81.8	0.89	A
			pCi/l	Fe-59	61.0	59.9	0.98	A
			pCi/l	Zn-65	123	120	0.98	A
			pCi/l	Co-60	167	146	0.87	A
September, 2005	E4769-396	AP Filter	pCi	Ce-141	169	193	1.14	A
			pCi	Cr-51	246	267	1.09	A
			pCi	Cs-134	88.8	78.4	0.88	A
			pCi	Cs-137	142	166	1.17	A
			pCi	Co-58	46.0	53.7	1.17	A
			pCi	Mn-54	66.8	81.6	1.22	W
			pCi	Fe-59	44.3	59.6	1.35	N (2)
			pCi	Zn-65	89.6	107	1.19	A
			pCi	Co-60	122	133	1.09	A
September, 2005	E4768-396	Charcoal	pCi	I-131	64.2	63.9	1.00	A

TABLE J-7

ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM - 2005
TELEDYNE QUALITY CONTROL SPIKE PROGRAM
TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES

Month/Year	Identification No.	Medium	Units	Nuclide	Analytics Calculated Results	TBE Results	TBE/Analytics Ratio	Evaluation (1)
December 2005	E4766-396	Milk	pCi/l	Sr-89	128	114	0.89	A
			pCi/l	Sr-90	10.3	11.6	1.13	A
December 2005	E4767-396	Milk	pCi/l	I-131	74.6	79.6	1.07	A
			pCi/l	Ce-141	224	202	0.90	A
			pCi/l	Cr-51	193	185	0.96	A
			pCi/l	Cs-134	87.3	74.9	0.86	A
			pCi/l	Cs-137	189	177	0.94	A
			pCi/l	Co-58	77.5	73.9	0.95	A
			pCi/l	Mn-54	152	152	1.00	A
			pCi/l	Fe-59	82.4	97.5	1.18	A
			pCi/l	Zn-65	154	161	1.05	A
			pCi/l	Co-60	111	102	0.92	A
December 2005	E4633-396	AP Filter	pCi	Ce-141	201	221	1.10	A
			pCi	Cr-51	173	195	1.13	A
			pCi	Cs-134	78.3	68.4	0.87	A
			pCi	Cs-137	170	194	1.14	A
			pCi	Co-58	69.4	77.4	1.12	A
			pCi	Mn-54	137	171	1.25	W
			pCi	Fe-59	73.9	94.2	1.27	W
			pCi	Zn-65	138	173	1.25	W
			pCi	Co-60	99.1	109	1.10	A
December 2005	E4409A-396	Charcoal	pCi	I-131	73.3	73.3	1.00	A

TABLE J-7
ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM - 2005
TELEDYNE QUALITY CONTROL SPIKE PROGRAM
TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES

COMMENTS

1 Analytics evaluation based on TBE internal QC limits: A= Acceptable. Reported result falls within ratio limits of 0.80-1.20. W-Acceptable with warning. Reported result falls within 0.70-0.80 or 1.20-1.30. N = Not Acceptable. Reported result falls outside the ratio limits of < 0.70 and > 1.30.

2 New technician - Air Particulate (AP) not counted in petri dish resulted in high Fe-59 activity. Counting in petri dish, the the Fe-59 would have been acceptable as evidenced by the 4Q05 AP recount data. NCR 06-01.

TABLE J-8
PPL REMP LABORATORY SPIKE PROGRAM
ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM - 2005
TELEDYNE BROWN ENGINEERING ENV SERVICES
(Page 1 of 5)

Month/Year	Identification No.	Medium	Units	Nuclide	Analytics Calculated Results (a)	TBE Results (a)	TBE/Analytics Ratio	Evaluation
March-05	E4504-186	Sediment	pCi/kg	Ce-141	258 ± 9	343 ± 25	1.33	1
			pCi/kg	Cr-51	375 ± 13	454 ± 93	1.21	
			pCi/kg	Cs-134	156 ± 5	203 ± 11	1.30	1
			pCi/kg	Cs-137	249 ± 8	321 ± 16	1.29	1
			pCi/kg	Co-58	129 ± 4	148 ± 14	1.15	
			pCi/kg	Mn-54	179 ± 6	230 ± 15	1.28	1
			pCi/kg	Fe-59	125 ± 4	183 ± 20	1.46	1
			pCi/kg	Zn-65	222 ± 7	290 ± 26	1.31	1
			pCi/kg	Co-60	161 ± 5	195 ± 11	1.21	
March-05	E4500-186	Milk	pCi/l	I-131	91 ± 3	81 ± 3	0.89	
			pCi/l	Ce-141	400 ± 13	361 ± 9	0.90	
			pCi/l	Cr-51	575 ± 19	556 ± 41	0.97	
			pCi/l	Cs-134	239 ± 8	200 ± 4	0.84	
			pCi/l	Cs-137	223 ± 7	212 ± 7	0.95	
			pCi/l	Co-58	199 ± 7	181 ± 8	0.91	
			pCi/l	Mn-54	275 ± 9	266 ± 8	0.97	
			pCi/l	Fe-59	191 ± 6	182 ± 9	0.95	
			pCi/l	Zn-65	341 ± 11	342 ± 13	1.00	
			pCi/l	Co-60	248 ± 8	229 ± 5	0.92	
March-05	E4505-186	Water	pCi/l	H-3	6040 ± 400	5760 ± 251	0.95	
March-05	E4501-186	Charcoal	pCi	I-131	61 ± 2	68.7 ± 5	1.13	
March-05	E4502-186	Charcoal	pCi	I-131	70 ± 2	77.8 ± 6	1.11	
March-05	E4503-186	Charcoal	pCi	I-131	82 ± 3	92.5 ± 2	1.13	

