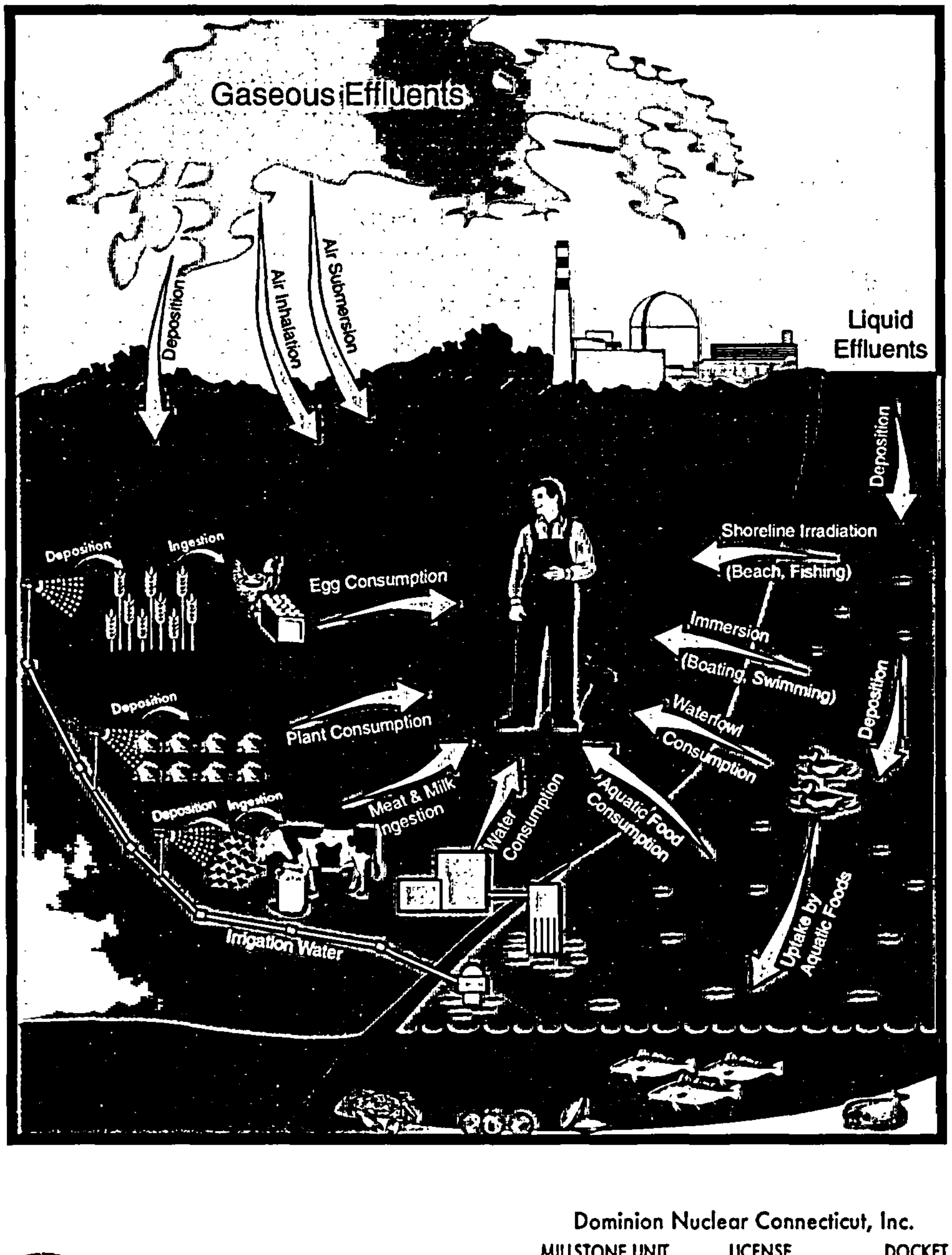
Serial No. 05-203
Docket Nos. 50-245
50-336
50-423
License Nos. DPR-21
DPR-65
NPF-49

Attachment 1

2004 Radioactive Effluent Release Report
Volume I

Millstone Power Station Units 1, 2, and 3
Dominion Nuclear Connecticut, Inc. (DNC)

Millstone Power Station
2004 Radioactive Effluent Release Report
Volume I



Dominion

Dominion Nuclear Connecticut, Inc.

MILLSTONE UNIT	LICENSE	DOCKET
1	DPR-21	50-245
2	DPR-65	50-336
3	NPF-49	50-423

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References

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8. 40 CFR Environmental Protection Agency, Part 190 Environmental Radiation Protection Standard for Nuclear Power Operation.

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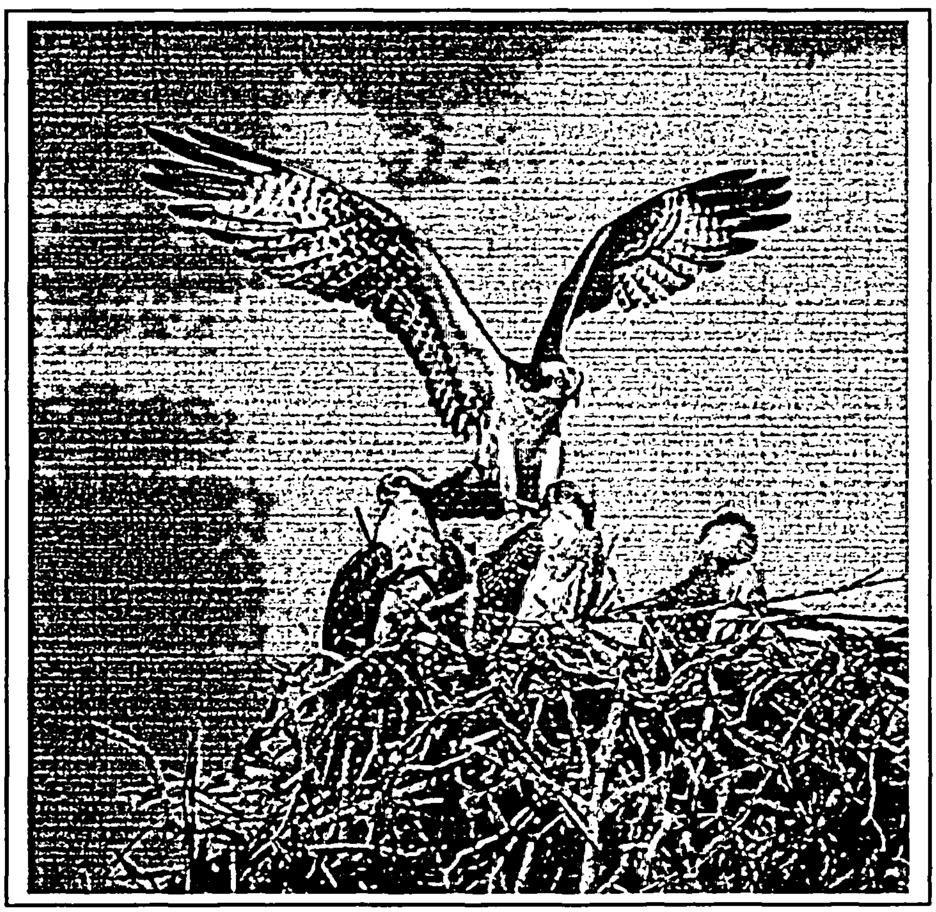
12. GASPAR II - Technical Reference and User Guide (NUREG/CR-4653), March 1987.

Introduction

This report, for the period of January through December of 2004, is being submitted by Dominion Nuclear Connecticut, Inc. for Millstone Power Station's Units 1, 2, and 3, in accordance with 10CFR50.36a, the REMODCM, and the Station's Technical Specifications. A combined report, written in the US NRC Regulatory Guide 1.21 format, is submitted for all three units.

Volume I contains radiological and volumetric information on airborne and liquid effluents and shipments of solid waste & irradiated components, calculated offsite radiological doses, all changes to the REMODCM, information on effluent monitors inoperable for more than 30 consecutive days, and any corrections to previous reports. Volume II contains a full copy of each of the complete revisions to the REMODCM effective during the calendar year.



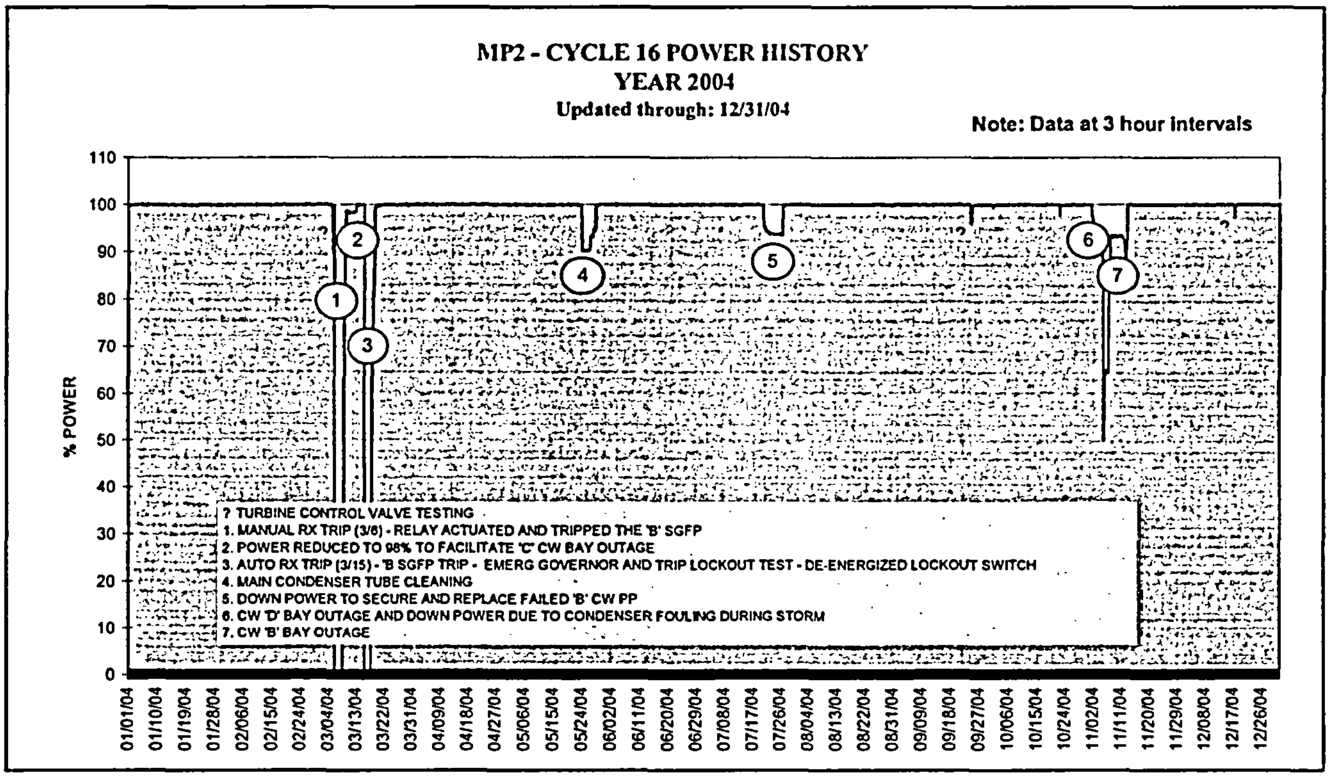
Nesting Ospreys

Operating History

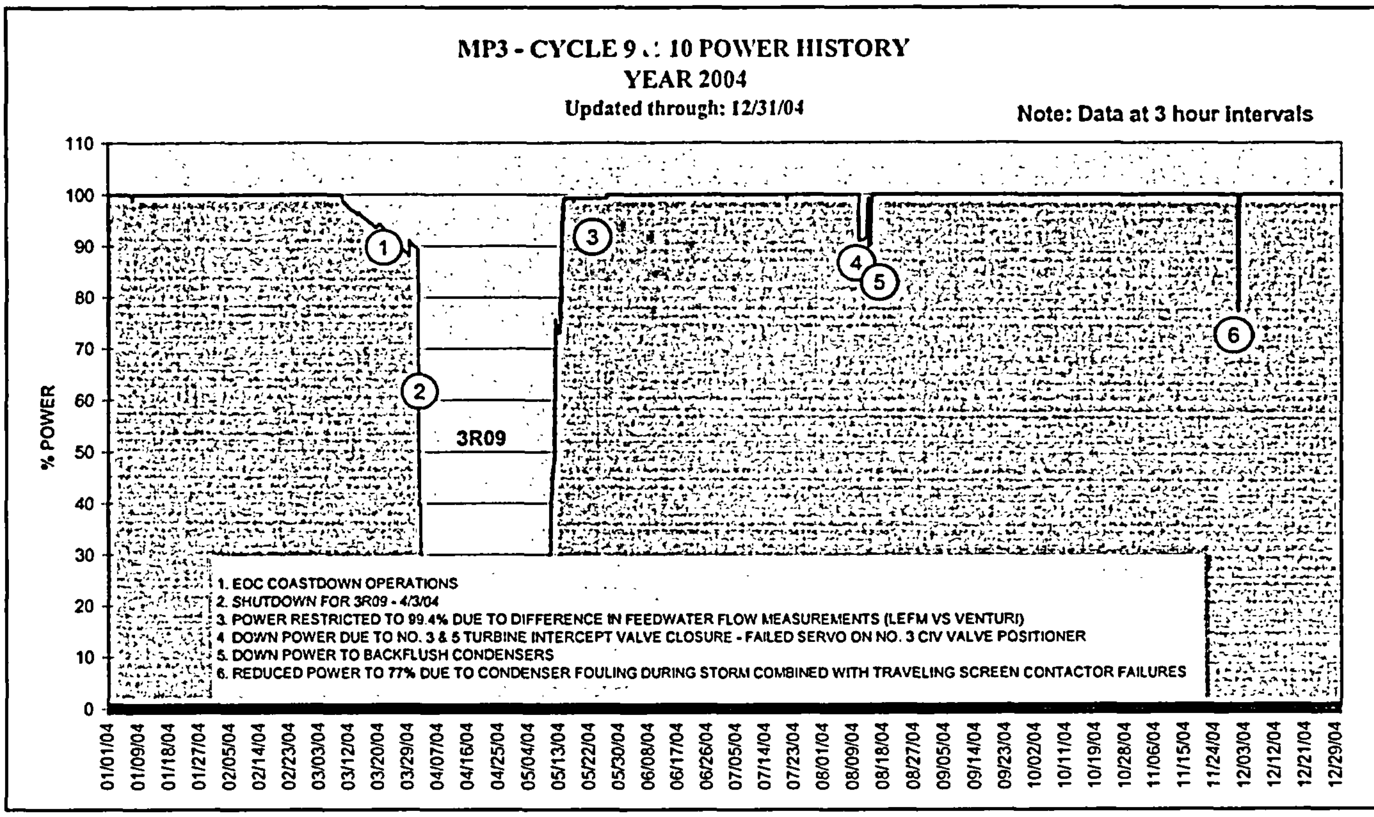
The operating history of the Millstone Units during this reporting period was as follows:

The annual capacity factor for Unit 1 was 0.0%. Unit 1 was shut down November 11, 1995 with a cessation of operation declared in July 1998.

The annual capacity factor for Unit 2 was **97.6%** based on Design Electrical Rating (DER).



The annual capacity factor for Unit 3 was **88.2%** based on Design Electrical Rating (DER). On April 3, 2004, Unit 3 was temporarily shut down for a refueling outage 3R09, and returned to power in May 2004.



1.0 Doses

This report provides a summary of the 2004 off-site radiation doses for releases of radioactive materials in airborne and liquid effluents from Millstone Units 1, 2, and 3. This includes the annual maximum dose (mrem) to any real member of the public as well the maximum gamma and beta air doses.

To provide perspective, these doses are compared with the regulatory limits and with the annual average dose a member of the public could receive from natural background and other sources.

1.1 Dose Calculations

The off-site dose to humans from radioactive airborne and liquid effluents have been calculated using measured radioactive effluent data, measured meteorological data, and dose computer models DOSAIR and DOSLIQ, which were developed by Millstone. The methodology and input parameters for DOSAIR are those used in GASPAR II (Reference 12) and NRC Regulatory Guide 1.109 (Reference 3). The methodology and input parameters for DOSLIQ are those used in LADTAP II (Reference 6) and NRC Regulatory Guide 1.109 (Reference 3). The calculated doses generally tend to be conservative due to the conservative model assumptions. More realistic estimates of the off-site dose can be obtained by analysis of environmental monitoring data. A comparison of doses estimated by each of the above methods is presented in the Annual Radiological Environmental Operating Report.

1.1.1 Maximum Individual Dose

The doses are based upon exposure to the airborne and liquid effluents over a one year period and an associated dose commitment over a 50-year period from initial exposure due to inhalation and ingestion, taking into account radioactive decay and biological elimination of the radioactive materials.

Maximum Individual dose is defined as the dose to the individual within the 50 mile population who would receive the maximum dose from releases of airborne and liquid effluents. Although the location of the maximum individual may vary each quarterly period, the annual dose is the sum of these quarterly doses. This conservatively assumes that the individual is at the location of maximum dose each quarter.

The dose calculations are based upon these three types of input: radioactive source term, site-specific data, and generic factors. The radioactive source terms (Curies) are characterized in the Radioactivity section of this report. The site specific data includes: meteorological data (e.g. wind speed, direction, stability, etc.) to calculate the transport and dispersion of airborne effluents, and dilution factors for liquid effluents. The generic factors include the average annual consumption rates (for inhalation of air and ingestion of fruits, vegetables, leafy vegetables, grains, milk, poultry, meat, fish, and shellfish) and occupancy factors (for air submersion and ground irradiation, shoreline activity, swimming, boating, etc.). All these inputs are used in the appropriate dose models to calculate the maximum individual dose from radioactive airborne and liquid effluents.

1.1.1.1 Airborne Effluents

Maximum individual doses due to the release of noble gases, radioiodines, and particulates were calculated using the computer code DOSAIR (Reference 11). This is equivalent to the NRC code, GASPAR II, which uses a semi-infinite cloud model to implement the NRC Regulatory Guide 1.109 (Reference 3) dose models.

