

### **3.0 – CLOSURE PLAN**

#### **3.1 CLOSURE STRATEGY/SCHEDULE**

This section describes the final cover construction, site capacity, schedule of closure implementation, estimated costs for closure, and final inspection procedures for the existing and future Phases at ISL.

The Director will be notified in writing at least 60 days prior to the anticipated last receipt of waste in accordance with R315-302-3(4)(a). Implementation of the final closure Phase will begin within 30 days after last receipt of waste. Final closure of the entire landfill will be completed within 180 days of implementation of closure activities unless an extension has been granted by the Director.

Closure will occur incrementally. Each landfill Phase will be closed once it has been filled to design capacity and has reached final design elevation. The following table summarizes by landfill Phases the remaining landfill capacity and projected dates of service starting from January 1 of 2021.

<b>Landfill Phase</b>	<b>Net Airspace Remaining (cubic yards)</b>	<b>Projected Date of Completion</b>
Phase I	16,487,678	2037
Phase II	12,990,404	2048
Phase III	9,871,416	2059
Phase IV	5,993,347	2066
Phase V	3,047,489	2073

The "net" volumes shown in the previous table reflect the volume available for MSW and C&D waste, assuming 25% of the gross volume will be consumed by daily and intermediate cover soils.

To estimate the landfill life and project the timing of constructed projects; engineering assumptions about the extent of each Phase were made to be able to calculate volumes. The length of time that each Phase will be in service will depend upon the day to day operation of the landfill and will vary from the specific dates of closure presented above. It may be

necessary, due to site access requirements, to partially fill future Phases to allow for final waste placement within a particular Phase.

The first closure construction is anticipated to occur once Phase II is to final grade in 2048. The rest of the closure constructions are anticipated to occur incrementally as each of the landfill phases reach final elevation.

### **3.2 FINAL COVER DESIGN AND INSTALLATION**

A preliminary design package consisting of drawings, specifications, and QA/QC plan will be prepared and submitted to the State of Utah DWMRC for review and approval prior to each final cover construction event. A final closure certification package will be issued prior to final closure of the facility to ensure compliance with federal and state regulations effective at the time of closure. The conceptual final cover design described herein is in accordance with current State of Utah regulations and RCRA Subtitle D criteria. The final cover system is designed to control the emission of landfill gas, promote the establishment of vegetative cover, minimize infiltration and percolation of water into the waste, and minimize the erosion of the final cover soils throughout the post-closure care period and beyond. Drawing 3, Drawing 4, and Drawing 5 (Appendix A) show the final topography for the landfill.

As discussed previously, the final covers will consist of a minimum of 18" of  $1 \times 10^{-5}$  soils and an additional six-inch layer of topsoil. Cover slopes will not be steeper than a 4:1 maximum slope for all areas of the ISL. Minimum slopes shall be no flatter than 20:1 (5%).

### **3.3 SEED, FERTILIZER AND MULCH**

The 6-inch vegetative layer of the cap will be seeded with a mixture of grasses suitable for fast growth in the region, then fertilized and mulched.

TRM's (turf reinforcement mats) will typically be placed in areas of concentrated runoff and/or drainage channels, as necessary.

Early establishment of vegetation on the landfill's final slope surface will impede soil erosion and promote evapotranspiration. ISL will periodically evaluate vegetative growth, vigor, and color so that the integrity of the final cover system is maintained. If stress signs on vegetation caused by landfill gas or if leachate seeps are noted, the problem will be corrected. Corrective procedures will be conducted based on current design recommendations and will be built

consistent with construction specifications. ISL staff or a licensed landscape contractor will make repairs, as necessary.

### **3.4 LANDSCAPING**

The landfill facility, including all surrounding grounds, will be maintained in conjunction with any scheduled maintenance activities (i.e., road improvements, etc.). The landscape of the landfill will be designed to be both functional and aesthetically pleasing.

