FENOC
FirstEnergy Nuclear Operating Company

Beaver Valley Power Station
Route 168
P.O. Box 4
Shippingport, PA 15077-0004

L. William Pearce
Site Vice President

724-682-5234
Fax: 724-643-8069

April 30, 2004
L-04-057

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

Subject: Beaver Valley Power Station, Unit No. 1 and No. 2
BV-1 Docket No. 50-334, License No. DPR-66
BV-2 Docket No. 50-412, License No. NPF-73
Annual Radioactive Effluent Release Report for 2003, and
Annual Radiological Environmental Operating Report for 2003

The Annual Radioactive Effluent Release Report (see Enclosure 2) is hereby submitted for year 2003 for Beaver Valley Power Station (BVPS) Unit 1 and Unit 2 in accordance with the requirements of BVPS Unit 1 and Unit 2 Technical Specification 6.9.3. This report contains the information required by NRC Regulatory Guide 1.21 along with the site specific information required by Report 6.9.3 of BVPS Unit 1 and Unit 2 Offsite Dose Calculation Manual procedure 1/2-ODC-3.03.

- The Annual Radioactive Effluent Release Report is considered a single submittal for the two unit site. This report combines those sections that are common to both units at the site. However, where the two units have separate radwaste systems, the report does differentiate the data for each unit. In reference to this, Unit 1 and Unit 2 have shared radwaste systems for elevated gaseous effluents and for liquid effluents. The report format is summarized in the index.

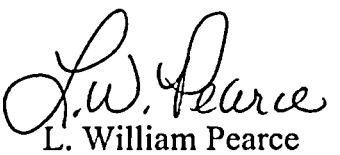
Also provided is the Annual Radiological Environmental Operating Report for 2003 (see Enclosure 3). This report is being submitted in accordance with BVPS Unit 1 and Unit 2 Technical Specification 6.9.2. The report also contains the site specific information required by Report 6.9.2 of BVPS Unit 1 and Unit 2 Offsite Dose Calciulation Manual Procedure 1/2-ODC-3.03.

IE48
IE25
A009

In summary, the Radioactive Effluent Control Program and the Radiological Environmental Monitoring Program outlined in the BVPS Unit 1 and Unit 2 Offsite Dose Calculation Manual was followed throughout 2003. The program results demonstrate the proficiency of radioactive effluent control at the BVPS and that the operations of Unit 1 and Unit 2 did not adversely affect the surrounding environment. A detailed Executive Summary of the Radioactive Effluent Control Program and the Radiological Environmental Monitoring Program is also provided (see Enclosure 1).

There are no regulatory commitments identifed in this document. If you have any questions regarding this submittal, please contact Mr. Larry R. Freeland, Manager, Regulatory Affairs/Performance Improvement at 724-682-5284.

Sincerely,



L. William Pearce

Enclosures:
1) Exective Summary for Year 2003 Annual Effluent and Environmental Report
2) Annual Radioactive Effluent Release Report for 2003
3) Annual Radiological Enviromental Operating Report for 2003

c: Mr. T. G. Colburn, NRR Senior Project Manager
Mr. P. C. Cataldo, NRC Sr. Resident Inspector
Mr. H. J. Miller, NRC Region I Administrator

c: American Nuclear Insurers
95 Glastonbury Boulevard
Glastonbury, CT 06033

Department of Environmental Protection (5 copies)
Bureau of Radiation Protection & Toxicology
P.O. Box 2063
Harrisburg, PA 17120

INPO (Attn: Bill Nestel)
700 Galleria Parkway SE
Suite 100
Atlanta, GA 30339-5957

J. Lee Miller, Beaver County Extension Director
Daniel V. Steen, FirstEnergy Environmental Department
John P. Jones, Hancock County Office of Emergency Services
Roger L. Suppes, Ohio Department of Health
Carol O'Claire, Ohio Emergency Management Agency
Keith Clark, East Liverpool Water Authority
Jerry Schulte, ORSANCO
B. F. Jones Memorial Library
Bronia Grob, Environmental, Inc.