The values of average relative effluent concentration (χ/Q) and average relative deposition (D/Q) used in the DOSAIR code were generated using EDAN 3, a meteorological computer code which implements the assumptions cited in NRC Regulatory Guide 1.111 (Reference 5), Section C. The annual summary of hourly meteorological data (in 15-minute increments), which includes wind speed, direction, atmospheric stability, and joint frequency distribution, is not provided in the report but can be retrieved from computer storage.

Millstone Stack (375 ft) releases are normally considered elevated with Pasquill stability classes determined based upon the temperature gradient between the 33 ft and 374 ft meteorological tower levels, however, the doses were conservatively calculated using mixed mode 142 ft meteorology since DOSAIR may underestimate the plume exposure for elevated releases from the Millstone Stack prior to touchdown. All three units had the ability to discharge effluents to the Millstone Stack, however, in March 2001, Unit 1 was separated from releasing to the stack and modifications were made to add two new release points, the Spent Fuel Pool Island Vent (SFPI) and the Balance of Plant Vent (BOP).

Unit 1 Spent Fuel Pool Island Vent (73 ft) and the Balance of Plant Vent (80 ft) releases are considered ground level and DOSAIR was used to calculate doses using 33 ft meteorology. Continuous ventilation of the spent fuel pool island and evaporation from the spent fuel pool water (H-3) release to the Spent Fuel Pool Island Vent. Continuous ventilation from other Unit 1 buildings and airborne releases from the reactor building evaporator are discharged to the BOP Vent. Each of these doses were summed to determine the total Unit 1 airborne effluent dose.

Unit 2 Vent (159 ft) releases are considered mixed mode (partially elevated and partially ground) releases; and, Pasquill stability classes are determined based upon the temperature gradient between the 33 ft and 142 ft meteorological tower levels. DOSAIR was used to calculate doses for Unit 2 mixed mode continuous releases (Auxiliary Building Ventilation and the Steam Generator Blowdown Tank flashed gases) and mixed mode batch releases (Containment Purge) through the Unit 2 Vent, and elevated batch releases (Waste Gas Decay Tanks and Containment Vents) through the Millstone Stack. The doses for these elevated batches were conservatively calculated using mixed mode 142 ft meteorology. Each of these doses were summed to determine the total Unit 2 airborne effluent dose. The Containment Equipment Hatch and the RWST Tank Vent releases are considered ground level and DOSAIR was used to calculate doses using 33 ft meteorology.

Unit 3 (142.5 ft) Vent releases are considered mixed mode (partially elevated and partially ground) releases; and, Pasquill stability classes are determined based upon the temperature gradient between the 33 ft and 142 ft meteorological tower levels. DOSAIR was used to calculate doses for Unit 3 mixed mode continuous releases through the Unit 3 Vent (Auxiliary Building Ventilation), mixed mode batch releases (Containment Purge) through the Unit 3 Vent, and "initial" Containment Drawdown through the roof of the Auxiliary Building. Gaseous waste and containment drawdowns are released through the Unit 3 SLCRS system to the Millstone Stack (375 ft). The doses for these elevated releases were conservatively calculated using mixed mode 142 ft meteorology. In addition, the Engineered Safety Features Building (ESF) Vent releases are considered ground level and doses are calculated using 33 ft meteorology Each of these doses were summed to determine the total Unit 3 airborne effluent dose.

1.1.1.2 Liquid Effluents

Maximum individual doses from the release of radioactive liquid effluents were calculated using the DOSLIQ program (Reference 10). This program uses the dose models and parameters cited in NRC Regulatory Guide 1.109 with site specific inputs to produce results similar to the LADTAP II code, (Reference 6).

1.1.2 Gamma and Beta Air Doses

Maximum gamma and beta air doses from the release of noble gases are calculated using DOSAIR.

1.2 Dose Results

1.2.1 Airborne Effluents

For the dose to the maximum individual, DOSAIR calculates the dose to the whole body, GI-tract, bone, liver, kidney, thyroid, lung, and skin from each of the following pathways: direct exposure from the plume and from ground deposition, inhalation, and ingestion of vegetation, cow and goat milk, and meat. The values presented are a total from all pathways; however, only the whole body, skin, thyroid and maximum organ (other than thyroid) doses are presented.

For the plume and inhalation pathways, the maximum individual dose is calculated at the off-site location of the highest decayed χ/Q where a potential for dose exists.

For ground deposition, the maximum individual dose is calculated at both the off-site maximum land location of the highest χ/Q and highest D/Q where a potential for dose exists.

For the vegetation pathway, the maximum individual dose is calculated at the vegetable garden of the highest D/Q except for the case when only tritium is released in which the maximum individual dose is calculated at the vegetable garden with the highest χ/Q. For the vegetation pathway, the calculated dose is included in the maximum individual's dose only at locations and times where these pathways actually exist.

For the meat, cow's milk, and goat's milk pathways, the calculated dose is included in the maximum individual's dose only at locations and times where these pathways actually exist.

To determine compliance with 10CFR50, Appendix I (Reference 7), the maximum individual whole body and organ doses include all applicable external pathways (i.e. plume and ground exposure) as well as the internal pathways (inhalation and ingestion).

The air dose includes only the dose from noble gases in the plume.

The off-site doses from airborne effluents are presented in Table 1-1. These are the calculated maximum off-site doses.

1.2.2 Liquid Effluents

The DOSLIQ code performs calculations for the following pathways: fish, shellfish, shoreline activity, swimming, and boating. Doses are calculated for the whole body, skin, thyroid, and maximum organ (GI-LLI, bone, liver, kidney, and lung).

The off-site doses from liquid effluents are presented in Table 1-2. These are the calculated maximum off-site doses.

1.2.3 Analysis of Results

Table 1-3 provides a quantitative dose comparison with limits specified in the REMODCM. The data indicates that the total whole body and organ doses to the maximum offsite individual from Millstone Station including all sources of the fuel cycle are well within the limits of 40CFR190 (Reference 8). On-site radioactive waste storage during this year was within storage criteria and the maximum dose to a member of the public was approximately 0.14 mrem/yr. The doses from airborne and liquid effluents were added to the estimated dose from on-site radioactive waste storage to show compliance with 40CFR190.

The Offsite Dose Comparison, Table 1-4, provides a perspective on the maximum offsite individual dose received from Millstone Station with the natural background radiation dose received by the average Connecticut resident. The total effective dose to the maximum individual received from Millstone Station is small in comparison to the dose received from natural background radiation.

Table 1-1
2004 Off-Site Dose Commitments from Airborne Effluents
Millstone Units 1, 2, 3

Unit 1	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Annual Total
Max Air	(mrad)	(mrad)	(mrad)	(mrad)	(mrad)
Beta	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Gamma	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Max Individual	(mrem)	(mrem)	(mrem)	(mrem)	(mrem)
Whole Body	7.59E-04	3.41E-04	6.76E-04	6.40E-04	2.42E-03
Skin	8.68E-04	3.41E-04	6.87E-04	7.39E-04	2.64E-03
Thyroid	7.58E-04	3.41E-04	6.35E-04	6.38E-04	2.37E-03
Max organ+	7.75E-04	3.41E-04	9.13E-04	6.42E-04	2.67E-03

Unit 2	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Annual Total
Max Air	(mrad)	(mrad)	(mrad)	(mrad)	(mrad)
Beta	3.07E-04	1.28E-04	1.36E-03	1.33E-03	3.12E-03
Gamma	2.10E-04	1.18E-04	1.12E-04	1.38E-04	5.78E-04
Max Individual	(mrem)	(mrem)	(mrem)	(mrem)	(mrem)
Whole Body	3.81E-04	7.03E-04	5.94E-04	2.61E-04	1.94E-03
Skin	5.89E-04	7.53E-04	1.27E-03	1.19E-03	3.81E-03
Thyroid	8.51E-04	8.31E-03	9.09E-04	2.72E-03	1.28E-02
Max organ+	3.84E-04	7.45E-04	6.03E-04	2.77E-04	2.01E-03

Unit 3	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Annual Total
Max Air	(mrad)	(mrad)	(mrad)	(mrad)	(mrad)
Beta	1.44E-04	1.40E-05	7.06E-06	4.52E-06	1.70E-04
Gamma	3.75E-05	1.85E-05	1.80E-05	1.20E-05	8.59E-05
Max Individual	(mrem)	(mrem)	(mrem)	(mrem)	(mrem)
Whole Body	4.67E-04	9.99E-03	9.29E-03	2.04E-03	2.18E-02
Skin	5.42E-04	1.01E-02	9.29E-03	2.10E-03	2.20E-02
Thyroid	4.67E-04	9.95E-03	9.29E-03	2.04E-03	2.17E-02
Max organ+	4.68E-04	1.03E-02	9.30E-03	2.04E-03	2.21E-02

+ Maximum of the following organs (not including thyroid): Bone, GI-LLI, Kidney, Liver, Lung

Table 1-2
2004 Off-Site Dose Commitments from Liquid Effluents
Millstone Units 1, 2, 3

Unit 1	*1st Quarter*	*2nd Quarter*	*3rd Quarter*	*4th Quarter*	*Annual Total*
Max Individual	(mrem)	(mrem)	(mrem)	(mrem)	(mrem)
Whole Body	0.00E+00	3.39E-06	1.62E-06	4.12E-07	5.42E-06
Thyroid	0.00E+00	1.48E-06	7.08E-07	1.41E-07	2.33E-06
Max Organ	0.00E+00	4.40E-06	2.10E-06	5.65E-07	7.07E-06

Unit 2	*1st Quarter*	*2nd Quarter*	*3rd Quarter*	*4th Quarter*	*Annual Total*
Max Individual	(mrem)	(mrem)	(mrem)	(mrem)	(mrem)
Whole Body	4.17E-05	6.73E-05	4.05E-05	8.10E-05	2.30E-04
Thyroid	1.81E-05	3.75E-05	1.85E-05	5.19E-05	1.26E-04
Max Organ	1.19E-04	1.91E-04	1.59E-04	2.14E-04	6.83E-04

Unit 3	*1st Quarter*	*2nd Quarter*	*3rd Quarter*	*4th Quarter*	*Annual Total*
Max Individual	(mrem)	(mrem)	(mrem)	(mrem)	(mrem)
Whole Body	4.82E-04	7.44E-04	1.75E-04	1.12E-04	1.51E-03
Thyroid	3.72E-04	2.51E-04	2.81E-05	3.74E-05	6.89E-04
Max Organ	6.93E-04	2.52E-03	8.65E-04	5.12E-04	4.59E-03

Table 1-3
2004 Off-Site Dose Comparison to Limits
Millstone Units 1, 2, 3

Airborne Effluents

Max Individual Dose vs REMODCM Limits

	Whole Body *(mrem)*	Thyroid *(mrem)*	Max Organ** *(mrem)*	Skin *(mrem)*	Beta Air *(mrad)*	Gamma Air *(mrad)*
Unit 1	2.42E-03	2.37E-03	2.67E-03	2.64E-03	0.00E+00	0.00E+00
Unit 2	1.94E-03	1.28E-02	2.01E-03	3.81E-03	3.12E-03	5.78E-04
Unit 3	2.18E-02	2.17E-02	2.21E-02	2.20E-02	1.70E-04	8.59E-05
Millstone Station	**2.61E-02**	**3.69E-02**	**2.68E-02**	**2.84E-02**	**3.29E-03**	**6.64E-04**
REMODCM Limits	***5****	***15****	***15***	***15****	***20***	***10***

Liquid Effluents

Max Individual Dose vs REMODCM Limits

	Whole Body *(mrem)*	Thyroid *(mrem)*	Max Organ** *(mrem)*
Unit 1	5.42E-06	2.33E-06	7.07E-06
Unit 2	2.30E-04	1.26E-04	6.83E-04
Unit 3	1.51E-03	6.89E-04	4.59E-03
Millstone Station	**1.75E-03**	**8.17E-04**	**5.28E-03**
REMODCM Limits	***3***	***10****	***10****

Millstone Station

Max Individual Dose vs 40CFR190 Limits

	Whole Body *(mrem)*	Thyroid *(mrem)*	Max Organ ** *(mrem)*
Airborne Effluents	2.61E-02	3.69E-02	2.68E-02
Liquid Effluents	1.75E-03	8.17E-04	5.28E-03
Radwaste Storage	1.40E-01	1.40E-01	1.40E-01
Millstone Station	**1.68E-01**	**1.78E-01**	**1.72E-01**
40CFR190 Limit	***25***	***75***	***25***

* 10CFR50, Appendix I Guidelines

** Maximum of the following organs (not including Thyroid): Bone, GI-LLI, Kidney, Liver, Lung

Table 1-4
2004 Offsite Dose Comparison
Natural Background vs. Millstone Station

Average Resident	Natural Background Radiation Dose (NCRP 94)
Cosmic	27 mrem
Cosmogenic	1 mrem
Terrestial (Atlantic and Gulf Coastal Plain)	16 mrem
Inhaled	200 mrem
In the Body	40 mrem
	~ 284 mrem

Maximum Offsite Individual	Millstone Station Whole Body Dose
Airborne Effluents	0.0261 mrem
Liqud Effluents	0.0017 mrem
On site RadWaste Storage	0.1400 mrem
	0.17 mrem

2.0 Radioactivity

2.1 Airborne Effluents

2.1.1 Measurement of Radioactivity

2.1.1.1 Millstone Stack

The MP2 Wide Range Gas Monitor (WRGM) and MP3 Secondary Leak Collection and Recovery System (SLCRS) continuously monitor the effluent activity concentration and flow rate to the Millstone Stack. Monthly gaseous grab samples are taken and analyzed for isotopic content. The isotopic concentrations at the release point are multiplied by the total flow to the stack to obtain the total activity released for each isotope.

The gas washing bottle method accomplishes tritium collection. The sample is counted on a liquid scintillation detector. Concentration is multiplied by volume to get the total activity released.

Charcoal cartridges and particulate filters are used to collect iodines and particulates, respectively. These filters are then analyzed for isotopic content using a gamma spectrometer. Particulate filters are also analyzed for Sr-89, Sr-90 and gross alpha. Isotopic concentrations are multiplied by the release flow rate and sampling time to determine the total amount of activity released.

2.1.1.2 Unit 1 Spent Fuel Pool Island (SFPI) Vent

The SFPI monitor continuously records the effluent activity concentration and flow rate. Monthly gaseous grab samples are taken and analyzed for isotopic content. The isotopic concentrations at the release point are multiplied by the total flow to the stack to obtain the total activity released for each isotope.

The gas washing bottle method accomplishes tritium collection. The sample is counted on a liquid scintillation detector. Concentration is multiplied by volume to get the total activity released.

Particulate filters are used to collect particulates. These filters are then analyzed for isotopic content using a gamma spectrometer. Particulate filters are also analyzed for Sr-90 and gross alpha. Isotopic concentrations are multiplied by the release flow rate and sampling time to determine the total amount of activity released.

2.1.1.3 Unit 1 Balance of Plant (BOP) Vent

The BOP monitor continuously records the effluent activity concentration and flow rate. Monthly gaseous grab samples are taken and analyzed for isotopic content. The isotopic concentrations at the release point are multiplied by the total flow to the stack to obtain the total activity released for each isotope.

The gas washing bottle method accomplishes tritium collection. Prior to processing each batch from the Reactor Building Evaporator a sample is collected and counted on a liquid scintillation detector. Concentration is multiplied by volume to get the total activity released.

Particulate filters are used to collect particulates. These filters are then analyzed for isotopic content using a gamma spectrometer. Particulate filters are also analyzed for Sr-90 and gross alpha. Isotopic concentrations are multiplied by the release flow rate and sampling time to determine the total amount of activity released.

2.1.1.4 Unit 2 Vent

Effluent volume from the Unit 2 vent is multiplied by the isotopic concentrations as measured by gamma spectrometer HPGe analysis for gases and liquid scintillation analysis for tritium to obtain the total activity released from the vent. The gas washing bottle method accomplishes tritium collection.

Since a major source of tritium is evaporation of water from the spent fuel pool, tritium releases were also estimated based upon amount of water lost and measured concentrations of the pool water. When the grab samples from the Unit 2 Vent are less than detectable, the measured evaporation technique is used to determine the amount of tritium released. If the grab samples from the Unit 2 Vent are detectable, the higher amount from either the vent or from the measured evaporation technique is used to determine the amount of tritium released.

Charcoal cartridges and particulate filters are used to collect iodines and particulates, respectively. These filters are then analyzed for isotopic content using a gamma spectrometer. Particulate filters are also analyzed for Sr-89, Sr-90 and gross alpha. Isotopic concentrations are multiplied by the release flow rate and sampling time to determine the total amount of activity released.

2.1.1.5 Unit 2 Containment Purges / Vents

A purge is the process of discharging air from containment to maintain temperature, humidity, pressure, concentration, etc., where air is replaced. Purges are considered batch releases and are filtered by HEPA and normally released through the Unit 2 vent. If necessary, the purge may be filtered by charcoal in the EBFS system and discharged to the Millstone Stack.

Gaseous grab samples are taken and are analyzed on a HPGe gamma spectrometer for noble gas and liquid scintillation detector for tritium. Computed concentrations are then multiplied by the calculated purge volume to obtain the total activity released. The gas washing bottle method accomplishes tritium collection.

A vent is the process of discharging air from containment usually once per week to maintain temperature, humidity, pressure, concentration without supplying replacement air. Weekly gaseous grab samples are taken and are analyzed on a HPGe gamma spectrometer for noble gas and liquid scintillation detector for tritium. Computed concentrations are then multiplied by the calculated containment vent volume to obtain the total activity released. The gas washing bottle method accomplishes tritium collection.

2.1.1.6 Unit 2 Waste Gas Decay Tanks

Waste Gases from the Gaseous Waste Processing System are held for decay in waste gas decay tanks (6) prior to discharge through the Unit 1 Stack. Calculated volume discharged is multiplied by the isotopic concentrations from the analysis of grab samples to determine the total activity released.

2.1.1.7 Unit 2 Steam Generator Blowdown Tank Vent

A decontamination factor (DF) across the SGBD Tank vent was determined for iodines by comparing the results of gamma spectrometry, HPGe, analysis of the Steam Generator Blowdown water and grab samples of the condensed steam exiting the vent. This DF was applied to the total iodine releases via the Steam Generator Blowdown water to calculate the iodine release out the vent. An additional factor of 0.33 was utilized to account for the fraction of blowdown water actually flashing to steam in the Steam Generator Blowdown Tank.

