APPENDIX L
REGULATORY COMPLIANCE DISCUSSION

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This appendix discusses the compliance with three requirements that would apply to site decommissioning actions:

- The Resource Conservation and Recovery Act (RCRA) of 1976 and the New York State Solid Waste Disposal Act (New York State Environmental Conservation Law Article 27 [Title 9]) govern the generation, storage, handling, and disposal of hazardous wastes, and the closure of treatment, storage, or disposal systems that handle those wastes. The Act was created to ensure that hazardous wastes are managed in a way that protects human health, safety, and the environment. Operation and closure of RCRA "regulated" units are performed in accordance with 6 New York Code of Rules and Regulations (NYCRR) Part 373. Corrective Action for solid waste management units is performed in accordance with the RCRA 3008(h) Administrative Order on Consent.

- The West Valley Decommissioning Policy Statement/License Termination Rule establishes radiological criteria for the decommissioning of West Valley Demonstration Project (WVDP) facilities and the termination of the U.S. Nuclear Regulatory Commission (NRC) licenses (NRC 2007). The Policy Statement/License Termination Rule provides for flexibility in establishing the final levels of residual contamination, but, in all cases, requires decontamination to the extent technically and economically feasible.

- The new regulations that the New York Department of Environmental Conservation (NYSDEC) is proposing to adopt for the cleanup of sites contaminated with radioactive materials (NYSDEC 2008) will be compatible with the NRC's License Termination Rule and will be applied as applicable and whenever NYSDEC requires the cleanup of a site contaminated with radioactive material.

RCRA regulations and the License Termination Rule are discussed more fully in Chapter 5 of this environmental impact statement (EIS).

Compliance with these key regulations is discussed in the following sections. The discussion draws on information and analytical results presented in this EIS. Actual determinations of compliance or non-compliance are made by the regulatory authorities in response to documents submitted by the regulated entities. The information and assessments presented in this appendix do not constrain the judgments that will be made by regulators in evaluating compliance for the alternative finally selected.

There are three decommissioning alternatives described in Chapter 2 of this EIS: Sitewide Removal, Sitewide Close-In-Place, and Phased Decisionmaking. The Sitewide Removal Alternative will, by definition, meet NYSDEC requirements for clean closure for RCRA-regulated units, NRC requirements for license termination without restriction for the NRC-regulated portion of the site, and NYSDEC cleanup requirements for the State-licensed Disposal Area (SDA). The actual determination of when removal is adequate for the Sitewide Removal Alternative to meet the various decommissioning requirements would be made through the appropriate NYSDEC and NRC regulatory review processes as noted in Chapter 1, Section 1.5, of this EIS.

While it is conceptually possible that the Sitewide Close-In-Place Alternative could meet NYSDEC, RCRA, and NRC Policy Statement/ License Termination Rule requirements, it is less clear if or under what conditions this alternative would meet these requirements. The balance of this appendix discusses RCRA and Policy

Statement/License Termination Rule requirements that would apply to this alternative and the issues associated with compliance, while drawing (as appropriate) on the information developed as part of this EIS.

A WVDP Decommissioning Plan has been prepared that develops allowable residual contamination levels for those areas where facilities would be removed under Phase 1 of the Phased Decisionmaking Alternative. These residual contamination levels are termed Derived Concentration Guideline Levels (DCGLs) and are based on limiting the dose to a potential onsite receptor to a total effective dose equivalent of 25 millirem per year, the dose standard for unrestricted release in the NRC License Termination Rule. The technical basis for the establishment of these West Valley-specific DCGLs is being reviewed by the NRC. Cleanup/closure activities performed during Phase 1 or under the Sitewide Removal Alternative would be performed in accordance with RCRA closure and/or corrective action requirements, as applicable. This appendix does not discuss Phase 2 of the Phased Decisionmaking Alternative because Phase 2 actions have not been defined. If Phase 2 were removal of the remaining Waste Management Areas (WMAs), the overall alternative would be the same as the Sitewide Removal Alternative. If Phase 2 were close-in-place for the remaining WMAs, it would involve the same issues identified for the Sitewide Close-In-Place Alternative, although they would be slightly reduced because the Main Plant Process Building and the Low-Level Waste Treatment Facility would have been removed under Phase 1. This appendix does not address the No Action Alternative because it is not intended to meet decommissioning requirements.

L.1 Resource Conservation and Recovery Act (RCRA)

Site cleanups under RCRA are conducted under its corrective action and permitting programs. The RCRA corrective action program is used for the corrective action of Solid Waste Management Units (SWMUs) following the process defined in the facility-operating permit or Consent Order, beginning with investigation and ending with the selection and implementation of a remedy. The Corrective Measures Study (CMS) Reports would be prepared by the DOE and/or New York State Energy Research and Development Authority (NYSERDA) for SWMUs identified by NYSDEC or the U.S. Environmental Protection Agency (EPA). These reports would propose a preferred corrective measure alternative for the SWMU, including applicable or appropriate cleanup standards. The CMS Report would be reviewed by NYSDEC and EPA, and a corrective measure alternative would be selected via the required administrative procedures, which would also include providing the public with an opportunity to review and comment.