bc: (with Enclosures)
RP Radwaste & Effluents Supervisor
RP RETS Administrator (10 copies)
RP REMP Administrator (15 copies)
RP Manager
Regulatory Affairs (2 copies)
Quality Services Unit
M. E. O'Reilly
J. J. Hagan
Document Control RTL A9.690E
BVRC - *Keywords: Annual Radioactive Effluent Release Report, Annual Environmental Report*

References:
BVBP-SITE-0016 Report #31
BVBP-SITE-0016 Report #38

Enclosure 1

Executive Summary for Year 2003 Annual Effluent Annual Environmental Report

I. Overall Summary of BVPS Effluent and Environmental Programs:

The attached documents represent a combined submittal comprised of the Annual RETS Report (see Enclosure 2) and the Annual REMP Report (see Enclosure 3). Historically, BVPS has submitted each these reports as separate documents. Specifically, the due dates for submittal of the reports were six weeks apart from one another, so a combined issue of the reports was not practical. However, a recent Technical Specification Change moved the submittal date for the Annual RETS Report to within two weeks of the submittal date for the Annual REMP Report.

This report is comprised of results from the RETS and REMP programs that are described in the BVPS Unit 1 and Unit 2 Offsite Dose Calculation Manual (ODCM) and are summarized as follows:

- RETS Results: The Controls for the Radioactive Effluent Technical Specification Program (as outlined in ODCM procedure 1/2-ODC-3.03, *Controls for RETS and REMP Programs*) were followed throughout year 2003. Adherence to the RETS Controls (e.g.; sampling, analysis and offsite dose projection requirements) demonstrated the proficiency of the Effluent Control Program. Also, results of the sample analyses, coupled with the offsite dose projections demonstrate that BVPS operations should not produce any adverse affect on the surrounding environment.

  For information, the Annual RETS Report is also referred to as the Annual Radioactive Effluent Release Report (ARERR).

- REMP Results: The Controls for the Radiological Environmental Monitoring Program (as outlined in ODCM procedure 1/2-ODC-3.03, *Controls for RETS and REMP Programs*) were followed throughout year 2003. Adherence to the REMP Controls (e.g.; sampling and analysis requirements) demonstrated the proficiency of the Radiological Environmental Monitoring Program. Also, results of the various environmental sample media validate the projections made in accordance with the Effluent Control Program. In summary, the results demonstrate that BVPS operations did not adversely affect the surrounding environment.

  For information, the Annual REMP Report is also referred to as the Annual Radiological Environmental Operating Report (AREOR).

Enclosure 1
Executive Summary for Year 2003 Annual Effluent and Environmental Report

II: Detailed Summary for Annual RETS Report (ARERR) for 2003:

The Annual Radioactive Effluent Release Report was prepared and submitted in accordance with the following requirements:

- BVPS Unit 1 & Unit 2 Technical Specification 6.9.3
- Attachment U of ODCM Procedure 1/2-ODC-3.03, *Controls for RETS and REMP Programs*
- BVPS procedure 1/2-ENV-01.05, *Compliance with Regulatory Guide 1.21 and Technical Specifications*

For information, submittal of this report (see Enclosure 2) closes BVPS Corrective Actions CR04-00934-03 and 04.

Graphs 1,2 and 3 of Enclosure 1 provide a comparison of ODCM dose projections for the last several years to show compliance with Members of the Public dose limits from 10 CFR Part 50. Also, Graph 4 of Enclosure 1 provides a comparison of the ODCM dose projections from all facility releases and direct radiation exposures to show compliance with Member of the Public dose limits from 10 CFR 20.1302 and 40 CFR Part 190. In general, as years of reactor operation cumulate, the radioactivity in primary plant systems will increase until equilibrium is reached. Specifically, this assumption should lead toward a slow but steady increase in offsite dose. Contrary to this, the graphs show the success of the efforts to stabilize and reduce offsite dose.