2.1.1.8 Unit 2 Radwaste Storage Tank (RWST) Vent

When reactor water is transferred to radwaste storage tank there is a potential for a release of radioactivity out the tank vent. A decontamination factor (DF) of 100 is applied to the total iodine transferred from the RCS to the RWST water to estimate the iodine released. All noble gases are assumed to be released through the tank vent.

2.1.1.9 Unit 2 Containment Equipment Hatch Opening

Samples of air near the opening are analyzed for particulates, iodines, during refueling outages for the period that the equipment hatch is open. An estimated flow out of the hatch together with the sample results are used to determine the radioactivity released. These samples of air near the opening are analyzed for particulates, and iodines, during refueling outages for the period that the equipment hatch is open.

2.1.1.10 Unit 3 Vent and ESF Building Vent

Effluent volume from the Unit 3 ventilation vent is multiplied by the isotopic concentrations as measured by gamma spectrometer HPGe analysis for gases and liquid scintillation analysis for tritium to obtain the total activity released from the vent. The gas washing bottle method accomplishes tritium collection.

Since a major source of tritium is evaporation of water from the spent fuel pool, tritium releases were also estimated based upon amount of water lost and measured concentrations of the pool water. When the grab samples from the Unit 3 Vent are less than detectable, the measured evaporation technique is used to determine the amount of tritium released. If the grab samples from the Unit 3 Vent are detectable, the higher amount from either the vent or from the measured evaporation technique is used to determine the amount of tritium released.

The Unit 3 Engineered Safety Features (ESF) building vent collects gas streams from the ESF building ventilation system.

Total effluent volume is multiplied by isotopic concentrations from the analysis of grab samples and composites to obtain the total activity released. These samples are obtained monthly for fission gases, weekly composites of filters for iodines and particulates, monthly composites of particulate filters for gross alpha and strontium.

2.1.1.11 Unit 3 Containment Drawdown and Purge

Unit 3 containment is initially drawn down prior to startup and purged typically during outages. The initial drawdown is accomplished by using the containment vacuum steam jet ejector and releases through an unmonitored vent on the roof of the auxiliary building. The containment vacuum pump discharge, which maintains subatmospheric pressure following initial drawdown, is released through the Millstone Stack.

The purge is the process of discharging air from containment to maintain temperature, humidity, pressure, concentration, etc., where air is replaced. Purges are normally released through the Unit 3 Vent. Intermittent purges and drawdowns are considered continuous releases since they occur usually 1 or 2 times a week. For initial drawdowns and purges, the calculated volume discharged is multiplied by isotopic concentrations from the analysis of grab samples to obtain total activity released. These are considered as batch releases.

2.1.1.12 Unit 3 Radwaste Storage Tank (RWST) Vent

When reactor water is transferred to radwaste storage tank there is a potential for a release of radioactivity out the tank vent. A decontamination factor (DF) of 100 is applied to the total iodine transferred from the RCS to the RWST water to estimate the iodine released. All noble gases are assumed to be released through the tank vent.

2.1.1.13 Unit 3 Containment Equipment Hatch Opening

A ground level release of radioactivity may occur during outages from the containment building through the open equipment hatch. The calculated volume discharged is multiplied by isotopic concentrations from the analysis of grab samples to obtain total activity released. These samples of air near the opening are analyzed for particulates, and iodines, during refueling outages for the period that the equipment hatch is open.

2.1.2 Estimate of Errors

Estimates of errors associated with radioactivity measurements were made using the following guidelines:

Sampling/Data Collection	10%	Variation in data collection
Sample Line Loss	10%	Deposition of some nuclides
Calibration	10%	Calibration to NBS standards
Sample Counting	10%	Error for counting statistics
Flow & Level Measurements	10%	Error for release volumes

2.1.3 Batch Releases - Airborne Effluents

Unit 1 – None

Unit 2	Ctmt Purges	WGDT
Number of Batches	0	13
Total Time (min)	0	4,754
Maximum Time (min)	0	711
Average Time (min)	0	367
Minimum Time (min)	0	88

Unit 3	Ctmt Purges	Drawdowns
Number of Batches	1	1
Total Time (min)	258	68
Maximum Time (min)	258	68
Average Time (min)	258	68
Minimum Time (min)	258	68

2.1.4 Abnormal Airborne Releases

An abnormal airborne release of radioactivity is defined as an increase in airborne radioactive material released to the environment that was unplanned or uncontrolled due to an unanticipated event. These do not include normal routine effluent releases from anticipated operational and maintenance occurrences such as power level changes, reactor trip, opening primary system loops, degassing, letdown of reactor coolant or transferring spent resin and do not include non-routine events such as minor leakages from piping, valves, pump seals, tank vents, etc.

In 2004, the following abnormal airborne releases occurred:

2.1.4.1 Unit 1 - None

2.1.4.2 Unit 2 – None

2.1.4.3 Unit 3 - None

2.2 Liquid Effluents

2.2.1 Measurement of Radioactivity

2.2.1.1 Liquid Tanks/Sumps

There are numerous tanks & sumps that are used to discharge liquids containing radioactivity to the environs; they are:

Unit 1 Reactor Cavity Water

Unit 2 Clean Waste Monitor Tanks (2)
Aerated Waste Monitor Tank
CPF Waste Neutralization Sump & Turbine Building Sump
Steam Generator Bulk

Unit 3 High Level Waste Test Tanks (2)
Low Level Waste Drain Tanks (2)
Boron Test Tanks
CPF Waste Neutralization Sump & Turbine Building Sump
Steam Generator Bulk

Prior to release, a tank is re-circulated for two equivalent tank volumes, a sample is drawn and then analyzed on the HPGe gamma spectrometer and liquid scintillation detector for individual radionuclide composition. Isotopic concentrations are multiplied by the volume released to obtain the total activity released. A proportional aliquot of each discharge is retained for composite analysis for Sr-89, Sr-90, Fe-55 and gross alpha.

2.2.1.2 Unit 2 and Unit 3 Steam Generator Blowdown

Steam generator blowdown water grab samples are taken and analyzed on the HPGe gamma spectrometer and liquid scintillation detector if required by the conditional action requirements of the REMODCM. Total volume of blowdown is multiplied by the isotopic concentrations (if any) to determine the total activity released via blowdown. A proportional aliquot of each discharge is retained for composite analysis for Sr-89, Sr-90, Fe-55 and gross alpha if required by the conditional action requirements of the REMODCM. Tritium is determined through liquid scintillation counting. Unit 2 is a continuous release while Unit 3 recycles blowdown except for periodic open cycle blowdown.

2.2.1.3 Unit 2 and Unit 3 Continuous Liquid Releases

Grab samples are taken for continuous liquid release pathways and analyzed on the HPGe gamma spectrometer and liquid scintillation detector. Total estimated volume is multiplied by the isotopic concentrations (if any) to determine the total activity released. A proportional aliquot of each discharge is retained for composite analysis for Sr-89, Sr-90, Fe-55 and gross alpha if required by the conditional action requirements of the REMODCM. Tritium is determined through liquid scintillation counting. Pathways for continuous liquid effluent releases include, Steam Generator Blowdown, Service Water Effluent, and Turbine Building Sump discharge from Units 2 & 3.

2.2.2 Estimate of Errors

Estimates of errors associated with radioactivity measurements were made using the following guidelines:

Sampling/Data Collection	10%	Variation in data collection
Calibration	10%	Calibration to NBS standards
Sample Counting	10%	Error for counting statistics
Flow & Level Measurements	10%	Error for release volumes

2.2.3 Batch Releases - Liquid Effluents

	Unit 1	Unit 2	Unit 3
Number of Batches	7	48	380
Total Time (min)	995	4,236	43,841
Maximum Time (min)	157	206	310
Average Time (min)	142	88	115
Minimum Time (min)	109	5	30
Average Stream Flow	Not Applicable - Ocean Site		

2.2.4 Abnormal Liquid Releases

An abnormal release of radioactivity is the discharge of a volume of liquid radioactive material to the environment that was unplanned or uncontrolled.

In 2004, the following abnormal liquid releases occurred:

2.2.4.1 Unit 1 - None

2.2.4.2 Unit 2 - None

2.2.4.3 Unit 3 - None

Table 2.1-A1
Millstone Unit 1 Airborne Effluents
Release Summary

	Units	2004 1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total
A. Fission & Activation Gases						
1. Total Activity Released	Ci	-	-	-	-	-
2. Average Period Release Rate	uCi/sec	-	-	-	-	-
B. Iodine-131						
1. Total Activity Released	Ci	-	-	-	-	-
2. Average Period Release Rate	uCi/sec	-	-	-	-	-
C. Particulates						
1. Total Activity Released	Ci	1.37E-05	-	4.25E-06	2.02E-05	3.82E-05
2. Average Period Release Rate	uCi/sec	1.75E-06	-	5.35E-07	2.54E-06	1.21E-06
D. Gross Alpha						
1. Total Activity Released	Ci	-	-	-	-	-
E. Tritium						
1. Total Activity Released	Ci	5.07E-01	1.97E-01	2.84E-01	1.88E-01	1.18E+00
2. Average Period Release Rate	uCi/sec	6.45E-02	2.50E-02	3.57E-02	2.37E-02	3.72E-02

"-" = Not Detected

Table 2.1-A2

Millstone Unit 1 Airborne Effluents

Elevated Continuous

<< No Radioactivity Released >>

Nuclides Released	Units	2004 1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total
A. Fission & Activation Gases						
	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-
B. Iodines						
I-131	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-
C. Particulates						
I-131	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-
D. Gross Alpha						
Gross Alpha	Ci	-	-	-	-	-
E. Tritium						
H-3	Ci	-	-	-	-	-

"-" = Not Detected

Table 2.1-A3

Millstone Unit 1 Airborne Effluents

Ground Continuous - Balance of Plant Vent & Spent Fuel Pool Island Vent

Nuclides Released	Units	2004				
		1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total
A. Fission & Activation Gases						
	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-
B. Iodines						
I-131	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-
C. Particulates						
Co-58	Ci	-	-	-	-	-
Co-60	Ci	5.83E-06	-	-	8.58E-07	6.69E-06
Cs-137	Ci	7.89E-06	-	4.25E-06	1.93E-05	3.15E-05
Total Activity	Ci	1.37E-05	-	4.25E-06	2.02E-05	3.82E-05
D. Gross Alpha						
Gross Alpha	Ci	-	-	-	-	-
E. Tritium						
H-3	Ci	5.07E-01	1.97E-01	2.84E-01	1.88E-01	1.18E+00

"-" = Not Detected

Table 2.1-L1

Millstone Unit No. 1

Liquid Effluents - Release Summary

(Release Point - Quarry)

	Units	2004 1st Qtr	2004 2nd Qtr	2004 3rd Qtr	2004 4th Qtr	2004 Total
A. Fission and Activation Products						
1. Total Activity Released	Ci	-	1.95E-04	1.12E-04	3.28E-05	3.40E-04
2. Average Period Diluted Activity (1)	uCi/ml	-	6.31E-13	2.98E-13	8.84E-14	9.09E-13
B. Tritium						
1. Total Activity Released	Ci	-	2.01E+00	1.17E+00	1.07E-01	3.29E+00
2. Average Period Diluted Activity (1)	uCi/ml	-	6.50E-09	3.10E-09	2.84E-10	8.72E-09
C. Dissolved and Entrained Gases						
1. Total Activity Released	Ci	-	-	-	-	-
2. Average Period Diluted Activity	uCi/ml	-	-	-	-	-
D. Gross Alpha						
1. Total Activity Released	Ci	-	-	-	-	-
E. Volume						
1. Released Waste Volume	Liters	0	1.04E+06	7.47E+05	1.20E+05	1.91E+06
2. Dilution Volume During Releases	Liters	0	1.86E+09	1.33E+09	2.10E+08	3.40E+09
3. Dilution Volume During Period (2)	Liters	0	0	0	0	0

"-" = Not Detected

(1) Diluted activity concentration for each batch discharge was a function of available dilution flow from Units 2 and/or 3. Therefore the reported average diluted activity is based on an average of dilution volumes from Unit 2 (see Table 2.2-L1)

(2) Unit 1 provided no dilution water flow during discharge, however, there was flow from Units 2 and 3 which diluted Unit 1 discharges prior to release to Long Island Sound.

Table 2.1-L2
Millstone Unit No. 1
Liquid Effluents - Batch
(Release Point - Quarry)

Nuclides Released	Units	2004 1st Qtr	2004 2nd Qtr	2004 3rd Qtr	2004 4th Qtr	2004 Total
A. Fission & Activation Products						
Ag-110m	Ci	-	-	-	-	-
Co-58	Ci	-	-	-	-	-
Co-60	Ci	-	-	-	-	-
Cs-137	Ci	-	1.95E-04	1.12E-04	3.28E-05	3.40E-04
Fe-55	Ci	-	-	-	-	-
Mn-54	Ci	-	-	-	-	-
Sr-89	Ci	-	-	-	-	-
Sr-90	Ci	-	-	-	-	-
Zn-65	Ci	-	-	-	-	-
Total Activity	Ci	-	1.95E-04	1.12E-04	3.28E-05	3.40E-04
B. Tritium						
H-3	Ci	-	2.01E+00	1.17E+00	1.07E-01	3.29E+00
C. Dissolved & Entrained Gases						
	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-
D. Gross Alpha						
Gross Alpha	Ci	-	-	-	-	-

"-" = Not Detected

Table 2.2-A1

Millstone Unit No. 2
Airborne Effluents - Release Summary

	Units	2004				
		1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total
A. Fission & Activation Gases						
1. Total Activity Released	Ci	1.37E+00	1.38E+00	3.35E+00	1.15E+00	7.25E+00
2. Average Period Release Rate	uCi/sec	1.75E-01	1.76E-01	4.21E-01	1.44E-01	2.29E-01
B. Iodine-131						
1. Total Activity Released	Ci	1.15E-04	1.06E-04	4.06E-06	1.01E-04	3.26E-04
2. Average Period Release Rate	uCi/sec	1.47E-05	1.34E-05	5.11E-07	1.27E-05	1.03E-05
C. Particulates						
1. Total Activity Released	Ci	7.25E-07	1.43E-06	1.28E-07	5.89E-07	2.87E-06
2. Average Period Release Rate	uCi/sec	9.22E-08	1.81E-07	1.62E-08	7.40E-08	9.07E-08
D. Gross Alpha						
1. Total Activity Released	Ci	-	-	-	-	-
E. Tritium						
1. Total Activity Released	Ci	2.15E+00	1.20E+00	1.19E+00	1.11E+00	5.66E+00
2. Average Period Release Rate	uCi/sec	2.73E-01	1.53E-01	1.50E-01	1.40E-01	1.79E-01

"-" = Not Detected

Table 2.2-A2

Millstone Unit No. 2

Airborne Effluents - Mixed Continuous - Aux Bldg Vent & SGBD Tank Vent & Spent Fuel Pool Evaporation

Nuclides Released	Units	2004				
		1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total
A. Fission & Activation Gases						
Ar-41	Ci	-	-	-	-	-
Kr-85	Ci	-	-	1.26E+00	-	1.26E+00
Kr-85m	Ci	-	-	-	-	-
Xe-131m	Ci	-	-	-	-	-
Xe-133	Ci	7.45E-01	-	7.95E-03	-	7.53E-01
Xe-133m	Ci	-	-	-	-	-
Xe-135	Ci	4.98E-01	-	-	2.25E-01	7.23E-01
Total Activity	Ci	1.24E+00	-	1.27E+00	2.25E-01	2.74E+00
B. Iodines						
I-131	Ci	1.15E-04	1.06E-04	4.06E-06	1.01E-04	3.26E-04
I-132	Ci	-	5.07E-05	-	1.41E-04	1.91E-04
I-133	Ci	4.14E-04	4.27E-04	1.76E-05	4.90E-04	1.35E-03
I-135	Ci	1.34E-04	1.57E-04	-	4.54E-04	7.45E-04
Total Activity	Ci	6.62E-04	7.41E-04	2.17E-05	1.19E-03	2.61E-03
C. Particulates						
I-131	Ci	-	-	-	-	-
Co-58	Ci	-	-	-	-	-
Co-60	Ci	-	-	-	-	-
Sr-89	Ci	-	-	-	-	-
Sr-90	Ci	-	-	-	-	-
Cs-137	Ci	6.94E-07	5.79E-07	-	-	1.27E-06
Total Activity	Ci	6.94E-07	5.79E-07	-	-	1.27E-06
D. Gross Alpha						
Gross Alpha	Ci	-	-	-	-	-
E. Tritium						
H-3	Ci	2.04E+00	1.09E+00	9.78E-01	8.25E-01	4.93E+00

"-" = Not Detected

Table 2.2-A3

Millstone Unit No. 2
Airborne Effluents - Mixed Batch - Containment Purges

<< No Radioactivity Released >>

Nuclides Released	Units	2004				
		1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total
A. Fission & Activation Gases						
Ar-41	Ci	-	-	-	-	-
Kr-85	Ci	-	-	-	-	-
Kr-85m	Ci	-	-	-	-	-
Xe-131m	Ci	-	-	-	-	-
Xe-133	Ci	-	-	-	-	-
Xe-133m	Ci	-	-	-	-	-
Xe-135	Ci	-	-	-	-	-
Xe-135m	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-
B. Iodines						
I-131	Ci	-	-	-	-	-
I-132	Ci	-	-	-	-	-
I-133	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-
C. Particulates						
I-131	Ci	-	-	-	-	-
Sr-89	Ci	-	-	-	-	-
Sr-90	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-
D. Gross Alpha						
Gross Alpha	Ci	-	-	-	-	-
E. Tritium						
H-3	Ci	-	-	-	-	-