Under any of the alternatives evaluated in this EIS, SWMUs subject to RCRA permitting ("regulated units") would be remediated pursuant to respective closure standards and requirements as defined in the regulations. A regulated unit-specific closure plan would be prepared by the owner or operator of a particular regulated unit or the organization that would implement the plan on the owner or operator's behalf. The plan would then be submitted to NYSDEC and/or EPA for review and approval. Upon approval, the closure plan would be implemented for the specific regulated unit. Closure standards may be met through a variety of methods, depending upon the type, design, and performance of the unit and whether any wastes remain in place. Clean closure is the method of closure in which all wastes are removed from the regulated unit and the surrounding media. In-place management is the method of closure in which some or all wastes remain in place, generally subjecting the unit to long-term controls. This would generally require both a regulatory variance and a post-closure permit or Order to document the monitoring and maintenance requirements. The closure requirements would usually satisfy the corrective action requirements. However, closed units may be further subject to corrective action requirements, if deemed necessary. Information regarding Solid Waste Management Units and RCRA Interim Status Units is provided in Chapter 2, Table 2–2, of this EIS.

For the Sitewide Close-In-Place Alternative, the acceptable steps to closure for each regulated unit would be the subject of a regulatory review, through a closure plan for each of the regulated units. Because wastes would be left in place under this option, engineered measures (such as a cover) or long-term controls could be

proposed as part of the process. The adequacy of these additional measures would be determined by NYSDEC and/or EPA, as would the need for special administrative provisions, such as a variance to the regulations. It is not clear what the regulators' decisions would be for this alternative, particularly for the units that appear to have the greatest inventory of hazardous constituents (Main Plant Process Building, Waste Tank Farm, NRC-licensed Disposal Area [NDA] and SDA). If such close-in-place actions were authorized for regulated units, it is expected that it would involve a permit with post-closure monitoring and maintenance requirements that would require a review of performance and options on some recurring interval, such as 5 years.

L.2 U.S. Nuclear Regulatory Commission Decommissioning Criteria

The NRC License Termination Rule (10 *Code of Federal Regulations* [CFR] 20, Subpart E) governs the decommissioning of the NRC-licensed portion of the Western New York Nuclear Service Center (WNYNSC). There is flexibility in the License Termination Rule with criteria for unrestricted use (10 CFR 20.1402), criteria for restricted use (10 CFR 20.1403), and alternate criteria (10 CFR 20.1404). In all cases it is necessary to decontaminate to the maximum extent technically and economically feasible. The License Termination Rule is discussed more in Chapter 5 of this EIS.

NRC established decommissioning criteria for WVDP through issuance of a Policy Statement (NRC 2002) under its authority in the WVDP Act, prescribing the License Termination Rule as the decommissioning criteria for WVDP. In this Policy Statement, NRC recognized that decommissioning of the West Valley Site would present unique challenges and acknowledged that the final end-state may involve a long-term, or even a perpetual, license or other innovative approach for some parts of the site where clean up to License Termination Rule requirements would be prohibitively expensive or technically impractical. DOE would document its planned WVDP decommissioning actions and specific cleanup levels in a Decommissioning Plan, which would be reviewed by NRC staff. The NRC Policy Statement on decommissioning criteria for the WVDP is also discussed in Chapter 5 of this EIS.

For the Sitewide Close-In-Place Alternative, there appear to be two primary options under the License Termination Rule: license termination under restricted conditions (CFR 20.1403) and license termination under alternative criteria (CFR 20.1404). While these options are applicable for those portions of the site where waste or contamination is closed-in-place, other portions of the site with minimal residual contamination could be released for unrestricted reuse under the criteria of CFR 20.1402.

The various decommissioning requirements of CFR 20.1403 and CFR 20.1404 include dose standards, standards for institutional controls, and procedural requirements. This appendix only addresses comparison to dose standards. **Table L–1** presents a summary matrix of the regulatory dose standards for the various regulatory options that could be applied to the Sitewide Close-In-Place Alternative.

Table L–1 Summary of U.S. Nuclear Regulatory Commission Dose Standards for Regulatory Options for the Sitewide Close-In-Place Alternative

Regulatory Option	*Dose Standards*	
	Dose Standard Assuming Institutional Controls	***Dose Standard Assuming Immediate Loss of Institutional Controls***
License termination with restriction (10 CFR 20.1403)	25 millirem per year	100/500 millirem per year
License termination under alternate criteria (10 CFR 20.1404)	Up to 100 millirem per year from all manmade sources other than medical	100/500 millirem per year

CFR = *Code of Federal Regulations.*

The balance of this section presents and discusses the result of the dose assessment for the NRC-regulated facilities on WNYNSC under the Sitewide Close-In-Place Alternative. The estimated doses for the situation where it is assumed that institutional controls remain in place are presented first in Section L.2.1.[1]

The estimated doses for the situation where it is assumed that institutional controls fail are presented second in Section L.2.2. Consistent with License Termination Rule compliance guidance (NRC 2006), the analysis assumes loss of institutional controls immediately after license termination. There is uncertainty about when the license might be terminated, so two timeframes are analyzed and presented in the tables. The first assumes license termination immediately following completion of the decommissioning actions. The second assumes license termination after 100 years, a timeframe that might be used to allow for decay of some of the activity in the North Plateau Groundwater Plume or Cesium Prong. It is possible that even longer timeframes might be used to allow for decay prior to license termination, but the effect of these longer timeframes was not analyzed.

L.2.1 Continuation of Institutional Controls

Three offsite receptors, in order of distance from the site, are presented first in this section. They are:

- An individual outside the current site boundary who uses contaminated Cattaraugus Creek water for drinking and irrigation and consumes fish raised in the local Cattaraugus Creek waters;
- An individual along the lower reaches of Cattaraugus Creek near Gowanda who also uses contaminated Cattaraugus Creek water for drinking and irrigation and consumes large amounts of fish raised in the Cattaraugus Creek waters near Gowanda; and
- Lake Erie and Niagara River water users.

