

## 1.0 INTRODUCTION

This report is submitted in accordance with DOE Order 5484.1 and presents a summary of environmental monitoring data collected at the West Valley Demonstration Project (WVDP) from January 1, 1984 through December 31, 1984 to meet the requirements of Technical Specification 5.1. The program implemented by West Valley Nuclear Services Company will provide data in full compliance with DOE recommendations for calendar year 1985.

On February 26, 1982, the responsibility for operation and maintenance of the former Nuclear Fuel Services, Inc. (NFS) reactor fuel reprocessing facility was transferred to the Department of Energy (DOE). Public Law No. 96-368, enacted in 1980, mandated the demonstration of technology for solidification of the 2.2 million litres (580,000 gallons) of liquid high-level radioactive waste that were produced by commercial fuel reprocessing at the West Valley plant and are now held in underground storage tanks at the facility. The DOE selected West Valley Nuclear Services Company (WVNS) as the contractor to implement the provisions of this law.

When WVNS assumed operational control, NFS was conducting an environmental monitoring program appropriate to the shutdown maintenance operating status of the facility in accordance with Technical Specification 5.1 under NRC License CSF-1. WVNS recognized that the NFS program required substantial change in order to prepare for the high-level waste solidification operations currently scheduled for start-up in September 1988. Accordingly in 1982 WVNS began to implement a full-scale environmental surveillance program in support of these planned operations and by early 1985 had fully implemented this program. As recommended in DOE Order 5484.1, Chapter III, Paragraph 1, this allows more than two years to gather preoperational environmental baseline data before solidification operations begin.

A comprehensive Environmental Evaluation (EE) was published in June, 1984 to initiate the decision-making process for disposal of Project low-level radioactive waste. The intent of the Project is to phase out the methods used by NFS and replace them with engineered disposal technology. The EE evaluated the environmental impact of engineered shallow land burial and determined that anticipated impacts were within acceptable regulatory levels.

Based on the review of the EE by the Department of Energy Headquarters and the Idaho Operations Office, the Project staff has been directed to assist the DOE with the preparation of an Environmental Assessment to be published in August, 1985.

Although the reprocessing plant is not now being used for its original purpose, it is being maintained in shutdown status. This requires continual operation of basic services, including low-level radioactive waste management. The facility operation includes periodic disposal of solid radioactive waste from decontamination and maintenance activity (plant wastes) in the formerly licensed disposal area. Liquid wastes resulting from plant activities are processed on-site at the low-level waste treatment facility (LLWT) prior to discharge.

The WVDP site is located in a rural setting approximately 50 km (30 mi) south of Buffalo, New York (Figure 1-1), at an average elevation of 400 m (1,300 ft) on New York State's western plateau. The plant facilities used by the Project occupy approximately 63 hectares (156 acres) of chain-link fenced area within a 1,350 hectare (3,300 acre) reservation that constitutes the Western New York Nuclear Service Center (WNYNSC). The communities of West Valley, Riceville, Ashford Hollow, and the village of Springville are located within 8 km (5 mi) of the plant. Several roads and one railway pass through the Center, but no human habitation and no hunting, fishing, or public access are permitted on the WNYNSC.

The land immediately adjacent to the WNYNSC is used primarily for agriculture and arboriculture. Cattaraugus Creek to the north is used for water recreation (swimming, canoeing, and fishing) in the summer. Although limited irrigation of adjacent golf course greens and tree farms is taken from the Cattaraugus Creek, no public water supply is drawn from the creek downstream of the WNYNSC.

The average annual temperature in the region is 7.2°C (45.0°F) with recorded extremes of 37°C (98.6°F) and -42°C (-43.6°F). Rainfall is relatively high, averaging about 104 cm (41 in) per year. Precipitation is evenly distributed throughout the year and is markedly influenced by Lake Erie to the west and Lake Ontario to the north. All surface drainage from the WNYNSC is to Buttermilk Creek which flows into Cattaraugus Creek and ultimately into Lake Erie. Regional winds are predominantly from the west and south at over 4 m/sec (9 mi/hr) during most of the year. WVNS is currently studying the influences of local topography on-site wind patterns. Wind rose data and site specific meteorological information are being developed, and a final meteorological summary report will be issued in fiscal year 1985.