"-" = Not Detected

Table 2.2-A4
Millstone Unit No. 2
Airborne Effluents - Elevated Batch - WGDT

Nuclides Released	Units	2004				
		1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total
A. Fission & Activation Gases						
Ar-41	Ci	-	-	-	-	-
Kr-85	Ci	-	1.25E+00	1.91E+00	6.04E-01	3.76E+00
Kr-85m	Ci	-	-	-	-	-
Xe-131m	Ci	-	-	5.04E-04	-	5.04E-04
Xe-133	Ci	-	-	1.89E-02	-	1.89E-02
Xe-133m	Ci	-	-	1.12E-04	-	1.12E-04
Xe-135	Ci	-	-	7.96E-06	-	7.96E-06
Xe-135m	Ci	-	-	-	-	-
Total Activity	Ci	-	1.25E+00	1.93E+00	6.04E-01	3.78E+00
B. Iodines						
I-131	Ci	-	-	-	-	-
I-133	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-
C. Particulates						
I-131	Ci	-	-	-	-	-
Sr-89	Ci					
Sr-90	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-
D. Gross Alpha						
Gross Alpha	Ci	-	-	-	-	-
E. Tritium						
H-3	Ci	-	1.65E-04	7.69E-04	1.38E-04	1.07E-03

"-" = Not Detected

Table 2.2-A5

Millstone Unit No. 2

Airborne Effluents - Elevated - Containment Vents/Site Stack

Nuclides Released	Units	2004 1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total
A. Fission & Activation Gases						
Ar-41	Ci	2.74E-02	2.95E-02	3.23E-02	3.85E-02	1.28E-01
Kr-85	Ci	-	-	-	1.07E-01	1.07E-01
Kr-85m	Ci	-	-	-	-	-
Xe-131m	Ci	-	-	-	-	-
Xe-133	Ci	1.01E-01	9.92E-02	1.16E-01	1.71E-01	4.88E-01
Xe-133m	Ci	-	2.36E-04	3.57E-04	3.13E-04	9.06E-04
Xe-135	Ci	4.90E-04	6.04E-04	9.08E-04	1.20E-03	3.21E-03
Total Activity	Ci	1.29E-01	1.30E-01	1.49E-01	3.18E-01	7.26E-01
B. Iodines *						
I-131	Ci	1.72E-07	-	-	-	1.72E-07
I-133	Ci	2.32E-07	5.10E-07	1.59E-07	-	9.01E-07
Total Activity	Ci	4.04E-07	5.10E-07	1.59E-07	-	1.07E-06
C. Particulates						
I-131	Ci	-	-	-	-	-
Co-58	Ci	-	8.05E-07	1.28E-07	-	9.34E-07
Co-60	Ci	-	-	-	5.89E-07	5.89E-07
Cs-137	Ci	3.09E-08	4.21E-08	-	-	7.31E-08
Sr-89	Ci	-	-	-	-	-
Sr-90	Ci	-	-	-	-	-
Total Activity	Ci	3.09E-08	8.47E-07	1.28E-07	5.89E-07	1.60E-06
D. Gross Alpha						
Gross Alpha	Ci	-	-	-	-	-
E. Tritium						
H-3	Ci	1.15E-01	1.14E-01	2.11E-01	2.89E-01	7.29E-01

* Prior to charcoal filtration

"-" = Not Detected

Table 2.2-A6

Millstone Unit No. 2

Airborne Effluents - Ground Batch - Containment Equipment Hatch

<< No Radioactivity Released >>

Nuclides Released	Units	2004				
		1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total
A. Fission & Activation Gases						
Ar-41	Ci	-	-	-	-	-
Kr-85	Ci	-	-	-	-	-
Kr-85m	Ci	-	-	-	-	-
Kr-87	Ci	-	-	-	-	-
Kr-88	Ci	-	-	-	-	-
Xe-131m	Ci	-	-	-	-	-
Xe-133	Ci	-	-	-	-	-
Xe-133m	Ci	-	-	-	-	-
Xe-135	Ci	-	-	-	-	-
Xe-135m	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-
B. Iodines						
I-131	Ci	-	-	-	-	-
I-133	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-
C. Particulates						
I-131	Ci	-	-	-	-	-
Co-58	Ci	-	-	-	-	-
Cs-137	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-
D. Gross Alpha						
Gross Alpha	Ci	-	-	-	-	-
E. Tritium						
H-3	Ci	-	-	-	-	-

"-" = Not Detected

Table 2.2-A7

Millstone Unit No. 2

Airborne Effluents - Ground Batch - RWST Vent

<< No Radioactivity Released >>

Nuclides Released	Units	2004 1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total
A. Fission & Activation Gases						
Ar-41	Ci	-	-	-	-	-
Kr-85	Ci	-	-	-	-	-
Kr-85m	Ci	-	-	-	-	-
Xe-131m	Ci	-	-	-	-	-
Xe-133	Ci	-	-	-	-	-
Xe-133m	Ci	-	-	-	-	-
Xe-135	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-
B. Iodines						
I-131	Ci	-	-	-	-	-
I-132	Ci	-	-	-	-	-
I-133	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-
C. Particulates						
I-131	Ci	-	-	-	-	-
Co-58	Ci	-	-	-	-	-
Co-60	Ci	-	-	-	-	-
Cs-134	Ci	-	-	-	-	-
Cs-136	Ci	-	-	-	-	-
Cs-137	Ci	-	-	-	-	-
Sb-124	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-
D. Gross Alpha						
Gross Alpha	Ci	-	-	-	-	-
E. Tritium						
H-3	Ci	-	-	-	-	-

"-" = Not Detected

Table 2.2-L1

Millstone Unit No. 2
Liquid Effluents - Release Summary
(Release Point - Quarry)

	Units	2004 1st Qtr	2004 2nd Qtr	2004 3rd Qtr	2004 4th Qtr	2004 Total
A. Fission and Activation Products						
1. Total Activity Released	Ci	7.74E-03	4.86E-03	3.71E-03	5.79E-03	2.21E-02
2. Average Period Diluted Activity	uCi/ml	2.80E-11	1.75E-11	1.31E-11	2.07E-11	1.98E-11
B. Tritium						
1. Total Activity Released	Ci	7.41E+00	8.19E+01	4.22E+01	1.34E+02	2.65E+02
2. Average Period Diluted Activity	uCi/ml	2.68E-08	2.94E-07	1.49E-07	4.79E-07	2.37E-07
C. Dissolved and Entrained Gases						
1. Total Activity Released	Ci	2.56E-01	3.30E-01	7.43E-02	1.22E-01	7.81E-01
2. Average Period Diluted Activity	uCi/ml	9.27E-10	1.19E-09	2.63E-10	4.36E-10	7.00E-10
D. Gross Alpha						
1. Total Activity Released	Ci	-	-	-	-	-
E. Volume						
1. Released Waste Volume	Liters	3.43E+05	1.39E+06	4.05E+07	2.06E+07	6.28E+07
2. Dilution Volume During Releases	Liters	1.94E+09	1.32E+09	1.31E+09	1.86E+09	6.42E+09
3. Dilution Volume During Period	Liters	2.76E+11	2.78E+11	2.83E+11	2.79E+11	1.12E+12

"-" = Not Detected

Table 2.2-L2

Millstone Unit No. 2
Liquid Effluents - Continuous - SGBD, SW, RBCCW
(Release Point - Quarry)

Nuclides Released	Units	2004				
		1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total
A. Fission & Activation Products						
	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-
B. Tritium						
H-3	Ci	1.23E-04	3.32E-04	4.36E-02	3.61E-02	8.01E-02
C. Dissolved & Entrained Gases						
	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-
D. Gross Alpha						
Gross Alpha	Ci	-	-	-	-	-

"-" = Not Detected

Table 2.2-L3

Millstone Unit No. 2
Liquid Effluents - Batch - LWS
(Release Point - Quarry)

Nuclides Released	Units	2004 1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total
A. Fission & Activation Products						
Ag-110m	Ci	1.36E-04	7.40E-05	8.04E-05	2.12E-05	3.12E-04
Co-57	Ci	4.11E-08	-	-	6.58E-07	6.99E-07
Co-58	Ci	1.19E-03	2.49E-04	5.47E-05	3.52E-05	1.53E-03
Co-60	Ci	1.46E-03	7.65E-04	6.91E-04	6.89E-04	3.61E-03
Cs-134	Ci	1.04E-04	1.72E-04	4.65E-05	8.42E-05	4.06E-04
Cs-137	Ci	1.38E-04	1.72E-04	6.63E-05	1.46E-04	5.22E-04
Fe-55	Ci	1.40E-03	2.01E-03	2.07E-03	2.74E-03	8.22E-03
I-133	Ci	-	-	1.75E-06	-	1.75E-06
Ba-141	Ci	-	-	-	4.59E-06	4.59E-06
Mn-54	Ci	1.59E-04	2.46E-05	2.23E-05	1.05E-05	2.17E-04
Nb-95	Ci	1.73E-04	6.04E-05	2.33E-06	-	2.35E-04
Mo-99	Ci	-	-	-	1.97E-06	1.97E-06
Tc-99m	Ci	-	-	-	2.13E-06	2.13E-06
Ru-103	Ci	1.69E-05	-	-	-	1.69E-05
Ru-105	Ci	5.85E-05	-	-	-	5.85E-05
Sb-124	Ci	1.88E-04	2.39E-05	-	-	2.12E-04
Sb-125	Ci	2.57E-03	1.19E-03	6.78E-04	2.06E-03	6.49E-03
Sn-113	Ci	7.44E-05	5.43E-05	-	-	1.29E-04
Sn-117m	Ci	3.11E-08	-	-	-	3.11E-08
Sr-89	Ci	1.83E-05	7.27E-05	-	-	9.10E-05
Sr-90	Ci	-	-	-	-	-
Zr-95	Ci	5.12E-05	-	-	-	5.12E-05
Total Activity	Ci	7.74E-03	4.86E-03	3.71E-03	5.79E-03	2.21E-02
B. Tritium						
H-3	Ci	7.41E+00	8.19E+01	4.22E+01	1.34E+02	2.65E+02
C. Dissolved & Entrained Gases						
Kr-85	Ci	2.54E-01	3.15E-01	7.39E-02	1.14E-01	7.58E-01
Xe-131m	Ci	9.98E-04	-	-	-	9.98E-04
Xe-133	Ci	3.21E-04	1.47E-02	4.21E-04	7.16E-03	2.26E-02
Xe-135	Ci	-	-	-	9.48E-06	9.48E-06
Total Activity	Ci	2.56E-01	3.30E-01	7.43E-02	1.22E-01	7.81E-01
D. Gross Alpha						
Gross Alpha	Ci	-	-	-	-	-

"-" = Not Detected

Table 2.2-L4

Millstone Unit No. 2

Liquid Effluents -Continuous-Turbine Building Sump

(Release Point - Yard Drain - DSN 006)

Nuclides Released	Units	2004 1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total
A. Fission & Activation Products						
Total Activity Released	Ci	-	-	-	-	-
Average Period Diluted Activity	uCi/ml	-	-	-	-	-
B. Tritium						
Total Activity Released	Ci	1.24E-02	-	1.55E-03	1.44E-02	2.83E-02
Average Period Diluted Activity	uCi/ml	5.05E-07	-	6.19E-08	5.74E-07	2.85E-07
C. Dissolved & Entrained Gases						
Total Activity Released	Ci	-	-	-	-	-
Average Period Diluted Activity	uCi/ml	-	-	-	-	-
D. Gross Alpha						
Gross Alpha	Ci	-	-	-	-	-
E. Volume						
Released Waste Volume	Liters	1.71E+06	0.00E+00	2.19E+05	2.18E+06	4.11E+06
Dilution Volume During Releases	Liters	Dilution Volumes cannot be accurately determined for yard drain releases				
Dilution Volume During Period	Liters	2.45E+07	2.48E+07	2.51E+07	2.51E+07	9.95E+07

"-" = Not Detected

Table 2.3-A1

Millstone Unit No. 3

Airborne Effluents - Release Summary

		Units	2004 1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total
A. Fission & Activation Gases							
1.	Total Activity Released	Ci	4.21E-01	3.51E-02	1.47E-02	1.35E-02	4.84E-01
2.	Average Period Release Rate	uCi/sec	5.35E-02	4.47E-03	1.84E-03	1.70E-03	1.53E-02
B. Iodine-131							
1.	Total Activity Released	Ci	-	1.33E-06	-	-	1.33E-06
2.	Average Period Release Rate	uCi/sec	-	1.69E-07	-	-	4.21E-08
C. Particulates							
1.	Total Activity Released	Ci	1.26E-05	3.53E-04	1.01E-06	1.84E-05	3.85E-04
2.	Average Period Release Rate	uCi/sec	1.61E-06	4.49E-05	1.26E-07	2.32E-06	1.22E-05
D. Gross Alpha							
1.	Total Activity Released	Ci	-	-	-	-	-
E. Tritium							
1.	Total Activity Released	Ci	6.07E+00	2.58E+01	2.61E+01	2.03E+01	7.83E+01
2.	Average Period Release Rate	uCi/sec	7.73E-01	3.28E+00	3.28E+00	2.56E+00	2.48E+00

"-" = Not Detected

Table 2.3-A2

Millstone Unit No. 3

Airborne Effluents - Mixed Continuous - Normal Ventilation & Spent Fuel Pool Evaporation

Nuclides Released	Units	2004				
		1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total
A. Fission & Activation Gases						
Xe-131m	Ci	-	-	-	-	-
Xe-133	Ci	-	-	-	-	-
Xe-135	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-
B. Iodines						
I-131	Ci	-	1.33E-06	-	-	1.33E-06
I-133	Ci	-	-	-	-	-
Total Activity	Ci	-	1.33E-06	-	-	1.33E-06
C. Particulates						
I-131	Ci	-	-	-	-	-
Co-58	Ci	-	1.20E-04	9.73E-07	-	1.21E-04
Co-60	Ci	-	1.77E-05	-	4.83E-06	2.25E-05
Cr-51	Ci	-	1.72E-04	-	-	1.72E-04
Mn-54	Ci	-	1.12E-05	-	-	1.12E-05
Nb-95	Ci	-	6.12E-06	-	-	6.12E-06
Zr-95	Ci	-	1.75E-05	-	-	1.75E-05
Be-7	Ci	-	-	-	1.33E-05	1.33E-05
Sr-89	Ci	-	-	-	-	-
Sr-90	Ci	-	-	-	-	-
Total Activity	Ci	-	3.45E-04	9.73E-07	1.81E-05	3.64E-04
D. Gross Alpha						
Gross Alpha	Ci	-	-	-	-	-
E. Tritium						
H-3	Ci	4.90E+00	2.53E+01	2.46E+01	1.95E+01	7.43E+01

"-" = Not Detected

Table 2.3-A3

Millstone Unit No. 3

Airborne Effluents - Ground Continuous - ESF Building Ventilation

Nuclides Released	Units	2004 1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total
A. Fission & Activation Gases						
Xe-131m	Ci	3.44E-01	-	-	-	3.44E-01
Total Activity	Ci	3.44E-01	-	-	-	3.44E-01
B. Iodines						
I-131	Ci	-	-	-	-	-
I-133	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-
C. Particulates						
I-131	Ci	-	-	-	-	-
Co-58	Ci	-	6.47E-08	-	-	6.47E-08
Cr-51	Ci	-	-	-	-	-
Ru-106	Ci	-	2.32E-07	-	-	2.32E-07
Hf-181	Ci	-	-	3.23E-08	-	3.23E-08
Sr-89	Ci	-	-	-	-	-
Sr-90	Ci	-	-	-	-	-
Total Activity	Ci	-	2.97E-07	3.23E-08	-	3.29E-07
D. Gross Alpha						
Gross Alpha	Ci	-	-	-	-	-
E. Tritium						
H-3	Ci	-	-	1.14E+00	1.77E-01	1.32E+00

"-" = Not Detected

Table 2.3-A4

Millstone Unit No. 3

Airborne Effluents - Mixed Batch - Containment Drawdowns

Nuclides Released	Units	2004 1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total
A. Fission & Activation Gases						
Xe-131m	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-
B. Iodines						
I-131	Ci	-	-	-	-	-
I-133	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-
C. Particulates						
I-131	Ci	-	-	-	-	-
Nb-97	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-
D. Gross Alpha						
Gross Alpha	Ci	-	-	-	-	-
E. Tritium						
H-3	Ci	-	1.07E-03	-	-	1.07E-03

"-" = Not Detected

Table 2.3-A5

Millstone Unit No. 3

Airborne Effluents - Mixed Batch - Containment Purges

Nuclides Released	Units	2004 1st Qtr	2004 2nd Qtr	2004 3rd Qtr	2004 4th Qtr	2004 Total
A. Fission & Activation Gases						
Xe-133	Ci	-	5.77E-03	-	-	5.77E-03
Xe-135	Ci	-	1.99E-03	-	-	1.99E-03
Total Activity	Ci	-	7.76E-03	-	-	7.76E-03
B. Iodines						
I-131	Ci	-	-	-	-	-
I-133	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-
C. Particulates						
I-131	Ci	-	-	-	-	-
I-133	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-
D. Gross Alpha						
Gross Alpha	Ci	-	-	-	-	-
E. Tritium						
H-3	Ci	-	6.70E-02	-	-	6.70E-02

"-" = Not Detected

Table 2.3-A6

Millstone Unit No. 3

Airborne Effluents - Elevated Continuous - Gaseous Waste System & Containment Vents

Nuclides Released	Units	2004				
		1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total
A. Fission & Activation Gases						
Ar-41	Ci	1.61E-02	5.66E-03	1.06E-02	1.13E-02	4.36E-02
Kr-85m	Ci	-	-	-	-	-
Kr-87	Ci	-	-	-	-	-
Kr-88	Ci	-	-	-	-	-
Xe-133	Ci	4.70E-02	1.31E-02	3.81E-03	1.91E-03	6.59E-02
Xe-135	Ci	1.37E-02	8.62E-03	2.54E-04	3.57E-04	2.29E-02
Xe-135m	Ci	-	-	-	-	-
Xe-138	Ci	-	-	-	-	-
Total Activity	Ci	7.68E-02	2.74E-02	1.47E-02	1.35E-02	1.32E-01
B. Iodines						
I-131	Ci	-	-	-	-	-
I-132	Ci	-	1.45E-05	-	-	1.45E-05
Total Activity	Ci	-	1.45E-05	-	-	1.45E-05
C. Particulates						
I-131	Ci	-	-	-	-	-
Co-58	Ci	-	2.16E-06	-	-	2.16E-06
Co-60	Ci	1.41E-07	-	-	-	1.41E-07
Cr-51	Ci	-	1.23E-06	-	-	1.23E-06
Ba-140	Ci	-	-	-	2.72E-07	2.72E-07
Mn-54	Ci	-	1.16E-08	-	-	1.16E-08
Nb-95	Ci	-	5.98E-08	-	-	5.98E-08
Co-57	Ci	-	7.62E-08	-	-	7.62E-08
Zr-95	Ci	-	1.58E-08	-	-	1.58E-08
Br-82	Ci	1.25E-05	4.01E-06	-	-	1.65E-05
Total Activity	Ci	1.26E-05	7.56E-06	-	2.72E-07	2.05E-05
D. Gross Alpha						
Gross Alpha	Ci	-	-	-	-	-
E. Tritium						
H-3	Ci	1.17E+00	4.40E-01	3.69E-01	6.59E-01	2.64E+00