The following summarizes the BVPS Liquid and Gaseous Effluent Control Program during 2003:

- Total Population Dose vs Natural Background: The 0-50 mile total and average population doses were calculated using release quantities and real time meteorology. The following comparison to natural background radiation demonstrates that BVPS operations did not adversely affect the surrounding environment:

  839 man-mrem = Total Population Dose for the year from BVPS liquid and gaseous effluents. Based on 4 million people within 0-50 miles of the BVPS site.

  0.000140 mrem = Average individual Population Dose for the year from BVPS liquid and gaseous effluents.

  296 mrem = Natural Background radiation exposure for a year from 1990 BEIR V Report.

Enclosure 1
Executive Summary for Year 2003 Annual Effluent and Environmental Report

- Liquid Release Volume and Activity: Unit 1 and Unit 2 discharged 3.74E+6 liters of liquid waste (undiluted volume). The total activity discharged from the site was 727 curies of tritium, and 0.318 curies of fission and activation products.

- Liquid Release Offsite Dose Projections: The following offsite dose projections were calculated to the maximum individual using ODCM default flow rates for the receiving water (Ohio River). The projections were performed prior to release authorization:

  0.0228 mrem = The Unit 1 or Unit 2 Total Body Dose for the year, or 0.759% of the 3 mrem per unit annual limit.

  0.0292 mrem = The Unit 1 or Unit 2 Highest Organ Dose for the year, or 0.292% of the 10 mrem per unit annual limit to the GI-LLI.

- Liquid Waste Treatment: During the 4th Quarter of 2003, a temporary modification was made to add a pre-conditioning filter to the Liquid Radioactive Treatment System. This filter has reduced particulate material by a minimum factor of 100.

- Abnormal Liquid Releases: There were no abnormal liquid releases during the report period.

- Gaseous Release Volume and Activity: Unit 1 and Unit 2 discharged 1.16E+4 cuft of stored gaseous waste. The total activity discharged from all site gaseous releases was 217 curies of tritium, and 61.4 curies of fission and activation gases.

- Gaseous Release Offsite Dose Projections: The following offsite dose projections were calculated to the maximum individual using ODCM default meteorology. The projections were performed prior to release authorization:

  0.0135 mrad = The Unit 1 or Unit 2 Highest Gamma Air Dose for the year, or 0.135% of the 10 mrad per unit annual limit.

  0.0483 mrad = The Unit 1 or Unit 2 Highest Beta Air Dose for the year, or 0.241% of the 20 mrad per unit annual limit.

  1.39 mrem = The Unit 1 or Unit 2 Highest Organ Dose for the year, or 9.25% of the 15 mrem per unit annual limit to the Thyroid.

- Abnormal Gaseous Releases: There were no abnormal gaseous releases during the report period.

- Effluent Monitoring Channels Inoperable >30 Days: There were three Effluent Monitoring Instrumentation Channels not returned to Operable status within 30 days during this report period. Monitor [RM-1LW-104] is used during discharge of Liquid Waste from Unit 1. The other two monitors [RM-1GW-109] and [RM-1VS-110] are used for monitoring the noble gas portion of gaseous effluent releases from the Unit 1 and Unit 2 Gaseous Waste/Process Vent System and from the Unit 1 SLCRS Vent System, respectively. The details of these conditions are shown in Table 6 of the report (see Enclosure 2).

- ODCM Surveillance Deficiencies: There were ODCM Surveillance Deficiencies during the report period. The deficiencies were associated with the inoperable periods of [RM-1VS-110] described in Table 6 of the report (see Enclosure 2).

