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APPENDIX 4.4-2 STRUCTURAL PERFORMANCE REMEDIAL ACTION PLAN

TABLE OF CONTENTS

Section Title	Page
1.0 PURPOSE.....	3
2.0 REGULATORY REQUIREMENTS.....	3
3.0 PLAN OBJECTIVES.....	3
4.0 ORGANIZATIONAL STRUCTURE AND RESPONSIBILITIES.....	4
5.0 LIMITING VALUES.....	4
6.0 REMEDIAL ACTIONS.....	4
6.1 Strain.....	5
6.2 Settlement	5
6.3 Joint Meters.....	5
6.4 Moisture Content in the Performance Cover	5
6.5 Moisture Content in the Vadose Zone Soils	6
6.6 Erosion	6

1.0 PURPOSE

Structural performance will have a long-term effect on the performance of the LLRW disposal facility performance cover and liner systems. The performance of structures used in support of the LLRW disposal will be monitored to verify design assumptions and satisfactory performance.

The Structural Performance Remedial Action Plan (SPRAP) provides guidance for those activities that will be required if there is an exceedance in the monitoring parameters defined in the Structural Performance Monitoring Plan (SPMP). This plan provides guidance and direction in the remedial actions of the structural components of the LLRW disposal facility to restore the structural components to a functionally satisfactory condition. Once those components are returned to that state, monitoring will continue to ensure that the structural components will satisfactorily meeting the design parameters related to the safety and performance of the facility.

2.0 REGULATORY REQUIREMENTS

TCEQ rule 30 TAC §336.730(b) states “Wastes designated as containerized Class A, Class B, or Class C under §336.362(a) of this title or §336.702 of this title (relating to Definitions) shall be disposed of in the following manner:

(2) in such a manner that the waste can be monitored and retrieved;

TCEQ recommends the use of guidance offered by NUREG/CR-5041 Vol. 2 and NUREG-1200 by monitoring containerized Class A, Class B, and Class C wastes through the structural performance of the structure holding the waste. It should be noted that all of NUREG/CR-5041 Vol. 2 and the portions of NUREG-1200 that discuss structural performance monitoring and remedial action were created specifically for either below-ground vaults or earth-mounded concrete bunkers, neither of which are being utilized at the WCS LLRW disposal site. Therefore, it is important to consider this and exercise caution in applying the guidance from these NUREGs.

When the structure reaches a limiting value based on design assumptions, an appropriate response is required in order to provide reasonable assurance that the performance objectives of Sub-part C of 10 CFR Part 61 are met.

3.0 PLAN OBJECTIVES

The primary objective of the SPRAP is to provide appropriate responses to remediate portions of the disposal site whose measured structural-related performance exceeds the limiting value provided in the SPMP (Appendix 4.4-1).

This plan works in coordination with Appendix 7.3.2, “Early Warning and Corrective Action Plan,” and the other LLRW monitoring plans for the purpose of meeting the objectives of 10 CFR Part 61 subpart C. The other monitoring plans are listed below:

- Environmental Monitoring Plans – Appendix 2.10.1-2, Appendix 2.10.2-2
- Construction Monitoring Plan – Section 4.4
- Structural Monitoring Plan – Appendix 4.4-1

- Closure Monitoring – Appendix 6.1.2-1
- Post-Closure Monitoring – Appendix 7.1.1
- Institutional Control Monitoring – Appendix 7.2.2

4.0 ORGANIZATIONAL STRUCTURE AND RESPONSIBILITIES

As appropriate, duties will be given to:

- General Manager
- Quality Assurance Manager
- Environmental Safety and Health Director
- Health and Safety Manager
- Environmental and Regulatory Compliance Manager
- Radiation Safety Officer
- Operations Manager – Support Operations
- Operations Manager – Disposal Operations
- Operations Supervisor
- Operators
- Contractors (Excavation, Construction, etc.)

5.0 LIMITING VALUES

The limiting values that will prompt a remedial action are listed in the Structural Performance Monitoring Plan (Appendix 4.4-1); refer to the SPMP for those values.

The SPMP also describes the types of instruments that will be installed and utilized, as well as their operating limits. The SPMP also describes where the instruments will be installed within the disposal site and gives their expected service life.