"-" = Not Detected

Table 2.3-A7
Millstone Unit No. 3
Airborne Effluents - Ground Batch - Containment Equipment Hatch

Nuclides Released	Units	2004 1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total
A. Fission & Activation Gases						
Ar-41	Ci	-	-	-	-	-
Kr-85	Ci	-	-	-	-	-
Kr-85m	Ci	-	-	-	-	-
Kr-87	Ci	-	-	-	-	-
Kr-88	Ci	-	-	-	-	-
Xe-131m	Ci	-	-	-	-	-
Xe-133	Ci	-	-	-	-	-
Xe-133m	Ci	-	-	-	-	-
Xe-135	Ci	-	-	-	-	-
Xe-135m	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-
B. Iodines						
I-131	Ci	-	-	-	-	-
I-133	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-
C. Particulates						
I-131	Ci	-	-	-	-	-
Cr-51	Ci	-	3.79E-07	-	-	3.79E-07
Co-58	Ci	-	5.52E-07	-	-	5.52E-07
Co-60	Ci	-	2.91E-08	-	-	2.91E-08
Mn-54	Ci	-	3.21E-08	-	-	3.21E-08
Zr-95	Ci	-	3.18E-08	-	-	3.18E-08
Total Activity	Ci	-	1.02E-06	-	-	1.02E-06
D. Gross Alpha						
Gross Alpha	Ci	-	-	-	-	-
E. Tritium						
H-3	Ci	-	-	-	-	-

"-" = Not Detected

Table 2.3-A8

Millstone Unit No. 3

Airborne Effluents - Ground Batch - RWST Vent

<< No Radioactivity Released >>

Nuclides Released	Units	2004				
		1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total
A. Fission & Activation Gases						
Ar-41	Ci	-	-	-	-	-
Kr-85	Ci	-	-	-	-	-
Kr-85m	Ci	-	-	-	-	-
Xe-131m	Ci	-	-	-	-	-
Xe-133	Ci	-	-	-	-	-
Xe-133m	Ci	-	-	-	-	-
Xe-135	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-
B. Iodines						
I-131	Ci	-	-	-	-	-
I-132	Ci	-	-	-	-	-
I-133	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-
C. Particulates						
I-131	Ci	-	-	-	-	-
Co-58	Ci	-	-	-	-	-
Co-60	Ci	-	-	-	-	-
Cs-134	Ci	-	-	-	-	-
Cs-136	Ci	-	-	-	-	-
Cs-137	Ci	-	-	-	-	-
Sb-124	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-
D. Gross Alpha						
Gross Alpha	Ci	-	-	-	-	-
E. Tritium						
H-3	Ci	-	-	-	-	-

"-" = Not Detected

Table 2.3-L1

Millstone Unit No. 3
Liquid Effluents - Release Summary
(Release Point - Quarry)

	Units	2004 1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total
A. Fission and Activation Products						
1. Total Activity Released	Ci	2.85E-02	7.32E-02	1.79E-02	9.24E-03	1.29E-01
2. Average Period Diluted Activity	uCi/ml	6.45E-11	2.15E-10	3.79E-11	2.00E-11	7.51E-11
B. Tritium						
1. Total Activity Released	Ci	9.43E+02	2.43E+02	6.17E+01	3.48E+01	1.28E+03
2. Average Period Diluted Activity	uCi/ml	2.13E-06	7.15E-07	1.31E-07	7.53E-08	7.48E-07
C. Dissolved and Entrained Gases						
1. Total Activity Released	Ci	5.53E-04	-	-	-	5.53E-04
2. Average Period Diluted Activity	uCi/ml	1.25E-12	-	-	-	3.22E-13
D. Gross Alpha						
1. Total Activity Released	Ci	-	-	-	-	-
E. Volume						
1. Released Waste Volume	Liters	1.32E+07	3.69E+06	9.42E+06	1.06E+07	3.69E+07
2. Dilution Volume During Releases	Liters	1.25E+10	7.62E+09	8.89E+09	5.97E+09	3.50E+10
3. Dilution Volume During Period	Liters	4.42E+11	3.40E+11	4.71E+11	4.62E+11	1.72E+12

"-" = Not Detected

Table 2.3-L2

Millstone Unit No. 3

Liquid Effluents - Continuous - SGBD & SW & TK2

(Release Point - Quarry)

Nuclides Released	Units	2004 1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total
A. Fission & Activation Products						
	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-
B. Tritium						
H-3	Ci	9.16E-02	1.52E-02	8.09E-02	1.30E-01	3.18E-01
C. Dissolved & Entrained Gases						
	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-
D. Gross Alpha						
Gross Alpha	Ci	-	-	-	-	-

"-" = Not Detected

Table 2.3-L3

Millstone Unit No. 3
Liquid Effluents - Batch - LWS
(Quarry Release Point)

Nuclides Released	Units	2004 1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total
A. Fission & Activation Products						
Be-7	Ci	-	-	-	1.15E-04	1.15E-04
Ag-110m	Ci	6.26E-05	5.71E-04	-	6.84E-06	6.40E-04
Co-57	Ci		1.55E-05	-	-	1.55E-05
Co-58	Ci	7.60E-04	7.86E-03	2.74E-03	7.30E-04	1.21E-02
Co-60	Ci	9.17E-03	1.87E-02	1.16E-03	8.39E-04	2.99E-02
Cr-51	Ci	1.64E-04	1.04E-02	3.84E-04	-	1.09E-02
Cs-134	Ci	-	-	-	-	-
Cs-137	Ci	1.76E-05	5.30E-06	-	-	2.29E-05
Fe-55	Ci	7.70E-03	2.57E-02	1.14E-02	6.73E-03	5.15E-02
Fe-59	Ci	-	9.32E-04	1.03E-04	-	1.04E-03
I-131	Ci	-	-	-	-	-
I-133	Ci	-	-	-	-	-
Mn-54	Ci	1.45E-03	2.63E-03	3.47E-04	1.35E-04	4.56E-03
Na-24	Ci	-	-	-	-	-
Nb-95	Ci	1.16E-05	1.11E-03	3.84E-04	2.48E-05	1.53E-03
Nb-97	Ci	1.43E-04	1.05E-04	-	-	2.48E-04
Ru-105	Ci	2.97E-05	9.36E-05	-	-	1.23E-04
Sb-124	Ci	-	3.29E-05	-	-	3.29E-05
Sb-125	Ci	8.99E-03	4.38E-03	1.15E-03	6.62E-04	1.52E-02
Sr-89	Ci	-	-	-	-	-
Sr-90	Ci	-	-	-	-	-
Sn-117m	Ci	-	3.57E-05	-	-	3.57E-05
Zr-95	Ci	-	3.34E-04	1.04E-04	-	4.38E-04
Ba-140	Ci	-	-		-	-
Ba-142	Ci	-	-	9.36E-05	-	9.36E-05
Y-91m	Ci	-	-	-	-	-
Total Activity	Ci	2.85E-02	7.29E-02	1.79E-02	9.24E-03	1.28E-01
B. Tritium						
H-3	Ci	9.43E+02	2.43E+02	6.16E+01	3.46E+01	1.28E+03
C. Dissolved & Entrained Gases						
Xe-133	Ci	4.86E-04	-	-	-	4.86E-04
Xe-135m	Ci	-	-	-	-	-
Xe-135	Ci	6.69E-05	-	-	-	6.69E-05
Total Activity	Ci	5.53E-04	-	-	-	5.53E-04
D. Gross Alpha						
Gross Alpha	Ci	-	-	-	-	-

"-" = Not Detected

Table 2.3-L4

Millstone Unit No. 3

Liquid Effluents - Batch - CPF Waste Neutralization Sumps, Hotwell, S/G Bulk

(Quarry Release Point)

Nuclides Released	Units	2004				
		1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total
A. Fission & Activation Products						
Co-58	Ci	-	2.96E-04	-	-	2.96E-04
Nb-95m	Ci	-	9.97E-05	-	-	9.97E-05
Sn-117m	Ci	-	1.22E-05	-	-	1.22E-05
Total Activity	Ci	-	2.96E-04	-	-	4.08E-04
B. Tritium						
H-3	Ci	1.67E-02	5.15E-03	3.57E-02	5.14E-02	1.09E-01
C. Dissolved & Entrained Gases						
Xe-131m	Ci	-	-	-	-	-
Xe-135	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-
D. Gross Alpha						
Gross Alpha	Ci	-	-	-	-	-

"-" = Not Detected

Table 2.3-L5
Millstone Unit No. 3
Liquid Effluents - Release Summary
(Release Point - Yard Drain - DSN 006)

	Units	2004 1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total
A. Fission and Activation Products						
1. Total Activity Released	Ci	-	-	-	-	-
2. Average Period Diluted Activity	uCi/ml	-	-	-	-	-
B. Tritium						
1. Total Activity Released	Ci	3.77E-02	7.52E-03	1.46E-02	5.94E-02	1.19E-01
2. Average Period Diluted Activity	uCi/ml	1.43E-06	3.03E-07	5.38E-07	2.21E-06	1.13E-06
C. Dissolved and Entrained Gases						
1. Total Activity Released	Ci	-	-	-	-	-
2. Average Period Diluted Activity	uCi/ml	-	-	-	-	-
D. Gross Alpha						
1. Total Activity Released	Ci	-	-	-	-	-
E. Volume						
1. Released Waste Volume	Liters	1.78E+06	3.97E+05	2.16E+06	1.75E+06	6.08E+06
2. Dilution Volume During Releases	Liters	Dilution Volumes cannot be accurately determined for yard drain releases				
3. Dilution Volume During Period	Liters	2.45E+07	2.48E+07	2.51E+07	2.51E+07	9.95E+07

"-" = Not Detected

Table 2.3-L6

Millstone Unit No. 3
Liquid Effluents - Continuous - Turbine Building Sump
(Release Point - Yard Drain - DSN 006)

Nuclides Released	Units	2004				
		1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total

A. Fission & Activation Products

	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-

B. Tritium

H-3	Ci	3.72E-02	4.59E-03	1.16E-02	5.93E-02	1.13E-01
Average Period Diluted Activity	uCi/ml	1.52E-06	1.85E-07	4.27E-07	2.21E-06	1.07E-06

C. Dissolved & Entrained Gases

	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-

D. Gross Alpha

Gross Alpha	Ci	-	-	-	-	-

E. Volume

Released Waste Volume	Liters	1.77E+06	3.41E+05	2.10E+06	1.74E+06	5.95E+06
Dilution Volume During Period	Liters	2.45E+07	2.48E+07	2.51E+07	2.51E+07	9.95E+07

"-" = Not Detected

Table 2.3-L7

Millstone Unit No. 3

Liquid Effluents - Continuous - WTT Berm Water

(Release Point - Yard Drain - DSN 006)

Nuclides Released	Units	2004 1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total
A. Fission & Activation Products						
	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-
B. Tritium						
H-3	Ci	4.60E-04	2.93E-03	3.04E-03	9.19E-05	6.52E-03
Average Period Diluted Activity	uCi/ml	1.88E-08	1.18E-07	1.21E-07	3.67E-09	6.55E-08
C. Dissolved & Entrained Gases						
	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	-
D. Gross Alpha						
Gross Alpha	Ci	-	-	-	-	-
E. Volume						
Released Waste Volume	Liters	1.04E+04	5.63E+04	5.70E+04	7.17E+03	1.31E+05
Dilution Volume During Period	Liters	2.45E+07	2.48E+07	2.51E+07	2.51E+07	9.95E+07

"-" = Not Detected

2.2 Liquid Effluents

2.2.1 Measurement of Radioactivity

2.2.1.1 Liquid Tanks/Sumps

There are numerous tanks & sumps that are used to discharge liquids containing radioactivity to the environs; they are:

Unit 1	Reactor Cavity Water
Unit 2	Clean Waste Monitor Tanks (2) Aerated Waste Monitor Tank CPF Waste Neutralization Sump & Turbine Building Sump Steam Generator Bulk
Unit 3	High Level Waste Test Tanks (2) Low Level Waste Drain Tanks (2) Boron Test Tanks CPF Waste Neutralization Sump & Turbine Building Sump Steam Generator Bulk

Prior to release, a tank is re-circulated for two equivalent tank volumes, a sample is drawn and then analyzed on the HPGe gamma spectrometer and liquid scintillation detector for individual radionuclide composition. Isotopic concentrations are multiplied by the volume released to obtain the total activity released. A proportional aliquot of each discharge is retained for composite analysis for Sr-89, Sr-90, Fe-55 and gross alpha.

2.2.1.2 Unit 2 and Unit 3 Steam Generator Blowdown

Steam generator blowdown water grab samples are taken and analyzed on the HPGe gamma spectrometer and liquid scintillation detector if required by the conditional action requirements of the REMODCM. Total volume of blowdown is multiplied by the isotopic concentrations (if any) to determine the total activity released via blowdown. A proportional aliquot of each discharge is retained for composite analysis for Sr-89, Sr-90, Fe-55 and gross alpha if required by the conditional action requirements of the REMODCM. Tritium is determined through liquid scintillation counting. Unit 2 is a continuous release while Unit 3 recycles blowdown except for periodic open cycle blowdown.

2.2.1.3 Unit 2 and Unit 3 Continuous Liquid Releases

Grab samples are taken for continuous liquid release pathways and analyzed on the HPGe gamma spectrometer and liquid scintillation detector. Total estimated volume is multiplied by the isotopic concentrations (if any) to determine the total activity released. A proportional aliquot of each discharge is retained for composite analysis for Sr-89, Sr-90, Fe-55 and gross alpha if required by the conditional action requirements of the REMODCM. Tritium is determined through liquid scintillation counting. Pathways for continuous liquid effluent releases include, Steam Generator Blowdown, Service Water Effluent, and Turbine Building Sump discharge from Units 2 & 3.

2.2.2 Estimate of Errors

Estimates of errors associated with radioactivity measurements were made using the following guidelines:

Sampling/Data Collection	10%	Variation in data collection
Calibration	10%	Calibration to NBS standards
Sample Counting	10%	Error for counting statistics
Flow & Level Measurements	10%	Error for release volumes

2.2.3 Batch Releases - Liquid Effluents

	Unit 1	Unit 2	Unit 3
Number of Batches	7	48	380
Total Time (min)	995	4,236	43,841
Maximum Time (min)	157	206	310
Average Time (min)	142	88	115
Minimum Time (min)	109	5	30
Average Stream Flow	Not Applicable - Ocean Site		

2.2.4 Abnormal Liquid Releases

An abnormal release of radioactivity is the discharge of a volume of liquid radioactive material to the environment that was unplanned or uncontrolled.

In 2004, the following abnormal liquid releases occurred:

2.2.4.1 Unit 1 - None

2.2.4.2 Unit 2 - None

2.2.4.3 Unit 3 - None

2.3 Solid Waste

2004 Solid waste shipment radioactivity summaries for each unit are given in the following tables:

Table 2.1-S	Unit 1 Solid Waste and Irradiated Component Shipments
Table 2.2-S	Unit 2 Solid Waste and Irradiated Component Shipments
Table 2.3-S	Unit 3 Solid Waste and Irradiated Component Shipments

The principal radionuclides in these tables were from shipping manifests.

Solidification Agent(s):
No solidification on site for 2004

Containers routinely used for radioactive waste shipment include:

55-gal Steel Drum DOT 17-H container	7.5 ft3
Steel Boxes	45 ft3
	87 ft3
	95 ft3
	122 ft3
Steel Container	202.1 ft3
Steel "Sea Van"	1280 ft3
Polyethylene High Integrity Containers	120.3 ft3
	132.4 ft3
	173.4 ft3
	202.1 ft3

Table 2.1-S
Solid Waste and Irradiated Component Shipments
Millstone Unit 1

January 1, 2004 through December 31, 2004

A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (Not irradiated fuel)

1. Type of Waste

a. Spent resins, Filter sludges, Evaporator bottoms, etc.

Disposition	Units	Annual Totals	Est. Total Error %
From Millstone Nuclear Power Station to Chem-Nuclear Services LLC, DCSF, Barnwell, SC for De-watering	m^3	6.4161E+00	
	Ci	2.8909E+01	25%
From Millstone Nuclear Power Station to Duratek Inc., Oak Ridge, TN for Super-Compaction	m^3	2.0400E-01	
	Ci	9.9517E-02	25%
From Millstone Nuclear Power Station to Studsvik Processing Center LLC, Erwin, TN for Incineration	m^3	9.8672E-02	
	Ci	3.4912E+00	25%

b. Dry compressible waste, Contaminated equipment, etc.

Disposition	Units	Annual Totals	Est. Total Error %
From Millstone Nuclear Power Station to Chem-Nuclear Services LLC, DCSF, Barnwell, SC for De-watering	m^3	3.9791E-01	
	Ci	2.7591E-01	25%
From Millstone Nuclear Power Station to Duratek Inc., Kingston, TN for Super-Compaction, Incineration, etc.	m^3	3.0528E+01	
	Ci	3.1940E-02	25%
From Millstone Nuclear Power Station to Duratek Inc., Oak Ridge, TN for Super-Compaction, Incineration, etc.	m^3	2.5424E+01	
	Ci	2.9896E+00	25%

c. Irradiated components, Control rods, etc.