### **3.5 FINAL COVER CONTOURS**

The landfill's final grades will be inspected and maintained in order to ensure its integrity and conformity with the conceptual final cover plans. The final surface of the ISL has been designed with a 4H: 1V slope and a minimum slope of 5%.

Any areas where water has collected (ponded) will be regraded. Erosion damage resulting from extremely heavy rainfall will be repaired. ISL staff will inspect the final grading no less than quarterly.

### **3.6 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)**

For construction of the final landfill cover, drawings, specifications, and QA/QC procedures will be developed by a Utah licensed Professional Engineer and submitted to the State of Utah DWMRC for review and approval prior to construction of each closure Phase.

### **3.7 CLOSURE COST ESTIMATES**

The current cost estimates for the closure of the ISL operation is provided in Appendix J – Closure/Post Closure Costs.

### **3.8 CERTIFICATION OF CLOSURE AND RECORD KEEPING**

A Utah licensed Professional Engineer will be retained to supervise closure of each of the development Phases. The registered engineer will be employed by Iron County or will be an Iron County hired consultant and will certify the landfill was closed according to the closure plan. Any amendment or deviation to the closure plan will be approved by the Director and any associated permit modifications will be made. Final closure work and documentation will be observed and reviewed by DWMRC personnel, as necessary.

As part of the certification process, the engineer shall also provide closure as-built drawings to the Director within 90 days following completion of closure activities.

Additionally, the final plats and the amount and location of waste will be recorded on the property title with the notarized plat filed with the County Recorder within 60 days following final closure.

## **4.0 – POST-CLOSURE CARE PLAN**

### **4.1 MONITORING PROGRAM**

Post closure activities will begin when closure is approved by the Director. The following presents the post-closure plan for the ISL facility. The following subsections offer a description of the monitoring program, which includes groundwater monitoring, leachate, and gas collection systems.

#### **4.1.1 Groundwater Armstrong and Lindsey Pits**

Groundwater is currently monitored in the Armstrong Pit as detailed in the approved Groundwater and Leachate Monitoring Plan (Appendix E). ISL will continue a groundwater monitoring program as required for the 30-year post-closure care period. No groundwater monitoring is required or performed at the Lindsey Pit.

#### **4.1.2 Surface Water**

Although no surface water sampling activities are scheduled for the landfill, ISL staff will inspect the drainage system no less than quarterly. Temporary repairs to any observed damage will be made until permanent repairs can be scheduled. ISL or a licensed general contractor will replace drainage facilities, if necessary.

#### **4.1.3 Leachate Collection and Treatment**

##### **4.1.3.1 Armstrong Pit**

A leachate collection system was neither required nor installed during utilization of the unlined landfill.

##### **4.1.3.2 Lindsey Pit**

A leachate collection system was neither required nor installed during utilization of the unlined landfill.

#### **4.1.4 Landfill Gas**

Landfill gas monitoring wells have not been installed at the ISL site. Landfill gas is monitored at

operator level around the site perimeter to monitor explosive landfill gas emissions from both the Armstrong and Lindsey Pits. The perimeter of each Pit, as well as all structures at the site, will be monitored quarterly to ensure compliance with State regulations regarding explosive landfill gas.

During post-closure; ISL landfill personnel or a contracted company will be responsible for the gas observations at the facility perimeter and facility structures. Monitoring will occur no less often than quarterly and will be conducted more often if the need arises. In the event that a sample exceeds the regulatory level, ISL personnel will notify the DWMRC immediately and undertake appropriate corrective actions.

As outlined in R315-303-3(5), ISL will take all the necessary steps to protect human health and will immediately notify UDEQ of explosive gas levels detected above allowable levels and actions to be taken. Also, within 7 days of incident, ISL will place in the operating record documentation of the explosive gas levels detected and a description of the interim steps taken to protect human health. Within 60 days of detection, ISL personnel will implement a remediation plan for the explosive gas releases, place a copy of the plan in the operating record, and notify UDEQ that the plan has been implemented. The remediation plan will describe the nature and extent of the problem and the proposed remedy.