6.0 REMEDIAL ACTIONS

Remedial actions will depend on the nature and extent of the problem. To quote from NUREG/CR-5041 2.6.2.8, “Appropriate responses may include no action, increased monitoring, or completion of remedial actions. These responses should be explicitly identified and justified.”

The following remedial actions will be implemented when a limiting value is exceeded. These limiting values are given in the Structural Performance Monitoring Plan, Appendix 4.4.-1. The actions are listed according to the parameter being monitored, namely strain, settlement, joint movement, and moisture content in the performance cover, moisture content in the vadose zone, and erosion. In the even that a limiting value is exceeded and a remedial action is executed, the necessary reporting and documentation will be done in strict accordance with Texas regulations.

6.1 Strain

If the level of strain in the strain monitors exceeds the limiting value provided in Appendix 4.4-1, the following remedial action will be taken.

If an exceedance occurs, the site operator will increase the frequency of groundwater monitoring and leachate collection monitoring. After the layers of cover layers are placed, water is the primary potential mode of transport. Because the cover layers are explicitly designed to prevent infiltration of water, it is anticipated that there will be no leachate once the cover layers are placed. But in the event of strains exceeding the limiting value, this extra monitoring activity will ensure that no radioactive or chemical material has been transported through the groundwater.

6.2 Settlement

If the level of settlement in the final cover exceeds the limiting value provided in Appendix 4.4-1, the following remedial action will be taken.

If an exceedance occurs, clean fill material will be brought in to raise the area of settlement. This will bring the settled area back to the proper finished grade, ensure proper runoff, and prevent ponding. Standing water on the disposal site is undesirable and therefore this mitigative action would be important.

If an exceedance occurs that is well beyond the values provided in Appendix 4.4-1, a capable team of engineers, geologists, and other pertinent professionals and managers will be organized and brought to the site to perform an investigation. They will determine the cause and the extent of the failure and establish a proper course of action. The details of a remedial action for this type of event cannot be determined at this point in time because the course of action will largely depend upon the nature, cause, and extent of the settlement.

6.3 Joint Meters

Because the cover layers are designed to prevent infiltration of water, it is anticipated that there will be no leachate once the cover layers are placed. In the event that joint displacement values exceed the limiting value, the likelihood of water infiltration through a joint will be increased. Since water is the most likely mode of contaminant transport, water entering the disposal units would be a cause for concern.

If the measurement of displacement in the joint meter exceeds the limiting value provided in Appendix 4.4-1, the following remedial action will be taken. If an exceedance occurs, the site operator will increase the frequency of groundwater monitoring and leachate collection monitoring. This extra monitoring activity will ensure that no contaminants have been transported into the groundwater.

6.4 Moisture Content in the Performance Cover

If the moisture content of the soil at the bottom of the performance cover of the disposal site exceeds the action level provided in Appendix 4.4-1, remedial action will be taken. An exceedance would indicate inadequate soil compaction in the portion of the performance cover that was placed above the sensor, as described in the SPMP.

If an exceedance occurs, the remedial action will be as follows. The portions of the performance cover and other layers (if already installed) above the sensor will be removed and stockpiled for reconstruction. The sensor will remain in place for future use as long as the sensor remains in working condition. If the sensor is not in working condition then it will be replaced with a new sensor. The performance cover will then be reinstalled, and extra care will be taken to ensure that proper compaction is achieved. The other cover layers will then be reconstructed above the performance cover and this portion will be monitored as described in the Structural Performance Monitoring Plan (Appendix 4.4-1) to ensure that the performance cover is preventing infiltration of water as designed.

6.5 Moisture Content in the Vadose Zone Soils

If the measurement of moisture content in the vadose zone exceeds the limiting value provided in Appendix 4.4-1, the following remedial action will be taken. If an exceedance occurs, the corrective action will be executed as contained in Section 5.0 of Appendix 7.3.2, “Early Warning and Corrective Action Plan.”

6.6 Erosion

If the amount of measured erosion exceeds the limiting value provided in Appendix 4.4-1, an investigation will be undertaken to discover the cause and determine a course of action to prevent future erosion. Possible corrective actions could include replacing eroded soil with the native conditioned soil, replacing the eroded soil with a more robust surface, such as several inches of gravel, or replacing the soil and adding more vegetation to prevent future erosion.