Disposition	Units	Annual Totals	Est. Total Error %
From Millstone Nuclear Power Station to Chem-Nuclear Services LLC, Barnwell, SC for Burial	m^3	1.6260E+00	
	Ci	4.8665E+03	25%

d. Other - (Water)

Disposition	Units	Annual Totals	Est. Total Error %
From Millstone Nuclear Power Station to Duratek Inc., Oak Ridge, TN for Incineration	m^3	2.3355E+00	
	Ci	6.0720E-02	25%

d. Other - (Mixed Waste)

Disposition	Units	Annual Totals	Est. Total Error %
From Millstone Nuclear Power Station to Perma-Fix of Florida, Inc., Gainesville, FL for Stabilization, Fuel Blending, etc.	m^3	1.3333E-02	
	Ci	2.5268E-05	25%

2. Estimate of major nuclide composition (by type of waste)

a. Spent resins, Filter sludges, Evaporator bottoms, etc.

From Millstone Nuclear Power Station to Chem-Nuclear Services LLC, DCSF, Barnwell, SC for De-watering

Radionuclide	% of Total	Curies
H-3	<0.01	1.8011E-03
C-14		
Cr-51		
Mn-54	0.07	1.9801E-02
Fe-55	79.28	2.2918E+01
Fe-59		
Co-57	<0.01	3.2056E-05
Co-58		
Co-60	17.29	4.9985E+00
Ni-59		
Ni-63	2.42	6.9949E-01
Zn-65	0.01	3.9320E-03
Sr-89		
Sr-90	<0.01	7.9430E-04
Nb-94		
Zr-95		
Nb-95		
Tc-99		
Ru-103		
Ru-106		
Ag-108m		
Ag-110m		
Sn-113		
Sb-124		
Sb-125	0.04	1.0172E-02
I-129	<0.01	2.2800E-05
I-131		
Cs-134		
Cs-137	0.68	1.9727E-01
Ba-140		
Ce-141		
Ce-144	0.05	1.4135E-02
U-234		
U-235		
U-238		
Pu-238	<0.01	1.3197E-03
Pu-239	<0.01	6.5587E-04
Pu-241	0.12	3.4743E-02
Am-241	0.02	5.2448E-03
Cm-242	<0.01	1.0718E-06
Cm-244	<0.01	2.2495E-03
CURIES (TOTAL)		2.8909E+01

2. Estimate of major nuclide composition (by type of waste)

a. Spent resins, Filter sludges, Evaporator bottoms, etc.

From Millstone Nuclear Power Station to Duratek Inc., Oak Ridge, TN for Super-Compaction

Radionuclide	% of Total	Curies
H-3	1.60	1.5920E-03
C-14	<0.01	8.2500E-06
Cr-51		
Mn-54	0.09	8.5200E-05
Fe-55	68.73	6.8400E-02
Fe-59		
Co-57		
Co-58		
Co-60	19.31	1.9220E-02
Ni-59		
Ni-63	5.04	5.0200E-03
Zn-65		
Sr-89		
Sr-90	0.02	1.4970E-05
Nb-94		
Zr-95		
Nb-95		
Tc-99		
Ru-103		
Ru-106		
Ag-108m		
Ag-110m	<0.01	1.3630E-06
Sn-113		
Sb-124		
Sb-125		
I-129		
I-131		
Cs-134		
Cs-137	4.54	4.5200E-03
Ba-140		
Ce-141		
Ce-144	<0.01	1.7590E-06
U-234		
U-235		
U-238		
Pu-238	0.02	2.1500E-05
Pu-239	0.01	1.0880E-05
Pu-241	0.40	4.0300E-04
Am-241	0.14	1.3910E-04
Cm-242	<0.01	8.1500E-10
Cm-244	0.08	7.8600E-05
CURIES (TOTAL)		9.9517E-02

2. Estimate of major nuclide composition (by type of waste)

a. Spent resins, Filter sludges, Evaporator bottoms, etc.

From Millstone Nuclear Power Station to Studsvik Processing Center LLC, Erwin, TN for Incineration

Radionuclide	% of Total	Curies
H-3	0.05	1.6977E-03
C-14	0.71	2.4899E-02
Cr-51	<0.01	5.4738E-17
Mn-54	0.60	2.1092E-02
Fe-55	45.98	1.6051E+00
Fe-59	<0.01	1.9549E-12
Co-57	0.05	1.8623E-03
Co-58	0.05	1.6360E-03
Co-60	18.60	6.4924E-01
Ni-59		
Ni-63	25.29	8.8280E-01
Zn-65		
Sr-89	<0.01	8.8074E-07
Sr-90	0.02	6.3175E-04
Nb-94		
Zr-95	<0.01	9.4145E-05
Nb-95	<0.01	2.9529E-07
Tc-99	<0.01	1.9446E-07
Ru-103	<0.01	1.1627E-16
Ru-106		
Ag-108m		
Ag-110m	<0.01	2.9941E-05
Sn-113	0.01	4.8873E-04
Sb-124	<0.01	3.6835E-11
Sb-125	0.24	8.3238E-03
I-129	<0.01	5.6384E-05
I-131		
Cs-134	3.21	1.1215E-01
Cs-137	4.86	1.6977E-01
Ba-140		
Ce-141		
Ce-144	0.10	3.6629E-03
U-234		
U-235		
U-238		
Pu-238	<0.01	1.6771E-04
Pu-239	<0.01	9.0852E-05
Pu-241	0.20	6.8834E-03
Am-241	<0.01	2.1504E-04
Cm-242	<0.01	3.6217E-05
Cm-244	<0.01	2.6237E-04
CURIES (TOTAL)		3.4912E+00

2. Estimate of major nuclide composition (by type of waste)

b. Dry compressible waste, Contaminated equipment, etc.

From Millstone Nuclear Power Station to Chem-Nuclear Services LLC, DCSF, Barnwell, SC for De-watering

Radionuclide	% of Total	Curies
H-3	<0.01	2.9239E-06
C-14		
Cr-51		
Mn-54	0.06	1.7902E-04
Fe-55	80.32	2.2160E-01
Fe-59		
Co-57	<0.01	8.4382E-07
Co-58		
Co-60	15.06	4.1550E-02
Ni-59		
Ni-63	2.36	6.5146E-03
Zn-65	<0.01	7.9509E-06
Sr-89		
Sr-90	<0.01	1.6697E-05
Nb-94		
Zr-95		
Nb-95		
Tc-99		
Ru-103		
Ru-106		
Ag-108m		
Ag-110m		
Sn-113		
Sb-124		
Sb-125	0.01	2.7700E-05
I-129	<0.01	6.0017E-07
I-131		
Cs-134		
Cs-137	1.86	5.1296E-03
Ba-140		
Ce-141		
Ce-144	0.13	3.7190E-04
U-234		
U-235		
U-238		
Pu-238	<0.01	1.4337E-05
Pu-239	<0.01	7.1302E-06
Pu-241	0.13	3.5651E-04
Am-241	0.03	8.5152E-05
Cm-242	<0.01	2.8213E-08
Cm-244	0.02	4.1550E-05
CURIES (TOTAL)		2.7591E-01

2. Estimate of major nuclide composition (by type of waste)

b. Dry compressible waste, Contaminated equipment, etc.

From Millstone Nuclear Power Station to Duratek Inc., Kingston, TN for Super-Compaction, Incineration, etc.

Radionuclide	% of Total	Curies
H-3		
C-14		
Cr-51		
Mn-54		
Fe-55	54.51	1.7410E-02
Fe-59		
Co-57		
Co-58		
Co-60	23.47	7.4950E-03
Ni-59		
Ni-63	7.88	2.5180E-03
Zn-65		
Sr-89		
Sr-90		
Nb-94		
Zr-95		
Nb-95		
Tc-99		
Ru-103		
Ru-106		
Ag-108m		
Ag-110m		
Sn-113		
Sb-124		
Sb-125		
I-129		
I-131		
Cs-134		
Cs-137	12.85	4.1030E-03
Ba-140		
Ce-141		
Ce-144	0.15	4.6570E-05
U-234		
U-235		
U-238		
Pu-238	0.04	1.1969E-05
Pu-239	0.02	6.2930E-06
Pu-241	0.99	3.1660E-04
Am-241	0.07	2.1529E-05
Cm-242		
Cm-244	0.03	1.1172E-05
CURIES (TOTAL)		3.1940E-02

2. Estimate of major nuclide composition (by type of waste)

b. Dry compressible waste, Contaminated equipment, etc.

From Millstone Nuclear Power Station to Duratek Inc., Oak Ridge, TN for Super-Compaction, Incineration, etc.

Radionuclide	% of Total	Curies
H-3		
C-14	0.01	4.0689E-04
Cr-51		
Mn-54		
Fe-55	2.39	7.1520E-02
Fe-59		
Co-57		
Co-58		
Co-60	1.05	3.1256E-02
Ni-59		
Ni-63	0.35	1.0539E-02
Zn-65		
Sr-89		
Sr-90	3.03	9.0700E-02
Nb-94		
Zr-95		
Nb-95		
Tc-99		
Ru-103		
Ru-106		
Ag-108m		
Ag-110m		
Sn-113		
Sb-124		
Sb-125		
I-129		
I-131		
Cs-134		
Cs-137	93.10	2.7835E+00
Ba-140		
Ce-141		
Ce-144	<0.01	1.8165E-04
U-234		
U-235		
U-238		
Pu-238	<0.01	5.0133E-05
Pu-239	<0.01	2.6329E-05
Pu-241	0.04	1.3203E-03
Am-241	<0.01	9.0051E-05
Cm-242		
Cm-244	<0.01	4.6620E-05
CURIES (TOTAL)		2.9896E+00

2. Estimate of major nuclide composition (by type of waste)

c. Irradiated components, Control rods, etc.

From Millstone Nuclear Power Station to Chem-Nuclear Services LLC, Barnwell, SC for Burial

Radionuclide	% of Total	Curies
H-3	<0.01	1.4400E-04
C-14	0.01	5.2400E-01
Cr-51	<0.01	7.7300E-07
Mn-54	0.04	1.7600E+00
Fe-55	36.17	1.7600E+03
Fe-59	<0.01	2.3700E-06
Co-57	<0.01	2.0300E-04
Co-58	<0.01	4.1300E-05
Co-60	55.07	2.6800E+03
Ni-59	0.07	3.2000E+00
Ni-63	8.65	4.2100E+02
Zn-65	<0.01	9.0300E-03
Sr-89	<0.01	2.8400E-08
Sr-90	<0.01	3.9600E-04
Nb-94	<0.01	1.2800E-02
Zr-95	<0.01	7.0700E-06
Nb-95	<0.01	1.1300E-06
Tc-99	<0.01	5.7800E-05
Ru-103	<0.01	9.5800E-07
Ru-106	<0.01	2.5200E-03
Ag-108m	<0.01	7.1400E-04
Ag-110m	<0.01	4.8700E-04
Sn-113		
Sb-124	<0.01	1.4000E-05
Sb-125	<0.01	6.7600E-04
I-129	<0.01	4.4700E-06
I-131		
Cs-134	<0.01	4.4500E-04
Cs-137	<0.01	2.9100E-02
Ba-140	<0.01	2.0800E-12
Ce-141	<0.01	1.0100E-06
Ce-144	<0.01	5.9700E-04
U-234		
U-235	<0.01	8.6000E-06
U-238	<0.01	1.3300E-06
Pu-238	<0.01	7.2600E-05
Pu-239	<0.01	3.4800E-05
Pu-241	<0.01	1.8100E-03
Am-241	<0.01	3.8400E-04
Cm-242	<0.01	3.3200E-07
Cm-244	<0.01	2.2100E-04
CURIES (TOTAL)		4.8665E+03

2. Estimate of major nuclide composition (by type of waste)

d. Other - (Water)

From Millstone Nuclear Power Station to Duratek Inc., Oak Ridge, TN for Incineration

Radionuclide	% of Total	Curies
H-3	99.47	6.0396E-02
C-14	<0.01	1.3923E-07
Cr-51		
Mn-54	<0.01	3.3714E-06
Fe-55	0.07	4.4263E-05
Fe-59		
Co-57	<0.01	9.3233E-07
Co-58	0.02	1.4355E-05
Co-60	0.05	2.7923E-05
Ni-59		
Ni-63	0.05	3.2216E-05
Zn-65		
Sr-89		
Sr-90		
Nb-94		
Zr-95	<0.01	5.1209E-08
Nb-95	<0.01	1.4524E-07
Tc-99		
Ru-103		
Ru-106		
Ag-108m		
Ag-110m		
Sn-113	<0.01	6.0340E-08
Sb-124		
Sb-125	<0.01	4.3944E-07
I-129		
I-131		
Cs-134	0.12	7.1965E-05
Cs-137	0.16	9.9364E-05
Ba-140		
Ce-141		
Ce-144	<0.01	1.0705E-08
U-234	<0.01	8.0405E-07
U-235		
U-238		
Pu-238	<0.01	4.7745E-08
Pu-239	<0.01	8.4546E-08
Pu-241	<0.01	3.3856E-07
Am-241	0.05	2.8014E-05
Cm-242		
Cm-244	<0.01	6.9327E-09
CURIES (TOTAL)		6.0720E-02

2. Estimate of major nuclide composition (by type of waste)

d. Other - (Mixed Waste)

From Millstone Nuclear Power Station to Perma-Fix of Florida, Inc., Gainesville, FL for Stabilization, Fuel Blending, etc.

Radionuclide	% of Total	Curies
H-3	0.22	5.5000E-08
C-14	0.05	1.2600E-08
Cr-51		
Mn-54		
Fe-55	54.09	1.3667E-05
Fe-59		
Co-57		
Co-58		
Co-60	26.78	6.7667E-06
Ni-59		
Ni-63	18.86	4.7667E-06
Zn-65		
Sr-89		
Sr-90		
Nb-94		
Zr-95		
Nb-95		
Tc-99		
Ru-103		
Ru-106		
Ag-108m		
Ag-110m		
Sn-113		
Sb-124		
Sb-125		
I-129		
I-131		
Cs-134		
Cs-137	<0.01	3.3333E-13
Ba-140		
Ce-141		
Ce-144		
U-234		
U-235		
U-238		
Pu-238		
Pu-239		
Pu-241		
Am-241		
Cm-242		
Cm-244		
CURIES (TOTAL)		2.5268E-05

3. Solid Waste Disposition (Shipments from Millstone)

Number of Shipments*	Mode of Transportation	Destination
3	Truck (Sole Use Vehicle)	Chem-Nuclear Services LLC, Barnwell, SC
2	Truck (Sole Use Vehicle)	Duratek Inc. - Kingston, TN
9	Truck (Sole Use Vehicle)	Duratek Inc. - Oak Ridge, TN
1	Truck (Sole Use Vehicle)	Perma-Fix of Florida Inc. - Gainesville FL
1	Truck (Sole Use Vehicle)	Studsvik Processing Center LLC, Erwin, TN

* Indicates the number of shipments in this category which contained *any* unit-1 waste. (Example: A shipment containing wastes from units 1, 2 *and* 3 will be counted once on *each* of the three unit-specific sections of this report.) 24 physical shipments were made from this station in 2004.

B. IRRADIATED FUEL SHIPMENTS (Disposition)

Number of Shipments	Mode of Transportation	Destination
No Shipments in 2004	N/A	N/A

Table 2.2-S
Solid Waste and Irradiated Component Shipments
Millstone Unit 2

January 1, 2004 through December 31, 2004

A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (Not irradiated fuel)

1. Type of Waste

a. Spent resins, Filter sludges, Evaporator bottoms, etc.

Disposition	Units	Annual Totals	Est. Total Error%
From Millstone Nuclear Power Station to Duratek Inc.,	m^3	2.5490E+00	
Kingston, TN for Super-Compaction, Incineration, etc.	Ci	1.0682E-03	25%
From Millstone Nuclear Power Station to Duratek Inc.,	m^3	2.0800E-01	
Oak Ridge, TN for Super-Compaction, Incineration, etc.	Ci	4.2787E-02	25%
From Millstone Nuclear Power Station to Studsvik	m^3	2.3358E+00	
Processing Center LLC, Erwin, TN for Thermal Destruction, Incineration, etc.	Ci	8.6391E+01	25%

b. Dry compressible waste, Contaminated equipment, etc.

Disposition	Units	Annual Totals	Est. Total Error%
From Millstone Nuclear Power Station to Duratek Inc.,	m^3	1.2745E+01	
Kingston, TN for Super-Compaction, Incineration, etc.	Ci	5.0602E-03	25%
From Millstone Nuclear Power Station to Duratek Inc.,	m^3	1.0995E+02	
Oak Ridge, TN for Super-Compaction, Incineration, etc.	Ci	1.2313E+00	25%

c. Irradiated components, Control rods, etc.

Disposition	Units	Annual Totals	Est. Total Error%
From Millstone Nuclear Power Station to Duratek Inc.,	m^3	4.3600E-01	
Oak Ridge, TN for Super-Compaction, Metal Melt, etc.	Ci	2.6262E+00	25%

d. Other - (Grease, Oil, Oily waste)

Disposition	Units	Annual Totals	Est. Total Error%
From Millstone Nuclear Power Station to Duratek Inc.,	m^3	6.2450E-01	
Kingston, TN for Super-Compaction, Incineration, etc.	Ci	1.1243E-03	25%
From Millstone Nuclear Power Station to Duratek Inc.,	m^3	1.2490E+00	
Oak Ridge, TN for Super-Compaction, Incineration, etc.	Ci	3.6511E-03	25%

d. Other - (Water)

Disposition	Units	Annual Totals	Est. Total Error%
From Millstone Nuclear Power Station to Duratek Inc.,	m^3	4.9149E+01	
Oak Ridge, TN for Incineration	Ci	1.4820E+00	25%

d. Other - (Mixed Waste)

Disposition	Units	Annual Totals	Est. Total Error%
From Millstone Nuclear Power Station to Perma-Fix of Florida, Inc.,	m^3	1.3333E-02	
Gainesville, FL for Stabilization, Fuel Blending, etc.	Ci	2.5268E-05	25%

2. Estimate of major nuclide composition (by type of waste)

a. Spent resins, Filter sludges, Evaporator bottoms, etc.

From Millstone Nuclear Power Station to Duratek Inc., Kingston, TN for Super-Compaction, Incineration, etc.