The WNYNSC lies within the northern hardwood forest region, and the diversity of its vegetation is typical of the area. Equally divided between forest and open land, the site provides habitats especially attractive to white-tailed deer and the various birds, reptiles, and small mammals indigenous to the region. No endangered species are known to be present on the reservation.

The geology of the site is characterized by glacial deposits of varying thickness in the valley areas, underlain by sedimentary rocks which are exposed in the upper drainage channels in hillsides. The soil is principally silty till consisting of unconsolidated rock fragments, pebbles, sand, and clays. There is an aquifer in the upper 6 m (20 ft) of granular fluvial materials concentrated near the western edge of the site; high ground to the west and the Buttermilk Creek drainage to the east intersect this aquifer, precluding off-site

continuity. Several shallow, isolated, water-bearing strata also occur at various other locations within the site boundary but do not appear to be continuous. The zone at which the till meets bedrock forms another aquifer that ranges in depth from 2 m (6 ft) underground on the hillsides to 170 m (560 ft) deep just east of the boundary of the facility exclusion area.

# LOCATION OF WESTERN NEW YORK NUCLEAR SERVICE CENTER

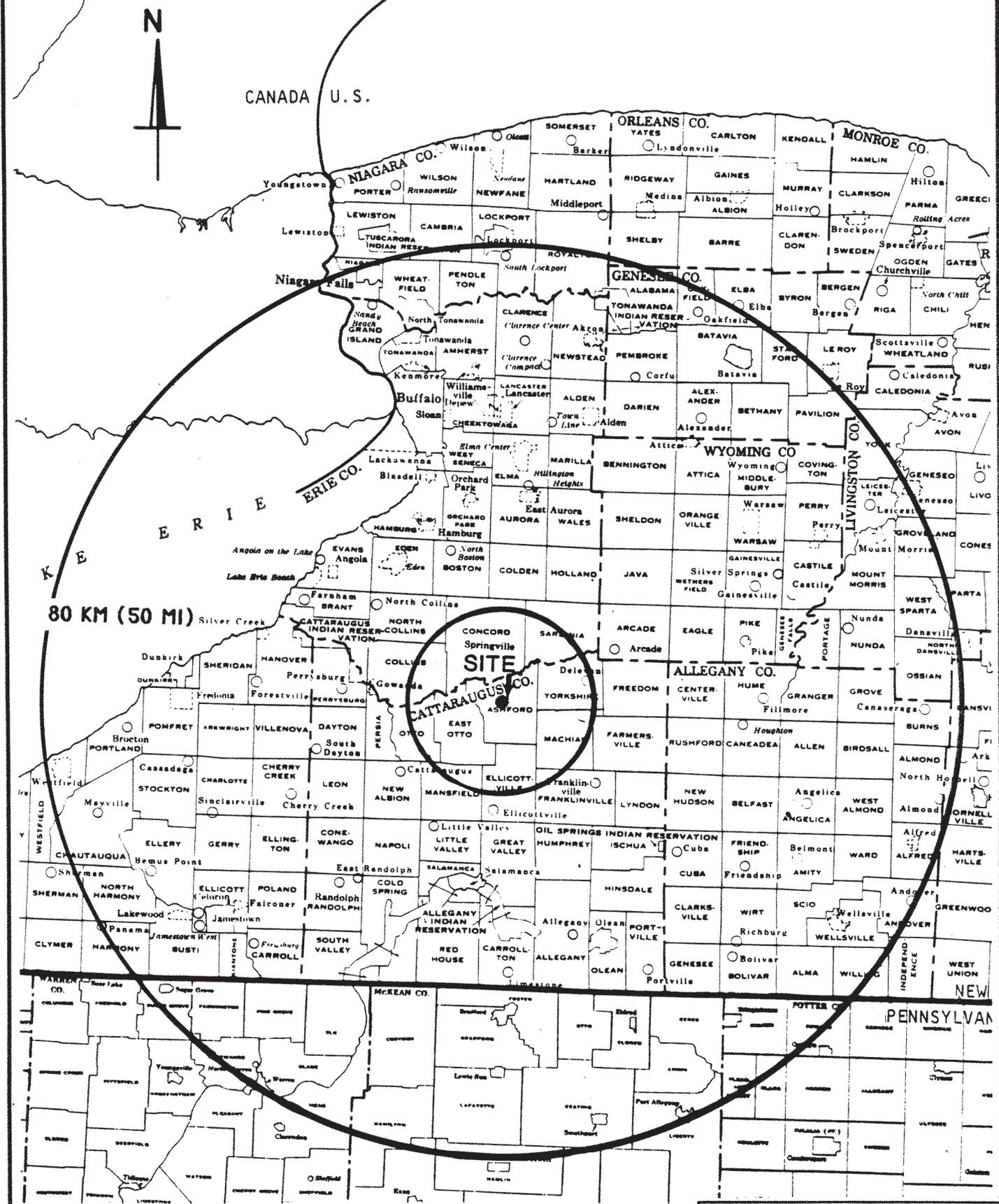


FIGURE 1-1

## 2.0 SUMMARY

In most environmental media collected from the Project environs, radionuclide concentrations could not be distinguished from radioactivity which occurs naturally or has been deposited from weapons testing. Radioactivity levels in surface water and in fish directly downstream of the Project appeared slightly lower than those of previous years. The content of radioactivity in venison from the single on-site deer specimen was comparable to levels in samples from the past several years but higher than for the 1983 sample. Although small amounts of radioactivity were discharged during the course of Project activities, radioactivity levels in air and water effluents were well within the concentration guides of DOE Order 5480.1, Chapter XI. A total of 0.00083 curies of particulate radioactivity was discharged to the air, and 0.093 curies of radioactivity (excluding 7.6 curies of tritium as tritiated water) were released to Buttermilk Creek. The resultant collective and individual dose estimates to the surrounding population from these releases imply negligible consequences with regard to impacts on human health.