III. Detailed Summary for Annual REMP Report (AREOR) for 2003:

The Annual Radiological Environmental Operating Report was prepared and submitted in accordance with the following requirements:

- Unit 1 & 2 Technical Specification 6.9.2
- Attachment T of ODCM Procedure 1/2-ODC-3.03, *Controls for RETS and REMP Programs*
- BVPS procedure 1/2-ENV-01.05, *Compliance with Regulatory Guide 1.21 and Technical Specifications*

For information, submittal of this report (see Enclosure 3) closes BVPS Corrective Actions CR04-00934-07 and 08.

The following summarizes the BVPS Radiological Environmental Monitoring Program during 2003:

- Sample Media: Results for precipitation, ground water, sediment, food, fish, TLDs, feed, air particulate, air iodine and soil media remained consistent from 2002 to 2003. A decrease in iodine-131 was noted in drinking water (80/104 - 73/106) and surface water (45/53 - 43/52). An increase in iodine-131 was noted in milk (9/154 - 18/163). Key: (2002 positive results / total analyses – 2003 positive results / total analyses.

  Note: The iodine-131 detected at surface water control location Upstream Side of Montgomery Dam (Site #49) was also detected at the same frequency and magnitude at drinking water locations Midland Water Treatment Plant (Site #4) and East Liverpool Water Treatment Plant (Site #5). The lower positive iodine-131 results detected at Searight Dairy (Site #25) were due to supplemental water obtained from

the Midland Water Treatment Plant (Site #4). Therefore, the iodine-131 detected was part of the environment and not due to BVPS operations.

- Population Dose-Liquid Releases: The calculated Total Body Population Dose was 189 man-mrem. The dose from tritium (180 man-mrem) represents 95.2% of the Total Body Population Dose. Also, the calculated Highest Organ Population Dose from Liquid Releases was 209 man-mrem to the GI-LLI. The dose from tritium (180 man-mrem) represents 86.1% of the Highest Organ Population Dose.

- Population Dose-Gaseous Releases: The calculated 50 mile Total Body Population Dose was 650 man-mrem. Also, the 50 mile Highest Organ Population Dose was 670 man-mrem to the Thyroid.

- Land Use Census Changes: For all sectors, there were no changes in the nearest residence. The range of the nearest resident is encompassed between 0.37 miles (NE sector), and 2.75 miles (WNW sector).

  Note 1: No garden locations moved closer, but six moved further away, and two were dropped. The range of the nearest garden is encompassed between 1.01 miles (ENE sector), and 2.85 miles (WSW sector). There are no gardens located in the NNE, W and WNW sectors.