In addition to the offsite receptors, a dose estimate for an onsite worker engaged in post close-in-place monitoring and maintenance activities is presented. The dose estimate is based on information from historical measurements for similar activities.

Table L–2 presents the dose to a Cattaraugus Creek receptor immediately outside the current WNYNSC. The total peak annual dose to this receptor from all NRC-regulated facilities/areas is about 0.08 millirem, and the peak would be dominated by the North Plateau Groundwater Plume.

Table L–2 Peak Annual Total Effective Dose Equivalent in Millirem Per Year for Cattaraugus Creek Receptor Outside the Western New York Nuclear Service Center Boundary (years till peak exposure in parentheses) – Continuation of Institutional Controls

Waste Management Areas	*Sitewide Close-In-Place Alternative*
Main Plant Process Building – WMA 1	0.019 (200)
Vitrification Facility – WMA 1	0.000082 (500)
Low-Level Waste Treatment Facility – WMA 2	0.00015 (100)
Waste Tank Farm – WMA 3	0.0029 (200)
NDA – WMA 7	0.018 (6,800)
North Plateau Groundwater Plume	0.072 (79)
Total	0.079 (79)

NDA = NRC-licensed Disposal Area, WMA = Waste Management Area.

[1] *This information for the offsite receptors is a subset of that presented in Chapter 4, Section 4.1.10, of this EIS, but is limited to the NRC-regulated facilities or areas.*

Figure L–1 shows this same information with emphasis on the peak annual dose as a function of time. The Figure shows the near-term peak which occurs in year 100, as well as a later peak from releases from the NDA.

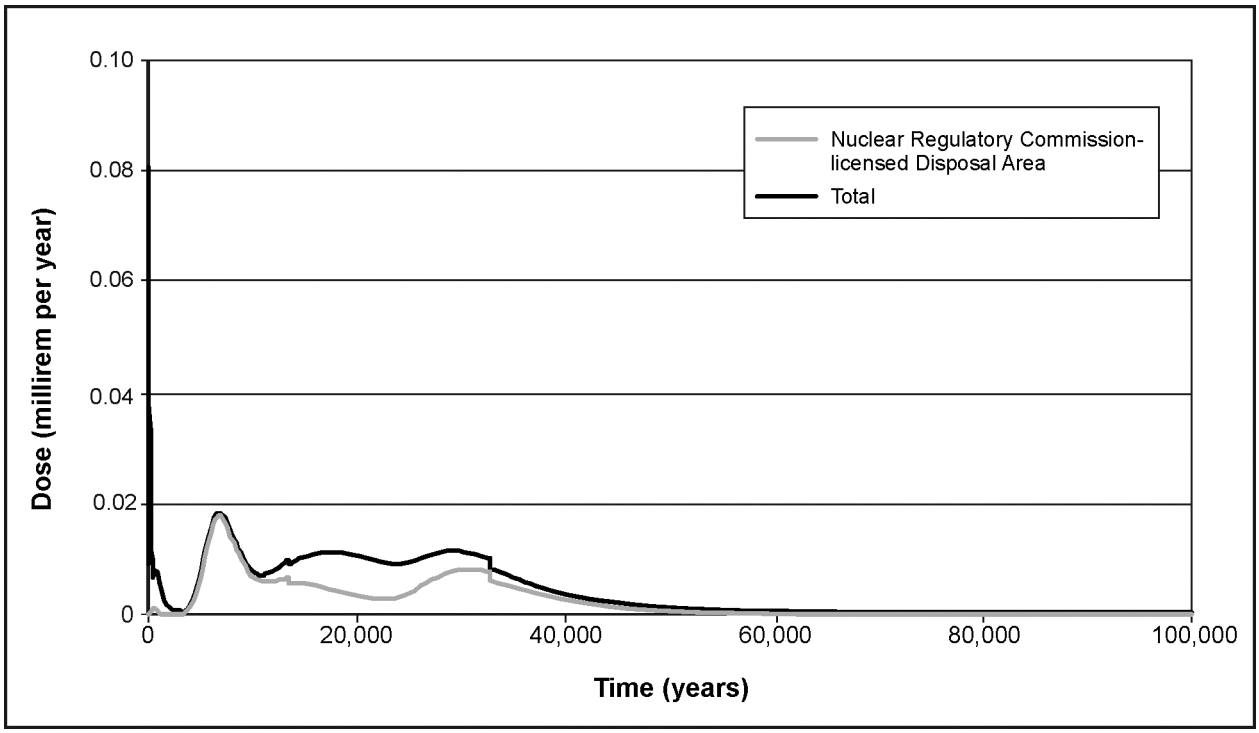

Figure L–1 Annual Dose for the Cattaraugus Creek Receptor for the Sitewide Close-In-Place Alternative with Continuation of Institutional Controls

L.2.1.1 Seneca Nation of Indians Receptor

Table L–3 presents the peak annual dose to the Seneca Nation of Indians receptor. The total peak annual dose to this receptor is slightly higher than the dose for the Cattaraugus Creek receptor because of the higher assumed fish consumption rate. The total peak annual dose is about 0.1 millirem per year and would be dominated in the first few hundred years by releases from the North Plateau Groundwater Plume and the Main Plant Process Building.