Radionuclide	% of Total	Curies
H-3	0.61	6.4700E-06
C-14	0.11	1.1800E-06
Cr-51		
Mn-54		
Fe-55	29.02	3.1000E-04
Fe-59		
Co-57		
Co-58	3.38	3.6100E-05
Co-60	19.47	2.0800E-04
Ni-59		
Ni-63	24.43	2.6100E-04
Zn-65		
Sr-89		
Sr-90		
Nb-94		
Zr-95		
Nb-95		
Tc-99		
Ru-103		
Ru-106		
Ag-108m		
Ag-110m		
Sn-113		
Sb-124		
Sb-125		
I-129		
I-131		
Cs-134	10.30	1.1000E-04
Cs-137	11.98	1.2800E-04
Ba-140		
Ce-141		
Ce-144	0.39	4.1400E-06
U-234		
U-235		
U-238		
Pu-238	<0.01	4.8500E-08
Pu-239	<0.01	3.8300E-08
Pu-241	0.29	3.0500E-06
Am-241	<0.01	7.1200E-08
Cm-242		
Cm-244	<0.01	6.2600E-08
CURIES (TOTAL)		1.0682E-03

2. Estimate of major nuclide composition (by type of waste)

a. Spent resins, Filter sludges, Evaporator bottoms, etc.

From Millstone Nuclear Power Station to Duratek Inc., Oak Ridge, TN for Super-Compaction, Incineration, etc.

Radionuclide	% of Total	Curies
H-3	1.09	4.6500E-04
C-14	1.28	5.4600E-04
Cr-51		
Mn-54	0.73	3.1100E-04
Fe-55	49.31	2.1100E-02
Fe-59		
Co-57		
Co-58		
Co-60	25.24	1.0800E-02
Ni-59		
Ni-63	19.12	8.1800E-03
Zn-65		
Sr-89		
Sr-90		
Nb-94		
Zr-95		
Nb-95		
Tc-99		
Ru-103		
Ru-106		
Ag-108m		
Ag-110m	0.74	3.1500E-04
Sn-113		
Sb-124		
Sb-125		
I-129	<0.01	1.2100E-06
I-131		
Cs-134	0.62	2.6700E-04
Cs-137	0.68	2.9000E-04
Ba-140		
Ce-141		
Ce-144	0.83	3.5600E-04
U-234		
U-235		
U-238		
Pu-238	<0.01	3.1900E-06
Pu-239	<0.01	1.2800E-06
Pu-241	0.33	1.4100E-04
Am-241	<0.01	2.3600E-06
Cm-242	<0.01	3.2000E-06
Cm-244	0.01	4.4900E-06
CURIES (TOTAL)		4.2787E-02

2. Estimate of major nuclide composition (by type of waste)

a. Spent resins, Filter sludges, Evaporator bottoms, etc.

From Millstone Nuclear Power Station to Studsvik Processing Center LLC, Erwin, TN for Thermal Destruction, Incineration, etc.

Radionuclide	% of Total	Curies
H-3	0.02	1.8524E-02
C-14	0.16	1.4100E-01
Cr-51	<0.01	3.0997E-16
Mn-54	0.57	4.9245E-01
Fe-55	14.33	1.2379E+01
Fe-59	<0.01	1.1071E-11
Co-57	0.01	1.0546E-02
Co-58	0.06	5.0964E-02
Co-60	9.27	8.0066E+00
Ni-59		
Ni-63	34.26	2.9599E+01
Zn-65		
Sr-89	<0.01	4.9876E-06
Sr-90	0.04	3.0878E-02
Nb-94		
Zr-95	<0.01	5.3313E-04
Nb-95	<0.01	1.6722E-06
Tc-99	<0.01	1.1012E-06
Ru-103	<0.01	6.5840E-16
Ru-106		
Ag-108m		
Ag-110m	<0.01	1.6955E-04
Sn-113	<0.01	2.7676E-03
Sb-124	<0.01	2.0859E-10
Sb-125	0.99	8.5114E-01
I-129	<0.01	3.1930E-04
I-131		
Cs-134	15.55	1.3435E+01
Cs-137	24.38	2.1061E+01
Ba-140		
Ce-141		
Ce-144	0.30	2.5874E-01
U-234		
U-235		
U-238		
Pu-238	<0.01	1.2207E-03
Pu-239	<0.01	6.1649E-04
Pu-241	0.05	4.6290E-02
Am-241	<0.01	1.3528E-03
Cm-242	<0.01	2.1790E-04
Cm-244	<0.01	1.6958E-03
CURIES (TOTAL)		8.6391E+01

2. Estimate of major nuclide composition (by type of waste)

b. Dry compressible waste, Contaminated equipment, etc.

From Millstone Nuclear Power Station to Duratek Inc., Kingston, TN for Super-Compaction, Incineration, etc.

Radionuclide	% of Total	Curies
H-3	0.60	3.0370E-05
C-14	0.11	5.5190E-06
Cr-51		
Mn-54		
Fe-55	29.03	1.4690E-03
Fe-59		
Co-57		
Co-58	3.83	1.9380E-04
Co-60	19.41	9.8200E-04
Ni-59		
Ni-63	24.21	1.2250E-03
Zn-65		
Sr-89		
Sr-90		
Nb-94		
Zr-95		
Nb-95		
Tc-99		
Ru-103		
Ru-106		
Ag-108m		
Ag-110m		
Sn-113		
Sb-124		
Sb-125		
I-129		
I-131		
Cs-134	10.28	5.2010E-04
Cs-137	11.84	5.9900E-04
Ba-140		
Ce-141		
Ce-144	0.40	2.0080E-05
U-234		
U-235		
U-238		
Pu-238	<0.01	2.2750E-07
Pu-239	<0.01	1.7960E-07
Pu-241	0.28	1.4310E-05
Am-241	<0.01	3.3370E-07
Cm-242		
Cm-244	<0.01	2.9360E-07
CURIES (TOTAL)		5.0602E-03

2. Estimate of major nuclide composition (by type of waste)

b. Dry compressible waste, Contaminated equipment, etc.

From Millstone Nuclear Power Station to Duratek Inc., Oak Ridge, TN for Super-Compaction, Incineration, etc.

Radionuclides	% of Total	Curies
H-3	0.61	7.4908E-03
C-14	0.11	1.3701E-03
Cr-51		
Mn-54	<0.01	2.5750E-05
Fe-55	28.88	3.5559E-01
Fe-59		
Co-57		
Co-58	3.30	4.0656E-02
Co-60	19.54	2.4062E-01
Ni-59		
Ni-63	24.68	3.0392E-01
Zn-65		
Sr-89		
Sr-90		
Nb-94		
Zr-95		
Nb-95		
Tc-99		
Ru-103		
Ru-106		
Ag-108m		
Ag-110m		
Sn-113		
Sb-124		
Sb-125		
I-129		
I-131		
Cs-134	10.15	1.2495E-01
Cs-137	12.04	1.4830E-01
Ba-140		
Ce-141		
Ce-144	0.38	4.6338E-03
U-234		
U-235		
U-238		
Pu-238	<0.01	5.6740E-05
Pu-239	<0.01	4.4704E-05
Pu-241	0.29	3.5370E-03
Am-241	<0.01	8.3320E-05
Cm-242		
Cm-244	<0.01	7.2885E-05
CURIES (TOTAL)		1.2313E+00

2. Estimate of major nuclide composition (by type of waste)

c. Irradiated components, Control rods, etc.

From Millstone Nuclear Power Station to Duratek Inc., Oak Ridge, TN for Super-Compaction, Metal Melt, etc.

Radionuclides	% of Total	Curies
H-3	<0.01	9.9080E-05
C-14	<0.01	9.1840E-05
Cr-51	1.70	4.4660E-02
Mn-54	0.60	1.5693E-02
Fe-55	17.21	4.5203E-01
Fe-59	0.05	1.2199E-03
Co-57		
Co-58	15.58	4.0914E-01
Co-60	4.15	1.0889E-01
Ni-59	0.49	1.2903E-02
Ni-63	59.95	1.5744E+00
Zn-65		
Sr-89		
Sr-90		
Nb-94	<0.01	1.5600E-06
Zr-95		
Nb-95		
Tc-99		
Ru-103		
Ru-106		
Ag-108m		
Ag-110m		
Sn-113		
Sb-124		
Sb-125		
I-129		
I-131		
Cs-134		
Cs-137	0.25	6.6390E-03
Ba-140		
Ce-141		
Ce-144	<0.01	2.2159E-04
U-234		
U-235		
U-238		
Pu-238	<0.01	2.5112E-06
Pu-239	<0.01	1.9849E-06
Pu-241	<0.01	1.5842E-04
Am-241	<0.01	3.6875E-06
Cm-242		
Cm-244	<0.01	3.2639E-06
CURIES (TOTAL)		2.6262E+00

2. Estimate of major nuclide composition (by type of waste)

d. Other - (Grease, Oil, Oily waste)

From Millstone Nuclear Power Station to Duratek Inc., Kingston, TN for Super-Compaction, Incineration, etc.

Radionuclide	% of Total	Curies
H-3	0.20	2.2500E-06
C-14	0.04	4.8600E-07
Cr-51		
Mn-54	1.39	1.5650E-05
Fe-55	46.25	5.2000E-04
Fe-59		
Co-57		
Co-58	1.45	1.6300E-05
Co-60	23.04	2.5900E-04
Ni-59		
Ni-63	16.37	1.8400E-04
Zn-65		
Sr-89		
Sr-90		
Nb-94		
Zr-95		
Nb-95		
Tc-99		
Ru-103		
Ru-106		
Ag-108m		
Ag-110m		
Sn-113		
Sb-124		
Sb-125		
I-129		
I-131		
Cs-134	2.79	3.1350E-05
Cs-137	7.87	8.8500E-05
Ba-140		
Ce-141		
Ce-144	0.16	1.7850E-06
U-234		
U-235		
U-238		
Pu-238	0.01	1.5500E-07
Pu-239	<0.01	8.3500E-08
Pu-241	0.39	4.3550E-06
Am-241	0.02	2.7650E-07
Cm-242		
Cm-244	0.01	1.4750E-07
CURIES (TOTAL)		1.1243E-03

2. Estimate of major nuclide composition (by type of waste)

d. Other - (Grease, Oil, Oily waste)

From Millstone Nuclear Power Station to Duratek Inc., Oak Ridge, TN for Super-Compaction, Incineration, etc.

Radionuclide	% of Total	Curies
H-3	0.63	2.3100E-05
C-14	0.12	4.2700E-06
Cr-51		
Mn-54		
Fe-55	28.76	1.0500E-03
Fe-59		
Co-57		
Co-58	1.43	5.2100E-05
Co-60	20.05	7.3200E-04
Ni-59		
Ni-63	25.80	9.4200E-04
Zn-65		
Sr-89		
Sr-90		
Nb-94		
Zr-95		
Nb-95		
Tc-99		
Ru-103		
Ru-106		
Ag-108m		
Ag-110m		
Sn-113		
Sb-124		
Sb-125		
I-129		
I-131		
Cs-134	9.97	3.6400E-04
Cs-137	12.60	4.6000E-04
Ba-140		
Ce-141		
Ce-144	0.33	1.1900E-05
U-234		
U-235		
U-238		
Pu-238	<0.01	1.7500E-07
Pu-239	<0.01	1.3900E-07
Pu-241	0.30	1.0900E-05
Am-241	<0.01	2.5700E-07
Cm-242		
Cm-244	<0.01	2.2400E-07
CURIES (TOTAL)		3.6511E-03

2. Estimate of major nuclide composition (by type of waste)

d. Other - (Water)

From Millstone Nuclear Power Station to Duratek Inc., Oak Ridge, TN for Incineration

Radionuclide	% of Total	Curies
H-3	98.74	1.4633E+00
C-14	<0.01	1.8896E-05
Cr-51		
Mn-54	0.01	2.1829E-04
Fe-55	0.35	5.1345E-03
Fe-59		
Co-57	<0.01	7.4338E-05
Co-58	0.03	5.1396E-04
Co-60	0.23	3.4030E-03
Ni-59		
Ni-63	0.28	4.2055E-03
Zn-65		
Sr-89		
Sr-90		
Nb-94		
Zr-95	<0.01	1.9333E-07
Nb-95	<0.01	5.4867E-07
Tc-99		
Ru-103		
Ru-106		
Ag-108m		
Ag-110m	<0.01	1.9890E-05
Sn-113	<0.01	2.2792E-07
Sb-124		
Sb-125	0.01	1.9813E-04
I-129		
I-131	<0.01	1.3005E-04
Cs-134	0.13	1.9288E-03
Cs-137	0.18	2.6694E-03
Ba-140		
Ce-141		
Ce-144	<0.01	6.2653E-08
U-234	<0.01	5.6807E-06
U-235		
U-238		
Pu-238	<0.01	1.1445E-06
Pu-239	<0.01	1.1165E-06
Pu-241	<0.01	4.9236E-05
Am-241	<0.01	1.2887E-04
Cm-242		
Cm-244	<0.01	1.0157E-06
CURIES (TOTAL)		1.4820E+00

2. Estimate of major nuclide composition (by type of waste)

d. Other - (Mixed Waste)

From Millstone Nuclear Power Station to Perma-Fix of Florida, Inc., Gainesville, FL for Stabilization, Fuel Blending, etc.

Radionuclide	% of Total	Curies
H-3	0.22	5.5000E-08
C-14	0.05	1.2600E-08
Cr-51		
Mn-54		
Fe-55	54.09	1.3667E-05
Fe-59		
Co-57		
Co-58		
Co-60	26.78	6.7667E-06
Ni-59		
Ni-63	18.86	4.7667E-06
Zn-65		
Sr-89		
Sr-90		
Nb-94		
Zr-95		
Nb-95		
Tc-99		
Ru-103		
Ru-106		
Ag-108m		
Ag-110m		
Sn-113		
Sb-124		
Sb-125		
I-129		
I-131		
Cs-134		
Cs-137	<0.01	3.3333E-13
Ba-140		
Ce-141		
Ce-144		
U-234		
U-235		
U-238		
Pu-238		
Pu-239		
Pu-241		
Am-241		
Cm-242		
Cm-244		
CURIES (TOTAL)		2.5268E-05

3. Solid Waste Disposition (Shipments from Millstone)

Number of Shipments*	Mode of Transportation	Destination
2	Truck (Sole Use Vehicle)	Duratek Inc. - Kingston, TN
12	Truck (Sole Use Vehicle)	Duratek Inc. - Oak Ridge, TN
1	Truck (Sole Use Vehicle)	Perma-Fix of Florida Inc. - Gainesville FL
2	Truck (Sole Use Vehicle)	Studsvik Processing Center LLC - Erwin, TN

* Indicates the number of shipments in this category which contained *any* unit 2 waste. (Example: A shipment containing wastes from units 1, 2 *and* 3 will be counted once on *each* of the three unit-specific sections of this report.) 24 physical shipments were made from this station in 2004.

B. IRRADIATED FUEL SHIPMENTS (Disposition)

Number of Shipments	Mode of Transportation	Destination
No Shipments in 2004	N/A	N/A

Table 2.3-S
Solid Waste and Irradiated Component Shipments
Millstone Unit 3

January 1, 2004 through December 31, 2004

A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (Not irradiated fuel)

1. Type of Waste

a. Spent resins, Filter sludges, Evaporator bottoms, etc.

Disposition	Units	Annual Totals	Est. Total Error %
From Millstone Nuclear Power Station to Duratek Inc.,	m^3	4.9870E+00	
Kinston, TN for Super-Compaction, Incineration, etc.	Ci	3.9111E-01	25%
From Millstone Nuclear Power Station to Duratek Inc.,	m^3	4.2130E+00	
Oak Ridge, TN for Super-Compaction, Incineration, etc.	Ci	4.4648E+00	25%
From Millstone Nuclear Power Station to Studsvik	m^3	4.5386E+00	
Processing Center LLC, Erwin, TN for Thermal Destruction, Incineration, etc.	Ci	6.6401E+01	25%

b. Dry compressible waste, Contaminated equipment, etc.

Disposition	Units	Annual Totals	Est. Total Error %
From Millstone Nuclear Power Station to Duratek Inc.,	m^3	2.2941E+01	
Kingston, TN for Super-Compaction, Incineration, etc.	Ci	1.2168E-02	25%
From Millstone Nuclear Power Station to Duratek Inc.,	m^3	1.5293E+02	
Oak Ridge, TN for Super-Compaction, Incineration, etc.	Ci	2.8663E+00	25%

c. Irradiated components, Control rods, etc.

Disposition	Units	Annual Totals	Est. Total Error %
- No shipments during this report period -	m^3	n/a	
	Ci	n/a	n/a

d. Other - (Grease, Oil, Oily waste)

Disposition	Units	Annual Totals	Est. Total Error %
From Millstone Nuclear Power Station to Duratek Inc.,	m^3	6.2450E-01	
Kingston, TN for Super-Compaction, Incineration, etc.	Ci	1.1243E-03	25%

d. Other - (Water)

Disposition	Units	Annual Totals	Est. Total Error %
From Millstone Nuclear Power Station to Duratek Inc.,	m^3	4.6548E+01	
Oak Ridge, TN for Incineration	Ci	3.1411E-01	25%

d. Other - (Mixed Waste)

Disposition	Units	Annual Totals	Est. Total Error %
From Millstone Nuclear Power Station to Perma-Fix of Florida, Inc.,	m^3	1.3333E-02	
Gainesville, FL for Stabilization, Fuel Blending, etc.	Ci	2.5268E-05	25%

2. Estimate of major nuclide composition (by type of waste)

a. Spent resins, Filter sludges, Evaporator bottoms, etc.

From Millstone Nuclear Power Station to Duratek Inc., Kinston, TN for Super-Compaction, Incineration, etc.