(a) Counting error is two standard deviations.

TABLE J-8
PPL REMP LABORATORY SPIKE PROGRAM
ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM - 2005
TELEDYNE BROWN ENGINEERING ENV SERVICES

Month/Year	Identification No.	Medium	Units	Nuclide	Analytics Calculated Results (a)	TBE Results (a)	TBE/Analytics Ratio	Evaluation
June-05	E4650-186	Charcoal	pCi	I-131	104 ± 3	112 ± 6	1.08	
June-05	E4651-186	Charcoal	pCi	I-131	81 ± 3	88 ± 3	1.08	
June-05	E4652-186	Charcoal	pCi	I-131	90 ± 3	103 ± 5	1.14	
September-05	E4744-186	AP Filter	pCi	Ce-141	199 ± 7	242 ± 4	1.22	
			pCi	Cr-51	289 ± 10	339 ± 20	1.17	
			pCi	Cs-134	104 ± 4	98.5 ± 2	0.95	
			pCi	Cs-137	166 ± 6	206 ± 4	1.24	
			pCi	Co-58	54 ± 2	64.7 ± 3	1.20	
			pCi	Mn-54	79 ± 3	105 ± 4	1.33	1
			pCi	Fe-59	52 ± 2	73.1 ± 5	1.41	1
			pCi	Zn-65	106 ± 4	146 ± 7	1.38	1
			pCi	Co-60	143 ± 5	164 ± 3	1.15	
September-05	E4745-186	AP Filter	pCi	Ce-141	173 ± 6	195 ± 4	1.13	
			pCi	Cr-51	252 ± 9	277 ± 17	1.10	
			pCi	Cs-134	91 ± 3	79.1 ± 2	0.87	
			pCi	Cs-137	145 ± 5	169 ± 4	1.17	
			pCi	Co-58	47 ± 2	53.1 ± 3	1.13	
			pCi	Mn-54	68 ± 2	87 ± 3	1.28	1
			pCi	Fe-59	45 ± 2	60.1 ± 4	1.34	1
			pCi	Zn-65	92 ± 3	121 ± 6	1.32	1
			pCi	Co-60	125 ± 4	139 ± 3	1.11	

(a) Counting error is two standard deviations.

TABLE J-8
PPL REMP LABORATORY SPIKE PROGRAM
ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM - 2005
TELEDYNE BROWN ENGINEERING ENV SERVICES
(Page 3 of 5)

Month/Year	Identification No.	Medium	Units	Nuclide	Analytics Calculated Results (a)	TBE Results (a)	TBE/Analytics Ratio	Evaluation
September-05	E4746-186	AP Filter	pCi	Ce-141	164 ± 6	198 ± 4	1.21	
			pCi	Cr-51	238 ± 8	278 ± 20	1.17	
			pCi	Cs-134	86 ± 3	81.9 ± 2	0.95	
			pCi	Cs-137	137 ± 5	177 ± 4	1.29	
			pCi	Co-58	45 ± 2	54.3 ± 3	1.21	
			pCi	Mn-54	65 ± 2	88.3 ± 3	1.36	
			pCi	Fe-59	43 ± 2	60.5 ± 4	1.41	
			pCi	Zn-65	87 ± 3	121 ± 6	1.39	
			pCi	Co-60	118 ± 4	136 ± 2	1.15	
September-05	E4743-186	Milk	pCi/l	I-131	93.9 ± 3	86.5 ± 8	0.92	
			pCi/l	Ce-141	489 ± 16	454 ± 25	0.93	
			pCi/l	Cr-51	708 ± 24	660 ± 7	0.93	
			pCi/l	Cs-134	256 ± 9	216 ± 10	0.84	
			pCi/l	Cs-137	408 ± 14	401 ± 20	0.98	
			pCi/l	Co-58	133 ± 4	123 ± 14	0.92	
			pCi/l	Mn-54	193 ± 6	199 ± 2	1.03	
			pCi/l	Fe-59	128 ± 4	124 ± 21	0.97	
			pCi/l	Zn-65	259 ± 9	232 ± 30	0.90	
			pCi/l	Co-60	351 ± 12	328 ± 14	0.93	
September-05	E4747-186	Charcoal	pCi	I-131	65 ± 2	72.4 ± 6	1.11	
September-05	E4748-186	Charcoal	pCi	I-131	59 ± 2	63.1 ± 4	1.07	
September-05	E4749-186	Charcoal	pCi	I-131	68 ± 2	77.6 ± 5	1.14	

(a) Counting error is two standard deviations.