Table L–3 Peak Annual Total Effective Dose Equivalent in Millirem Per Year for Seneca Nation of Indians Creek Receptor Near Gowanda (years till peak exposure in parentheses) – Continuation of Institutional Controls

Waste Management Areas	*Sitewide Close-In-Place Alternative*
Main Plant Process Building – WMA 1	0.052 (200)
Vitrification Facility – WMA 1	0.0002 (500)
Low-Level Waste Treatment Facility – WMA 2	0.00029 (100)
Waste Tank Farm – WMA 3	0.0027 (200)
NDA – WMA 7	0.048 (6,800)
North Plateau Groundwater Plume	0.093 (78)
Total	0.11 (78)

NDA = NRC-licensed Disposal Area, WMA = Waste Management Area.

L.2.1.2 Lake Erie/Niagara River Water User

The Lake Erie/Niagara River water user that would receive the highest dose would be a Sturgeon Point water user because this intake structure would have less dilution than water from other intake structures. The peak annual dose for this receptor is presented in **Table L–4**. This receptor is assumed to drink water from Lake Erie, to eat fish from Lake Erie, and raise produce in a garden irrigated with water from Sturgeon Point. The small total peak annual dose (0.026 millirem per year) would be dominated by releases from the North Plateau Groundwater Plume.

Table L–4 Peak Annual Total Effective Dose Equivalent in Millirem Per Year for Sturgeon Point Water User (years till peak exposure in parentheses) – Continuation of Institutional Controls

Waste Management Areas	*Sitewide Close-In-Place Alternative*
Main Plant Process Building – WMA 1	0.0021 (200)
Vitrification Facility – WMA 1	0.000011 (500)
Low-Level Waste Treatment Facility – WMA 2	0.000036 (100)
Waste Tank Farm – WMA 3	0.0012 (200)
NDA – WMA 7	0.0019 (30,600)
North Plateau Groundwater Plume	0.024 (80)
Total	0.026 (80)

NDA = NRC-licensed Disposal Area, WMA = Waste Management Area.

L.2.1.3 Site Worker

Site workers would be responsible for monitoring and maintenance activities after the site is closed-in-place. The peak annual dose to such a worker has been estimated based on a review of historical exposure recorders for workers that have done work including environmental monitoring and grounds maintenance (WVES 2008). The estimated annual dose to site workers is estimated to be in the range of 10 to 20 millirem per year.

L.2.1.4 Conclusion about Peak Annual Dose with Continuation of Institutional Controls

The analysis of future offsite receptors indicates that the peak annual dose to an average member of the critical group (receptors outside the current site boundary) for the Sitewide Close-In-Place Alternative would be well below 25 millirem per year. The historical information on the occupational exposure to site monitoring and maintenance workers suggests that the annual dose to monitoring and maintenance workers who would work at the site following implementation of the Sitewide Close-In-Place actions would be below 25 millirem per year.

L.2.2 Loss of Institutional Controls

Multiple scenarios have been analyzed in Appendix H of this EIS. For this presentation, the scenarios are organized according to the estimated time for the scenario to develop, from shortest to longest. These specific scenarios and an estimate of the scenario duration are presented in **Table L–5**. As discussed earlier, two times for these intruder scenarios are analyzed in this appendix. The first analysis assumes the intruder scenario occurs immediately after completion of the decommissioning activities, and would be consistent with a license termination immediately after decommissioning. The second analysis assumes the intruder scenario occurs 100 years after completion of the decommissioning actions. This second analysis would be consistent with an assumption that the license was terminated after 100 years, a strategy that could be used for management of areas such as the Cesium Prong or North Plateau Groundwater Plume, where the contaminating radionuclide has a moderately short half-life (30 years or less).

Table L–5 Exposure Scenarios and Estimated Scenario Development Time

Scenario	*Estimated Scenario Development Time*
Well driller (Section L.2.2.1)	On the order of a few weeks
Resident farmer (with or without a well) (Section L.2.2.2)	1 – 2 years
Erosion (Section L.2.2.3)	Many hundreds of year of unmitigated erosion

L.2.2.1 Well Driller

Table L–6 presents the doses to an intruder worker assumed to be a well driller. For the well driller, exposure pathways include inadvertent ingestion of contaminated soil, inhalation of contaminated dust, and direct exposure to contaminated water in a cuttings pond.

Table L–6 Peak Annual Total Effective Dose Equivalent in Millirem Per Year for Well Driller – Loss of Institutional Controls

Waste Management Areas	*Sitewide Close-In-Place Alternative – Immediate License Termination*	*Sitewide Close-In-Place Alternative – License Termination After 100 Years*
Main Plant Process Building – WMA 1	Not applicable	Not applicable
Vitrification Facility – WMA 1	Not applicable	Not applicable
Low-Level Waste Treatment Facility – WMA 2	8.6	1.7
Waste Tank Farm – WMA 3	Not applicable	Not applicable
NDA – WMA 7	Not applicable	Not applicable
North Plateau Groundwater Plume	0.000002	2×10^{-9}

NDA = NRC-licensed Disposal Area, WMA = Waste Management Area.

The projected peak annual dose to the well driller in the area of the Low-Level Waste Treatment Facility is 8.6 millirem per year if the license is terminated immediately after completion of the Sitewide Close-In-Place decommissioning actions. A well driller in areas other than the Low-Level Waste Treatment Facility and North Plateau Groundwater Plume was not analyzed because it was assumed that well drilling equipment would not be placed over areas protected by multi-layered engineered barriers with rock on the sides and top.