The maximum hypothetical dose an individual could have received from 1984 WVDP activities is about 0.27% of the protection standard. The collective population dose to persons living within 80 km (50 mi) of the site was estimated to be 0.15 person-rem. This is equivalent to an average individual dose of 0.00009 millirem as compared approximately to 100 millirem received from natural sources.

No increase in radioactivity over previous years' levels was observed in groundwater monitoring wells on-site and off-site around the perimeter of the site. Special surface and groundwater monitoring activities initiated in December 1983 demonstrated that radioactivity in a burial area monitoring well was confined to that immediate area and did not appear in adjacent monitoring wells or surface water.

Concentrations of particulate radioactivity in air measured at the site boundary were no different statistically than those reported from New York State Department of Health background samples for 1982 and 1983. Samples of water obtained off-site from Cattaraugus Creek (which receives Buttermilk Creek drainage from the entire site) contained two detectable man-made isotopes: tritium and strontium-90. Buttermilk Creek is not used as a drinking water supply for humans, but the water is accessible to dairy cattle at one location on the creek downstream of the site. Radionuclide concentrations in milk samples from this herd were at or below detectable limits for all fuel-cycle isotopes. Thermoluminescent dosimeters placed around the site perimeter indicated that direct external radiation exposure was within the range expected from natural background in this region and was statistically the same as background measurements at a remote location.

Nonradioactive chemical water quality measurements indicated no discharges which would adversely affect the waters receiving site effluents. Several water quality measurements have exceeded the permitted limits at the discharge point, but effluent stream consolidation and conditioning are now in progress to eliminate the cause of these excursions. Studies to more clearly identify potential sources and preventative measures for possible future effluent problems are also underway.