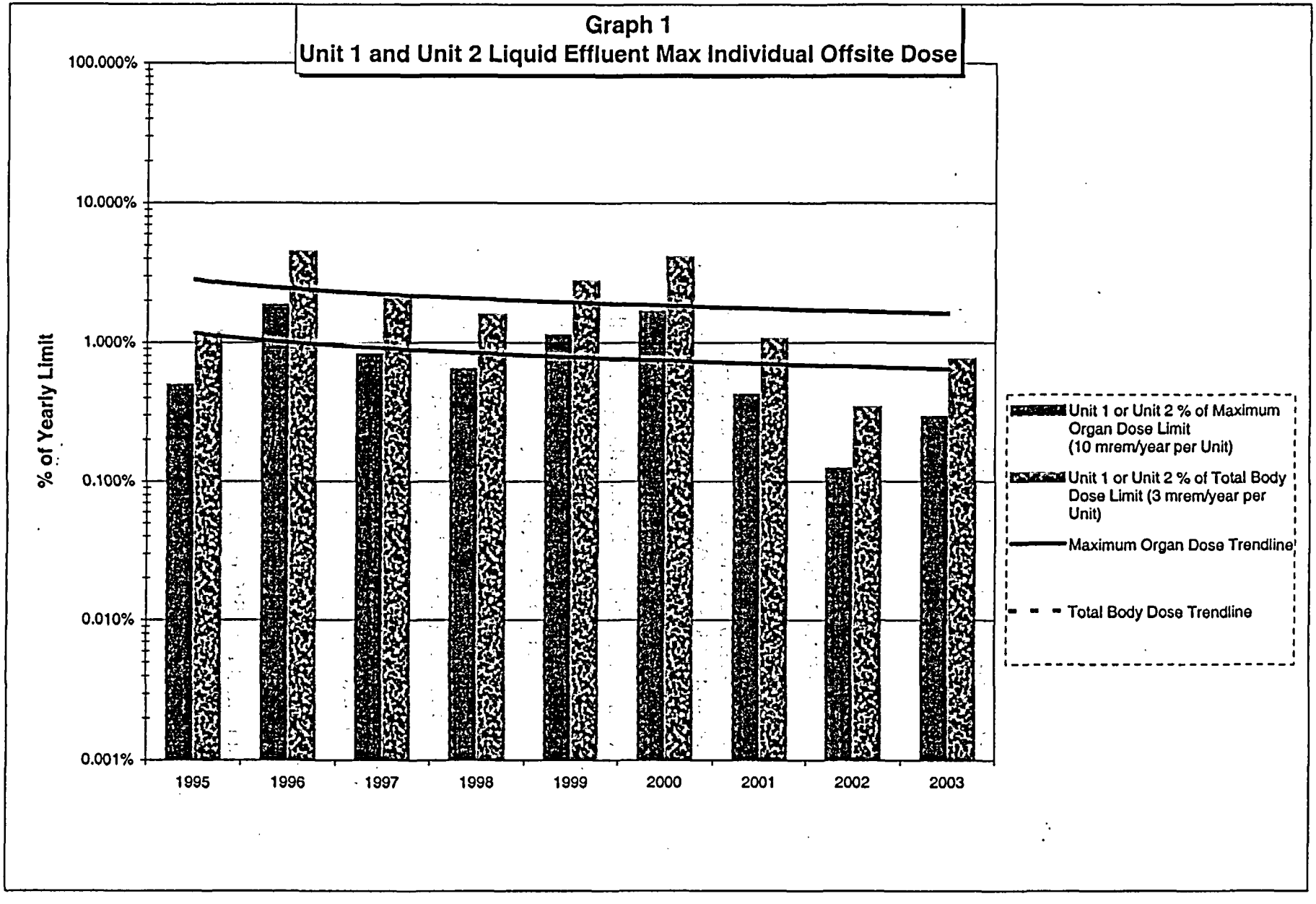
  Note 2: One milch animal location was dropped, but the rest remained at the same locations. The range of the nearest milch animal is encompassed between 2.10 miles (SSW sector), and 4.92 miles (NW sector). There are no milch animals located in the N, NNE, NE, ENE, ESE, S, and W sectors.

- Split Sample Program: BVPS shares split sample data with the Pennsylvania Department of Environmental Protection (PADEP) in support of the nuclear power plant monitoring program. The shared media and number of locations are comprised of; milk (1), surface water (3), sediment (1), fish (1), food crops (2) co-located air particulate/air iodine (4), and TLD (24).