L.2.2.2 Resident Farmer (with or without a well)

Three types of resident farmers are presented in this section. The first is a resident farmer along Buttermilk Creek below the confluence with Franks Creek. This receptor is assumed to experience the impacts of releases from all the WMAs on the North and South Plateaus. The second is a resident farmer who places a well directly into a WMA that is not covered by an intrusion barrier for the Sitewide Close-In-Place Alternative. The third is for a resident farmer who places a well downgradient of a WMA. This scenario is particularly relevant for WMAs that have engineered multi-layer caps that would make direct intrusion more difficult.

Resident Farmer on Buttermilk Creek

A resident farmer was analyzed for the lower reaches of Buttermilk Creek. This receptor would use contaminated water in the lower reaches of Buttermilk Creek for drinking and irrigation and would consume fish assumed to be raised in the local contaminated waters. The results of this analysis are presented in **Table L–7**.

Table L–7 Peak Annual Total Effective Dose Equivalent in Millirem Per Year for Buttermilk Creek Receptor (years till peak exposure in parentheses) – Loss of Institutional Controls

Waste Management Areas	*Sitewide Close-In-Place Alternative – Immediate License Termination*	*Sitewide Close-In-Place Alternative – License Termination After 100 Years*
Main Plant Process Building – WMA 1	0.15 (200)	0.15 (200)
Vitrification Facility – WMA 1	0.00062 (500)	0.00062 (500)
Low-Level Waste Treatment Facility – WMA 2	0.00079 (500)	0.00079 (500)
Waste Tank Farm – WMA 3	0.022 (200)	0.022 (200)
NDA – WMA 7	0.13 (6,800)	0.13 (6,800)
North Plateau Groundwater Plume	0.54 (79)	0.34 (100)
Total	0.59(79)	0.39 (100)

NDA = NRC-licensed Disposal Area, WMA = Waste Management Area.

The predicted peak annual dose to the Buttermilk Creek Receptor is less than 1 millirem per year and is dominated by releases from the North Plateau Groundwater Plume for both the immediate license termination and the delayed license termination analysis.

Resident Farmer Using Contaminated Soil

Table L–8 presents the doses to the resident farmer as a result of direct contact with contamination that would be brought to the surface and placed in a garden following a well drilling or house construction scenario. The highest dose is to the farmer whose garden is contaminated by cuttings from the Low-Level Waste Treatment Facility. These peak doses would occur in the year of license termination.

Table L–8 Estimated Peak Total Effective Dose Equivalent in Millirem Per Year for Resident Farmer whose Garden Contains Contaminated Soil from Well Drilling or House Construction (years till peak exposure in parentheses) – Loss of Institutional Controls

Waste Management Areas	*Sitewide Close-In-Place Alternative – Immediate License Termination*	*Sitewide Close-In-Place Alternative – License Termination After 100 Years*
Main Plant Process Building – WMA 1	Not applicable	Not applicable
Vitrification Facility – WMA 1	Not applicable	Not applicable
Low-Level Waste Treatment Facility – WMA 2	120 (1)	12 (100)
Waste Tank Farm – WMA 3	Not applicable	Not applicable
NDA – WMA 7	Not applicable	Not applicable
North Plateau Groundwater Plume	0 (1)	0 (100)
Cesium Prong	44 (1)	4.4 (100)

NDA = NRC-licensed Disposal Area, WMA = Waste Management Area.

Resident Farmer Using Contaminated Groundwater

Table L–9 presents the doses to the resident farmer whose contact with the waste would be through an indirect pathway – the use of contaminated water. The receptors for the North Plateau facilities (Main Plant Process Building, Low-Level Waste Treatment Facility, Waste Tank Farm, and North Plateau Groundwater Plume) are assumed to have wells in the sand and gravel layer on the North Plateau about 100 meters (330 feet) downgradient from the edge of the WMA. The scenario is not applied to the NDA because of the low hydraulic conductivity of the unweathered Lavery till and the unsaturated conditions in the Kent Recessional Sequence.

Table L–9 Estimated Peak Total Effective Dose Equivalent in Millirem Per Year for Resident Farmer using Contaminated Groundwater (years till peak exposure in parentheses) – Loss of Institutional Controls

Waste Management Areas	*Sitewide Close-In-Place Alternative – Immediate License Termination*	*Sitewide Close-In-Place Alternative – License Termination After 100 Years*
Main Plant Process Building – WMA 1	366 (200)	366 (200)
Vitrification Facility – WMA 1	1.9 (412)	1.9 (412)
Low-Level Waste Treatment Facility – WMA 2	113 (82)	110 (100)
Waste Tank Farm – WMA 3	556 (200)	556 (200)
NDA – WMA 7	Not applicable	Not applicable
North Plateau Groundwater Plume	24,760 (1)	846 (100)
Cesium Prong	44 (1)	4.4 (100)

NDA = NRC-licensed Disposal Area, WMA = Waste Management Area.

The dose is greatest for the resident farmer with a well in the North Plateau Groundwater Plume, but there is a noticeable decrease with time for this situation due to decay, and the dose would decrease to levels below 100 millirem per year after 125 years as shown in **Figure L–2**. The dose is greater than 100 millirem per year for wells downgradient of the Main Plant Process Building, the Low-Level Waste Treatment Facility, and the Waste Tank Farm, but there is not as noticeable a decrease in the dose from these wells with a delay in license termination.

The time series of dose for the North Plateau Groundwater Plume under the Sitewide Close-In-Place Alternative is presented in Figure L–2 for receptors at 100 and 300 meters (330 and 980 feet) from the source of the plume. The figure illustrates how sensitive the dose is to the time at which the intrusion occurs and where the intruder places his well. The peak doses in Table L–9 come from the receptor at 300 meters (980 feet). The distance of 100 meters (330 feet) is in the vicinity of the peak concentration of the Plume at the first year of the period of analysis and just outside of the downgradient slurry wall for the Sitewide Close-In-Place Alternative. The distance of 300 meters is located just upgradient of the North Plateau drainage ditch, the first location of discharge of the Plume to the surface.