TABLE J-8
PPL REMP LABORATORY SPIKE PROGRAM
ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM - 2005
TELEDYNE BROWN ENGINEERING ENV SERVICES

Month/Year	Identification No.	Medium	Units	Nuclide	Analytics Calculated Results (a)	TBE Results (a)	TBE/Analytics Ratio	Evaluation
September-05	E4750-186	Water	pCi/l	H-3	4190 ± 140	4290 ± 199	1.02	
December-05	E4855-186	Milk	pCi/l	I-131	70 ± 2	67 ± 2	0.96	
			pCi/l	Ce-141	416 ± 8	390 ± 2	0.94	
			pCi/l	Cr-51	359 ± 21	346 ± 10	0.96	
			pCi/l	Cs-134	162 ± 9	138 ± 9	0.85	
			pCi/l	Cs-137	352 ± 7	345 ± 19	0.98	
			pCi/l	Co-58	144 ± 8	138 ± 16	0.96	
			pCi/l	Mn-54	283 ± 7	294 ± 19	1.04	
			pCi/l	Fe-59	153 ± 7	148 ± 2	0.97	
			pCi/l	Zn-65	286 ± 11	296 ± 28	1.03	
			pCi/l	Co-60	206 ± 9	197 ± 12	0.96	

(a) Counting error is two standard deviations.

TABLE J-8
PPL REMP LABORATORY SPIKE PROGRAM
ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM - 2005
TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES

COMMENTS

1 High Bias identified. Evaluation of results requested by PPL via email on March 10, 2006.

TABLE J-9

DOE - ENVIRONMENTAL MEASUREMENTS LABORATORY (EML)

QUALITY ASSESSMENT PROGRAM (QAP)

TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES

(Page 1 of 1)

Month/Year	Identification No.	Medium	Units	Nuclide	EML Known Result	TBE Results	TBE/EML Ratio	Evaluation(3)

*EML has notified the industry that March 2004 was the final set of samples to be issued.

TABLE J-10
DOE - MAPEP
MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM
TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES (TBE)

Month/Year	Identification No.	Medium	Units	Nuclide	MAPEP Known Result	TBE Results	Control Limits	Evaluation(2)
April 2005	05-MaW13	Water	Bq/l	Cs-134	127	108	88.90 - 165.10	A
			Bq/l	Cs-137	332	305	232.40 - 461.60	A
			Bq/l	Co-57	227	215	158.90 - 295.10	A
			Bq/l	Co-60	251	241	175.70 - 326.30	A
			Bq/l	H-3	280	283	196.00 - 364.00	A
			Bq/l	Mn-54	331	314	231.70 - 430.30	A
			Bq/l	Sr-90	False Positive Test	0.093 ± 0.0908	no range given	A
			Bq/l	Zn-65	496	509	347.20 - 644.80	A
April 2005	MaS13	Soil	Bq/kg	Cs-134	759	655	531.30 - 986.70	A
			Bq/kg	Cs-137	315	310	220.50 - 409.50	A
			Bq/kg	Co-57	242	234	169.40 - 314.60	A
			Bq/kg	Co-60	212	219	148.40 - 275.60	A
			Bq/kg	Mn-54	485	512	339.50 - 630.50	A
			Bq/kg	K-40	604	642	422.80 - 785.20	A
			Bq/kg	Zn-65	810	890	567.00 - 1053	A
April 2005	GrW13	Water	Bq/l	Gr-Alpha	0.525	0.601	>0.0 - 1.05	A
			Bq/l	Gr-Beta	1.67	1.54	0.84 - 2.51	A
April 2005	GrF13	AP	Bq	Gr-Alpha	0.232	0.0764	>0.0 - 0.46	A
				Gr-Beta	0.297	0.305	0.15 - 0.45	A

TABLE J-10
DOE - MAPEP
MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM
TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES (TBE)
(Page 2 of 5)

