5.0 STANDARDS AND QUALITY ASSURANCE

5.1 Environmental Standards and Regulations

The following environmental standards and regulations are applicable at the WVDP site boundary:

- DOE Order 5480.1, "Requirements for Radiation Protection," August 1981.

- U.S. Federal Radiation Council, Background Material for the development of Radiation Protection Standard, Report No. 1, (1960) and Report No. 2 (1961), Superintendent of Documents, U.S. Government Printing Office, Washington, D.C.

- U.S. Environmental Protection Agency, National Primary and Secondary Ambient Air Quality Standards, 40 CFR 50, 1980.

- Department of Environmental Conservation, State of New York, Environmental Conservation Law of New York State, Title 8, Article 19, October 18, 1972.

The standards and guides for releases of radionuclides at the WVDP are those of DOE Order 5480.1 Chapter XI, dated August 13, 1981, entitled, "Requirements for Radiation Protection." Radiation protection standards and selected radioactivity concentration guides from Chapter XI are listed in Appendix B. When there is a difference between soluble and insoluble chemical forms, the most restrictive guide is listed. These listed guides are virtually identical to those in the Code of Federal Regulations (CFR), Title 10, Part 20. Ambient air and water quality standards contained in the individual SPDES permits issued for the facility are listed in Table C-5.2

5.2 Quality Assurance

Off-site laboratories performed most of the radiochemical analyses for the environmental samples collected during 1984. The documented quality assurance plan used by these laboratories includes periodic interlaboratory cross-checks, prepared standard and blank analyses, routine instrument calibration, and use of standardized procedures.

Sample collection, preparation, and most instrumental radiometric analyses were performed at the WVDP site environmental laboratory for all media collected. In 1984, radiochemical determination of Sr-90 in water was added to the list of procedures performed at the WVDP site. For all continuous sampling equipment, measurement devices, and counting instruments, periodic calibration was maintained using standards traceable to the National Bureau of Standards. Off-site laboratories analyze duplicates of approximately 10% of the samples analyzed on-site for the same parameters. Also in 1984, a formal documentation of quality assurance polices and performance criteria was completed for use in the environmental monitoring program. The scope of the quality assurance program includes sample collection methods and record keeping; sample preparation, preservation, shipping, and inventory control; analytical measurements, standards and backgrounds, and calibrations; data reduction, analysis of trends, and reporting formats. The program also defines requirements for review and corrective action.

A cross-check program was not formally in place at WVDP for radiometric measurements in 1984, but a summary of off-site laboratory split sample comparisons including U.S. Environmental Protection Agency (EPA) cross-check results for Nonradiological water quality parameters is included in Appendix D. All the parameters tested in the EPA cross-check program were within the acceptable limits. The

split sample measurements were compared among the WVDP on-site analytical radiochemistry lab, the WVDP contract laboratory (EAL), and a DOE laboratory (RESL); they are generally in close agreement.

5.3 Statistical Reporting Of Data

Except where noted, individual analytical results are reported with plus or minus (+/-) two analytical standard deviations (2σ) indicating the counting uncertainty. The arithmetic averages were calculated using actual results, including zero and negative values. In the final results, if the 95 percent confidence interval included zero, the measurement was assumed to indicate no discernable activity. Less than (<) values indicate the Lower Limit of Detection (LLD) for that analysis. These LLD values will vary among samples, especially in biological media where sample size cannot be easily standardized.

The total statistical uncertainty, including systematic uncertainty plus the random counting uncertainty, is not reported separately for the 1984 data. In most cases, systematic uncertainties due to glassware or balance variation are a small percentage of the large counting uncertainties at environmental levels. The notation normally used in laboratory reporting to convey the total uncertainty is in the form: (V.OO +/- R.O; T.O) E-OO where "V.OO" is the analytical value to three significant figures, "+/-R.O" is the random uncertainty to two significant figures, "T.O" is the total of random plus systematic uncertainties, and "E-OO" is the exponent of 10 used to signify the magnitude of the parenthetical expression.

6.0 REFERENCES

Dunning, Donald E., "Estimates of Internal Dose Equivalent from Inhalation and Ingestion of Selected Radionuclides," WIPP-DOE-176, undated.

Huang, J., New York State Department of Health, Bureau of Environmental Radiation Protection, Albany, New York, personal communication, April 11, 1984.

ICRP Publication 26. "Recommendations of the International Commission on Radiological Protection," Annals of the ICRP, Vol. 1, No. 3, 1977.

"Long Term Management of Liquid High-Level Radioactive Wastes Stored at the Western New York Nuclear Services Center, West Valley," DOE/EIS-0081, June 1982.

Moore, R. E., et al., "AIRDOS-EPA: A Computerized Methodology for Estimating Environmental Concentrations and Dose to Man from Airborne Releases of Radionuclides," ORNL-5532, June 1979.

"National Council on Radiation Protection and Measurements, Washington, DC, "Environmental Radiation Measurements, NCRP Report No. 50,"December 1976.

Oak Ridge National Laboratory (ORNL), 1980, "User's Manual for LADTAP II - A Computer Program for Calculating Radiation Exposure to Man from Routine Release of Nuclear Reactor Liquid Effluents," NUREG/CR-1276, May, 1980.

Simpton, D. B. and McGill, B. L., "LADTAP II: A Computer Program for Calculating Radiation Exposure to Man from Routine Release of Nuclear Reactor Liquid Effluents," D. B. Simpton and B. L. McGill, Technical Data Management Center ORNL/NUREG/TDMC-1.

U. S. Nuclear Regulatory Commission (NRC), 1977, "Regulatory Guide 1.109 Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 60, Appendix I," October, 1977.

U. S. Nuclear Regulatory Commission (NRC), 1977, 'Regulatory Guide 1.111 Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Light-Water-Cooled Reactors,' July, 1977.

West Valley Demonstration Project, 1984 Effluent and On-site discharge Report, March, 1985.

West Valley Nuclear Services Co., Inc., "Environmental Monitoring Program Report for the West Valley Demonstration Project," May 1983.

Wilcox, D. P. and Smokowski, R. T., "Nuclear Fuel Services Environmental Reports," Nuclear Fuel Services, West Valley, New York, Nos. 25 through 31, July 1978 - December 1981 inclusive.

7.0 DISTRIBUTION

J. Turi	DOE-HQ
W. Hannum	DOE-PO
T. DeBoer	NYSERDA
R. Spaunburgh	NYSERDA
R. Novitzki	USGS
R. Fakundiny	NYSGS
L. Meyer	USEPA, Washington, DC
P. Giardina	USEPA, Region II
R. Mitre	NYSDEC, Region 9
K. Rimawi	NYSDOH
T. Clark	NRC
P. Merges	NYSDEC, Albany
P. Hamric	DOE-ID
Technical File- Public Information	WVNS