L.2.2.3 Loss of Institutional Controls Leading to Unmitigated Erosion

Erosion is recognized as a site phenomenon, so a bounding erosion scenario (unmitigated erosion where no credit is taken for monitoring and maintenance of erosion control structures) was analyzed to estimate the dose to various receptors. The erosion scenarios presented here are the same ones analyzed in Appendix H of this EIS, although the timeframe for initiation of unmitigated erosion in this analysis is consistent with the assumptions stated earlier in this appendix. The scenarios for erosion in the area of the NDA and Low-Level Waste Treatment Facility are presented in an order consistent with their distance from the industrialized portion of the site.

NDA Resident/Recreational Hiker

Table L–10 presents the peak annual total effective dose equivalent (TEDE) for the resident/recreational hiker for the Low-Level Waste Treatment Facility and the NDA if unmitigated erosion of the site were allowed to take place. Exposure modes for a hiker include inadvertent ingestion of soil, inhalation of fugitive dust, and exposure to direct radiation. The peak annual dose for this receptor is not sensitive to the timing of license termination.

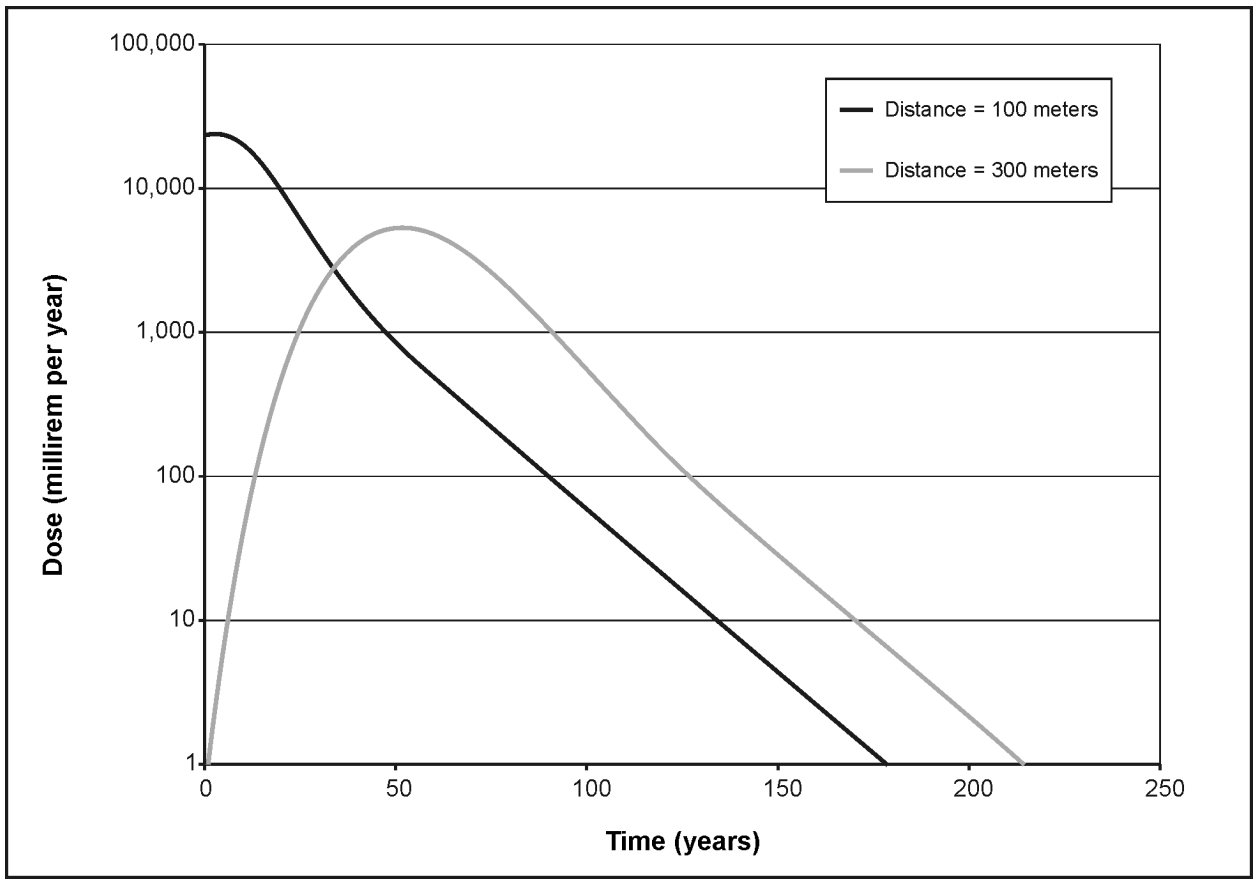

Figure L–2 Time Series of Dose for Onsite Receptors for North Plateau Groundwater Plume Under Sitewide Close-In-Place Alternative

Table L–10 Peak Annual Total Effective Dose Equivalent in Millirem Per Year for a Resident/Recreational Hiker Near the Low-Level Waste Treatment Facility and NRC-licensed Disposal Area – Unmitigated Erosion Scenario (years till peak exposure in parentheses)

Waste Management Areas	*Sitewide Close-In-Place Alternative – Immediate License Termination*	*Sitewide Close-In-Place Alternative – License Termination After 100 Years*
Low-Level Waste Treatment Facility	36 (122)	36 (122)
NDA – WMA 7	10 (500)	10 (500)
Total	36 (122)	36 (122)

NDA = NRC-licensed Disposal Area, WMA = Waste Management Area.