Radionuclide	% of Total	Curies
H-3	1.12	4.3868E-03
C-14	0.03	1.0200E-04
Cr-51		
Mn-54	2.90	1.1347E-02
Fe-55	74.33	2.9073E-01
Fe-59		
Co-57	0.07	2.5900E-04
Co-58	2.44	9.5444E-03
Co-60	9.85	3.8528E-02
Ni-59		
Ni-63	8.13	3.1780E-02
Zn-65		
Sr-89		
Sr-90		
Nb-94		
Zr-95	0.17	6.7800E-04
Nb-95	0.36	1.3900E-03
Tc-99		
Ru-103		
Ru-106		
Ag-108m		
Ag-110m		
Sn-113		
Sb-124		
Sb-125	0.33	1.2746E-03
I-129		
I-131		
Cs-134		
Cs-137	0.06	2.2742E-04
Ba-140		
Ce-141		
Ce-144	0.21	8.2700E-04
U-234		
U-235		
U-238		
Pu-238	<0.01	4.5600E-07
Pu-239	<0.01	3.6500E-07
Pu-241	<0.01	3.5800E-05
Am-241	<0.01	5.3500E-07
Cm-242	<0.01	2.1100E-06
Cm-244	<0.01	1.9400E-06
CURIES (TOTAL)		3.9111E-01

2. Estimate of major nuclide composition (by type of waste)

a. Spent resins, Filter sludges, Evaporator bottoms, etc.

From Millstone Nuclear Power Station to Duratek Inc., Oak Ridge, TN for Super-Compaction, Incineration, etc.

Radionuclide	% of Total	Curies
H-3	0.40	1.7892E-02
C-14	<0.01	1.6870E-04
Cr-51		
Mn-54	2.52	1.1231E-01
Fe-55	69.00	3.0806E+00
Fe-59		
Co-57	0.04	1.9630E-03
Co-58	0.47	2.0969E-02
Co-60	14.21	6.3450E-01
Ni-59		
Ni-63	12.61	5.6316E-01
Zn-65		
Sr-89		
Sr-90		
Nb-94		
Zr-95	0.02	7.9500E-04
Nb-95	0.04	1.9619E-03
Tc-99		
Ru-103		
Ru-106		
Ag-108m		
Ag-110m		
Sn-113		
Sb-124		
Sb-125	0.42	1.8689E-02
I-129		
I-131		
Cs-134		
Cs-137	0.05	2.3728E-03
Ba-140		
Ce-141		
Ce-144	0.18	8.2410E-03
U-234		
U-235		
U-238		
Pu-238	<0.01	1.9486E-05
Pu-239	<0.01	5.7100E-06
Pu-241	0.02	1.0743E-03
Am-241	<0.01	1.2735E-05
Cm-242	<0.01	8.3330E-06
Cm-244	<0.01	3.5845E-05
CURIES (TOTAL)		4.4648E+00

2. Estimate of major nuclide composition (by type of waste)

a. Spent resins, Filter sludges, Evaporator bottoms, etc.

From Millstone Nuclear Power Station to Studsvik Processing Center LLC, Erwin, TN for Thermal Destruction, Incineration, etc.

Radionuclide	% of Total	Curies
H-3	0.09	5.7888E-02
C-14	0.12	7.7061E-02
Cr-51	<0.01	1.6729E-16
Mn-54	5.40	3.5845E+00
Fe-55	25.76	1.7105E+01
Fe-59	<0.01	5.9746E-12
Co-57	0.22	1.4569E-01
Co-58	0.69	4.6000E-01
Co-60	13.55	8.9942E+00
Ni-59		
Ni-63	49.09	3.2598E+01
Zn-65		
Sr-89	<0.01	2.6917E-06
Sr-90	<0.01	4.9307E-03
Nb-94		
Zr-95	<0.01	2.8772E-04
Nb-95	<0.01	9.0247E-07
Tc-99	<0.01	5.9431E-07
Ru-103	<0.01	3.5533E-16
Ru-106		
Ag-108m		
Ag-110m	<0.01	9.1505E-05
Sn-113	<0.01	1.4936E-03
Sb-124	<0.01	1.1257E-10
Sb-125	3.20	2.1254E+00
I-129	<0.01	1.7232E-04
I-131		
Cs-134	0.52	3.4275E-01
Cs-137	0.90	5.9654E-01
Ba-140		
Ce-141		
Ce-144	0.42	2.8119E-01
U-234		
U-235		
U-238		
Pu-238	<0.01	5.3555E-04
Pu-239	<0.01	3.0076E-04
Pu-241	0.04	2.3257E-02
Am-241	<0.01	6.5720E-04
Cm-242	<0.01	1.2599E-04
Cm-244	<0.01	8.4595E-04
CURIES (TOTAL)		6.6401E+01

2. Estimate of major nuclide composition (by type of waste)

b. Dry compressible waste, Contaminated equipment, etc.

From Millstone Nuclear Power Station to Duratek Inc., Kingston, TN for Super-Compaction, Incineration, etc.

Radionuclide	% of Total	Curies
H-3	6.28	7.6470E-04
C-14		
Cr-51		
Mn-54	3.10	3.7720E-04
Fe-55	50.92	6.1960E-03
Fe-59		
Co-57		
Co-58	0.79	9.6698E-05
Co-60	23.44	2.8520E-03
Ni-59		
Ni-63	13.12	1.5960E-03
Zn-65		
Sr-89		
Sr-90		
Nb-94		
Zr-95		
Nb-95		
Tc-99		
Ru-103		
Ru-106		
Ag-108m		
Ag-110m		
Sn-113		
Sb-124		
Sb-125	1.73	2.1060E-04
I-129		
I-131		
Cs-134		
Cs-137	0.61	7.4600E-05
Ba-140		
Ce-141		
Ce-144		
U-234		
U-235		
U-238		
Pu-238		
Pu-239		
Pu-241		
Am-241		
Cm-242		
Cm-244		
CURIES (TOTAL)		1.2168E-02

2. Estimate of major nuclide composition (by type of waste)

b. Dry compressible waste, Contaminated equipment, etc.

From Millstone Nuclear Power Station to Duratek Inc., Oak Ridge, TN for Super-Compaction, Incineration, etc.

Radionuclide	% of Total	Curies
H-3	5.82	1.6677E-01
C-14	<0.01	2.5819E-05
Cr-51		
Mn-54	2.58	7.4068E-02
Fe-55	51.56	1.4778E+00
Fe-59		
Co-57	<0.01	2.8600E-05
Co-58	0.32	9.0818E-03
Co-60	21.49	6.1605E-01
Ni-59		
Ni-63	13.83	3.9653E-01
Zn-65		
Sr-89		
Sr-90		
Nb-94		
Zr-95	<0.01	1.3071E-04
Nb-95	<0.01	3.1100E-06
Tc-99		
Ru-103		
Ru-106		
Ag-108m		
Ag-110m		
Sn-113		
Sb-124		
Sb-125	1.31	3.7565E-02
I-129		
I-131		
Cs-134	<0.01	1.2045E-04
Cs-137	3.07	8.7955E-02
Ba-140		
Ce-141		
Ce-144	<0.01	1.0080E-04
U-234		
U-235		
U-238		
Pu-238	<0.01	7.4950E-07
Pu-239	<0.01	4.3135E-07
Pu-241	<0.01	2.5930E-05
Am-241	<0.01	1.2730E-06
Cm-242	<0.01	1.4200E-07
Cm-244	<0.01	1.0440E-06
CURIES (TOTAL)		2.8663E+00

2. Estimate of major nuclide composition (by type of waste)

d. Other - (Grease, Oil, Oily waste)

From Millstone Nuclear Power Station to Duratek Inc., Kingston, TN for Super-Compaction, Incineration, etc.

Radionuclide	% of Total	Curies
H-3	0.20	2.2500E-06
C-14	0.04	4.8600E-07
Cr-51		
Mn-54	1.39	1.5650E-05
Fe-55	46.25	5.2000E-04
Fe-59		
Co-57		
Co-58	1.45	1.6300E-05
Co-60	23.04	2.5900E-04
Ni-59		
Ni-63	16.37	1.8400E-04
Zn-65		
Sr-89		
Sr-90		
Nb-94		
Zr-95		
Nb-95		
Tc-99		
Ru-103		
Ru-106		
Ag-108m		
Ag-110m		
Sn-113		
Sb-124		
Sb-125		
I-129		
I-131		
Cs-134	2.79	3.1350E-05
Cs-137	7.87	8.8500E-05
Ba-140		
Ce-141		
Ce-144	0.16	1.7850E-06
U-234		
U-235		
U-238		
Pu-238	0.01	1.5500E-07
Pu-239	<0.01	8.3500E-08
Pu-241	0.39	4.3550E-06
Am-241	0.02	2.7650E-07
Cm-242		
Cm-244	0.01	1.4750E-07
CURIES (TOTAL)		1.1243E-03

2. Estimate of major nuclide composition (by type of waste)

d. Other - (Water)

From Millstone Nuclear Power Station to Duratek Inc., Oak Ridge, TN for Incineration

Radionuclide	% of Total	Curies
H-3	98.45	3.0924E-01
C-14	<0.01	3.5912E-06
Cr-51		
Mn-54	0.02	7.2162E-05
Fe-55	0.36	1.1408E-03
Fe-59		
Co-57	<0.01	1.4771E-05
Co-58	0.06	2.0013E-04
Co-60	0.23	7.1887E-04
Ni-59		
Ni-63	0.26	8.3090E-04
Zn-65		
Sr-89		
Sr-90		
Nb-94		
Zr-95	<0.01	7.1981E-07
Nb-95	<0.01	2.0420E-06
Tc-99		
Ru-103		
Ru-106		
Ag-108m		
Ag-110m	<0.01	3.5100E-06
Sn-113	<0.01	8.4829E-07
Sb-124		
Sb-125	0.01	4.6900E-05
I-129		
I-131	<0.01	2.2950E-05
Cs-134	0.16	5.0451E-04
Cs-137	0.26	8.0105E-04
Ba-140		
Ce-141		
Ce-144	<0.01	2.2822E-07
U-234	<0.01	2.0551E-05
U-235		
U-238		
Pu-238	<0.01	1.4549E-06
Pu-239	<0.01	1.9371E-06
Pu-241	<0.01	9.7075E-06
Am-241	0.15	4.7059E-04
Cm-242		
Cm-244	<0.01	2.0971E-07
CURIES (TOTAL)		3.1411E-01

2. Estimate of major nuclide composition (by type of waste)

d. Other - (Mixed Waste)

From Millstone Nuclear Power Station to Perma-Fix of Florida, Inc., Gainesville, FL for Stabilization, Fuel Blending, etc.

Radionuclide	% of Total	Curies
H-3	0.22	5.5000E-08
C-14	0.05	1.2600E-08
Cr-51		
Mn-54		
Fe-55	54.09	1.3667E-05
Fe-59		
Co-57		
Co-58		
Co-60	26.78	6.7667E-06
Ni-59		
Ni-63	18.86	4.7667E-06
Zn-65		
Sr-89		
Sr-90		
Nb-94		
Zr-95		
Nb-95		
Tc-99		
Ru-103		
Ru-106		
Ag-108m		
Ag-110m		
Sn-113		
Sb-124		
Sb-125		
I-129		
I-131		
Cs-134		
Cs-137	<0.01	3.3333E-13
Ba-140		
Ce-141		
Ce-144		
U-234		
U-235		
U-238		
Pu-238		
Pu-239		
Pu-241		
Am-241		
Cm-242		
Cm-244		
CURIES (TOTAL)		2.5268E-05

3. Solid Waste Disposition (Shipments from Millstone)

Number of Shipments*	Mode of Transportation	Destination
2	Truck (Sole Use Vehicle)	Duratek Inc. - Kingston, TN
13	Truck (Sole Use Vehicle)	Duratek Inc. - Oak Ridge, TN
1	Truck (Sole Use Vehicle)	Perma-Fix of Florida Inc. - Gainesville FL
2	Truck (Sole Use Vehicle)	Studsvik Processing Center LLC - Erwin, TN

* Indicates the number of shipments in this category which contained *any* unit-3 waste. (Example: A shipment containing wastes from units 1, 2 *and* 3 will be counted once on *each* of the three unit-specific sections of this report.) 24 physical shipments were made from this station in 2004.

B. IRRADIATED FUEL SHIPMENTS (Disposition)

Number of Shipments	Mode of Transportation	Destination
No Shipments in 2004	N/A	N/A

3.0 REMODCM Changes

In 2004, the following changes were made to the Millstone REMODCM:

<u>Rev</u>	<u>Effective Date</u>	
24-02	April 1, 2004	(Non-intent administrative change)

The description and the bases of the change(s) for each REMODCM revision are included in Volume I of this report. In addition, a complete copy of the REMODCM revision(s) for the calendar year 2004 is provided to the Nuclear Regulatory Commission as Volume II of this report.

<u>REMODCM</u> Rev 24-02

Description of Changes

Dominion

Memo

SORC Summary

Unit: NA

Document: REMODCM (MP-22-REC-BAP01)

Presenter: Claude Flory (ext. 2337)

Date: 3/11/04

Length: 10 minutes

An administrative change is being made to the REMODCM to change the designation from MP-22-REM-BAP01 to MP-22-REC-BAP01, to change references to documents which have had their designations changed, and to make the corrections listed below:

1) "Figure I.C-2" on Page 22 and in TOC is corrected to "Figure I.C-1",
2) Name of REMP sample location #72 is corrected from "Background Well" to "Onsite Well" on Page 43, and
3) Corrected title of reference on Page 68.

REMODCM Change Request - Routing and Cover Sheet

Change Request Number #:	Page 2 of 3

II. Technical Reviews:

[signature] 2/24/04 — Approve ☑ Disapprove ☐

Manager, Radiological Protection and Chemistry — Date

[signature] No Rad. Env. Review required due to Admin. changes only — Approve ☑ Disapprove ☐

Supervisor - Radiological Engineering Date

III. SORC Review: MP-04-015 **Meeting No.**

Unreviewed Radiological Environmental Impact (Bases Attached) Yes ☐ No ☐

[signature] 3/11/04 — Approve ☑ Disapprove ☐

SORC Chairman — Date

IV. Management Approval:

[signature] 3-16-04 — Approve ☑ Disapprove ☐

Site Vice President - Millstone — Date

V. Implementation: Verify that the affected document changes have been approved.

Effective date of REMODCM revision 4/1/04

[signature] 4/22/04

Supervisor - Radiological Engineering Section (NFE) — Date

VI. Distribution: Change sent to Document Control for distribution

[signature] 4/22/04

Supervisor - Radiological Engineering Section (NFE) — Date

VII. Documentation: In Annual Effluent Report (or separate submittal to NRC)

[signature] 4/8/05

Supervisor - Radiological Engineering Section (NFE) — Date

4.0 Inoperable Effluent Monitors

During the period January 1 through December 31, 2004, the following effluent monitors were inoperable for more than 30 consecutive days:

4.1 Unit 1 – None

4.2 Unit 2 – None

4.3 Unit 3 - None

5.0 Errata

Unit 2 – Table 2.2-A6 – The Fission & Activation Gases Total Activity did not include Xe-133. The corrected Total Activity is 3.15E-01. See attached corrected Table 2.2-A6.

Unit 3 – Table 2.3-A6 – The Table indicated 2002 rather than 2003. See attached corrected Table 2.3-A6.

Table 2.2-A6

Millstone Unit No. 2

Airborne Effluents - Ground Batch - Containment Equipment Hatch

Nuclides Released	Units	2003 1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total
A. Fission & Activation Gases						
Ar-41	Ci	-	-	-	-	-
Kr-85	Ci	-	-	-	-	-
Kr-85m	Ci	-	-	-	-	-
Kr-87	Ci	-	-	-	-	-
Kr-88	Ci	-	-	-	-	-
Xe-131m	Ci	-	-	-	-	-
Xe-133	Ci	-	-	-	3.07E-01	3.07E-01
Xe-133m	Ci	-	-	-	-	-
Xe-135	Ci	-	-	-	7.53E-03	7.53E-03
Xe-135m	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	3.15E-01	3.15E-01
B. Iodines						
I-131	Ci	-	-	-	6.94E-07	6.94E-07
I-133	Ci	-	-	-	9.22E-07	9.22E-07
Total Activity	Ci	-	-	-	1.62E-06	1.62E-06
C. Particulates						
I-131	Ci	-	-	-	-	-
Co-58	Ci	-	-	-	9.99E-09	1.52E-08
Cs-137	Ci	-	-	-	9.97E-09	9.97E-09
Total Activity	Ci	-	-	-	2.00E-08	2.52E-08
D. Gross Alpha						
Gross Alpha	Ci	-	-	-	-	N/D
E. Tritium						
H-3	Ci	-	-	-	-	N/D

N/D = Not Detected

Table 2.3-A6

Millstone Unit No. 3

Airborne Effluents - Elevated Continuous - Gaseous Waste System & Containment Vents

Nuclides Released	Units	2003				
		1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total
A. Fission & Activation Gases						
Ar-41	Ci	1.09E-02	1.63E-02	5.43E-04	1.87E-02	4.64E-02
Kr-85m	Ci	3.53E-03	-	-	3.51E-05	3.57E-03
Kr-87	Ci	5.18E-03	-	-	-	5.18E-03
Kr-88	Ci	6.89E-03	-	-	-	6.89E-03
Xe-133	Ci	4.33E-03	2.34E-03	1.80E-03	7.53E-03	1.60E-02
Xe-135	Ci	2.80E-03	8.81E-04	1.49E-04	2.40E-03	6.23E-03
Xe-135m	Ci	2.00E-02	-	-	-	2.00E-02
Xe-138	Ci	8.40E-03	-	-	-	8.40E-03
Total Activity	Ci	6.20E-02	1.95E-02	2.49E-03	2.86E-02	1.13E-01
B. Iodines						
I-131	Ci	-	-	-	-	-
I-133	Ci	-	-	-	-	-
Total Activity	Ci	-	-	-	-	N/D
C. Particulates						
I-131	Ci	-	-	-	-	-
Co-58	Ci	1.74E-07	-	-	-	1.74E-07
Co-60	Ci	1.43E-07	-	-	2.79E-07	4.22E-07
Cr-51	Ci	-	-	-	-	-
Cs-137	Ci	-	-	-	-	-
Mn-54	Ci	5.68E-08	-	-	-	5.68E-08
Nb-95	Ci	-	-	-	-	-
Ru-106	Ci	-	-	-	-	-
Zr-95	Ci	-	-	-	-	-
Br-82	Ci	-	-	9.43E-06	1.08E-05	2.02E-05
Total Activity	Ci	3.74E-07	-	9.43E-06	1.11E-05	2.09E-05
D. Gross Alpha						
Gross Alpha	Ci	-	-	-	-	N/D
E. Tritium						
H-3	Ci	6.60E-01	2.43E+00	7.49E-01	1.27E+00	5.11E+00

N/D = Not Detected