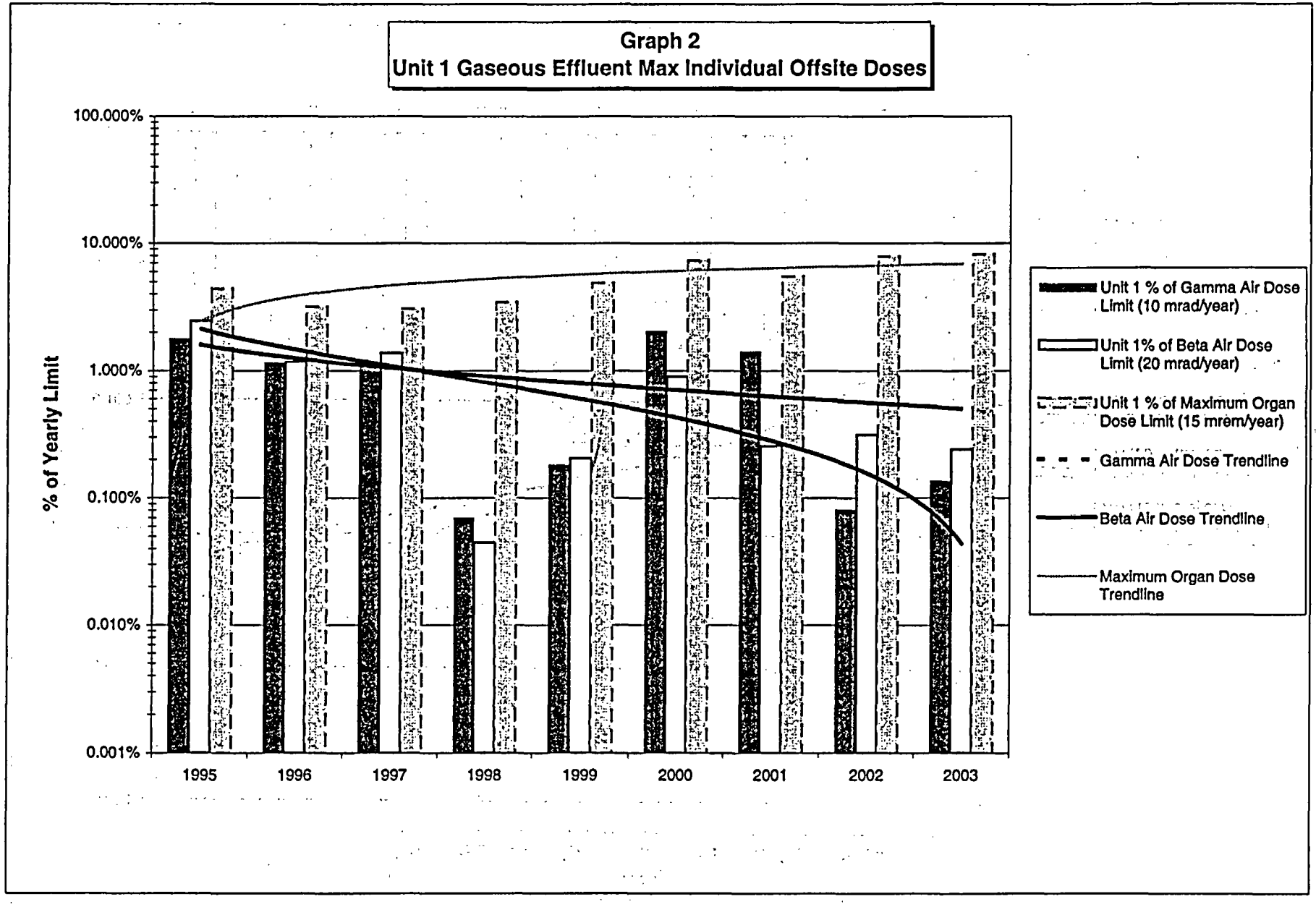
- Spike Sample Program: Spiked samples include water, milk, air charcoal, and air particulate media. Of the 102 spiked samples, only one strontium-90 milk analysis result did not meet the NRC comparison criteria.

- Sample Location Changes: There were no changes to any sample point locations during the report period. Also, there were no changes in the required frequency of sampling during the report period.