Buttermilk Creek Resident Farmer

Table L–11 presents the peak annual TEDE to a Buttermilk Creek resident farmer given unmitigated erosion at the Low-Level Waste Treatment Facility and NDA. A receptor at this location would experience a dose contribution from both the Low-Level Waste Treatment Facility and NDA, but the peaks are in the future and occur in very different timeframes. The greater peak is associated with the NDA.

Table L–11 Peak Annual Total Effective Dose Equivalent in Millirem Per Year for a Buttermilk Creek Resident Farmer – Unmitigated Erosion Scenario (years till peak exposure in parentheses)

Waste Management Areas	*Sitewide Close-In-Place Alternative – Immediate License Termination*	*Sitewide Close-In-Place Alternative – License Termination After 100 Years*
Low-Level Waste Treatment Facility	16 (156)	16 (156)
NDA – WMA 7	342 (725)	342 (725)
Total	342 (725)	342 (725)

NDA = NRC-licensed Disposal Area, WMA = Waste Management Area.

Cattaraugus Creek Resident Farmer

Table L–12 presents the peak annual TEDE from the Low-Level Waste Treatment Facility and NDA for the Cattaraugus Creek resident farmer for the unmitigated erosion scenario.

Table L–12 Peak Annual Total Effective Dose Equivalent in Millirem Per Year for Cattaraugus Creek Receptor Outside the Western New York Nuclear Service Center Boundary - Unmitigated Erosion Scenario (years till peak exposure in parentheses)

Waste Management Areas	*Sitewide Close-In-Place Alternative – Immediate License Termination*	*Sitewide Close-In-Place Alternative – License Termination After 100 Years*
Low-Level Waste Treatment Facility	2 (156)	2 (156)
NDA – WMA 7	45 (725)	45 (725)
Total	45 (725)	45 (725)

NDA = NRC-licensed Disposal Area, WMA = Waste Management Area.

The results for this receptor show a similar pattern to that seen for the Buttermilk Creek resident farmer, but the doses are lower because of the reduced contaminant concentrations further downstream.

An illustration of how the peak annual dose to the Cattaraugus Creek receptor would vary as a function of time for the Sitewide Close-In-Place Alternative is presented in **Figure L–3**. The figure shows the near-term peak for erosion of the Low-Level Waste Treatment Facility and the later peak for erosion of the NDA. The dose-time curve would have a similar pattern for all three downstream receptors but the magnitude of the peaks will vary.

Seneca Nation of Indians Receptor

A Seneca Nation of Indian receptor is postulated to use Cattaraugus Creek near Gowanda for drinking water and to consume large quantities of fish raised in these waters. The peak annual dose for this receptor is presented in **Table L–13**.

As noted above, the dose-time pattern for the Seneca Nation of Indians receptor is similar to that seen for the other downgradient water users, but the numerical values of the peaks are greater as a result of the higher assumed fish consumption rates.

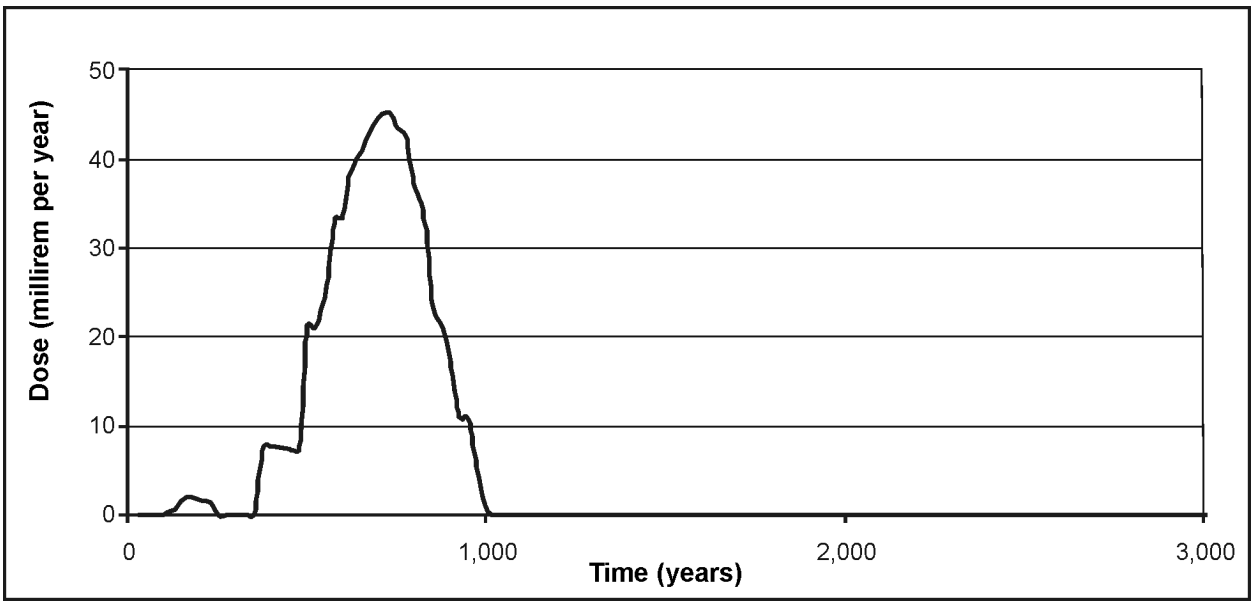

Figure L–3 Annual Total Effective Dose Equivalent (millirem per year) for the Cattaraugus Creek Receptor as a Function of Time – Unmitigated Erosion Scenario