## **4.2 MAINTENANCE PROGRAM**

The following subsections offer a description of the maintenance of installed equipment, including groundwater monitoring systems and leachate and gas collection systems.

### **4.2.1 Monitoring Systems**

#### **4.2.1.1 Groundwater**

All current and future groundwater monitoring wells will be inspected for signs of failure or deterioration during each sampling event. If damage is discovered, the nature and extent of the problem will be recorded. A decision will be made to replace or repair the well. Possible repairs include redevelopment, chemical treatment, partial casing replacement or repair, sealing the annulus, or pumping and testing. If a well needs to be replaced, it will be properly abandoned. Damaged wells will be scheduled for repair or replacement.

#### **4.2.1.2 Surface Water**

Drainage control problems can result in accelerated erosion of a particular area within the landfill. Differential settlement of drainage control structures can limit their usefulness and may result in a failure to properly direct storm water off-site.

Implementation of a post-closure maintenance program will maintain the integrity of the final drainage system throughout the post-closure maintenance period. The final surface water drainage system will be evaluated and inspected, no less than quarterly, for ponded water and blockage of, or damage to, drainage structures and swales. Where erosion problems are noted or drainage control structures need repair, proper maintenance procedures will be implemented as soon as site conditions permit so that further damage is prevented. Damaged drainage pipes and broken ditch linings will be removed and replaced.

ISL staff will inspect the drainage system no less than quarterly. Temporary repairs will be made until permanent repairs can be scheduled. ISL or a licensed general contractor will replace drainage facilities.

#### **4.2.1.3 Leachate Collection and Treatment**

No systems are installed; therefore, no maintenance is required.

#### **4.2.1.4 Landfill Gas**

No systems are installed; therefore, no maintenance is required. If gas collection systems are installed in the future due to air quality requirements, those systems will be maintained as recommended by designing engineer.

#### **4.2.1.5 Final Grading**

The landfill cover final grade will be inspected no less than quarterly and maintained in order to preserve its integrity. Evaluation and inspection of the cover final grades will include evaluations of vegetation and overall system performance. At the completion of closure activities, the surface of the cover will be surveyed to provide a reference point for monitoring settlement.

Areas where water has collected (ponded) will be regraded. Erosion damage resulting from extremely heavy rainfall will be repaired.

#### **4.2.2 Cover and Run-On/Run-Off Systems**

The final cover system will incorporate features to manage storm water, minimize erosion, and provide for efficient removal of storm water. The constructed cap will convey collected water via earthen dikes, swales, and drainage channels away from the landfill cover.

Placement of all permanent drainage facilities will be completed during, or immediately following, installation of the final soil cover.

#### **4.3 SCHEDULE OF POST-CLOSURE ACTIVITIES**

Post-closure activities, consisting of monitoring and maintaining the final cover and permanent drainage facilities, will be implemented once the facility has reached final capacity and landfill disposal operations have ceased.

#### **4.4 POST CLOSURE COST ESTIMATES**

Updated cost estimates for post-closure care for the ISL facilities are presented in Appendix J – Closure/Post Closure Costs.

#### **4.5 CHANGES TO RECORD OF TITLE, LAND USE, AND ZONING**

ISL will notify the Iron County Recorder's Office at any such time when there is a change to the Record of Title, land use plan, or zoning restrictions. In addition, ISL will notify the Recorder at that time when the post-closure care period has expired.

#### **4.6 POST CLOSURE FACILITY CONTACTS**

For all post-closure care information; all contact will be through the Iron County Commission or a designee. Contact with Iron County officials will be at the following number:

Iron County Courthouse..... (435) 477-8300

#### **4.7 POST CLOSURE LAND USE**

Iron County will select an end use that will be limited to those that do not threaten the integrity of the existing control systems. All activities will be approved by the appropriate cities/agencies prior to implementation. Typical end uses range from recycling operations (which complement existing operations) to recreational activities. Since the closure of the first landfill site may be over 50 years away, it is not currently possible to develop those land use plans to be consistent with surrounding land uses and the needs of the area that may be relevant at that future time.