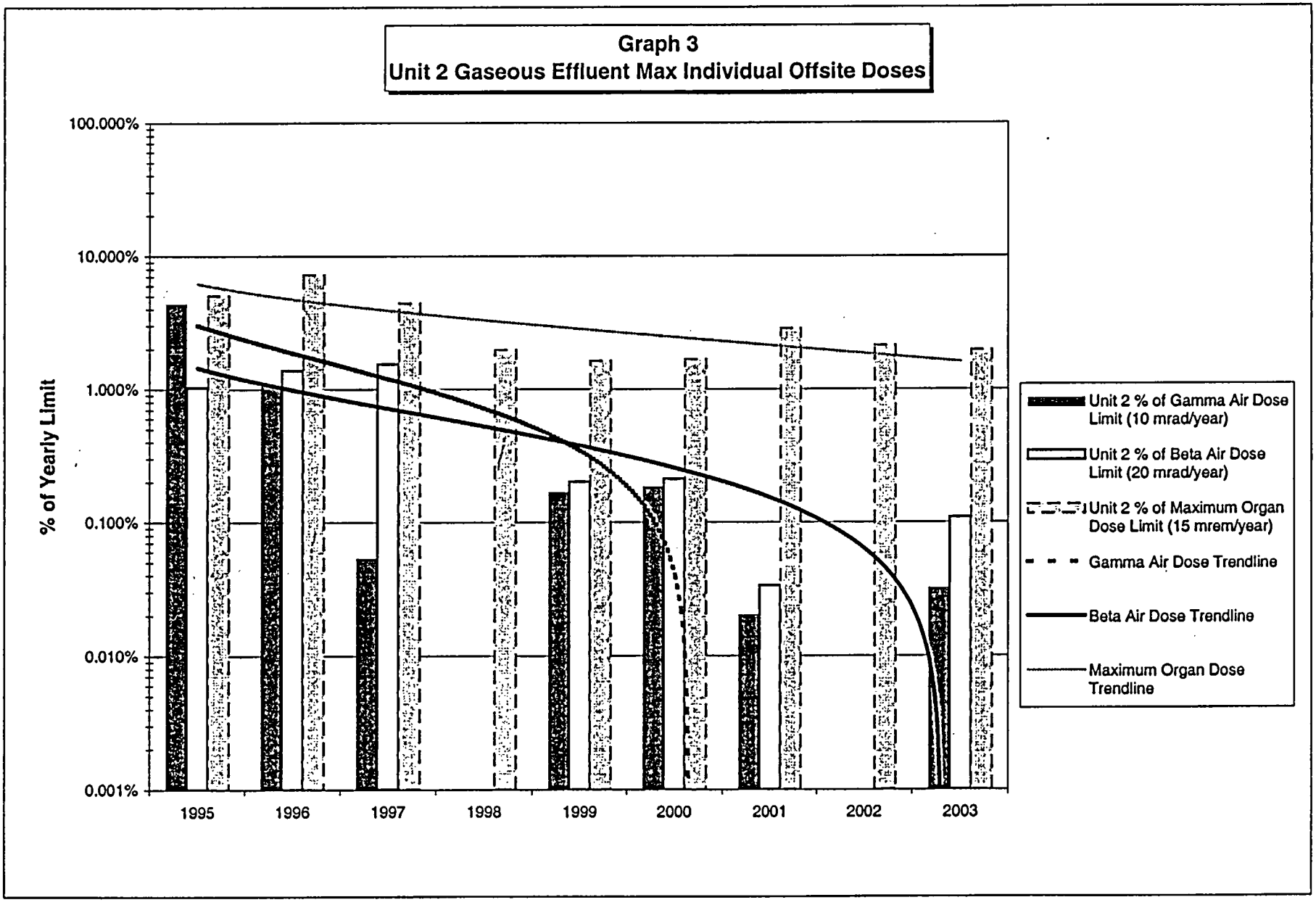
Enclosure 1
Executive Summary for Year 2003 Annual Effluent and Environmental Report



Enclosure 1
Executive Summary for Year 2003 Annual Effluent and Environmental Report



Enclosure 1
Executive Summary for Year 2003 Annual Effluent and Environmental Report



Enclosure 1
Executive Summary for Year 2003 Annual Effluent and Environmental Report