Table L–13 Peak Annual Total Effective Dose Equivalent in Millirem Per Year for the Postulated Seneca Nation of Indians Receptor – Unmitigated Erosion Scenario (years till peak exposure in parentheses)

Waste Management Areas	*Sitewide Close-In-Place Alternative – Immediate License Termination*	*Sitewide Close-In-Place Alternative – License Termination After 100 Years*
Low-Level Waste Treatment Facility	4 (156)	4 (156)
NDA – WMA 7	107 (725)	107 (725)
Total	107 (725)	107 (725)

NDA = NRC-licensed Disposal Area, WMA = Waste Management Area.

Lake Erie Water User

In addition to the Cattaraugus Creek and Seneca Nation of Indians receptors, the peak annual dose for a Sturgeon Point water user has been prepared for the unmitigated erosion release scenario. These are summarized in **Table L–14**. Again, two separate peaks are shown, with releases from the NDA producing the higher dose level.

Table L–14 Peak Annual Total Effective Dose Equivalent Dose in Millirem Per Year for a Sturgeon Point Water User – Unmitigated Erosion Scenario (years till peak exposure in parentheses)

Waste Management Areas	*Sitewide Close-In-Place Alternative – Immediate License Termination*	*Sitewide Close-In-Place Alternative – License Termination After 100 Years*
Low-Level Waste Treatment Facility	0.39 (156)	0.39 (156)
NDA – WMA 7	6.9 (725)	6.9 (725)
Total	6.9 (725)	6.9 (725)

NDA = NRC-licensed Disposal Area, WMA = Waste Management Area.

Dose from Multiple Sources

The previous discussion presented information on the dose to various receptors from individual WMAs. There is the potential for receptors to come in contact with contamination from multiple areas and therefore experience higher doses than those from a single WMA. The highest doses are generally for resident farmers who use contaminated water near a specific WMA (Table L–9). It is conceivable that a single well on the North Plateau could intercept contamination from multiple sources. The information in Table L–9 suggests there may be combined impacts for plumes that have peaks that occur during similar timeframes.

The greatest potential for a dose from multiple sources appears to be a water well on the North Plateau that would intercept the plume from both the Main Plant Process Building and the Waste Tank Farm. The peak dose for the Main Plant Process Building and Waste Tank Farm is estimated to occur around year 200 for both WMAs (see Table L–9). A conservative estimate of the combined dose from the Main Plant Process Building and the Waste Tank Farm would be about 900 millirem per year (366 from Main Plant Process Building and 556 from the Waste Tank Farm).

Other combinations for the Sitewide Close-In-Place Alternative appear to have much less potential for high doses. The thick engineered caps limit the peak annual dose for drilling or home construction scenarios to a few millirem, doses which are small in comparison to the doses from using contaminated water.

L.2.2.4 Conclusions about Sitewide Close-In-Place Alternative Compliance with License Termination Rule Dose Criteria

Assuming the area of institutional controls is consistent with the current site boundary, the analysis in this section indicates that the Sitewide Close-In-Place Alternative could comply with the dose criteria that apply when institutional controls are in effect.

The analysis also indicates that, in some cases, the Sitewide Close-In-Place Alternative could exceed the dose criteria for situations involving the loss of institutional controls. In both cases, the determination of what constitutes the License Termination Rule compliance scenarios and what are justifiable assumptions for the long-term performance will be critical in determining whether the dose criteria are met.

These issues, along with compliance with the decommissioning requirements for institutional controls and procedural requirements, would be addressed and resolved as part of the Decommissioning Plan preparation and review process.

L.3 Radiological Decommissioning of the State-licensed Disposal Area

It is expected that the SDA would continue to be regulated via a Part 380 permit and a New York State Department of Health license. Decommissioning criteria that would apply for a close-in-place option for the SDA have not been established. The 6 NYCRR Part 384 regulations being developed by NYSDEC (NYSDEC 2008) could apply to the SDA, but it is not clear that these regulations would accommodate a close-in-place option. The outreach for public comments on the planned 6 NYCRR Part 384 did not mention the SDA.

L.4 References

NRC (U.S. Nuclear Regulatory Commission), 2002, *Decommissioning Criteria for the West Valley Demonstration Project (M-32) at the West Valley Site; Final Policy Statement*, 67 *Federal Register* 5003, Washington, DC, February 1.

NRC (U.S. Nuclear Regulatory Commission), 2006, *Consolidated Decommissioning Guidance*, NUREG-1757, Volume 2, Rev. 1, Washington, DC, September.

NRC (U.S. Nuclear Regulatory Commission), 2007, *Radiological Criteria for License Termination*, 10 CFR Part 20, Subpart E, Washington, DC, January.

NYSDEC (New York State Department of Environmental Conservation), 2008, *Public Outreach for Proposed Regulation 6 NYCRR Part 384, New Regulations for Cleanup of Radioactively Contaminated Sites* (accessed August 29, 2008, http://www.dec.ny.gov/ chemical/42047.html), February 11.

WVES (West Valley Environmental Services) 2008, Personal communication (Email) from K. Mortensen, West Valley Environmental Services, to R. Steiner, Washington Safety Management Solutions, Subject: EIS Dose Information, September 3.