Month/Year	Identification No.	Medium	Units	Nuclide	MAPEP Known Result	TBE Results	Control Limits	Evaluation(2)
April 2005	RdF13	AP	Bq	Cs-134	3.51	3.26	2.46 - 4.56	A
			Bq	Cs-137	2.26	2.05	1.58 - 2.94	A
			Bq	Co-57	4.92	4.78	3.44 - 6.40	A
			Bq	Co-60	3.03	3.02	2.12 - 3.94	A
			Bq	Sr-90	1.35	1.15	0.95 - 1.76	A
			Bq	Zn-65	3.14	3.14	2.20 - 4.08	A
July 2005	RdV13	Vegetation	Bq/kg	Cs-134	5	5.45	3.50 - 6.50	A
			Bq/kg	Cs-137	4.1	4.80	2.88 - 5.34	A
			Bq/kg	Co-57	9.88	13.4	6.92 - 12.84	N (3)
			Bq/kg	Co-60	3.15	3.67	2.21 - 4.10	A
			Bq/kg	Mn-54	5.18	6.45	3.63 - 6.73	A
			Bq/kg	Sr-90	1.65	1.49	1.16 - 2.15	A
			Bq/kg	Zn-65	6.29	7.71	4.40 - 8.18	A
October 2005	05-MaW14	Water	Bq/l	Cs-134	167	142	116.90 - 217.10	A
			Bq/l	Cs-137	333	302	233.10 - 432.90	A
			Bq/l	Co-57	272	251	190.40 - 353.60	A
			Bq/l	Co-60	261	243	182.70 - 339.30	A
			Bq/l	H-3	527	547	368.90 - 685.10	A
			Bq/l	Mn-54	418	383	292.60 - 543.40	A
			Bq/l	Sr-90	8.98	8.75	6.29 - 11.67	A
			Bq/l	Zn-65	330	324	231.00 - 429.00	A

TABLE J-10
DOE - MAPEP
MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM
TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES (TBE)
(Page 3 of 5)

Month/Year	Identification No.	Medium	Units	Nuclide	MAPEP Known Result	TBE Results	Control Limits	Evaluation(2)
October 2005	MaS14	Soil	Bq/kg	Cs-134	568	494	397.60 - 738.40	A
			Bq/kg	Cs-137	439	446	307.30 - 570.70	A
			Bq/kg	Co-57	524	506	366.80 - 681.20	A
			Bq/kg	Co-60	287	289	200.90 - 373.10	A
			Bq/kg	Mn-54	439	460	307.30 - 570.70	A
			Bq/kg	K-40	604	626	422.80 - 785.20	A
			Bq/kg	Sr-90	757	571	529.90 - 984.10	W (1)
			Bq/kg	Zn-65	823	889	576.10 - 1070	A
October 2005	GrW14	Water	Bq/l	Gr-Alpha	0.79	0.858	0.21 - 1.38	A
			Bq/l	Gr-Beta	1.35	1.22	0.85 - 1.92	A
October 2005	RdF14	AP	Bq	Cs-134	3.85	4.11	2.70 - 5.01	A
			Bq	Cs-137	3.23	3.16	2.26 - 4.20	A
			Bq	Co-57	6.2	6.14	4.34 - 8.06	A
			Bq	Co-60	2.85	2.86	2.00 - 3.71	A
			Bq	Mn-54	4.37	4.54	3.06 - 5.68	A
			Bq	Sr-90	2.25	2.12	1.58 - 2.93	A
			Bq	Zn-65	4.33	4.28	3.03 - 5.63	A
October 2005	GrF14	AP	Bq	Gr-Alpha	0.482	0.304	>0.0 - 0.80	A
			Bq	Gr-Beta	0.827	0.858	0.55 - 1.22	A

TABLE J-10
DOE - MAPEP
MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM
TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES (TBE)

Month/Year	Identification No.	Medium	Units	Nuclide	MAPEP Known Result	TBE Results	Control Limits	Evaluation(2)
October 2005	RdV13	Vegetation	Bq/kg	Cs-134	4.09	4.35	2.86 - 5.32	A
			Bq/kg	Cs-137	5.4	5.99	3.80 - 7.06	A
			Bq/kg	Co-57	13.30	17.0	9.31 - 17.29	W
			Bq/kg	Co-60	4.43	4.87	3.10 - 5.76	A
			Bq/kg	Mn-54	6.57	7.40	4.60 - 8.54	A
			Bq/kg	Sr-90	2.42	2.03	1.69 - 3.15	A
			Bq/kg	Zn-65	10.2	11.8	7.14 - 13.26	A

COMMENTS

1 NCR 05-18 assigned to investigate low bias in Sr-90 in soil - pending fusion procedure development

2 DOE/MAPEP evaluation: A=acceptable, W=acceptable with warning, N=not acceptable. Performance is considered acceptable when a mean result for the specified analyte is ± 20% of the reference value. Performance is acceptable with warning when a mean result falls in the range from ± 20% to ± 30% of the reference value (i.e., 20% < bias < 30%). If the bias is greater that 30%, the results are deemed not acceptable.

3 High Bias identified. Evaluation of results requested by PPL via email on April 10, 2006.